

**ENTREPRENEURIAL INTENSITY:
THE INFLUENCE OF ANTECEDENTS TO
CORPORATE ENTREPRENEURSHIP IN FIRMS
OPERATING IN SOUTH AFRICA**

by

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DECLARATION OF OWN WORK

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

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ABSTRACT

The turbulent, rapidly changing knowledge economy has forced enterprises to become more entrepreneurial in order to capitalise on new opportunities and to create value. Previous research has shown the financial and non-financial benefits of corporate entrepreneurship (CE), but the implementation and management of CE remains problematic. Despite heightened awareness and interest by both scholars and practitioners in studying and better understanding entrepreneurship within large organisations, CE is still regarded as an emerging field of inquiry. Furthermore, limited research has thus far been conducted on CE and entrepreneurial intensity (EI) in the South African context. A review of the CE literature revealed a research gap that culminated in the following research question: How do the antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa?

To address the research question stated above a literature review of antecedents to CE, and entrepreneurial intensity was conducted, and an empirical study was executed. The literature review emphasised five salient internal antecedents to CE: management support for CE; autonomy of employees; rewards for CE; time and resource availability; and flexible organisational boundaries. The external antecedents which influence CE were identified as munificent, opportunity-rich environments, and hostile environments filled with threats. Other factors that also play a role in influencing the level of entrepreneurship in enterprises are the type of industry, size and age of a company, managerial influence and the role of the individual in the CE process. The level of entrepreneurship was defined as entrepreneurial intensity, a function of frequency and degree of entrepreneurship.

To address the research problem, empirical cross-sectional telephone surveys were conducted in two stages. The sample selected for the study was companies active in e-business operating in South Africa and aware of innovation practices. Two groups of companies were identified, namely JSE companies and Information and Communication Technology (ICT) companies. The key respondent targeted in JSE companies was the Information Technology (IT) Manager or the Chief Information

Office (CIO), while the Chief Executive Officer (CEO) or Sales Manager was the key respondent in ICT companies. The population consisted of 715 companies. The response rate for first stage of the study was 44%, while the response rate was 20% for the second stage of the study. Measurement instruments were adapted, developed and revised where necessary to ensure the reliability and validity of the data. The collected data were analysed using descriptive and inferential statistics.

The findings indicated that internal antecedents to CE have a significantly stronger influence on degree of entrepreneurship than munificent, external factors. This finding underlines the important role managers can play in providing a supportive climate for CE. The prominent internal antecedents in this study were management support for CE, autonomy of employees and rewards for CE. The findings also emphasised the importance of a positive, munificent business climate, as perceived by managers inside the organisations. Furthermore, the findings suggested that the more frequently enterprises act entrepreneurially, the higher their degree of entrepreneurship should be. Differences in EI, degree of entrepreneurship, internal and external antecedents were also discernable between JSE and ICT companies, with ICT companies showing higher levels of entrepreneurship than JSE companies. Moreover, the findings suggested that the size of a company did not influence EI, but the age of companies showed a negative relationship with EI, degree of entrepreneurship and the internal antecedents to CE. It appears that as companies become older, their internal environments become less supportive of entrepreneurial behaviour.

The most important contribution of this study is the testing of CE-theories in the South African context. The managerial implications of the behavioural model tested in the study are that top and middle management could create a supportive environment for CE, while munificent environments encourage entrepreneurial behaviour. Measurement instruments have been developed, which may be used by managers, consultants and other researchers to measure these phenomena in future. Furthermore, the findings suggest that there are country differentials with regard to CE, while opportunities for further research were also identified.

UITTREKSEL

Die turbulente, vinnig veranderende kennisekonomie het ondernemings gedwing om meer entrepreneursies te word sodat nuwe geleenthede benut en waarde geskep kan word. Vorige navorsing het aangetoon dat korporatiewe entrepreneurskap (KE) verskeie finansiële en nie-finansiële voordele inhou, maar die implementering en bestuur van KE bly problematies. Ten spyte van die verhoogde bewustheid en belangstelling deur beide akademië en praktisyns om entrepreneurskap in groot organisasies te bestudeer en beter te verstaan, word KE steeds as 'n ontluikende studieveld beskou. Verder is slegs beperkte navorsing tot dusver oor KE en entrepreneursiese intensiteit (EI) in die Suid-Afrikaanse konteks uitgevoer. 'n Oorsig van die KE-literatuur het 'n navorsingsgaping aangetoon, wat gelei het tot die volgende navorsingsvraag: Hoe beïnvloed die fasiliterende faktore tot KE die entrepreneursiese intensiteit van ondernemings aktief in e-besigheid, in Suid-Afrika?

Om hierdie navorsingsvraag te beantwoord, is 'n literatuuroorsig uitgevoer oor die fasiliterende faktore van KE en om entrepreneursiese intensiteit te identifiseer. Verder is 'n empiriese ondersoek ook onderneem. Die literatuuroorsig het vyf belangrike interne fasiliterende faktore tot KE beklemtoon, naamlik bestuursondersteuning vir KE, outonomie van werknemers, belonings vir KE, die beskikbaarheid van tyd en ander hulpbronne asook buigsame organisasiegrense. Die eksterne fasiliterende faktore wat KE beïnvloed, is geïdentifiseer as milddadige ("*munificent*"), geleenthedsryke omgewings asook vyandige omgewings, wat vol bedreigings is. Ander faktore wat ook die vlak van entrepreneurskap beïnvloed, is die tipe industrie, ouderdom en grootte van die onderneming, die invloed van bestuur en die rol van die individu in die KE-proses. Die vlak van entrepreneurskap is gedefinieer as entrepreneursiese intensiteit, 'n funksie van frekwensie en graad van entrepreneurskap.

Om die navorsingsprobleem aan te spreek, is empiriese kruisseksionele telefoononderhoude in twee stadia gevoer. Die steekproef wat vir die studie gekies is, was maatskappye aktief in e-besigheid, in Suid-Afrika en bewus van innovasiepraktyke. Twee groepe maatskappye is geïdentifiseer, naamlik JSE- en Informasie- en Kommunikasietegnologie (IKT) maatskappye. Die sleutelrespondent wat in JSE-maatskappye geïdentifiseer is, was die Informatietegnologie (IT) bestuurder of die Hoofinligtingsbeampte (HIB), terwyl die Hoof Uitvoerende Beampte (HUB) of Verkoopsbestuurder die sleutelrespondent in IKT-maatskappye was. Die

populasie het uit 715 maatskappye bestaan. Die responskoers vir die eerste stadium van die studie was 44%, terwyl die responskoers 20% vir die tweede stadium van die studie was. Meetinstrumente is aangepas, ontwikkel en hersien waar nodig om die betroubaarheid en geldigheid van die data te verseker. Die versamelde data is met behulp van beskrywende en inferensiële statistiek ontleed.

Die bevindinge het aangedui dat die interne fasiliterende faktore tot KE 'n beduidende sterker invloed op die graad van entrepreneurskap uitoefen as milddadige, eksterne faktore. Hierdie bevinding beklemtoon die belangrike rol wat bestuurders kan speel om 'n ondersteunende klimaat vir KE te skep. Die prominente interne fasiliterende faktore in hierdie studie was bestuursondersteuning vir KE, outonomie van werknemers en belonings vir KE. Die bevindinge beklemtoon ook die belangrikheid van 'n positiewe, milddadige besigheidsklimaat, soos waargeneem deur bestuurders binne die onderneming. Verder is bevind dat hoe meer gereeld ondernemings entrepreneurs optree, hoe hoër sal die graad van entrepreneurskap wees. Verskille in EI, graad van entrepreneurskap, interne en eksterne fasiliterende faktore was ook waarneembaar tussen JSE- en IKT-maatskappye, met IKT-maatskappye wat hoër vlakke van entrepreneurskap getoon het as JSE-maatskappye. Verder is bevind dat die grootte van 'n maatskappy nie EI beïnvloed nie, maar die ouderdom van maatskappye toon wel 'n negatiewe verhouding met EI, die graad van entrepreneurskap en die interne faktore tot KE. Dit wil voorkom asof namate maatskappye ouer word, hul interne omgewings minder ondersteunend vir entrepreneuriese gedrag word.

Die belangrikste bydrae van hierdie studie is die toetsing van KE-teorieë in die Suid-Afrikaanse konteks. Die bestuursimplikasies van die gedragsmodel wat in die studie getoets is, is dat top- en middelvlakbestuur 'n ondersteunende omgewing vir KE kan skep, terwyl milddadige omgewings ook entrepreneuriese gedrag fasiliteer. Meetinstrumente is ontwikkel wat bestuurders, konsultante en ander navorsers kan gebruik om hierdie verskynsels in die toekoms te meet. Verder suggereer die bevindinge dat daar verskille tussen lande bestaan met betrekking tot toepaslikheid van KE-teorieë, terwyl geleenthede vir toekomstige navorsing ook geïdentifiseer is.

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TO GOD BE THE GLORY!

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CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

The increasing rate of global change is forcing many large firms to re-examine their strategies in order to maintain their competitive positions (Pascale, 1999; Bullinger, Lenten & Scholtz, 2000:1470; Leibold, Probst & Gibbert, 2002; Rigby, 2003). Corporate entrepreneurship, intrapreneurship, renewal, corporate venturing and innovation have been proposed as antidotes to the sluggish growth businesses experience, because of their beneficial effect on revitalisation and performance of firms (see Schollhammer, 1982; Pinchot, 1985; Zahra, 1991; Struwig, 1991; Zahra & Covin, 1995; Wiklund, 1999; Zahra & Garvis, 2000; Goosen, 2002). South African businesses, especially in the manufacturing and services sectors, have experienced intensified competition and declining growth due to globalisation (Visser, 2003). Some of the challenges facing South African businesses are the need for economic growth, the need to improve the country's international competitiveness, and the innovation imperative, especially in the area of e-business (NRF, 2004; Porter, 2004; Hartley & Worthington-Smith, 2004). It appears that corporate entrepreneurship (CE) may contribute to addressing the challenges of economic growth, international competitiveness and capacity for innovation.

Heightened awareness of and interest by both scholars and practitioners in studying and better understanding entrepreneurship within large organisations led to the development of CE as a field of inquiry. A review of the body of CE research revealed certain research gaps, such as the lack of research into CE in the South African context (Scheepers & Hough, 2004). For example, only two doctoral studies on CE have been completed in South Africa (see Struwig, 1991; Goosen, 2002).

Since CE could make a positive contribution to economic growth, international competitiveness and the innovation imperative in e-business, a clear understanding of what CE entails and how it should be implemented is essential. In this context, the

study identified the antecedents of CE from the literature, and surveyed companies operating in South Africa to ascertain how these antecedents influenced the entrepreneurial intensity these companies exhibited.

This chapter provides the background to the research problem, defines key concepts and describes the research problem. Subsequently it describes the methodology, specifies the delimitations and scope of the study and provides an outline of the study.

1.2 BACKGROUND

To provide a background to the research problem, this section first describes the changing global business landscape and demonstrates the relevance of entrepreneurship in this context. Additionally, it describes some of the challenges facing South Africa, and finally points out the challenging nature of corporate entrepreneurship, often driven by an innovation strategy.

1.2.1 THE CHANGING BUSINESS LANDSCAPE

Global mega-trends are leading to increasing levels of complexity, dynamism and uncertainty in the corporate environment (Amidon, 1997; Bullinger *et al.*, 2000:1470; Nayager & Van Vuuren, 2003:2). In an uncertain economy, businesses need effective strategies that enable them to thrive (Cap Gemini, Ernst & Young, 2000). Traditional management approaches have been rendered ineffective by the rapid changes in the knowledge economy (Allee, 2000; Leibold *et al.*, 2002), while to remain competitive businesses need to practise systemic innovation in this fast-changing, knowledge-driven global business landscape (Beinhocker, 1999; Pascale, 1999).

Systemic innovation requires companies to reinvent their business models to create and maintain competitive advantage (Hamel & Välikangas, 2003). In addition, systemic innovation enables existing enterprises to renew themselves. It is thus crucial to businesses' long-term success to maintain their ability to innovate in a systemic manner (Pearce, Kramer & Robbins, 1997; Crossan & Berdrow, 2003). This

type of innovation requires businesses to embark on entrepreneurial activities (Zahra & Garvis, 2000), and by means of CE activities and innovation, renewal is possible.

Innovation generates new products, processes, and organisation systems that set the company apart from its rivals. Another advantage of innovation is that the firm's knowledge base is revised, allowing it to develop new competitive approaches to achieve growth and profitability (Zahra & Garvis, 2000). Drucker (2002) argues that innovation is the specific instrument of entrepreneurship, but the question arises as to what role CE should play in the economic health of the firm and the economy. The following sections examine the role CE could play in the South African context.

1.2.2 THE ROLE OF CORPORATE ENTREPRENEURSHIP

CE is an important element in organisational and economic development (Antoncic & Hisrich, 2001). Entrepreneurial behaviours and attitudes are key determinants of the ability of large firms to survive and prosper in turbulent environments (Lumpkin & Dess, 1996). A number of studies have found that there is a positive relationship between firms' CE activities and their long-term organisational performance (see Zahra & Covin, 1995; Wiklund, 1999; Covin & Miles, 1999; Goosen, DeConing & Smit, 2002).

Additionally, many authors have discussed entrepreneurship as a means to economic growth and global competitiveness, for example Morris and Lewis (1991); Drucker (2002) and Kuratko and Hodgetts (2004). Birch (1979, 1987) has provided evidence that entrepreneurial ventures are responsible for as much as 85% of the growth in employment in the United States in recent years (Morris & Sexton, 1996). Grulke and Silber (2001) agree and argue that the lack of innovation in a country is directly reflected in economic performance. They further maintain that in the 1960s, South Africa's gross domestic product (GDP) represented 6% of world GDP. Today that figure is less than 0.5%, though the South African economy has never shrunk. They conclude that South Africa has simply been "out-innovated" by other nations.

1.2.3 CHALLENGES FACING SOUTH AFRICA

Some of the challenges facing South Africa are to develop sustainable economic growth, to improve its international competitiveness, and to build the country's capacity for innovation, especially in the e-business arena. According to Rwigema and Venter (2004), such an economy would have the capacity to generate wealth. The previous section has already demonstrated the role that CE may play in creating jobs and economic growth. This section focuses on the role businesses could play in improving South Africa's international competitiveness; and the importance of building and sustaining the country's capacity for innovation in the e-business arena.

1.2.3.1 International competitiveness

Middle-income countries such as South Africa need to improve their international competitiveness if sustainable economic growth and development is to occur (Porter, 2004:31). The world's economies are in the process of being transformed and integrated as a result of globalisation (Hough, 2004); a major factor of competitiveness identified by businesses is the increased need to operate globally (Gamble & Blackwell, 2002). South African businesses too have experienced intensified competition (Visser, 2003) and the need to build a sustainable competitive advantage.

Competitiveness at the level of the enterprise is of the utmost importance, since it affects the profitability, survival and future development of the enterprise (Porter, 2004:30). The management of technology, innovation and information has emerged as a key requirement for success in the 21st century (NRF, 2004). This view is supported by research conducted by the World Economic Forum (Porter, 2004; Claros, Altinger, Blanke, Drzeniek & Mia 2006), and the authors of the Business Competitiveness Index (BCI). According to the BCI, which examines the micro economic foundation of countries' prosperity, South Africa was ranked 28th out of 100 countries in 2004; 30th out of 113 countries in 2005; and 33rd out of 121 countries in 2006. The profile of the country fits those of other middle-income countries, and therefore faces similar competitive challenges. The main competitive challenges of middle-income countries are to build brands, to expand regional and international markets, to increase the professionalism of employees and management, and to create the capacity for innovation and technology absorption (Porter, 2004; Claros *et al.*, 2006).

1.2.3.2 The innovation imperative in e-business

According to the South African National Research Foundation (NRF, 2004) the capacity for science and technology in this country has not been adequately translated into innovative and dynamic enterprises. A sound scientific and technological base from which wealth-creating technological innovations and applications could develop is essential to improve economic growth in South Africa, operating as it does in an increasingly global competitive landscape. The ability to innovate is imperative for South African companies.

The Department of Science and Technology conducted a survey in 2004 to determine the intensity of Research and Development (R&D) expenditure in South Africa (Department of Science & Technology, 2004). The R&D expenditure as a percentage of GDP is the most widely used indicator of the economic competitiveness of countries, and is closely linked to the level of innovation that businesses exhibit (OECD, 2003). The results of the survey indicated that South Africa's gross R&D expenditure is 0.76% of GDP. The R&D expenditure of Sweden, the leader in the OECD, is equivalent to 4.27% of GDP. Even though South Africa has a higher R&D intensity (0.76% of GDP) than many other developing countries, it needs to keep pace with competitor countries where R&D expenditure is increasing rapidly. The stated goal of the South African government is to improve the figure to 1% of GDP (Department of Science & Technology, 2004). The innovation imperative is emphasised when viewed against the background of R&D expenditure.

In South Africa, the innovation imperative is especially pertinent in the e-business arena. E-business is seen as information exchanges, commercial or administrative transactions between individuals, businesses and government that take place via an information and communication technology (ICT) based, computer-mediated network (Moodley, 2002). The e-business innovation imperative is reinforced by inadequate competitor differentiation (Scheepers, 2005), the growth of e-business (Hartley & Worthington-Smith, 2004) and the promise e-business holds for a developing country such as South Africa (World Trade Organisation, 1998). 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 prevails and the majority of companies fail to use the latest technology to gain a sustainable competitive advantage (Scheepers, 2005; Minniti, Bygrave & Autio, 2005). The result of this lack of innovation can lead to the obsolescence of products and loss of competitive advantage for businesses. For example, stand alone e-business technologies such as e-mail, instant messaging, mobile wireless services and integrated speech and voice systems are fast transforming the traditional way in which businesses and employees communicate (Botha, 2007:40), and have rendered paging and facsimile systems obsolete.

Secondly, innovation-intensive growth is exemplified by new information and communication technologies (ICTs) such as the Internet and Internet applications like e-business. The Information and Communication Technology (ICT) sector has been identified in the National Research and Development Strategy (2002) as one of the “lead sectors” in innovation and economic growth (Mbeki, 2002:1). The industry is expected to show growth rates in excess of 10% in the next three years (Economist Intelligence Unit Survey, 2005). Annual innovations within this industry are reported in the *e-Business Handbook* (Hartley & Worthington-Smith, 2004). These innovations are recognised and elaborated upon in concrete and practical terms in the annual e-business survey, but it appears that limited attention is given to the entrepreneurial processes that take place to turn ideas into innovations.

Thirdly, the e-business innovation imperative is underlined by the facilitating role e-business plays by fostering greater networking in the economy, and making faster diffusion of ideas and knowledge possible (Moodley, 2003:557). The adoption of e-commerce applications is promoted in the developing world as a systemic innovation offering manufacturing firms a new exchange mechanism that enables them to compete on a more equal basis in world markets. “E-commerce optimists” view the potential of e-commerce applications as enabling developing countries to gain access to global markets, to reduce barriers to market entry, facilitate low-cost access to international bidding and to obtain information on import restrictions, customs regulations and potential demand (Moodley & Morris, 2004:155).

These three factors illustrate that the e-business arena presents many opportunities for innovation in South Africa. According to Allen, in an interview with Planting (2004), there is no inherent reason why a country such as South Africa should not be acknowledged for e-business innovation. What is missing is the entrepreneurial flair needed to capture and process ideas. Hall, also interviewed by Planting (2004),

cautions that South African companies need to set realistic goals for the levels of innovation they aim to master. A realistic objective is applied innovation, i.e. taking existing knowledge and building on it, rather than innovating from scratch.

However, Sharma (1999) emphasises that simply adopting an e-business innovation strategy will not guarantee success, since the implementation of such a strategy is often challenging.

1.2.4 THE CHALLENGING NATURE OF CORPORATE ENTREPRENEURSHIP

Even though the popular business press accentuates the need for innovation (Stones, 2004; Planting, 2004; Hof, 2004; Liebenberg, 2004), two surveys point to the challenging nature of innovation. In the first instance, Bain and Company's 2003 Management Tools survey found that though innovation was singled out as an important antidote to sluggish growth, most companies (65%) were concerned about how they would meet their growth targets (Rigby, 2003). In the second instance, the Strategos Survey (2004) found that despite innovation being viewed as critically important by the majority of senior executives, most companies rate themselves poorly at implementing innovation. Fahden (1998) terms this the "innovation gap".

Mokoena (1999) also describes this "innovation gap", and refers to it as an "organisational paradox". The paradox also centres on the implementation issue: how can a sense of innovation, autonomy and entrepreneurship be encouraged despite organisational trappings? Also, how are large and seemingly bureaucratic organisations to create an environment that will foster entrepreneurship and innovation? (Cornwall & Perlman, 1990; Sharma, 1999). These questions are discussed in more detail when the research problem is presented in Section 1.4. Key terms will be defined before the research problem is stated and discussed.

1.3 DEFINITIONS

Certain key terms will be used repeatedly in the study and thus need to be defined. These terms are corporate entrepreneurship (CE), entrepreneurial intensity (EI), antecedents to CE and e-business.

1.3.1 CORPORATE ENTREPRENEURSHIP

Broadly speaking, CE refers to the development of new business ideas and opportunities within large and established corporations (Birkinshaw, 2003:3). A number of terms are used to describe this type of entrepreneurship within existing organisations, such as corporate entrepreneurship (Zahra, 1993; Dess, Lumpkin & McGee, 1999); corporate venturing (VonHippel, 1977; Burgelman, 1983, Altman & Zacharckis, 2003); intrapreneuring (Pinchot, 1985; Goosen, 2002); internal corporate entrepreneurship (Burgelman, 1984; Jones & Butler, 1992); internal entrepreneurship (Schollhammer, 1982; Vesper, 1984); strategic renewal (Guth & Ginsberg, 1990; Crossan & Berdrow, 2003); and venturing (Hornsby, Naffziger, Kuratko & Montagno, 1993).

In an attempt to eliminate the confusion regarding CE terminology, Sharma and Chrisman (1999:18) define CE as the “process whereby an individual or a group of individuals, in association with an existing organisation, create a new organisation or instigate renewal or innovation within that organisation”. For the purposes of this study the above definition of Sharma and Chrisman (1999) is accepted.

1.3.2 ENTREPRENEURIAL INTENSITY (EI)

There are certain levels of entrepreneurship in every organisation. Thus the question arises; how do we determine how entrepreneurial a given organisation is? Morris and Kuratko (2002:48) define entrepreneurial intensity as a function of the degree and frequency of entrepreneurship (see Figure 4.1).

A number of authors (Morris & Sexton, 1996:6; Antoncic & Hisrich, 2001:198-499) point out that the degree of entrepreneurship consists of three key dimensions: innovativeness, risk-taking, and proactiveness. The first dimension, innovativeness, refers to the creation of new products, services and technologies. The second dimension, risk-taking, involves the willingness to commit significant resources to opportunities which have an uncertain outcome and return on the investment. These risks can be minimised by the knowledge an entrepreneur or company has of the

opportunity, and by technology, unique capabilities or networks. The third dimension of entrepreneurship, proactiveness, reflects top management's orientation to pursuing enhanced competitiveness and includes initiative, competitive aggressiveness and boldness. Entrepreneurial firms will act, rather than react, to their changing environments (Morris & Kuratko, 2002).

Frequency refers to the number of times organisations act entrepreneurially (e.g. develop new products, services, processes or businesses), and thus firms also vary in terms of the frequency of entrepreneurship (Morris & Sexton, 1996). Figure 4.1 illustrates five sample positions, and combines different levels of the degree and frequency of entrepreneurship.

1.3.3 ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP (CE)

According to the *American Heritage Dictionary* (2003), the term "antecedent" refers to a preceding occurrence or event. The literature on CE has identified two main sets of antecedents to CE. The first group of antecedents refers to a set of *internal* factors pertaining to the organisation, and the second group of antecedents refers to a set of *external* factors, which influence the environment in which the organisation conducts its business. The *internal* factors refer to aspects such as organisational leadership, communication, culture, systems, structures, processes, people and the availability of resources (see Section 3.2). The *external* factors refer to environmental variables and industry characteristics (see Section 3.3).

1.3.4 E-BUSINESS

E-business is best understood as the use of ICT in conjunction with the organisational and management advances that pull the technology and are pushed by it in turn. The term e-business has no widely accepted definition, but Moodley (2002:70) defines e-business as "any form of commercial or administrative transaction or information exchange that takes place via an ICT-based, computer-mediated network." E-business is ultimately about using ICTs to enable networks of communication, knowledge sharing, and information processing that take place both within and between organisations. E-business thus entails the application of the Internet to the complete value chain of business processes (Botha, 2007).

E-business is primarily due to six significant transformations in the global economy:

- (1) the globalisation of markets;
- (2) the shift towards an economy based on knowledge and information;
- (3) the growing prominence of ICTs in the economy;
- (4) innovations in business organisations (such as just-in-time production, total quality management, and knowledge management);
- (5) the liberalisation of the telecommunication sectors, especially in the OECD countries; and
- (6) technological innovations such as email, the World Wide Web, internet browsers, and the expansion in the volume and capacity of communication networks (such as, optic fibre, digital subscriber line technologies and satellites) (Moodley, 2002).

Among the principal technologies directly enabling modern e-business are: computer networking and telecommunications; client/server computing, multimedia, and hypermedia in particular; information retrieval systems; electronic data interchange (EDI); message handling and workflow management systems; groupware and electronic meeting systems; and public key cryptography. However, it would be incorrect to view e-business largely as a technological development (Botha, 2007).

E-business can be used to link government, business and consumer markets. For instance, firms, individuals and governments can use electronic infrastructure to exchange information and acquire goods and services. This study focuses on B2B (business-to-business) and B2C (business-to-consumer) transactions.

In summary, the changing business landscape has rendered traditional management approaches insufficient and highlighted the need for CE and innovation. Some of the challenges facing South Africa are to develop sustainable economic growth, to improve its international competitiveness and build the country's capacity for innovation, especially in the e-business arena. Although e-business innovations are recognised and showcased in the annual e-business survey conducted by Trialogue, limited attention is paid to the entrepreneurial processes that take place to turn ideas into innovations. Companies experience an "innovation gap" or "organisational paradox" in the sense that they realise the importance of innovation, but experience the implementation of innovation as problematic. Thus the question raised in Section 1.2.4 remains: how can large, seemingly bureaucratic organisations create an environment that will foster entrepreneurship and innovation? In the following section

the research problem will be discussed and a response will be sought to the above question.

1.4 RESEARCH PROBLEM AND RESEARCH QUESTIONS

The background scope indicated a research gap that culminated in the following research question:

How do the antecedents to corporate entrepreneurship influence the entrepreneurial intensity of firms active in e-business operating in South Africa?

Essentially, this study argued that the level of entrepreneurial intensity (EI) would vary depending on the antecedents that inhibit or enhance CE. To address this research question, a literature review of antecedents to CE and entrepreneurial intensity was conducted, and an empirical study was executed.

1.4.1 AIMS AND HYPOTHESES

The purpose of the study is to determine how the antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa.

The proposed study, by means of the literature review, aims to:

- establish whether certain company characteristics influence EI
- ascertain the nature of the relationship between degree and frequency of entrepreneurship, which in turn determines EI
- establish how internal antecedents to CE influence EI
- determine how external antecedents to CE influence EI
- determine the relationships between various constructs, namely internal and external antecedents to CE and EI.

As previously pointed out (see Section 3.2), EI is a function of the degree of entrepreneurship and the frequency of entrepreneurship. Thus a composite index of EI was calculated, consisting of the degree and frequency of entrepreneurship. In the

methodology and results chapters (see Chapters 5 and 6); hypotheses (see Section 5.2), based on the primary goal and secondary aims of the study, were assessed using this composite index.

Perry (1998:70) recommends that after the presentation of the research problem and a brief summary of how it would be solved, the following section should present the major bodies of theory whence the research problem would be approached.

1.4.2 MAJOR BODIES OF THEORY CONSULTED

Entrepreneurship as a field of study is still in an emergent stage (Busenitz, West, Shepherd, Nelson, Chandler & Zacharakis, 2003:304). Phan (2004:217) argues that the search for a distinctive theory of entrepreneurship continues, while Aldrich and Baker (1997) claim that the field of entrepreneurship has made only limited progress toward disciplinary status in a normal science framework. However, Busenitz *et al.*, (2003:296) point out that as an emerging field of inquiry, entrepreneurship is in the process of seeking boundaries and legitimacy, in addition to which Dess, Ireland, Zahra, Floyd, Janney and Lane (2003) point out that CE, too, is an emerging field.

As a field of inquiry, CE has grown from both the entrepreneurship and the strategic management fields of study, because it has the ability to revitalise established companies and renew their ability to compete in a global environment (Zahra & Garvis, 2000). A number of authors (Zahra, Nielson & Bogner, 1999; Floyd & Woolridge, 1999; Covin & Miles, 1999; Hult & Ketchen, 2001) have suggested that entrepreneurship is an organisational capability that contributes to the creation of unique resources enabling companies to build a sustainable competitive advantage (Dess *et al.*, 1999:96). As discussed before (see Section 1.2.2), CE positively affects long-term organisational performance.

Schick (2002:39) argues that the term “capabilities” spans from technological and production capabilities over organisational to dynamic capabilities. The attributes considered and related to dynamic capabilities are strategic, organisational and managerial capabilities. Teece, Pisano and Shuen (1997) argue that dynamic capabilities such as entrepreneurship and innovation, are difficult for competitors to

imitate, and could thus help create a competitive advantage for the firm - capabilities evolved from the resource-based view (RBV) of the firm (Schick, 2002:38).

The resource-based view of the firm (RBV) is grounded in economics, and explains how a company's resources drive its performance in a dynamic, competitive environment. The RBV combines the internal analysis of phenomena within companies with the external analysis of the industry and the competitive environment. The RBV sees companies as different collections of physical and intangible assets and capabilities. No two companies are alike because no two companies have had the same set of experiences, acquired the same assets and skills, or built the same organisational cultures (Collis & Montgomery, 1995:160).

These assets and capabilities determine how efficiently and effectively a company performs its functional activities. It is logical to argue that a company would be positioned to succeed if it had the best and most appropriate stocks of resources for its business and strategy. Superior performance will, therefore, be based on developing a competitively distinct set of resources (difficult for competitors to imitate) and deploying them in a well-conceived strategy (Collis & Montgomery, 1995:161). Alvarez and Busenitz (2001) extended the RBV of the firm to include entrepreneurship.

Leonard-Barton (1992) warns that capabilities could enhance innovation, but may also inhibit innovation. She terms this the "capability-rigidity paradox". Antecedents to CE could inhibit or enhance entrepreneurial behaviour in firms. Models that explain CE as firm behaviour could be useful for explaining the CE process from this perspective of inhibiting/enhancing antecedents to CE (see Zahra, 1991; Hornsby *et al.*, 1993; Covin & Miles, 1999; Goosen *et al.*, 2002). This view is similar to Leonard-Barton's (1992) perspective of core capabilities/rigidities, in which antecedents that in some instances are core capabilities, are in other instances rigidities that hinder entrepreneurial behaviour.

Antecedents to CE (core capabilities/core rigidities) will thus influence the degree of entrepreneurship and the frequency of entrepreneurship and, therefore, the entrepreneurial intensity of large firms. If managers view the CE process through the

capability/rigidity lens, the proposed study could be justified for the practical value it may provide for managers.

1.4.3 JUSTIFICATION FOR THE RESEARCH

The justification for the proposed study may be divided into three main areas:

- The practical value added for managers of firms operating in South Africa
- The lack of CE research in South Africa
- The importance of building South Africa's innovation capacity

On a practical level, managers need guidelines to identify and overcome obstacles that impede innovation and entrepreneurial strategies. Antecedents to CE can inhibit entrepreneurial behaviour and can be termed barriers. If these barriers could be identified, managers would be in a better position to reduce the influence of these obstacles. Bailey and Clarke (2000) point out that even though the volume of academic research regarding a topic (such as CE) may be growing, managers are "embroiled" in the everyday functioning of the organisation and organisational survival. Managers do not respond with the same enthusiasm as academics to new ideas and, therefore, the study aims to clarify the personal relevance, utility and organisational significance of CE and EI for managers.

Very little in-depth research regarding CE had been undertaken in the South African context prior to 2004 (when this study commenced). Only two doctoral studies on CE have been completed in South Africa. The first comprehensive study was conducted by Struwig (1991), entitled: "Intrapreneurship: a strategy for managing change and innovation". The other was completed by Goosen (2002), and focused on the relationship between management factors and performance in a corporate entrepreneurship setting. Other research conducted by South African researchers was mainly of a theoretical, conceptual nature e.g. MCom and MBA dissertations. Apart from the above-mentioned studies, very little empirical research had been conducted on the CE topic in the South African context by 2004 (Scheepers & Hough, 2004).

The importance of improving economic growth and international competitiveness, and building South Africa's capacity to innovate in the e-business arena, was discussed in Section 1.2. Government, private sector and the popular business press view the capacity to innovate as crucial. However, large companies find it particularly difficult to implement innovation practices (Morris & Sexton, 1996; Fahden, 1998; Sharma, 1999). Given the magnitude of the problem, it was important that this study should focus on the antecedents to CE that could inhibit or enhance e-business entrepreneurial behaviour in firms operating in South Africa.

As mentioned above, the study may be justified on its practical value to managers the lack of CE research in South Africa and the importance of building the country's capacity to innovate in the e-business arena. The study makes valuable contributions to the CE body of knowledge in the South African context, which is discussed in the following section.

1.4.4 CONTRIBUTION OF THE RESEARCH TO THE BODY OF KNOWLEDGE

To cope with the challenges of the knowledge economy, organisations need to innovate and improve their existing practices (Drucker, 2002). Managers should provide a facilitating environment to stimulate innovation and creativity (Mokoena, 1999); in order to create such an environment, organisations need to develop a clear understanding of the nature of CE and the antecedents to CE. This understanding would enable organisations to provide conditions or internal environments within which intrapreneurs may pursue their own creative and innovative ideas to benefit both parties (Cornwall & Perlman, 1990).

In this study a model of antecedents to CE and their influence on EI is constructed. In this model the behaviour of firms forms the central element in the CE process. Constructing a behavioural model of CE is appealing, because behaviour of both managers and employees is manageable (Covin & Slevin, 1991). Therefore, managerial interventions could be aimed at improving the level of entrepreneurial intensity of a firm by focusing on the behavioural aspects of the antecedents to CE.

Thus the contribution of the study is based on the expansion of existing research by showing how antecedents may function as core capabilities and core rigidities. The CE field would be enriched by testing CE concepts empirically in the South African context, and by providing managers with insights when identifying obstacles to CE. Furthermore managers would be able to use this knowledge to reduce the influence of possible barriers and create environments conducive to CE, thus creating firms that would exhibit higher levels of EI. The ability of firms to act more intrapreneurially builds their capacity to innovate and could result in South Africa becoming more internationally competitive.

1.5 RESEARCH METHODOLOGY

The methodology of the study specifies how the study was carried out to reach the stated objective of determining how antecedents to CE influence the EI of firms active in e-business and operating in South Africa. Secondary research, followed by empirical research, was also conducted. A detailed exposition of the research design and methodology is presented in Chapter 5. However, the following section provides a brief description of the research methodology.

1.5.1 SECONDARY RESEARCH

Saunders, Lewis and Thornhill (1997:38-42) recommend that during the secondary research process, the foundation of the study should be built on a critical literature review. Perry (1998) recommends that most PhD studies should follow a deductive approach. In this approach the literature is used to help the researcher identify theories and ideas to be tested through the use of data. In this way a theoretical framework can be developed.

The literature review undertaken in this study is outlined in Chapters 2, 3 and 4. Aspects covered include the nature of the CE field of study, the internal and external antecedents to CE and the concept of entrepreneurial intensity.

1.5.2 PRIMARY EMPIRICAL RESEARCH

Empirical research, also known as primary research, refers to sources of information that have originated directly as a result of a particular problem under investigation (McDaniel & Gates, 2001:25). As a number of authors have proposed (Tull & Hawkins, 1993:51-197; Saunders *et al.*, 1997:72-273; Hair, Bush & Ortinau, 2000:34-44; Welman & Kruger, 2002:32-170), the methodology section of the primary research process should address the following decision stages: defining the study population and sample, describing the data collection method, determining the research instruments to be used and specifying how the collected data will be analysed.

1.5.3 THE STUDY POPULATION AND SAMPLE

The population selected for this study consisted of companies that use e-business systems extensively for information, administrative or commercial purposes. However, no comprehensive sampling frame of companies who use e-business systems was available.

To obtain a sample of companies who were extensive users of e-business systems, it was decided to use companies in the information- and communication technology industry, and companies listed on the Johannesburg Securities Exchange. Moodley (2002) found that since e-business systems required a significant investment, JSE companies and companies employing more than 100 employees were more likely to make extensive use of e-business systems. Hartley (2005) concurs that these two groups are extensive users of e-business systems.

A non-probability, judgement sample was chosen, consisting of companies operating in South Africa and active in e-business listed on the Johannesburg Securities Exchange (hereafter referred to as JSE), as well as companies active in the information and communication technology (ICT) sector. The sample of JSE and ICT companies consisted of 715 companies, all of which were contacted individually. The sample of JSE companies was drawn from JSE-listed operating companies at the end of 2004, and consisted of 300 firms. Companies in the ICT sector were drawn

from the database of ITWeb (Hartley, 2005) and consisted of 424 firms. Nine companies appeared on both lists; therefore the total sample under consideration was 715 companies.

The key informant (respondent) in JSE companies was typically the CIO (Chief Information Officer) or IT (Information Technology) manager and the CEO (Chief Executive Officer) or Sales Manager in ICT companies. The responsibilities of these individuals provide them with a unique and comprehensive view of innovation and corporate entrepreneurship and e-business activities. After the sample of the study was finalised, decisions were made as to the most suitable data collection method.

1.5.4 DATA COLLECTION METHOD

The empirical study consisted of two stages (see Figure 5.2). During *stage one* the measurement instrument was pre-tested in the pilot study, then refined and administered to the total population, using telephone surveys. During *stage two* a further round of data collection was carried out to refine certain constructs, such as the external antecedents, by conducting another pilot and telephone survey. The advantages of telephone surveys were utilised. These advantages include the collection of a large volume of data from a sizeable population in a highly economical way, higher response rates than mail surveys and few non-response errors (Tull & Hawkins, 1993:188).

1.5.5 SPECIFIC RESEARCH INSTRUMENTS

The structured telephone interviews were based on a questionnaire measuring the antecedents that enhance or inhibit CE and entrepreneurial intensity. Measures of entrepreneurial intensity were taken from Morris and Sexton's (1996) Entrepreneurial Performance Index (EPI) questionnaire. These items were supplemented by other measures of intrapreneurship, such as the ENTRESALE (Khandwalla, 1977; Miller & Friesen, 1978; Covin & Slevin, 1989; Knight, 1997) and Zahra's (1991, 1993) corporate entrepreneurship scale. Items used to measure antecedents to CE were also drawn from the appropriate CE literature. A Likert scale was used, since it provided response categories for respondents to indicate their agreement or

disagreement with statements, making the questions simple to answer and easier to interpret with the use of statistical analysis.

1.5.6 ANALYSIS OF THE DATA

The data were analysed by using the Statistica (Statsoft, 2006; 2007) programme. The results of the data analyses are presented in Chapter 6. Tests of reliability were conducted, using Cronbach's Alpha coefficients, presented in Section 5.6.1, and tests for validity were conducted by means of confirmatory factor analysis (CFA), discussed in Section 5.6.2. Exploratory data analysis (EDA) was used to assess individual variables, and descriptive statistics – such as means, standard deviations and coefficients of variance – were used to describe the data. Additionally, inferential statistics were employed to determine key predictors among the various antecedents to CE (see Section 5.5.2).

1.6 LIMITATIONS AND SCOPE OF THE STUDY

The scope of the study refers to economic sectors, and institutional, geographical and functional domains to provide an indication of which areas were investigated in the study. The sample interviewed consisted of JSE and ICT companies. The functional scope of the study focuses on the CIO or IT director (JSE companies) and CEO or Sales Manager (ICT companies) as key respondents.

The research design contains certain inherent limitations. Since only the e-business activities of companies operating in South Africa were studied, the findings of entrepreneurial intensity and antecedents to CE cannot be generalised to all sectors, other innovation spheres, and firms operating outside South Africa.

The inherent limitations of the survey research design also apply to the study. Since a large amount of data was collected in two stages of telephone interviews, the findings did not explore the in-depth and complex nature of the CE phenomenon. Since only one respondent per company was consulted, it is possible that another study, which examined the perception of top, middle and lower management, might yield different results. Several researchers (Zahra & Covin, 1995; Goosen, 2002)

advocate a longitudinal design when studying CE, but since the time line of the study was limited, this was not practical.

1.7 STRUCTURE OF THE THESIS

Figure 1.1 provides an overview of the thesis, which is an outflow of the study.

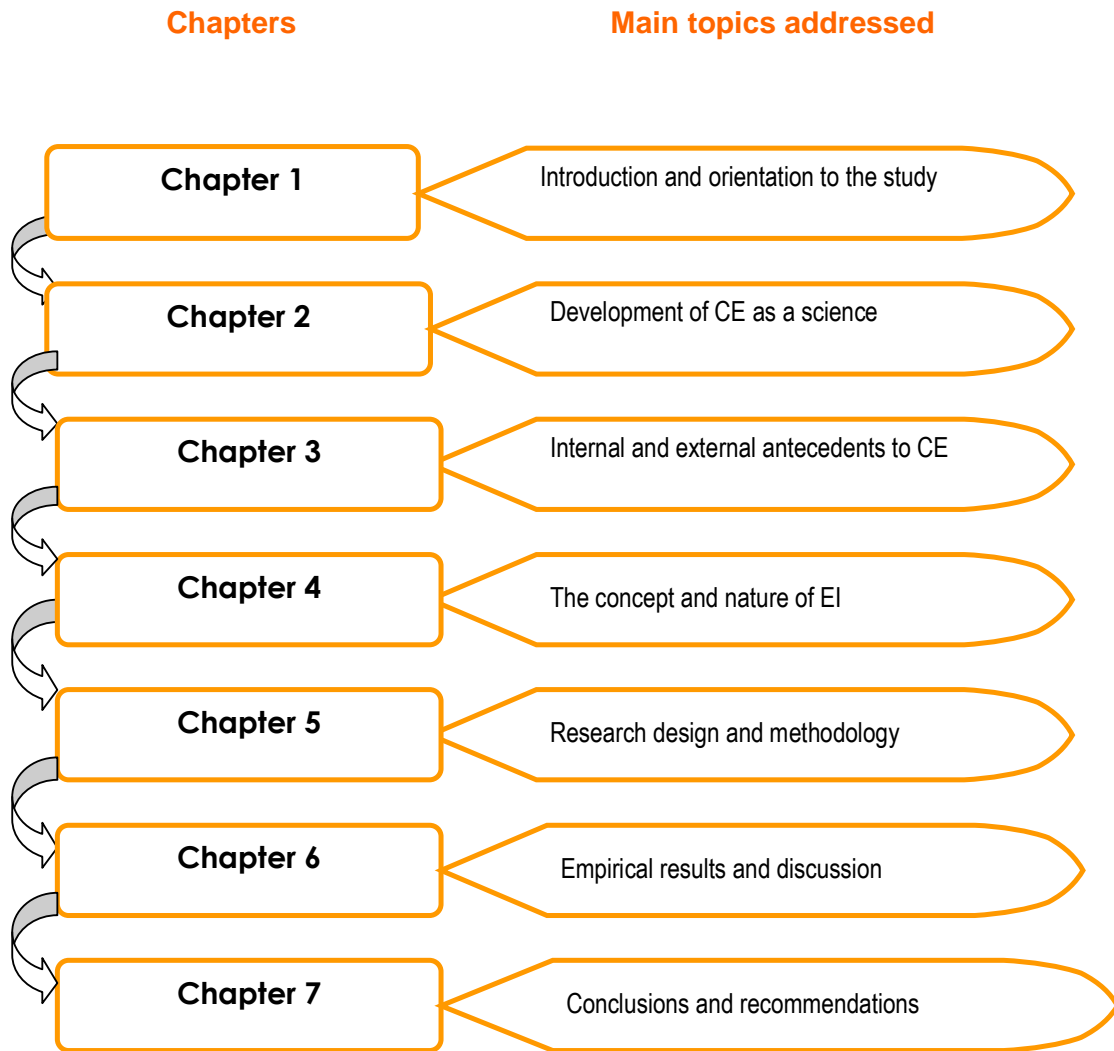


Figure 1.1: A graphical representation of the structure and layout of the thesis

As shown in Figure 1.1 the thesis is structured as follows:

Chapter 1 serves as an introduction and orientation to the study and presents the background, importance, purpose, objectives and aim of the research. The terms used throughout the study are defined and the secondary and primary sources related to the research problem are discussed. Thereafter the limitations and scope of the study are explained, followed by an overview of the structure of the thesis.

Chapter 2 outlines the development of CE as a field of science. CE is defined by examining the link between entrepreneurship and CE, contrasting divergent views of CE and exploring the multi-dimensional nature of CE. It explores the reasons for the rise of research and interest in CE, in particular environmental turbulence, the new economy and the problematic nature of competitive advantage. Finally the chapter discusses the blurring boundaries with other disciplines and the implementation of CE in South African enterprises.

The antecedents to CE are explored in *Chapter 3*. The chapter explores the internal context of a company and then reviews various internal antecedents and external antecedents to CE. It examines top- and middle-management influence on CE, and proposes a theoretical model of the influence of antecedents on entrepreneurial behaviour.

Chapter 4 explains the concept of entrepreneurial intensity. It analyses the frequency and degree of entrepreneurship, with their various dimensions. The combinations of frequency and degree of entrepreneurship that companies may exhibit are clarified using the entrepreneurial grid (Figure 4.1). Finally it explains the approach followed in this study.

Research design and methodology constitute the topics of *Chapter 5*. This Chapter elaborates on the selected sample, measurement instruments and data collection process. It also provides an overview of the statistical analyses performed.

Chapter 6 presents the empirical results. The findings refer to the profile of the sample, descriptive statistics, and the various influences on the entrepreneurial intensity in the respondent companies.

The summary, conclusions and recommendations of the research study are presented in *Chapter 7*. The contributions and limitations are highlighted and recommendations for future research made.

1.8 SUMMARY

South African businesses are faced with numerous challenges, including the need to ensure economic growth, to improve the country's international competitiveness, and to build the country's capacity for innovation in the e-business arena (NRF, 2004; Porter, 2004; Hartley & Worthington-Smith, 2004). It appears that corporate entrepreneurship (CE) may help to address the challenges of economic growth, international competitiveness and capacity for innovation. However, very little research has been done on CE in South Africa. Implementing a CE or innovation strategy is challenging, since it is difficult to create an environment that fosters entrepreneurship and innovation within a large bureaucratic organisation. In this context, the study identifies the antecedents to CE from the literature, and surveys the e-business practices of companies operating in South Africa, to ascertain how these antecedents influence the entrepreneurial intensity of these companies.

The empirical study consists of two stages. *Stage one* focuses on the internal antecedents to CE and EI, while *Stage two* focuses on the external antecedents to CE.

The study should contribute to the existing body of knowledge by demonstrating how antecedents may function as core capabilities and core rigidities. The CE field is enriched by testing CE concepts empirically in the South African context, and by providing managers with insights on how to create an environment conducive to CE. Furthermore managers should be able to assess how their perceptions of the external environment influence CE activities. By improving the internal environment and determining perceptions of the external environment, firms can adapt their strategies and increase their levels of EI. If firms operating in South Africa are able to raise their levels of EI and improve their innovation activities, South Africa as a country may become more internationally competitive; since the ability of firms improve their innovation performance is critical to increased international competitiveness (Porter, 2004; Claros *et al.*, 2006).

CHAPTER 2

THE DEVELOPMENT OF CORPORATE ENTREPRENEURSHIP AS A SCIENCE

2.1 INTRODUCTION

Research regarding corporate entrepreneurship (CE) has grown rapidly since the 1980s (see Antoncic & Hisrich, 2001; Morris & Kuratko, 2002; Goosen, 2002; Dess *et al.*, 2003), but the field is still regarded as an emerging field of scientific inquiry (Sharma & Chrisman, 1999:11; Meyer, Neck & Meeks, 2002:24-26; Busenitz *et al.*, 2003).

The growth of interest in CE may be attributed to the challenges of the new competitive landscape (Hitt, Ireland, Camp, Sexton, 2001:1; Leibold *et al.*, 2002). In this landscape, increased environmental turbulence (Morris, 1998; Dess *et al.*, 1999:85), the pressures of the new economy (Wennekers & Thurik, 1999:27; Dess *et al.*, 2003:352) and the difficulty of building a sustainable competitive advantage (Srivastava & Lee, 2005:2) are driving enterprises to develop entrepreneurial strategies (DeSimone, 1995:183-185; Lichtenthaler, 2005:698). An entrepreneurial mindset is required for enterprises to compete effectively in this new competitive landscape (Hitt, *et al.*, 2001:2). Enterprises that simply maintain their existing strategies and fail to reinvent their business models face extinction. For example, Coca-Cola struggled to raise its “share of throat” in non-carbonated beverages. McDonalds tried to stimulate consumer demand in a saturated burger market. Sun Microsystems attempted to protect its high-margin server market from Linux (Hamel & Vålikangas, 2003:53). These strategies were “unsuccessful”, because these companies tried to compete using the same business model, even though the business environment had changed more rapidly than they anticipated. In a turbulent environment, the only advantage is the capacity to reinvent an enterprise’s business model through constant entrepreneurial actions (Hamel & Vålikangas, 2003:53).

Despite the importance and growth in popularity of CE among practitioners and theorists, both CE and its parent discipline, *entrepreneurship*, are struggling to achieve academic legitimacy (see Aldrich & Baker, 1997; Low & MacMillan, 1988; Shane & Venkataraman, 2000; Low, 2001; Dess *et al.*, 2003; Phan, 2004). The absence of a unifying entrepreneurship research paradigm (Meyer *et al.*, 2002) and the lack of universally acceptable definitions (Sharma & Chrisman, 1999) limit the progress of the field and its legitimacy (Venkataraman, 1997).

Some researchers view entrepreneurship and CE as part of strategic management (see Schendel & Hofer, 1979; Schendel, 1990), while others take the view that entrepreneurship and CE should stand on their own intellectual platform (Meyer *et al.*, 2002; Dess *et al.*, 2003; Busenitz *et al.*, 2003). The questions thus arise:

- How has the field of CE developed?
- On which major theoretical grounding is it based?
- What is the current state of the subject field?

In an attempt to answer these questions, this chapter will define corporate entrepreneurship; outline the drivers in the business landscape of CE; provide an overview of the development of CE; highlight the theoretical foundations and blurring boundaries with other disciplines; discuss how CE is implemented; and finally conclude by providing a summary of the *status quo*, with special reference to South Africa.

2.2 DEFINING CORPORATE ENTREPRENEURSHIP (CE)

As mentioned in Chapter 1 (see Section 1.3.1) a host of terms¹ are used to describe the CE phenomenon. However, a set of clear definitions is needed for scientific understanding, explanation and prediction in the behavioural sciences (Jennings, 1994; Low, 2001). Clearly stated, agreed-upon definitions assist researchers to build on one another's work, and practitioners to decide whether research findings are relevant to their circumstances (Low & MacMillan, 1988; Sharma & Chrisman, 1999:11). This section will firstly provide an overview of the CE phenomenon by clarifying the "entrepreneurship" construct, secondly highlight various divergent and contradictory

¹ Terms such as intrapreneurship, corporate venturing and internal entrepreneurship are used when referring to corporate entrepreneurship.

definitions, thirdly integrate the divergent views and then lastly refine the definition of CE to be used for the purposes of this study.

2.2.1 DEFINING ENTREPRENEURSHIP

Many authors (Antoncic & Hisrich, 2001; Birkinshaw, 2003) describe CE in brief as entrepreneurship within existing organisations. Hence it is important to define the term “entrepreneurship”, and then distinguish between entrepreneurship and CE.

Although the term “entrepreneurship” has been in use for over 200 years, considerable disagreement remains over its meaning. After conducting a study on the topic, Gartner (1990) identified two schools of thought regarding the meaning of entrepreneurship. On the one hand, one group of scholars focus on the outcomes of entrepreneurship (e.g. value creation, new businesses, new products or services), while on the other hand, another group of scholars focus on the characteristics of entrepreneurship (e.g. innovation, growth, uniqueness).

Although multiple definitions of entrepreneurship could be found in existing research (see Table 2.1), no single definition of which has been accepted by the whole entrepreneurship field (Meyer *et al.*, 2002:20-23). Table 2.1 highlights selected authors and definitions of entrepreneurship over a 70-year period (1934--2004).

Table 2.1

Summary of selected definitions of entrepreneurship 1934–2004

Author	Definition
Schumpeter (1934)	Entrepreneurship is seen as new combinations, including the doing of new things that are already being done in a new way. New combinations include: (1) introduction of a new good; (2) new method of production; (3) opening of a new market; (4) new source of supply; (5) new organisations.
Kirzner (1973)	Entrepreneurship is the ability to perceive new opportunities. This recognition and seizing of the opportunity will tend to “correct” the market and return toward equilibrium.
Stevenson, Roberts & Grousbeck (1985)	Entrepreneurship is the pursuit of an opportunity without concern for current resources or capabilities.
Low & Macmillan (1988)	Entrepreneurship is the creation of new enterprise.

Author	Definition
Venkataraman (1997)	Entrepreneurship research seeks to understand how opportunities to bring into existence future goods and services are discovered, created and exploited, by whom and with what consequences.
Morris (1998)	Entrepreneurship is the process through which individuals and teams create value by bringing together unique packages of resource inputs to exploit opportunities in the environment. It may occur in any organisational context and may result in a variety of possible outcomes, including new ventures, products, services, processes, markets and technologies.
Sharma & Chrisman (1999)	Entrepreneurship encompasses acts of organisational creation, renewal, or innovation that can occur within or outside an existing organisation.
Busenitz <i>et al.</i> , (2003)	Entrepreneurship research should focus on the constructs of opportunities, individuals and teams, and mode of organising within the context of a wider environment that offers both opportunities and threats to entrepreneurs.
Yamada (2004)	Entrepreneurship should be viewed as a multi-dimensional construct. The role of the entrepreneur is two-fold. Firstly, entrepreneurs define their organisation domains and contemplate the gaps between various interested parties, and obtain their consensus. This process is accompanied by knowledge creation in knowledge communities within a social network. Secondly, entrepreneurs create or obtain needed social capital to establish their domain and build consensus.

Source: Meyer *et al.* (2002:22)

Morris (1988) identified seven common “creation” themes emphasised in entrepreneurship research, namely the creation of wealth, the creation of enterprise, the creation of innovation, the creation of change, the creation of employment, the creation of value and the creation of growth. Subsequently Sharma and Chrisman, in their seminal article “Towards a reconciliation of the definitional issues in the field of Corporate Entrepreneurship” (1999:17-18), refined the concept of “entrepreneurship” to define independent entrepreneurship as a separate construct. They viewed independent entrepreneurship as the process whereby an individual or group of individuals (acting independently or in association with an existing organisation) create a new organisation.

The debate about what entrepreneurship entails will surely continue despite the efforts of scholars to delineate the field. Yet there are advantages to reconciling the language used in the field, as ambiguity and uncertainty in terminology retard the development of a cohesive, explanatory core predictive theory (Low & MacMillan, 1988; Low, 2001). It is, therefore, necessary to distinguish between independent entrepreneurship and corporate entrepreneurship (CE), and in so doing identify the similarities and differences between the two concepts.

2.2.2 INDEPENDENT ENTREPRENEURSHIP VERSUS CORPORATE ENTREPRENEURSHIP

Even though some researchers (Low & MacMillan, 1988; Gartner, 1990) regard entrepreneurship as only new venture creation, Morris and Kuratko (2002:60-62) argue that entrepreneurship may well occur in various contexts, such as establishing a new enterprise, growing an existing small business, or innovation within large enterprises. Morris (1998) argues that whether entrepreneurship occurs when a new venture is established or inside a large enterprise, it still remains the same phenomenon. There are several similarities between independent entrepreneurship and CE. Both involve opportunity recognition, a unique business concept, a champion, proactiveness, creativity and risk-taking, as well as value creation (Busenitz *et al.*, 2003:297). However, differences do occur between the entrepreneurship contexts of an independent enterprise and a large, existing enterprise, and these are shown in Table 2.2.

As shown in Table 2.2, entrepreneurship is often described in terms of risks and rewards, and differences exist between the types of risks (e.g. financial, market, supplier, career, etc.) that the independent entrepreneur experiences as opposed to the corporate entrepreneur. When a new enterprise is established, the independent entrepreneur is accountable for all the risks being incurred – financially, professionally and personally. The other side of the coin is the possibility that the independent entrepreneur may earn unlimited rewards (Kuratko & Hodgetts, 2004). In contrast the risks faced by the corporate entrepreneur are much less severe. Most of the risk is absorbed by the large enterprise, while the major risk taken by the corporate entrepreneur is career related (Rwigema & Venter, 2004). By pursuing projects not directly related to normal job responsibilities, the entrepreneur may jeopardise future promotions, pay increases or

even his or her job. The rewards earned by the “innovation” conceptualised by the entrepreneur are usually limited to a modest share in the profits, a bonus, or shares (Morris & Kuratko, 2002:62-63).

Table 2.2

Summary of the major differences between independent and corporate entrepreneurship

Independent Entrepreneurship	Corporate Entrepreneurship
Entrepreneur assumes the risk	Company bears most of the risk, except career-related risk
Entrepreneur “owns” the idea and all or much of the business	Company owns the idea and intellectual property rights
Theoretically the rewards for the entrepreneur are unlimited	Limited or no equity is held by the intrapreneur
One mistake may mean failure	More room for errors
Vulnerable to environmental influences	More insulated against environmental influences
Entrepreneur or team of entrepreneurs is relatively independent	Interdependence of intrapreneur with co-workers; may have to share credit with others
Can change strategy or direction – flexibility	Rules, procedures and bureaucracy hinder the entrepreneur’s ability to manoeuvre
Fast decision-making	Longer approval cycles
Little security or safety net	Job security and dependable benefit package
Few people to share ideas with or talk to	Extensive network for bouncing ideas around
Initially limited in scale and scope	Fairly rapid potential for sizeable scale and scope
Severe resource limitations	Access to finances, R&D, production facilities for prototypes, distribution channels, and other internal resources.

Source: Adapted from Morris and Kuratko (2002:63)

Another sizeable difference between the independent and corporate entrepreneur is the influence of the external environment (see Table 2.2). The independent entrepreneur is vulnerable to changes in the external environment, such as product shortages of suppliers, regulatory changes or changes in the economic climate. In contrast to this the

corporate entrepreneur is more insulated from external environmental changes (Kuratko & Hodgetts, 2004). However, the corporate entrepreneur deals with a number of unique internal challenges. The success of the corporate entrepreneur is often dependent on gaining the approval of senior managers and team members who are tasked with implementing an innovation (Howell & Boies, 2004). In contrast, the independent entrepreneur enjoys relative freedom from the internal politics found within large enterprises (Morris & Kuratko, 2002:63-65).

From the overview provided above it could be concluded that even though there are many similarities between the independent entrepreneur and the corporate entrepreneur, the management of corporate entrepreneurship and innovation poses unique challenges for the enterprise. Management needs to recognise the differences between the two contexts in order to provide a climate supportive of innovation, so that entrepreneurial behaviour may flourish within the corporate environment. Additionally, rewards and reinforcement should be focused on entrepreneurial efforts, and enterprises need to invest in developing their employees. This study was enriched by these entrepreneurship definitions, but for the entrepreneurship researcher the challenge begins in adequately defining these terms. In the next section divergent views of CE will be explored.

2.2.3 DIVERGENT VIEWS ON CORPORATE ENTREPRENEURSHIP

Generally CE refers to the development of new business ideas and opportunities within large and established corporations (Birkinshaw, 2003:3). A number of different terms are used to describe this type of entrepreneurship within existing organisations, such as corporate entrepreneurship (Zahra, 1993; Dess *et al.*, 1999), corporate venturing (Von Hippel, 1977; Altman & Zacharckis, 2003), intrapreneuring (Pinchot, 1985; Antoncic & Hisrich, 2001; Goosen, 2002), internal entrepreneurship (Schollhammer, 1982) and strategic renewal (Guth & Ginsberg, 1990, among others). An analysis of the literature resulted in the compilation of a large number of definitions, which aims to define CE or related aspects of CE. Table 2.3 summarises the authors and major definitions on CE and related terms found in the literature. These definitions were chosen to illustrate how

the term CE and the understanding of researchers have evolved over the last three decades.

Table 2.3

Summary of the definitions used by corporate entrepreneurship researchers 1977–2006

Authors	Definitions
Corporate venturing Von Hippel, 1977:163	Corporate venturing is an activity that seeks to generate new businesses for the corporation in which it resides through the establishment of external or internal corporate ventures.
Internal entrepreneurship Schollhammer, 1982:211	Internal (or intra-corporate) entrepreneurship refers to all formalised entrepreneurial activities within existing business organisations. Formalised internal entrepreneurial activities are those which receive explicit organisational sanction and resource commitment for the purpose of innovative corporate endeavours – new product development, product improvements, new methods or procedures.
Intrapreneuring Nielson, Peters & Hisrich, 1985:185	Intrapreneurship is the development within a large organisation of internal markets and relatively small and independent units designed to create, internally test-market, and expand improved and/or innovative staff services, technologies or methods within the organisation. This is different from the large organisation entrepreneurship/venture units whose purpose is to develop profitable positions in external markets.
Intrapreneuring Pinchot, 1985	Intrapreneurs are any of the “dreamers who do”: those who take hands-on responsibility for creating innovation of any kind within an organisation. They may be the creators or inventors but are always the dreamers who figure out how to turn an idea into a more profitable reality.
Corporate entrepreneurship Zahra, 1986:71	CE is a multi-dimensional concept (individual, process, performance focus) that incorporates a company’s activities directed at product and technological innovation, risk-taking and proactiveness.

Authors	Definitions
Strategic Renewal Guth & Ginsberg, 1990:6	Strategic renewal involves the creation of new wealth through new combinations of resources.
Corporate entrepreneurship Guth & Ginsburg, 1990	CE may be viewed more broadly as consisting of two types of phenomena and processes: (1) the birth of new businesses within existing organisations, whether through internal innovation or joint ventures/alliances; and (2) the transformation of organisations through strategic renewal, i.e., the creation of new wealth through the combination of resources.
Intrapreneuring Struwig, 1991:11-12	Intrapreneurship is a concept coined to describe entrepreneurs inside the large firm, people who implement new ideas inside established companies and who, though employed in a corporate position, are nevertheless given freedom and incentives to create and market their own ideas.
Intrapreneuring DeConing, 1992:10-11	From a systems perspective, intrapreneurship may be considered as a dialectic management process which manifests itself through: corporate venturing (establishing new businesses as part of the existing business); and strategic renewal of existing organisations by transforming the very key ideas on which the existing business has been built (in South Africa, examples would include Transnet, Eskom and Armscor).
Corporate venturing Block & MacMillan, 1993:14	A project is a corporate venture when it (a) involves an activity new to the organisation; (b) is initiated or conducted internally; (c) involves significantly higher risk of failure or large losses than the organisation's base business; (d) would be managed separately at some time during its life; (e) is undertaken for the purpose of increasing sales, profit, productivity or quality.
Corporate entrepreneurship Sharma & Chrisman, 1999	The process whereby an individual or group of individuals, in association with an existing organisation, create a new organisation or instigate renewal or innovation within that organisation.

Authors	Definitions
<p>Corporate entrepreneurship Covin & Miles, 1999</p>	<p>CE refers to a distinct, multi-dimensional, and empirically verifiable set of organisational phenomena. CE may be defined as the presence of innovation plus the presence of the objective of rejuvenating or purposefully redefining organisations, markets, or industries in order to create or sustain competitive superiority. Four types of CE could be identified:</p> <ul style="list-style-type: none"> a) Sustained regeneration: focusing a continuous stream of new product introductions in current and new markets. b) Organisational rejuvenation: emphasises changing the enterprise's internal processes, structures, and capabilities, resulting in process and administrative innovations. c) Strategic Renewal: refers to entrepreneurial efforts that result in significant changes to an organisation's business or corporate level strategy or structure. d) Domain redefinition: centres on radical or 'breakthrough' inventions, where the enterprise proactively seeks to create a new product market position that competitors have not recognised yet or have underserved.
<p>Intrapreneuring Antoncic & Hisrich, 2001:498,500; 2003:9</p>	<p>Intrapreneurship could be defined as entrepreneurship within an existing organisation, referring to emergent behavioural intentions and behaviours of an organisation that are related to departures from the customary. Intrapreneurship is a process inside an existing organisation regardless of its size, and leads not only to new business ventures, but also to other innovative activities and orientations such as the development of new products, services, technologies, administrative techniques, strategies and competitive postures. Intrapreneurship includes four dimensions: new business venturing, innovativeness, self-renewal and proactiveness.</p>
<p>Corporate entrepreneurship Bouchard, 2001:3</p>	<p>Corporate Entrepreneurship is a multi-faceted concept that for some refers to a firm-level disposition to strategic daring; for others to the process of new business creation within established companies and for still othersto the adoption of entrepreneurial values and behaviour of corporate staff.</p>

Authors	Definitions
Strategic Renewal Volberda, Baden-Fuller & Van den Bosch, 2001:160	Strategic renewal may be broadly defined as the activities a firm undertakes to alter its path dependence. Important parameters of a journey of renewal include: the behaviour of managers at each level of the organisation in response to each other (top-down or bottom-up); the way they view investing for tomorrow versus milking profits today (exploration versus exploitation); and the way in which they share knowledge with each other across organisational boundaries (intra-organisation learning). Strategic renewal could be viewed as an ongoing journey instead of a discrete shift from one state to another. Four journeys could be labelled as emergent, directed, facilitated, and transformational.
Corporate venturing Altman & Zacharakis, 2003:68	Corporate venturing is a growth strategy to tap into new opportunities that differ from a company's current focus. More formally, corporate venturing is the birth of new businesses within an existing organisation that transforms the organisation through the renewal of key assumptions on which the organisation is built.
Corporate entrepreneurship Birkinshaw, 2003:3	Broadly speaking, CE refers to the development of new business ideas and opportunities within large and established corporation. Four schools of thought have evolved around the topic: corporate venturing, intrapreneurship, entrepreneurial transformation and "bringing the market inside".
Corporate entrepreneurship Garvin & Levesque, 2006	Corporate entrepreneurship is the creation and development of sustainable new businesses within an established enterprise. The creation of emerging businesses requires a balancing act of new organisational traits with well-established systems, processes and cultures.

It seems that efforts to define CE (and related terms) are reminiscent of Gartner's (2001) outlook regarding the "Blind Men and the Elephant" anecdote. In the tale, six blind men touch different parts of the elephant and all return back home to give very different accounts of the same elephant's appearance. They each use a single characteristic (one part) of the elephant, such as the trunk, to describe the entire beast (the whole). This anecdote symbolises the different perceptions researchers hold of the complex and multi-dimensional phenomenon of CE.

CE has developed from an implementation perspective, i.e. corporate venturing, to a multi-dimensional, multi-faceted phenomenon. The notion of generating new revenue streams for existing businesses is not new (see Von Hippel, 1977). Initially this kind of revenue and new business creation was studied as “corporate venturing” by Von Hippel (1977) and other researchers (Burgelman, 1983). Schollhammer (1982:211) used the term “internal entrepreneurship” to refer to formalised sanctioned entrepreneurial activities within the enterprise, while Nielson *et al.* (1985) used the term “intrapreneuring” to refer to the development of small independent units (like ventures) to internally test-market concepts to staff members. Conversely, Pinchot (1985) used the term “intrapreneuring” to refer to individual entrepreneurs (creators or inventors) within a large enterprise who implement innovations, turning them into commercial successes. The term “corporate entrepreneurship” was first used by Zahra (1986:71) who viewed it as a multi-dimensional concept. He viewed this concept as the sum total of all the activities of an enterprise directed at product and technological innovation, risk-taking and proactiveness.

The most widely accepted definition of CE appears to be that of Sharma and Chrisman (1999) based on the work of Guth and Ginsberg (1990). They define CE as the process whereby an individual or group of individuals, in association with an existing organisation, create a new organisation or instigate renewal or innovation within that organisation. Although the use of these terms has progressed over the years, both “intrapreneurship” (Antoncic & Hisrich, 2001) and “corporate entrepreneurship” (Zahra, 1986; Sharma & Chrisman, 1999; Birkinshaw, 2003) are used to describe the multi-faceted phenomenon of “entrepreneurship in large organisations”. This phenomenon refers to an intangible component, being the entrepreneurial orientation of risk-taking, innovativeness and proactiveness of an enterprise, and the tangible outcome of the process, being corporate venturing, a new product, service or process development and strategic renewal. “Strategic renewal”, as a component of corporate entrepreneurship, is used to refer a change in the strategy of an enterprise (Covin & Miles, 1999), which may result in the creation of new wealth (Guth & Ginsberg, 1990) or the crafting of a new business model (Volberda *et al.*, 2001).

As is evident from Table 2.3 and the discussion, CE is a complex, multi-faceted phenomenon. Thus the next section will examine CE from a multi-dimensional perspective to reveal how the various divergent views regarding CE could be integrated.

2.2.4 INTEGRATING DIVERGENT VIEWS

To reconcile and integrate the divergent views discussed in the previous section, a multi-dimensional view of corporate entrepreneurship will be presented. Zahra (1992) conceptualised corporate entrepreneurship in a holistic manner by pointing out that (1) it is a variable, which can assume different levels of intensity; (2) the formality of entrepreneurship activities can vary; and (3) the duration of such efforts can vary.

2.2.4.1 Intensity of entrepreneurial efforts

Entrepreneurship is a variable that could assume different levels of intensity. Most researchers have emphasised that the entrepreneurship of an individual or organisation varies on three key dimensions: innovativeness, risk-taking and proactiveness (see Covin & Slevin, 1991; Zahra, 1992; Morris, 1998; Antoncic & Hisrich, 2001; Morris & Kuratko, 2002). These components were defined in Chapter 1 (see Section 1.3.2). The variable nature of entrepreneurship will be analysed in detail in Chapter 4. Entrepreneurship within an enterprise could also vary with regard to how formally or informally it is pursued.

2.2.4.2 Formality of entrepreneurial activities

Burgelman (1983; 1991) distinguished between formal (induced) and informal (autonomous) entrepreneurship activities. If entrepreneurship efforts are part of a deliberate strategic drive of top management, entrepreneurial efforts are regarded as formal (Zahra, 1992:6). However, if individual members of the organisation pursue innovative activities autonomously, on their own accord (Pinchot, 1985; Harrison, 2004:779), or even secretly (Augsdorfer, 2005), these activities are regarded as informal.

Parboteeah (2000:31) goes so far as to argue that the level of top management's perception of the need for entrepreneurial activity within a firm and the level of

employees' desire to exploit entrepreneurial activity influence the formality of CE activities. Additionally, the following matrix (Figure 2.1) was drawn up by Parboteeah (2000:31) to describe the form CE would take in various situations, depending on the two variables mentioned above.

Employees' desire to exploit entrepreneurial opportunities	Top Management Perception of the need for Entrepreneurial Activity		
		Low	High
Low		Status quo	Corporate Renewal
High		Corporate Venturing	Schumpeterian Entrepreneurship

Figure 2.1: Four quadrants contrasting the formality and informality of CE efforts

Source: Parboteeah (2000:31)

In the *status quo* quadrant neither top managers nor employees exhibit “real” entrepreneurial behaviour. This strategy may be effective within a stable environment. The *corporate renewal* quadrant entails the internal transformation of the organisation. Renewal would be prevalent if top management “requests” a degree of entrepreneurship, but employees do not exhibit entrepreneurial behaviour. For example, employees do not suggest new ideas or produce new entrepreneurial proposals.

The *corporate venturing* quadrant refers to the creation of a new business or businesses within an existing organisation to exploit new opportunities (Guth & Ginsburg, 1990). Parboteeah (2000:34) argues that this form of CE prevails when employees have a strong desire to exploit entrepreneurial opportunities, but top management does not see the need for such activities. Several authors (Merck KgaA, 2003; Altman & Zacharakis, 2003; Birkinshaw & Hill, 2005) point out that the way in which top management approaches the venture unit determines the success or failure of such a venture unit.

The *Schumpeterian entrepreneurship* quadrant refers to a situation where a firm changes the rules of the industry (Birkinshaw, 2003). In this situation both top managers

and employees agree on the necessity for exploiting entrepreneurial opportunities, and actions from both may well result in a transformation of the industry (Parboteeah, 2000:36). Depending on the form entrepreneurial activities take within an enterprise, it may vary in duration.

2.2.4.3 Duration of entrepreneurial activities

Zahra (1992:7) points out that CE activities have different durations. Some projects last a few weeks or months (as in some acquisitive or opportunistic ventures); while others span several years or even decades, as in quantum changes through research and development efforts, diversification (Lichtenthaler, 2005) or redefinition of the firm's business concept. Such innovation and experimentation have taken place in multinational companies such as Sasol. Sasol developed South Africa's first indigenous automotive fuel in 1955, followed by the construction of the National Petroleum Refiners of South Africa in 1967 and the establishment of Sasol Chemicals Europe in 1990. Today, after the development of world-leading technology for the conversion of low-grade coal into value-added synfuels and chemicals, Sasol is one of the top five companies listed on the JSE and is also listed on the New York Stock Exchange (Sasol, 2004). Such R&D efforts enhance a company's capacity to pioneer technological and product change, thus surpassing the achievement of its global rivals.

From the discussion above it should be clear that CE is a broad concept and that enterprises may pursue many different types of entrepreneurial behaviour.

2.2.5 DEFINITION OF CORPORATE ENTREPRENEURSHIP FOR THE PURPOSES OF THIS STUDY

The definition used in this study broadly builds on past definitions of entrepreneurship and CE. This approach facilitates the reconciliation of the theory and research on entrepreneurship and CE (Sharma & Chrisman, 1999:13).

In this study CE is regarded as a process through which formal and informal creative activities are encouraged and intangible resources are managed. Additionally CE is aimed at creating new products, services, innovation,

processes, strategies and business units, with the objective of improving and sustaining a company's competitive position and financial performance.

This study will focus on CE as a process which is influenced by internal organisational factors and external environmental conditions. The outcome of the CE process, namely new products, services, innovation process, strategies or business units, antecedents and the intensity of these outcomes, will be examined. Even though the link between CE and improved financial performance and competitive position does not form part of the focus of this study, reference will be made to this relationship, since this is often cited as a reason why enterprises should engage in CE activities. A number of external trends, called drivers, have also contributed to the growth in importance of corporate entrepreneurship in recent years.

2.3 DRIVERS OF CORPORATE ENTREPRENEURSHIP

CE is an important element in organisational and economic development (Antoncic & Hisrich, 2001), since it contributes to job creation and developing a competitive advantage in the new economy. Lumpkin and Dess (1996) view entrepreneurial behaviours and attitudes as key determinants of the ability of large firms to survive and prosper in turbulent environments. Zahra (1992) cautions that CE influences different dimensions of performance differently at various points in time. Although a number of studies (Zahra & Covin, 1995; Covin & Miles, 1999; Wiklund 1999; Goosen *et al.*, 2002) have found that a positive relationship exists between firms' CE activities and long-term financial performance; some entrepreneurship activities fail to produce their intended results (Zahra, 1992:12). The return on entrepreneurial activities could simply be preserving the existence of the enterprise, rather than improving its revenue generation and profitability activities.

In addition to the financial outcomes, several authors have also examined positive non-financial outcomes of CE, such as improved staff morale, increasing employee motivation and task involvement (Srivastava & Lee, 2005), retaining the firm's best and most talented employees (Van Vuuren, 2004), effective workplace learning (Crossan & Berdrow, 2003), problem-solving and achievement of organisational goals (Harrison, 2004). But what are the underlying drivers fuelling the renewed interest in CE?

Certain fundamental changes in the new economy serve as core drivers adding impetus to the current interest in CE. Some of the major drivers of CE discussed in this section are environmental turbulence, the new economy and the difficulty in building a sustainable competitive advantage. These drivers present considerable challenges to executive management and managers.

2.3.1 ENVIRONMENTAL TURBULENCE

Global mega-trends are leading to increasing levels of complexity, dynamism and uncertainty in the corporate environment (Amidon, 1997; Bullinger, *et al.*, 2000:1470; Nayager & Van Vuuren, 2003:2). Worldwide globalisation has been a gradual process, but its impact in South Africa has been more intensive and concentrated over a shorter period of time (Visser, 2003; Van Vuuren, 2004). Globalisation implies that managers have to deal with complex issues of diversity, synchronisation and turbulence (Gqubule, 2004:44).

Turbulence refers to the increasing complexity and rate of environmental change and has three components. These include the rate of change in key components of the environment; the extent to which the environment is hostile or threatening; and the degree of complexity in the environment. Turbulence creates both opportunities and threats for enterprises and is a major trigger for entrepreneurial activity (Morris, 1998). Managing in the age of turbulence requires the ability to control risks, react quickly to emerging circumstances and control the direction and speed of the organisation's responses to match the external pace of events. It is too risky not to innovate (Johannessen, Olaisen & Olsen, 1999:119).

Researchers have shown that the more dynamic, hostile and heterogeneous the environment, the higher the level of innovation, risk-taking and proactivity among the most successful firms (Miller & Friesen, 1983; Covin & Slevin, 1989; Zahra, 1996:1730). Similarly, Hitt *et al.* (2001:479-480) state that an entrepreneurial mindset and strategies are needed to exploit the opportunities created in the external environment by continuous change. Hamel and Välikangas (2003:52-53) label this new mindset as "strategic resilience", meaning the ability to dynamically reinvent business models and

strategies as circumstances change. In other words, CE is essential for ensuring corporate profitability and growth by enhancing an enterprise's innovation ability, redefining its business concept and renewing its operations. Environmental turbulence can in part be attributed to the "new economy".

2.3.2 NEW ECONOMY

Many authors (Bullinger *et al.*, 2000:1470; Asmal & Kahn, 2000; Gamble & Blackwell, 2002) describe the business landscape as changing from an "Industrial" to an "Information" economy and recently from "Information" to a "Knowledge" economy (Hough, 2004). This "New economy" has also been termed the "Innovation economy" (Shepherd, 2004) and "Entrepreneurial economy" (Audretsch & Thurik, 2001:267; Drucker, 2002). In this "New economy", wealth would be created through the entrepreneurial management of intangible intellectual resources. Such intangible resources include knowledge, innovation and creativity. In contrast to the above, the management of physical resources was of paramount importance in the traditional industrial economy (Burton-Jones, 1999; Hough, 2004). The implications for businesses are profound, and the rules of the game have changed radically (Hamel, 1998; Govindarajan & Gupta, 2001:3). Consequently traditional management approaches, responses, and processes used to manage physical resources are insufficient to manage intangible resources (Allee, 2000; Leibold, *et al.*, 2002).

But other authors question the existence or "newness" of this economy (Asmal & Kahn, 2000:131; Audretsch & Thurik, 2001; Stopford, 2001:165; Senge & Carstedt, 2001:24). This dichotomy may be explained by scrutinising Arthur's (1996:100-103) theory of increasing returns. He argues that Western economies operate in two overlapping intertwined worlds that operate under fundamentally different economic principles. On the one hand one encounters the "old industrial" economy, based primarily on bulk-processing of resources, and on the other hand the new knowledge-based economy, increasingly based on the processing of both resources and information. Most companies struggle to do business in both worlds at the same time (Brown, 1997). These two worlds require different managerial approaches, which complicate the internal management process of the enterprise. South African authors (Asmal & Kahn, 2000:132; Botha & Fouché, 2002:13) agree that the dual economy creates a polarised society, with

its own unique challenges, such as how to become a global player and to increase its competitiveness, while alleviating poverty.

One of the major future challenges of the “New economy” will be the management of intangible, intellectual resources (human capital, i.e. knowledge, creativity and innovation, and organisational capital), which are difficult for competitors to imitate (Zack, 1999:128; Allee, 2000; Botha & Fouché, 2002:13; Kaplan & Norton, 2004:52). Large enterprises, therefore, need to attract and retain innovative, entrepreneurial employees who are able to create value. Thus in this new economy value creation would increasingly depend on entrepreneurship and the management of knowledge, ideas and innovation (Allee, 2000; Kim & Mauborgne, 2003:128). However, it is becoming increasingly problematic to establish a sustainable competitive advantage in the turbulent, hostile business environment.

2.3.3 THE ELUSIVE SUSTAINABLE COMPETITIVE ADVANTAGE

In the new economy, inter-organisational competition has not only intensified, but its nature has fundamentally changed: it has become more knowledge-based and the sources of competitive advantage have shifted from physical assets to intellectual resources (Subramanian & Venkatarman, 2001:359). These intellectual resources include continuous innovation (Nonaka, Toyama & Konno, 2001:13; Amidon, 2002), knowledge (Nonaka, 1991; Zack, 1999:125; Botha, 2000:141) and the creation of new ideas (Amidon, 1997; Hough, 2004).

Various authors (Floyd & Wooldridge, 1999; Zahra, Nielson & Bogner, 1999; Hough, 2004) have proposed CE, intra- and entrepreneurial leadership to manage resources and create an inimitable sustainable competitive advantage. Building on these premises, sustainable competitive advantage can be described as a “superior marketplace position” that captures the provision of superior customer value, based on the core competencies of knowledge and intellectual capital, resulting in market share dominance and superior performance (Lubit, 2001:164). In their study of manufacturing firms, Weerawardena and O’Cass (2004:422-426) found a positive relationship between organisational innovation and sustainable competitive advantage.

Kaplan and Norton (2004:52) argue that companies are worth far more than their tangible assets. Unlike financial and physical assets, intangible assets are hard for competitors to imitate, which makes them a powerful source of inimitable sustainable competitive advantage. Amongst other factors, enterprises aspiring to achieve a competitive advantage have to adopt an entrepreneurial posture in their key decisions and build distinctive capabilities that are difficult to imitate.

This section provided the background to understanding what the underlying drivers are that compel enterprises to act more entrepreneurially. The key drivers discussed in this section were environmental turbulence, the new economy and the necessity of building an inimitable competitive advantage. The next section will give an overview of how CE has developed as a science over the past three decades.

2.4 DEVELOPMENT OF CORPORATE ENTREPRENEURSHIP

Over the past 30 years a variety of frameworks and models have been developed that have contributed towards understanding entrepreneurial activities inside companies. This section presents an overview of how the body of CE knowledge has developed over the past two to three decades. Chapter 3 will discuss other models of CE, the internal and external antecedents of CE and the influence of top and middle management on CE.

Scheepers and Hough (2004) built on the domain framework of Guth and Ginsburg (1990); Covin and Miles (1999); Antoncic and Hisrich (2001) and Zahra (2007) to draw up a unifying framework to systemise the development of CE knowledge. Key components of the model are illustrated in Figure 2.2 and include seven categories. The initial framework of Guth and Ginsburg (1990) consisted of five categories, namely: CE dimensions; organisational form and conduct; organisational performance; the environment; and strategic leadership. Since these categories did not fully reflect the CE research completed to date, Scheepers and Hough (2004) added two additional categories, namely the changing context of the new economy; and theoretical development.

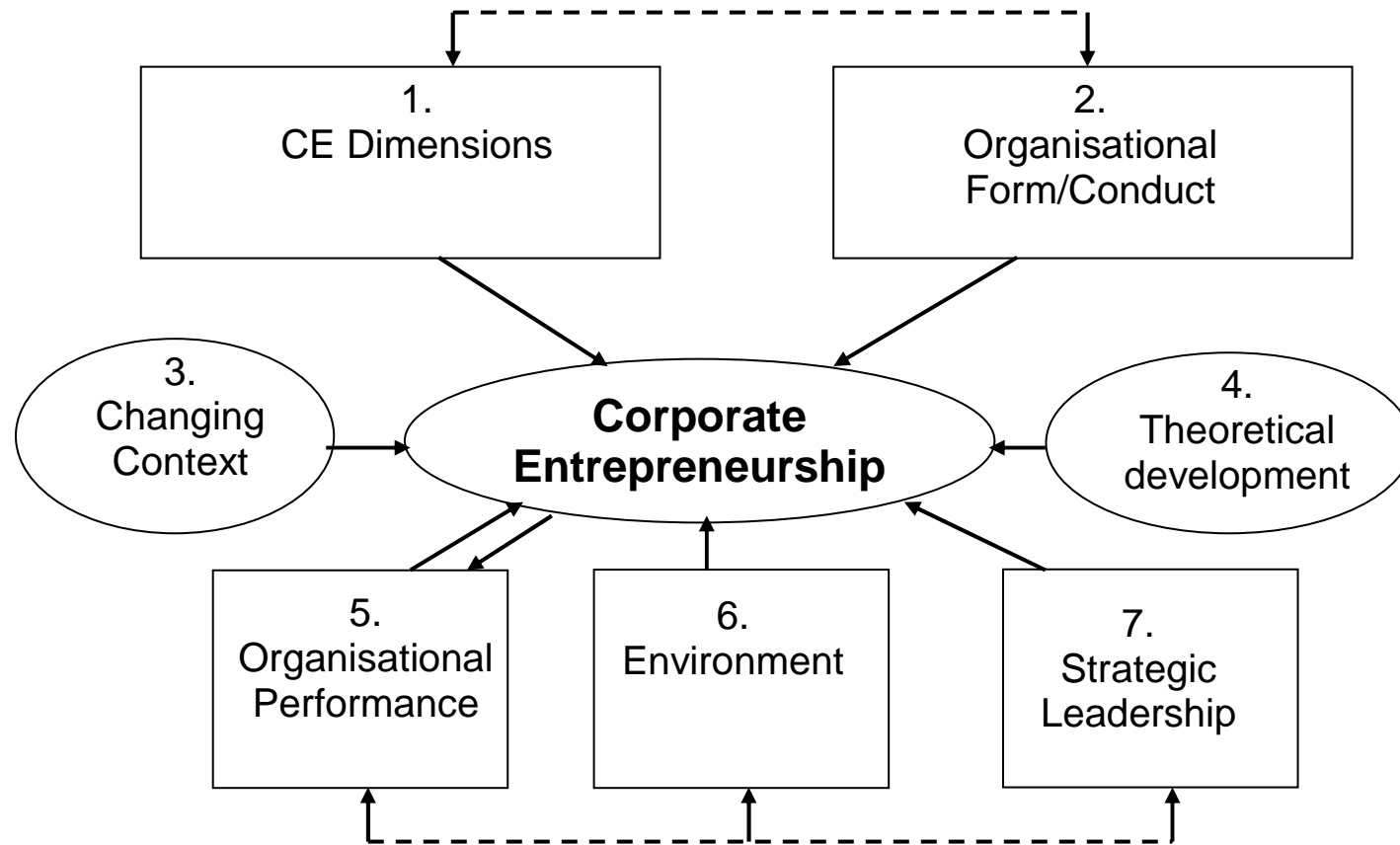
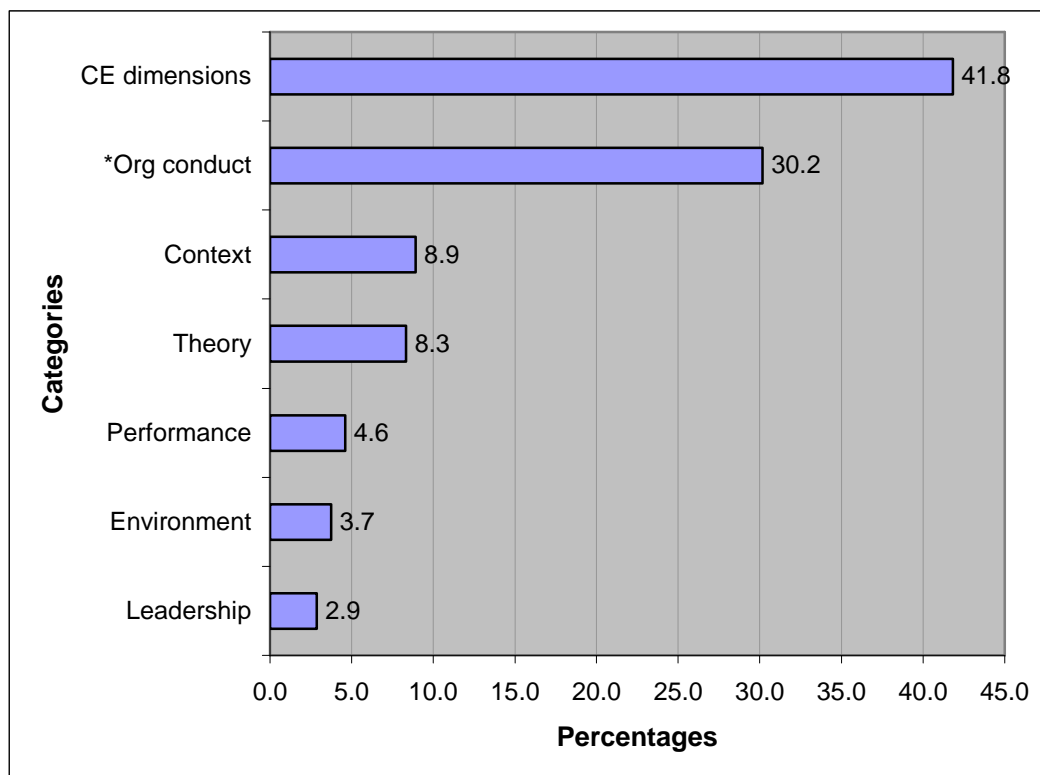


Figure 2.2: Illustration of seven categories summarising Corporate Entrepreneurship research in a framework

Sources: Guth & Ginsburg, 1990; Covin & Miles, 1999; Antonic & Hisrich, 2001; Zahra, 2007

They (Scheepers & Hough, 2004:9) proceeded to compile a set of CE writings to gain insight into the development of the research body of CE knowledge. They undertook a literature search of the Ebsco, Elsevier Science, General Business File International (Gale) and SABINET databases. Articles that met the following two search criteria were included in the dataset: (1) the use of one or more key words relating to corporate entrepreneurship, (i.e. intrapreneurship, corporate venturing and entrepreneurial orientation) in the article title or abstract, and (2) publications between January 1970 and May 2004. They also included seminal books, and relevant papers cited in the reference section of articles in their dataset.

Using the framework, they categorised 280 CE writings in the dataset into the seven categories of the unifying framework (Figure 2.2). The results are presented in the histogram below (Figure 2.3).



***Org conduct = Organisational conduct**

Figure 2.3: Bar chart of the volume of corporate entrepreneurship items according to seven corporate entrepreneurship research framework categories

As may be seen from Figure 2.3, the majority of authors researched the dimensions of CE (41.8%), and organisational form/conduct (30.2%). However, when taking into account the changing context of the business landscape (regarding the management of intangible resources and globalisation) only 8.9% of the items within the dataset focused on this topic. In line with findings by other authors (Busenitz *et al.*, 2003; Dess *et al.*, 2003), it is disconcerting that such a small percentage of theoretical articles (8.3%) seek to develop unique knowledge for the field. All 14 items relating to organisational performance focus on financial performance, and none on non-financial performance. In the light of the importance of intangible assets (Amidon, 2002; Kaplan & Norton, 2004), this fact highlights a clear shortcoming of current research. The influence of environmental factors also received little attention (3.7%), but factors that hold significant implications for the new economy would also be particularly interesting to investigate, such as globalisation and the knowledge creation process. Bearing in mind that leadership is crucial in the new economy (Visser, 2003; Ready & Conger, 2003), very little research (2.9%) has been done on entrepreneurial leadership at different managerial levels. Therefore, the conclusion could be drawn that there are important gaps in the research body of CE knowledge (Scheepers & Hough, 2004).

In addition, very little empirical research has been completed in South Africa regarding the topic of CE. Out of a total of 280 writings in the dataset, only eight texts were written by South African authors, i.e. 2.9%. Only two doctoral studies have been completed on CE (intrapreneurship) in South Africa (Struwig, 1991; Goosen, 2002).

The development of CE emanated from the strategic management and entrepreneurship perspectives. Although the field of CE has progressed towards more legitimacy, it remains important to acknowledge the blurring boundaries between CE and strategic management, the influence of several theoretical perspectives on CE and CE and entrepreneurship as its parent discipline.

2.5 BLURRING BOUNDARIES WITH OTHER DISCIPLINES

CE involves identifying, organising for and exploiting entrepreneurial opportunities (Shane & Venkataraman, 2000; Hitt *et al.*, 2001). However, to create value entrepreneurial enterprises should act strategically. This necessitates acknowledging advances made in strategic management theories, the resource-based view of the firm and entrepreneurship thinking. A brief discussion on these three interlinking issues follows.

2.5.1 STRATEGIC MANAGEMENT

Strategic management scholars primarily seek to understand which decisions and actions are needed to achieve competitive advantages in business (Hitt & Ireland, 2000). Entrepreneurship scholars have focused on understanding opportunities, new venture creation and high-growth entrepreneurial ventures (Low, 2001). While strategic management researchers have mostly been interested in large enterprises, entrepreneurship researchers have studied small and medium-sized enterprises (Meyer *et al.*, 2002). But the study of CE points to an increasing intersection of these fields of study (Zahra, 1996). Both fields overlap in terms of their interest in venture creation, novel strategies, growth and performance of organisations (Barringer & Bluedorn, 1999).

The boundaries between strategic management, CE and entrepreneurship are becoming increasingly blurred because of the new competitive landscape, where the ability to manage continuous change and maintain flexibility is indispensable for survival. Traditional business models are no longer applicable (Leibold *et al.*, 2002) and managers are abandoning traditional approaches to strategy as they search for new ways to achieve a competitive advantage in a turbulent environment. Both small and large enterprises are facing the same challenges, which in turn have shifted strategic management paradigms from essentially static to more dynamic worldviews. Thus an attempt to alter the corporate/bureaucratic mind to an entrepreneurial mindset is a high priority in enterprises of all ages and sizes around the world (Meyer *et al.*, 2002:30-32).

Underlying paradigms in strategic management that influence CE strongly are the Resource-Based View (RBV) (Wernerfelt, 1984) and an extension of RBV, namely

Dynamic Capabilities (Teece *et al.*, 1997). Consistent with the strategic view is that CE requires “changes in pattern of resource deployment and the creation of new capabilities” (Stopford & Baden-Fuller, 1994:522). This contributes to the creation of a unique resource, “positional advantage”, which positively affects performance (Bhuiyan, Menguc & Bell, 2005:9). In other words, an essential aspect of CE is developing and configuring organisational resources and capabilities (Kazanjian, Drazin & Glynn, 2002:173).

2.5.2 RESOURCE-BASED VIEW (RBV) OF THE FIRM

The resource-based view (RBV) of the firm emphasises idiosyncratic resources (e.g. Penrose, 1959; Wernerfelt, 1984), especially resources that reside inside organisations. RBV regards the enterprise as a bundle of resources and suggests that their attributes significantly affect the enterprise’s competitive advantage and, by implication, its performance (Greene, Brush & Hart, 1999:103; Alvarez & Busenitz, 2001:131; Bhuiyan *et al.*, 2005:9). Most conspicuous among these resources are those that are valuable, scarce, and hard for competitors to imitate, such as intellectual property, firm-specific knowledge, an entrepreneurial orientation and a market orientation, to name but a few (Lee, Lee & Pennings, 2001:616; Hitt *et al.*, 2001:482; Yamada, 2004:292). Thus large enterprises are able to accumulate core managerial resources, such as knowledge, entrepreneurial orientation, market orientation and other resources (Hamel & Prahalad, 1991; Floyd & Wooldridge, 1999; Kazanjian *et al.*, 2002; Bhuiyan *et al.*, 2005) as intangible assets. These resources could enable the enterprise to achieve greater operational success if used effectively (Yamada, 2004:292).

However, Leonard-Barton (1992) points out that by their nature core capabilities are deeply rooted in values. Values and norms bear the imprint of company founders and early leaders and reflect accumulated behaviours and beliefs based on early corporate successes. But innovation requires a degree of “creative destruction”. The concept of creative destruction, introduced by the Austrian economist Joseph Schumpeter, embodies the notion that creating the new inevitably destroys the old. As such, innovations (an outcome of entrepreneurial behaviour) would sometimes question values

or require capabilities to change, or even cause new capabilities to be developed. Thus core capabilities can simultaneously enhance and inhibit entrepreneurial efforts within a firm, since certain organisational norms may serve as barriers to new ideas. This downside or inhibiting nature of core capabilities could be referred to as core rigidities. Managers of entrepreneurial projects thus face a paradox: how to take advantage of core capabilities without being hampered by their dysfunctional flip side.

CE is a key means of accumulating, converting and leveraging resources for competitive purposes (Floyd & Wooldridge, 1999) such as developing and using product, process and administrative innovations to rejuvenate and redefine the firm and its markets or industries (Covin & Miles, 1999). To harness these core competencies, it is necessary to view CE from a process perspective.

2.5.3 ENTREPRENEURIAL THINKING AS AN INTEGRATIVE PROCESS

Viewing the entrepreneurial process as an integrative model of entrepreneurial inputs and outcomes, Morris, (1998) shows that certain factors may constrain or facilitate the process. According to Morris and Kuratko (2002:38), the entrepreneurial process generally consists of the following stages:

- Opportunity identification
- Business concept development
- Assessment of resource requirements
- Acquiring of resources
- Concept implementation and management
- Harvesting of the concept or venture

Morris, Sexton and Lewis (1994) developed a systems model to provide an overview of entrepreneurship as an integrative process. This systems model is constructed around the concepts of inputs to the entrepreneurial process and outcomes of the entrepreneurial process, as shown in Figure 2.4.

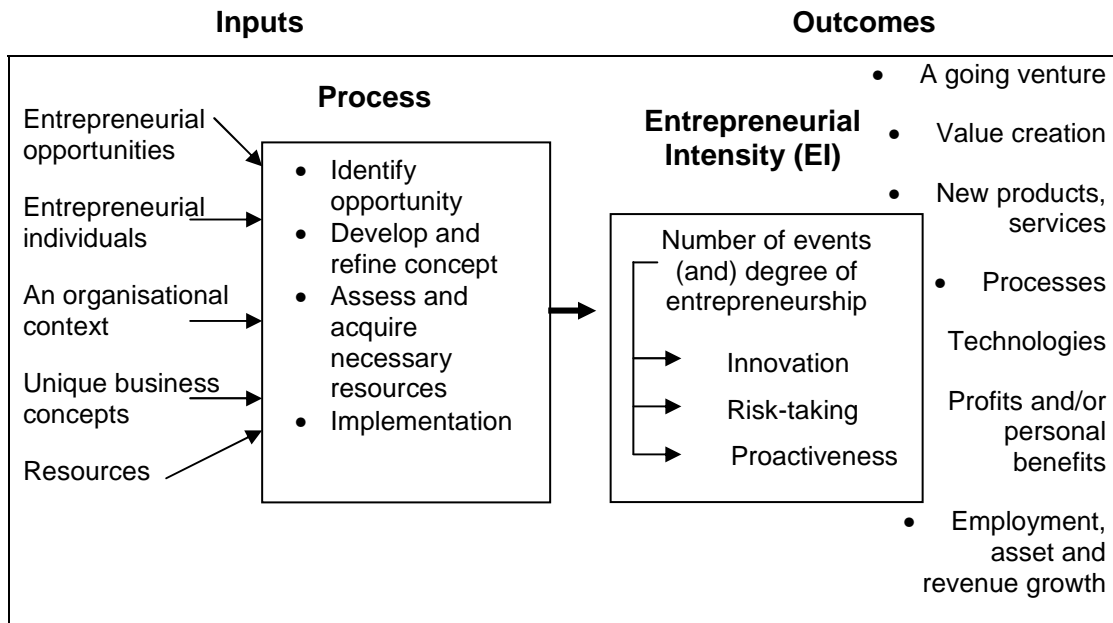


Figure 2.4: An integrative model of entrepreneurial inputs and outcomes

Source: Morris *et al.*, 1994

The input component of the model focuses on the entrepreneurial process itself and identifies five key elements that contribute to the process. These five elements are entrepreneurial opportunities, the individual entrepreneur, an organisational context, unique business concepts and resources. *Entrepreneurial opportunities* emerge because of changes in the external environment, such as demographic or regulatory changes. The *individual entrepreneur* can seize an opportunity by developing a *unique business concept* to serve emerging customer needs. *Organisational context* refers to where the idea is implemented (this could range from a sole proprietorship, franchise or national branches to a separate business unit within a large enterprise). Finally, *resources* refer to a wide variety of financial and non-financial resources that are required on an ongoing basis. These key elements are combined throughout the stages of the entrepreneurial process. In other words, the process provides a logical framework for organising entrepreneurial inputs (Morris & Kuratko, 2002:29-30).

The output component of the model includes the level of entrepreneurship exhibited in the entrepreneurial event. As discussed in Chapter 1 (see Section 1.3.2), entrepreneurship is a variable. The process could result in any number of entrepreneurial outcomes, such as new products, services, processes, technologies, new venture creation, renewal of an existing enterprise, employment and so forth. The outcomes vary considerably in terms of how entrepreneurial they are (Morris, 1998). While an imitation strategy may not be high in entrepreneurial intensity, the development of a radical innovation, or creation of a new venture, may be regarded as highly entrepreneurial.

This model enriches the field of entrepreneurship, because it illustrates that entrepreneurship takes place in various contexts (new venture creation or existing enterprises), is driven by an individual (entrepreneur or champion), is focused on an opportunity, could produce a number of outcomes (from new products to job creation), and varies in degree (intensity).

This section discussed the blurring boundaries of CE with other fields, namely strategic management, the resource-based view and entrepreneurship. The next section will briefly touch on how CE is implemented in large enterprises.

2.6 IMPLEMENTING CORPORATE ENTREPRENEURSHIP

Depending on the type of CE that is pursued, different modes of implementation may be applied. It is important to bear in mind that although certain structural factors, such as organisational structure and bureaucratic processes, may be adapted to facilitate entrepreneurship, cultural factors, such as values and norms, also play an important role in influencing the behaviour of employees in large organisations (Russell, 1999). Morris and Kuratko (2002:69-70) identify seven major forms CE may assume inside an existing enterprise, shown in Table 2.4.

Table 2.4:

Expressions characterising the seven major forms of Corporate Entrepreneurship

Traditional R&D: “Leave it to the technical guys”

Ad hoc venture teams: “Here’s the concept, the budget and the deadline – go to it.”

Corporate venturing: “We need a separate unit for breakthrough concepts.”

Intrapreneurs and champions: “It’s up to everyone, including you.”

Acquisitions and Take-overs: “We can buy growth and obtain the products, markets and technologies of others.”

Outsourcing: “Let’s have someone else develop it for us, and then we’ll make the money.”

Hybrid forms: “We can mix and match the other approaches to fit our context.”

Source: Adapted from Morris and Kuratko (2002:69)

The first of these could be termed “*traditional research and development*” (R&D) departments or units (Lichtenthaler, 2005). The focus of these units is on technical advancement and is driven by research. A number of projects, closely linked to the mission of the enterprise, may be pursued simultaneously. While some of these projects would focus on developing “breakthrough” new technologies, others may replicate the efforts of competitors. In an enterprise where R&D’s purpose is to develop new products, other employees could easily escape the responsibility for innovation.

The second form of CE identified by Morris and Kuratko (2002:70) is the “*ad hoc venture team*”. Other researchers have termed these teams cross-functional project teams. Product champions often lead them and implement sustained regeneration, i.e. new product or market introductions (Akgün, Lynn & Byrne, 2004:42; Howell, Shea & Higgins, 2005). These teams may receive ample resources, but need to adhere to strict project schedules. Even though this form of CE tends to successfully achieve set goals, it is not outstanding at producing sustained entrepreneurship.

A third, very popular, form of CE is *corporate venturing*. A corporate venture is a relatively permanent unit, established with the objective of identifying and seizing opportunities in the environment (in other words strategic renewal). This unit may focus

on breakthrough innovations or new ways of competing in its industry (i.e. domain redefinition) (Altman & Zacharakis, 2003; Husted & Vintergaard, 2004). In a sense the division or group is a kind of incubator where bold new ventures may be formulated and brought to life. Many researchers (Miller & Camp, 1985; Sykes & Block, 1989) warn that this division should be separate from the rest of the organisation, the reason being that the managerial requirements of a new venture differ radically from those of a mature company. One of the great challenges of these divisions is that newly developed or launched products and services should be left in the hands of the mainstream operating units. That may be quite difficult, since the mainstream operating units may resist adopting or taking ownership of an initiative which they played no role in creating (Morris & Kuratko, 2002:70).

Pinchot's (1985) view of the *intrapreneur* is referred to by Morris and Kuratko (2002:70) as a "*champion*". Schon (1963:84) viewed the importance of this individual as breathing life into new ideas. He argues: "A new idea either finds a champion or it dies". Champions informally emerge to actively and enthusiastically promote innovations through the crucial organisational stages. They play a critical role in overcoming the social and political pressures imposed by an organisation and convert them to its advantage (Howell *et al.*, 2005:642). Champions often seek out higher-level "sponsors". They beg and borrow resources, often relying on informal networks, exchanging favours, and doing considerable development work in secret, or at least prior to formal approval and support for the concept (Augsdorfer, 2005). In fact, many of these concepts are rejected multiple times by management, but the champion perseveres in keeping the idea alive and adapting it into a form management would eventually accept (Morris & Kuratko, 2002:70).

Some companies prefer to achieve entrepreneurial growth through "*acquisitions and take-overs*". A classic example is Barclays (UK) acquiring a majority stake in Absa to gain access to new markets in South Africa. The key here is strategic fit, that is making acquisitions and take-overs that are related to the core competencies of the company, or acquiring skills, technologies, and customers that complement the strategic direction of the company. These acquisitions and take-overs often result in a restructuring of the acquired enterprise and organisational rejuvenation aimed at improving internal processes or the implementation of new systems (Smits & Groeneveld, 2001; Crossan &

Berdrow, 2003; Boyett & Currie, 2004). The challenge for the acquiring enterprise is to instil its values and culture in these new acquisitions (Morris & Kuratko, 2002:71).

Rather than acquiring another firm, a growing number of companies are buying some of the intellectual capital of other companies and individuals. For example, when VeriSign bought Mark Shuttleworth's business (Twathe), it was "*outsourcing innovation*". Taking into account the investment needed to cultivate this kind of entrepreneurial behaviour inside an enterprise, this form of CE can be a realistic path to innovation. For another enterprise, timing, speed or potential competitive considerations may drive it to either acquire the rights to an invention or effectively pay someone else to develop it while retaining ownership (Morris & Kuratko, 2002:71).

Finally, any number of "*hybrid forms*" are possible. Enterprises experiment with different forms in attempts to spur entrepreneurial performance. Even within the six forms described above, there is considerable variance across firms. Discovery Health simultaneously focuses on developing new services, strategies and identifying unmet consumer needs, thereby changing the way medical aid schemes compete in the industry (Planting, 2003). But how entrepreneurial is corporate South Africa in reality?

2.7 CORPORATE ENTREPRENEURSHIP IN SOUTH AFRICA

South Africa is part of the global competitive landscape and, therefore, South African enterprises also face a turbulent business environment filled with ambiguity and discontinuity. Geraldine Fraser-Moleketi, Minister of Public Service and Administration, emphasised that innovation would form the key to success in South Africa. "The qualities and skills of entrepreneurship and innovation need to be developed among South Africans to drive growth; only then will the country's long term prospects improve" (Fraser-Moleketi, 2004).

Some large South African enterprises are cognisant of the benefits that CE has to offer. Downsizing, outsourcing, the formation of profit centres and the establishment of ventures within large enterprises are becoming commonplace in giant enterprises such as Sasol, Altron, Anglo American, the major banks and others (Rwigema & Venter, 2004). Unprofitable subsidiaries are either retrenched or 'unbundled', as Anglo-American

did with Johnnic several years ago (Grulke & Silber, 2001). In the meantime, subsidiaries are run semi-autonomously, with managers serving as intrapreneurs while ultimately reporting to their head offices. Since many managers' and directors' rewards are performance-related, independent business units tend to produce improved returns that benefit the staff and the holding company (Rwigema & Venter, 2004:79). Some subsidiaries are becoming known for their innovative management style, such as Discovery Health, part of Discovery Holdings (Planting, 2004).

Despite the increasing relevance of CE for large enterprises, several research gaps remain. A need exists for empirical studies on the CE dimensions and organisational form and/or conduct (see Section 2.4.). South African researchers should also examine the relationship between CE and competitiveness (Goosen *et al.*, 2002) and the type of strategic leadership (Visser, 2003) manifested during CE. In addition, the changing local context and conceptual theoretical development also offer research opportunities (Scheepers & Hough, 2004:11). This study will aim to address one of these research gaps by focusing on the internal and external antecedents of CE and empirically determine how these influence the entrepreneurial intensity of enterprises active in e-business operating in South Africa.

2.8 SUMMARY

This chapter focused on the issues of how CE evolved, explored the theoretical foundations on which it is based and described the state of the proposed research field.

For the purpose of this study, CE is defined as a process through which formal and informal creative activities are encouraged and intangible resources are managed. Additionally CE is aimed at creating new products, services, innovation, processes, strategies and business units, with the objective of improving and sustaining a company's competitive position and financial performance.

Major drivers of CE were identified as increasingly turbulent environments, the difficulty of building a sustainable competitive advantage and the new economy. Underlying forces of the new economy are knowledge, innovation, globalisation and networks. These drivers have led to the realisation in most large enterprises that they cannot

continue to “do business as usual”. Innovative, entrepreneurial responses are imperative to survive within this new environment.

Section 2.4 examined the development of CE by presenting an overview of CE research. Scheepers and Hough (2004) built on the domain framework of Guth and Ginsburg (1990) and other researchers to provide an overview of the development of CE and to identify gaps in the CE body of knowledge.

CE originated from two main perspectives, namely strategic management and entrepreneurship. The blurring boundaries between CE and strategic management were explored. Theoretical foundations of CE may be found in the strategic management theories of the resource-based view of the firm, population ecology and strategic adaptation. The perspective of entrepreneurship as a process also adds value to the CE perspective. Finally the implementation of CE and the state of CE in South Africa were discussed.

The following chapter will examine which internal and external antecedents influence corporate entrepreneurship within existing enterprises.

CHAPTER 3

ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP

3.1 INTRODUCTION

The previous chapter presented the ambiguities and definitional difficulties of corporate entrepreneurship, the development and current state of the field and the theoretical foundations of CE. As could be seen from the literature, CE is a multi-dimensional concept, referring to a process through which formal and informal creative activities are encouraged and intangible resources are managed. Additionally CE is aimed at creating new products, services, innovations, processes, strategies and business units, with the objective of improving and sustaining a company's competitive position and financial performance.

Defining CE is challenging, but the implementation thereof is also complicated by numerous difficult issues. These issues require acknowledgement of the influence of the internal conditions (internal antecedents) within an enterprise (Hornsby *et al.*, 2002), as well as the opportunities and threats present in the external environment (external antecedents) (Zahra, 1991:197). Together, both internal and external antecedents influence the intensity of entrepreneurial behaviour that enterprises exhibit.

Over the past three to four decades researchers have conducted a number of empirical studies examining the antecedents of CE activities (Zahra, 1991; Zahra & Covin, 1995; Morris & Sexton, 1996; Antoncic & Hisrich, 2001; Goosen, 2002). Zahra and Nielsen (1998) point out that the factors in the external environment interact with factors inside the organisation, challenging managers to respond creatively and act in innovative ways. But what exactly are these antecedents and how could they be influenced by management? This chapter will identify and elaborate on key internal antecedents and discuss external antecedents to CE. Subsequently the firm's internal context will be considered and the role of top and middle management in the CE process will be

discussed. This chapter concludes with a proposed model highlighting the interaction between the internal and external antecedents and their impact on CE.

3.2 INTERNAL ANTECEDENTS

The impact of corporate entrepreneurial activities on successful company performance has attracted research into the organisational factors that could promote and/or impede these activities (see Covin & Slevin, 1991; Damanpour, 1991; Zahra, 1991; 1993; 1995; Zahra & Covin, 1995; Hornsby *et al.*, 2002; Goosen, 2002). Burgelman's (1983; 1984) and Elenkov, Judge and Wright's (2005:680) research clearly shows that internal organisational factors influence the types of CE activities a company pursues. Researchers have sought to identify some of the key internal variables that may affect a company's pursuit of CE. These factors include organisational leadership, the culture and value system of the enterprise, structure and processes, systems and the availability of resources. While the literature discusses a wide variety of key internal CE factors, these factors, individually and in combination, are understood to be important antecedents of CE efforts. They affect the internal environment, which moulds managers' outlook on and interest in CE (Kuratko, Montagno & Hornsby, 1990).

The following section will discuss these internal factors in general and will then show how Hornsby *et al.* (2002) synthesised these internal antecedents to five factors.

3.2.1 ORGANISATIONAL LEADERSHIP: STRATEGY

The term *organisational leadership* encompasses a wide number of concepts. Botha (2005:1-2) identifies vision, strategy and organisational learning, as well as top management involvement and support, as forming part of organisational leadership. The role of middle management in strategy formulation and CE is also increasingly being recognised (see Section 3.4.2).

Several authors (Kuratko & Hodgetts, 2004:58; Elenkov *et al.*, 2005) recommend that entrepreneurship or innovation should be stated as part of the vision (see Section 3.4.1). To have an impact on the organisation, corporate entrepreneurs should embody the

corporate vision (Pearce *et al.*, 1997:159). To turn the vision into reality most enterprises would formulate their strategies, taking into account the opportunities and threats of the external environment and the enterprise's internal strengths and weaknesses. Entrepreneurship plays an important role in strategy formulation. Morris and Kuratko (2002:155-156) argue that the integration of entrepreneurship with strategy consists of two aspects. Firstly, creativity and entrepreneurial thinking are needed to develop a great strategy. Developing unique positions in the marketplace is complex, since it may involve significant change. Secondly, a strategy for entrepreneurship and innovation should be developed for entrepreneurial activities to flourish. As part of such a strategy, also called an innovation charter, the enterprise should set clear innovation goals (Govender, 1998; Goosen *et al.*, 2002:40), spell out the focus on new venture development and identify departments or business units specifically responsible for innovation.

Organisational learning is a critical success factor of the entrepreneurial organisation. Senge (1990) refers to a learning organisation as one that continually improves through its capacity to learn from its experience. Organisational learning in this context refers to the attainment of new knowledge by managers and employees who are keen to apply knowledge in making decisions or influencing others in the organisation (Arnoldi, 1999). It simultaneously includes the unlearning of old routines and the learning of new routines. Unlearning is especially important in an entrepreneurial context, since entrenched beliefs and past experiences may hold little significance for the present-day environment. Thus these beliefs and experiences often serve as barriers to an entrepreneurial project (Morris & Kuratko, 2002:346). Block and Macmillan (1993) found that enterprises rarely possess systematic methods of learning: which venture team structures are more effective for certain types of innovation projects; approaches to goal setting and monitoring that keep projects on track; methods for opportunity identification; ways of achieving the appropriate balance between autonomy and control on innovation projects; and human resource policies that encourage initiative and collaboration around innovation projects.

Each entrepreneurial effort represents an experiment. Learning is critical not only to enable management to redirect the individual employee more effectively, but also to enable management to gather cumulative information on entrepreneurial projects that

would help encourage and nurture CE activities more effectively in future (Ahuja & Lampert, 2001:540; Morris & Kuratko, 2002:248).

Numerous researchers have also identified the support and commitment of top and middle management as vital to ensure the success of CE activities. Brown and Eisenhardt (1995) emphasise the considerable role of top management in the product development process. The authors argue that the product development process might be delegated to a cross-functional project team; but management support is critical for timely and successful introduction of a new product. Top management support may take various forms, such as the presentation of a vision for the future, communicating a distinctive product concept, giving the approval to the project team proceed with a new idea, and providing the necessary resources (Srivistava & Lee, 2005: 465). A more comprehensive discussion of the role of top management is provided in Section 3.4.1. Middle managers can support employees by championing innovative ideas, recognising people who articulate ideas, and providing needed resources or expertise, such as seed money to kick-start ideas or institutionalising the entrepreneurial activity within the firm's systems and processes (Hornsby *et al.*, 2002).

From the above discussion it is evident that management plays an instrumental role in articulating the vision, strategy and providing support for such a strategy. However, management also plays a key role in creating an entrepreneurial culture and value system of an enterprise.

3.2.2 CULTURE AND VALUE SYSTEM

Culture is a distinct factor in fostering entrepreneurial activity within an organisation. Culture may be defined as “an organisation's basic beliefs and assumptions about what the company is about, how its members should behave, and how it defines itself in relation to its external environment” (Cornwall & Perlman, 1990). Components such as values, rules of conduct, communication style, vocabulary, methodology, rituals and myths and stories form part of organisational culture (Morris & Kuratko, 2002:255).

Organisational culture has a critical impact on the attitude of people (Ferris, Arthur, Berkson, Kaplan, Harrell-Cook & Frink, 1998). It is manifested in the attitude shown when people of the company interact with each other in the workplace, ranging from how employees suggest new ideas to how top management formulate strategies. Simply put, culture could be viewed as: “The way things are done around here” (Knapp & Yu, 1999:16).

An enterprise can create an entrepreneurial culture of innovation and creativity through various means. Such an innovation culture involves the taking of risks, worker participation, creativity and shared responsibility (Ngo & Lau, 2004). In an entrepreneurial work environment, open communication is encouraged. Very little hierarchical communication takes place; feedback is encouraged and a free flow of information and the sharing of ideas occur (Goosen *et al.*, 2002:40).

Several values are inherent to an entrepreneurial culture. Hornsby *et al.* (2002) point out that in such cultures people are willing to take risks and management will tolerate failure and mistakes employees make when innovating. Employees are empowered to suggest, try and experiment, create and grow regardless of the department in which they currently work. For example, an air hostess may suggest improvements to the catering system on an aircraft, which strictly speaking is part of operational issues, since she is directly engaged with the food and drinks; she could well provide valuable feedback and ideas for improving operational processes. Furthermore, employees are encouraged to take responsibility for and ownership of projects (Nayager & Van Vuuren, 2003:4).

Govender (1998:13) argues that value is created through the innovation and change process. Norms that are widely shared and strongly held by members of the organisation will serve as guidelines to facilitate the generation of ideas and to implement new approaches. Norms that are regularly identified in innovative organisations include rewards for change; openness; a belief in action; common goals; and autonomy (Jacobs & Kruger, 2001:7).

Autonomy is the freedom granted to individuals and teams who are able to exercise their creativity and champion promising ideas needed for entrepreneurship to occur (Lumpkin & Dess, 1996:140). Linked to these norms is a proactive, hands-on management style

(Morris & Kuratko, 2002:260). Gemünden, Salomo and Krieger (2005:371-372) found that even though higher autonomy within new projects does not lead to significantly higher project success, autonomy is, among other factors, a necessary condition for project success.

Since culture and structure reinforce each other (Echols & Neck, 1998:43), changes to the enterprise's organisational structure and systems are required to support an innovative culture (Ngo & Lau, 2004).

3.2.3 STRUCTURE AND PROCESSES

As enterprises evolve, the structures and processes used to create order and logic for company operations may become bureaucratic, and within this kind of environment entrepreneurship is inhibited. Nevertheless, there are alternative options to enhance entrepreneurial performance.

The term *structure* may be used to describe the formal ways in which a company organises people and tasks. Entrepreneurship requires structure, but is often a victim of structural arrangements created in companies. Mechanistic and rigid structures are effective in large organisations, where coordination of tasks is achieved through standardisation of work. In these systems well-developed automated information systems are used to track internal operations and power is concentrated among top executives who design workflow processes, while middle and lower-level management are expected to implement plans (Morris & Kuratko, 2002:212). A mechanistic type of structure inhibits entrepreneurial behaviour. Streamlined processes with explicit policies and procedures are designed to bring order and consistency to everyday business operations. This becomes a barrier to entrepreneurial behaviour, as there are no set norms in place to guide entrepreneurs, resulting in the restriction of CE activities. Examples of constraints include long, complex approval cycles, extensive documentation, over-reliance on established rules of thumb, and unrealistic performance criteria (Govender, 1998:12).

Morris and Kuratko (2002:205) argue that the mechanistic structure succeeds in predictable, controllable external environments, but organic structures are needed to

facilitate entrepreneurship in more hostile environments. Organic structures are highly flexible and consist of groups of trained specialists from different work areas who collaborate to design and produce complex and rapidly changing products. Power is decentralised and authority is linked to expertise. Organic structures are informal flat structures, which facilitate communication and teamwork (Govender, 1998:11). Similarly Echols and Neck (1998:42) elaborate on the above-mentioned description and point out that in a flat, three-tiered organisation, front-line employees act as players and innovators; middle managers act as coaches and supporters who integrate tasks, develop players' skills, facilitate organisational learning and help others achieve their best work; and the top leaders energise and shape the organisation's purpose and goals. Entrepreneurial structure supports the systematic discovery of innovative opportunities (Drucker, 2002), and provides a climate in which innovative ideas could be evaluated, chosen and implemented (Hornsby *et al.*, 2002:260).

Ultimately structure is a matter of balance. Organisations need to balance lean and flexible aspects of the organisation against the need for administrative controls and some level of bureaucracy in other areas of the enterprise. They should balance a customer focus with a technological focus (Hamel & Prahalad, 1994). Structure could well be an important facilitator for entrepreneurship, because it may give employees a sense that they have room to explore new ideas and innovate while also allowing them to interact with others in the organisation. Another valuable structural ingredient is a formal champions' programme (Morris & Kuratko, 2002:133).

3.2.4 PEOPLE: CHAMPIONS AND SKILLS

While intellectual capital is one of the key intangible resources of the New Economy, *people* are also able to form one of the greatest obstacles to implementing a CE programme. When people become comfortable with the way things are done in the enterprise they resist change. Change may threaten their security, which may consequently result in perceived failure. If there are no role models at middle and senior management level, there is no incentive for employees to act intrapreneurially (Govender, 1998:12). Intrapreneurial freedom needs to be encouraged by empowering employees, providing access to resources, and presenting rewards and recognition

(Goosen *et al.*, 2002:40). Innovative and entrepreneurial behaviours are often encouraged by allowing champions to emerge.

Howell and Boies (2004:124) emphasise that champions are individuals who informally emerge to actively and enthusiastically promote innovations through the crucial stages of the innovation process. They are viewed as essential to the successful implementation of an innovation. In order to overcome the social and political pressures imposed by an organisation and convert them to their advantage, champions demonstrate personal commitment to the idea, promote the idea with conviction, persistence, and energy through informal networks and willingly risk their position and reputation to ensure its success (Howell *et al.*, 2005:646). In order to facilitate champion behaviour Morris and Kuratko (2002:133-134) urge enterprises to institute a formal champions' programme.

A formal champions' programme encourages ambitious and talented entrepreneurs throughout the enterprise to suggest, develop, champion, and implement new products. These champions should emerge voluntarily throughout the enterprise. The role of management in such a programme would be to build an internal environment or infrastructure that enables these individuals to flourish. The infrastructure should incorporate properly developed rewards and incentives, effective use of performance appraisals, flexibility in terms of resources, open communication, incentives for interfunctional cooperation and the elimination of red tape (Morris & Kuratko, 2002:134). To encourage CE behaviours the systems of the enterprise should also be adapted to embrace entrepreneurial behaviours.

3.2.5 SYSTEMS: REWARDS AND CONTROL SYSTEMS

As organisations mature they become dependant on *formal systems* to provide stability, order and coordination to compensate for an increasingly complex corporate structure. Within these systems some areas may become strong disincentives for entrepreneurship and innovative behaviour. These include misdirected reward and evaluation systems, oppressive control systems, inflexible budgeting systems, arbitrary allocation systems, and overly rigid planning systems (Govender, 1998:11).

Organisational systems should provide reward and recognition for creative work and performance accomplishments. Even though organisational control systems such as pay-for-performance may encourage in-role behaviours, they may also discourage behaviours not linked to specific rewards. Hence the reward system could have a significant impact on innovative activity, both because it can be a tool to increase such activity and because it may discourage innovative activity by rewarding other behaviours (Chandler, Keller & Lyon, 2000:62). Theorists therefore stress that an effective reward system that spurs entrepreneurial activity should consider goals, feedback, emphasis on individual responsibility, and performance-based incentives. The use of appropriate rewards could also enhance middle managers' willingness to assume the risks associated with entrepreneurial activity. Innovative organisations are characterised by providing 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).

Organisational systems, especially human resource (HR) systems, should prepare innovation-enhancing HR policies. These policies may vary from conventional HR practices in a stable environment. As mentioned above, the reward and compensation system plays a vital role in creating a climate conducive to CE activities. An effective reward system that impels entrepreneurial activity should consider goals, feedback, emphasis on individual responsibility and results-based incentives (Hornsby *et al.*, 2002). Such a system would encourage employees to embrace some of the risks associated with CE (Parbhoo, 1997).

Control systems also influence the level of entrepreneurial behaviour within an enterprise. In recent research conducted by Morris, Allen and Schindehutte (2006), three important findings emerged with regard to control systems. Firstly, levels of entrepreneurship are highest when controls are very informal (few explicitly documented rules, procedures and policies). Thus, even though intermediate or balanced control systems facilitate entrepreneurship, highly informal control systems appear to be even more conducive to higher levels of entrepreneurship. Secondly, a widely held belief is that the more autonomy (discretion and/or decision-making freedom) junior managers are given to interpret or ignore rules and procedures in performing their jobs, the more entrepreneurial an enterprise will be (Thurley, 1997; Ferner, 2000; Floyd & Lane, 2000).

However, even though discretion is positively associated with entrepreneurial behaviour, higher levels of formality tend to offset the impact of discretion (Morris *et al.*, 2006). Thirdly, earlier research (Simons, 1990; Shih & Yong, 2001) suggested that tight budgeting systems (budgets which impose strict restrictions on how resources are allocated and performance evaluated) are consistent with the pursuit of an innovation strategy. However, Morris *et al.* (2006) found that balanced or intermediate levels of budgetary tightness produce the highest levels of entrepreneurship. It would seem that fiscal controls should strongly emphasise outcomes and individual accountability, while also including resource slack that permits individuals and teams to experiment with initiatives that are consistent with the firm's objectives.

Therefore, budgeting systems need to convey trust in employee discretion and provide flexibility for the funding of bootleg projects or experimentation. Planning, although critical for successful entrepreneurship, could present a serious obstacle. Problems occur when there is an overemphasis on analysis and form, instead of content. The result may be an overly rigid process that is incapable of responding to new opportunities (Morris & Kuratko, 2002:174).

3.2.6 AVAILABILITY OF RESOURCES

Resources (including time) and their availability for entrepreneurial activity are a crucial dimension for CE. Employees should perceive the availability of resources for innovative activities. The availability of slack resources could encourage experimentation and risk-taking behaviours (Hornsby *et al.*, 2002). Employees may develop beliefs about the intrinsic value of projects that have been undertaken based upon the level of resource allocation. A lack of resources such as time, materials, information, and the like may lead to reduced commitment to assigned goals. Perceptions of the level of resource allocations in support of innovative activities may thus influence the degree to which employees perceive the organisation to be supportive of innovation (Chandler *et al.*, 2002:62).

3.2.7 SUMMARY OF INTERNAL ANTECEDENTS

In summary, the literature identifies many internal factors that influence the success of CE activities. Even though this section discussed organisational leadership, culture and values, structure, people, systems and resources as internal antecedents, developing items to measure each of these antecedents would involve a separate study on each. However, this is not the purpose of this study.

The researcher attempted to identify a measurement instrument which could capture the most salient internal antecedents. The Corporate Entrepreneurship Assessment Instrument (CEAI), developed by Hornsby *et al.* (2002) synthesised these internal antecedents to five factors. These authors concur that while the literature illustrates a wide variety of CE factors, there are a few elements that are consistent throughout the texts in this field, namely management support for innovation, work discretion and autonomy, rewards, resource and time availability and flexible organisational boundaries. The measurement scale and the above-mentioned five internal factors are discussed in more detail in Chapter 5, Section 5.3.4.2.

This section has shown that the literature identifies various internal antecedents to CE. This study views management support for CE; autonomy of employees; effective reward systems; time availability; and flexible organisational boundaries as vital for entrepreneurial activities to develop. However, the influence of the external environment on organisations cannot be overlooked. As discussed in Section 3.1, the interaction of external and internal antecedents compels organisations to act entrepreneurially. The importance and the impact of the external antecedents on the mission, vision and strategy of the organisation will now be analysed.

3.3 EXTERNAL ANTECEDENTS

Enterprises should instigate innovative strategies or formulate responses to the external environment that surrounds them. An environment poses challenges and offers new opportunities on which firms may try to capitalise by acting in creative and innovative manners. Opportunities may arise from ideas or suggestions made by customers, suppliers, buyers, and even competitors (Booz-Allen Hamilton, 2005). These stimuli can

provide incentives for the CE activities of enterprises (Zahra, 1991). Companies in South Africa face the challenge of globalisation and the added challenge of internal transformation of the economy. Pressure from the government to transform is felt especially through the government's policy of black economic empowerment (BEE), employment equity (Mahabane, 2005:2), the "Convergence Bill" for the ICT industry (Hartley and Worthington-Smith, 2004:12), the new National Credit Act (Neves & Leonard, 2007) and various other legislative reforms. These pressures create a hostile and dynamic environment in which South African enterprises are obliged to operate and find ways to manage environmental hostility and complexity, such as CE initiatives.

Managers' perceptions of the external environment influence the strategic choices that are made. Although these perceptions do not always reflect the "objective reality" of the environment, they constitute the foundation that guides managerial decision-making (Zahra & Bogner, 1999:138). For example, two enterprises that compete in the same industry and serve similar customer segments may well perceive the environment in different ways. While one enterprise may experience the environment as being predictable, another may view it as being multi-faceted and uncertain (Govender, 1998).

These perceived differences in the environment arise from variations in the way enterprises define their industry, boundaries of the industry and business domain. The disparity in perceptions of senior executives in terms of the institutional and competitive forces that shape their industry also contributes to the view of a heterogeneous environment (Hornsby, Kuratko & Montagno, 1999). Because environments are seen as diverse, both within and across industries, there is a need to use multiple dimensions to capture enterprises' perceptions of their environments (Lumpkin & Dess, 1996). For example, technology-intensive industries are often seen to require higher levels of innovation and entrepreneurship than traditional industries in which commodities are traded (Giarratana, 2004:804; Lee *et al.*, 2001:618).

Capturing executives' perceptions of the environment is a challenging task because the literature highlights multiple classifications of environmental dimensions (Dess & Rasheed, 1991). Such dimensions that influence CE are munificence, dynamism, technological opportunities, demand for new products, hostility and heterogeneity (Zahra, 1991; 1993:321-322). However, the concept of munificence is multi-dimensional (Kreiser, Marino & Weaver, 2002). Munificence can be defined as a multi-dimensional construct,

embodying the constructs of dynamism, the abundance of technological opportunities, industry growth and the demand for new products in the environment (Zahra, 1993). The following section will analyse these concepts in more detail.

3.3.1 DYNAMISM

Dynamism refers to the perceived instability of an enterprise's market, because of the rate of change (Lumpkin & Dess, 2001:436), unpredictability of change (Dess & Beard, 1984) and persistence of change (Zahra, 1993:222) in the enterprise's external environment and forms part of the munificence construct. Dynamism indicates uncertainty (Anderson, 2005:1060), which diminishes the ability of managers to forecast future scenarios and events and their influence on the organisation (Lumpkin & Dess, 2001). However, changes in the external environment open new windows of opportunity for firms (Antonich & Hisrich, 2001).

Opportunities emerge from the dynamism of an industry where macro-environmental changes, competitive rivalry and regulatory changes bring about new developments (Zahra, 1991; Ferreira, 2002:14). Enterprises formulate entrepreneurial strategies such as new product development (sustained regeneration), innovation, self-renewal or corporate venturing strategies to exploit opportunities (Zahra, 1993:322; Kreiser *et al.*, 2002). These responses of firms also intensify rivalry by encouraging new entry into the market. When entry occurs and competition intensifies, the environment becomes volatile, thereby increasing the risk of failure for companies. To cope with this volatility, companies may diversify into new fields, thereby altering their business model (Zahra, 1991:197-198; Ferreira, 2002:14). Several studies indicate a relationship between increased dynamism in the external environment and entrepreneurial posture (Khandwalla, 1977; Miller, Burke & Glick, 1998; Covin & Slevin, 1991; Zahra, 1991, 1993, 1995). Thus higher levels of innovative, risk-taking behaviour are also associated with uncertain opportunity-rich environments (Löfsten & Lindelöf, 2005:728).

3.3.2 TECHNOLOGICAL OPPORTUNITIES

Technological opportunities form part of the munificence² construct and refer to the perceived availability of new niches in the market for new or existing technologies. These technological opportunities create a “technological push” and could stimulate or impede CE (Zahra, 1993:322). Technological opportunities vary from one sector of the economy to another because of differences in the industry life cycle of technologies. Giarrantana (2004) analysed the founding of the encryption software industry and showed that innovation and product differentiation, along with investments in specific firm capabilities, were strongly correlated to firm growth and profitability. Zahra (1993:323) points out that companies differ with regard to their perceptions of these opportunities. These differences in perceived technological opportunities are likely to influence CE activities. Differences with regard to perceived industry growth also influence CE.

3.3.3 PERCEIVED INDUSTRY GROWTH

Asymmetry of access to industry data, industry reports and external networks influence the perceptions of executives with regard to industry growth (Lee *et al.*, 2001:620-622). Perceived industry growth or decline prompts companies to reformulate their strategies, change their business models and rebuild their capabilities, and subsequently influences their CE activities (Zahra, 1993:323; Morrow, Sirmon, Hitt & Halcomb, 2007:272-275).

3.3.4 IMPORTANCE OF NEW PRODUCTS

This final component of environmental munificence (see the definition of munificence in Section 3.3 above) refers to the importance an industry places on new product development (NPD) for creating and retaining a competitive advantage. In industries where NPD is seen as a source of competitive advantage, firms will focus their investments on stimulating demand and building their capabilities to ensure market success (Elenkov *et al.*, 2005). Zahra (1993) views a “demand pull” by the market for new products as an antecedent to corporate venturing activities. This “demand pull” may

lead to process, technological and administrative innovations and force companies to redefine their business portfolios. To collate information about market changes, enterprises may intensify their scanning efforts, become more flexible in their planning processes and adapt strategic controls. These efforts in turn should increase the levels of CE in a firm (Barringer & Bluedorn, 1999).

3.3.5 HOSTILITY

Environmental hostility refers to environmental conditions where changes are unfavourable and the rivalry between competitors could create threats to a firm's mission. Declining demand for the enterprise's products, competitive rivalry and limited resources may contribute to the perceived threats posed by the environment (Dess & Beard, 1984; Zahra, 1993:324-325; Zahra & Bogner, 1999:144; Löfsten & Lindelöf, 2005:728). To ensure that enterprises reach their goals, they need to commit limited resources to managing threats in unfavourable environments (Zahra & Garvis, 2000:475; Lumpkin & Dess, 2001). The literature highlights two components of hostility: competitive rivalry and the unfavourability of changes in the environment.

3.3.5.1 Competitive rivalry

The intensity of competition or rivalry between competitors could create threats to a company's mission and survival. Rivalry between enterprises results from competition for resources, opportunities, and customers. Hostile environments are resource-poor, lean environments and they lack the abundance of resources and capacity needed to support a large number of companies (Dess & Beard, 1984). Rivalry among competitors reflects the nature of competitive dynamics in an industry (Porter, 1980). The existence of too many competitors increases rivalry, leads to a paucity of readily exploitable market opportunities, tremendous competitive, market, and/or product-related uncertainties, and a general vulnerability to influences from forces and elements external to the firm's immediate environment. These environmental conditions are harsh, and sheer survival is often viewed as a major accomplishment (Zahra & Covin, 1995:48; Antonic & Hisrich, 2001). In environments where the intensity of competition is high, firms may try to diversify their business activities and focus on additional market segments. These activities in turn lead to higher levels of CE.

3.3.5.2 Unfavourability of change

This dimension refers to the extent to which the environment is perceived as posing a threat to a company's goals and mission. Unfavourable change arises from several sources such as radical industry changes, intense regulatory burdens placed on an industry, loss of investor confidence and change in corporate ownership. In addition unfavourable changes may also result from market and product-uncertainties. These threats could well motivate managers to consider bold strategic actions to outperform market expectations (Morrow *et al.*, 2007:271).

Firms' responses to these environmental conditions differ. Some enterprises may decide to pursue growth strategies, such as market penetration through intensive marketing and advertising activities, in order to maintain customer loyalty. Other strategies include market development by differentiating products, or even new product development by modifying and changing existing products (Zahra, 1991:198; Ferreira, 2002:14-15).

Increased hostility compels managers to find innovative ways to reduce or manage sources of hostility. When environmental hostility escalates, enterprises usually continue to redefine their business, decide on their new domain and undertake significant alignments in their operations through divestments, retrenchments, or restructuring (Zahra, 1993:324). Another option is to institute self-renewal programmes that redefine their business concept, diminish inefficiencies within the existing business and stimulate flexible responses to change, or to protect current markets from the adversity introduced by rising environmental hostility. These renewal activities may entail decentralisation of authority, creating separate business units, adopting organic organisational structures or increasing environmental scanning (Covin & Slevin, 1989; 1991). Thus, as the environment becomes more hostile, a firm would become more involved in CE activities.

3.3.6 HETEROGENEITY

Heterogeneity refers to the existence of multiple segments with varied characteristics and needs that are being served by the firm. Hence a heterogeneous environment is perceived to be complex because of the multiplicity and diversity of needs with which the enterprise needs to contend (Dess & Beard, 1984). Diversity of needs results from an industry's natural conditions and from the choices enterprises exercise within an industry. As industries evolve, new segments emerge, while competition in these segments increases concomitantly. For an enterprise to compete effectively in these segments, knowledge and expertise are essential. The enterprise needs to address a large number of interrelated sectors, a factor that could increase the managers' perceptions of the complexity of their environments (Lumpkin & Dess, 1996). Enterprises respond to heterogeneous environments by developing creative ways to manage environmental complexity. Some enterprises may engage in corporate venturing, while others may use administrative innovations to deal with the uncertainty and complexity (Zahra, 1991:199; Ferreira, 2002:15).

In industries where the value assigned to the development of new products is high, and also in order to create and retain a competitive position, enterprises would need to invest heavily in stimulating demand. Demand for new products will compel enterprises to increase their investment in new product development and introduction. Product, technological and administrative innovations are inseparable. To increase its levels of product innovation, an enterprise should also develop appropriate internal technological and administrative structures (Zahra & Bogner, 1999). In this process enterprises are compelled to redefine their business portfolio, create effective scanning systems to monitor market changes, and develop appropriate structures for new ventures. Management may also be forced to change the reward and communication systems to speed the introduction of new products to the market (Zahra & Ellor, 1993). These changes increase self-renewal activities (Zahra, 1993:323).

Thus the extent to which the firm views its external environment as being heterogeneous depends on the industry's variables themselves and the company's strategic choices (Zahra & Bogner, 1999:140). The management of an enterprise would base their

strategic decisions on their perceptions of the opportunities and threats in the external environment. But the question arises as to whether environmental antecedents to CE differ in different countries?

3.3.7 COUNTRY DIFFERENTIALS

External business environments differ between countries and between developed, developing and transitional economies. It is, therefore, questionable whether the theory of external antecedents is equally applicable to different countries and different economies.

As discussed in Chapter 2, CE is regarded as an emerging field of science (Busenitz *et al.*, 2003) and as such it is based on a stream of literature that is still growing in scope and quantity (Barringer & Bluedorn, 1999). In this regard, Antoncic and Hisrich (2001) point out that CE theory and measures have North American biases. They argue that while entrepreneurship is considered as being universal, its “generalisability has been limited” because of the lack of cross-cultural testing. Hills and LaForge (1992) concur, stating that like cross-cultural organisational research, entrepreneurship research lacks universal entrepreneurship theories. Thus even though implicitly universal theories exist, there seems to be a lack of explicitly tested universal entrepreneurship constructs.

Antoncic and Hisrich (2001) attempted to address this gap by focusing their research on refining the construct of “intrapreneurship” and developing a valid cross-cultural scale to measure CE in the United States of America (USA), representing a developed economy, and Slovenia, which is a transitional economy. With regard to environmental antecedents their research findings present important implications for researchers and managers in developing and transitional economies.

They established that CE antecedents had differential levels of importance in different countries. Environmental characteristics were found to have a strong direct and moderating effect through organisational antecedents on CE in Slovenia. However, the total effects of environmental antecedents were relatively less important for CE than the organisational antecedents were. In contrast with these findings, for firms in the US

environmental antecedents, even though having only minimal moderating effects through the organisational antecedents, were more important for CE than were the organisational antecedents. They performed a multi-group path analysis and found that the impact of the environmental antecedents on CE is significantly higher in the US than in Slovenia.

3.3.8 APPROACH FOLLOWED IN THIS STUDY

South Africa is viewed as a developing country, but its economy has a dual nature. Mbeki (2003) referred to this dualism as the “first formal economy” and the “third (informal) economy”. As such, it is possible that in South Africa, CE antecedents could well assume differential importance compared with the US or Slovenia. As a developing economy, South Africa thus offers unique opportunities for testing entrepreneurship concepts and research has the potential to expand concepts and theories developed in a single cultural setting.

This study proceeded during *stage one* to view technological opportunities and perceived industry growth as part of the dynamism construct; competitive rivalry and unfavourable environmental changes as part of the hostility construct; and the importance of new products as part of the heterogeneity construct. Thus the constructs measured in *stage one* were dynamism, hostility and heterogeneity. Because of the poor internal consistency of these constructs, they were redefined during *stage two* of the research. During *stage two* the construct of dynamism was expanded to environmental munificence; the hostility construct refined and the heterogeneity construct omitted. As such, these environmental constructs were tied to the goals of the research. Refer to Appendix 2 and 4 and Section 5.3.4.2c.

The internal context and characteristics of a firm, such as the size and age of a firm and the industry in which it operates, could also influence levels of CE.

3.4 THE CONTEXT OF FIRMS: SIZE AND AGE

This section will discuss research findings regarding the influence of size and age of firms on CE activities.

In the innovation literature the relationship between firm size and innovation has received a great deal of attention. In the 1940s Joseph Schumpeter proposed that large firms were more effective innovators than smaller firms (Schilling, 2007:209). While mergers and acquisitions reflect a belief that size provides a number of advantages, size achieved through mergers and acquisitions is fraught with difficulties (Stock, Greis & Fischer, 2002:539).

From an economic point of view, Schumpeter argued that

- (1) Capital markets are imperfect, and large firms are better able to obtain financing for R&D projects.
- (2) Larger firms experience economies of scale in R&D, managerial competencies, and access to markets.
- (3) Learning effects enable large firms to become better and more efficient at innovation over time.
- (4) Larger firms are in a better position to undertake high-risk innovation projects than smaller firms (Schilling, 2007:210).

However, on the opposing side, there are arguments that smaller firms are more flexible, better able to adapt and effect change and, therefore, experience more advantages in innovation. Furthermore, smaller firms are in a position to avoid the “bureaucratic inertia” found in larger companies; they are able to be more responsive to market needs; they may employ more motivated engineers and scientists based on partial ownership; and innovation will make a more visible impact on the smaller firm’s overall performance than in a larger firm. The empirical results on this issue are mixed, with some studies supporting the viewpoint that larger firms are better (Acs & Audretsch, 1988; Graves & Langowitz, 1993; Harrison, 1994), while others again found that smaller firms are better at innovation (Gilder, 1988; Damanpour, 1992; Stock *et al.*, 2002). Yet other researchers, such as Antoncic and Hisrich (2001:521) and Goosen (2002), found that organisational size did not have a meaningful influence on CE in the firms they studied.

The age of a company may be linked to the venture life cycle through which enterprises progress. Enterprises experience the natural patterns of life cycle stages, from initial venture development through start-up activities; venture growth, stabilisation or maturity, innovation and/or decline (Kuratko & Hodgetts, 2004). Each of these venture life cycle stages requires different sets of managerial competencies regarding the managerial focus, organisational structure, top management style, and control and reward systems, which need to be adapted and changed for each stage to ensure an enterprise's survival and success.

Table 3.1 shows that during the initial stages of the venture life cycle the enterprise may be entrepreneurial, but can be managed in an individualistic and directive manner. In contrast to this type of management style, when the enterprise grows and reaches maturity, managers are required to gradually step away and move to a delegative style and then, in innovation or decline, to a participatory management style.

Table 3.1:
Summary of changing organisational practices through corporate growth

Organisational practice	New venture development	Start-up activities	Venture growth	Business stabilisation and maturity	Innovation or Decline
Management focus	Make and sell	Efficiency of operations	Expansion of market	Consolidation of organisation	Problem-solving, innovative
Organisational structure	Informal	Centralised, functional	Decentralised and geographical	Line-staff and product groups	Matrix of teams
Top management style	Individual and entrepreneurial	Directive	Delegative	Watchdog	Participative
Control system	Market results	Standards, cost centres	Reports, profit centres	Plans and investment centres	Mutual goal setting
Reward system	Ownership	Salary and merit increases	Individual bonus	Profit sharing and stock options	Team bonus

Source: Morris and Kuratko (2002:11)

As shown in Table 3.1, management should consciously introduce planned changes, adapt the organisational structure and invent solutions for the current and future venture life cycle stages to ensure enterprise survival and success. Each stage requires specific managerial actions because of “crisis points” that are encountered. To make the transition from new-venture development to start-up, creativity and leadership are required. From start-up to venture growth the entrepreneur is required to shift the focus from him or herself to granting employees more autonomy and to delegate. To move from venture growth to stabilisation, certain bureaucratic procedures should be implemented to ensure administrative success, but management moves further away from the operational issues and transfers control and ownership in the process. If an enterprise is unable to move from maturity to innovation, decline will follow. Many enterprises encounter a so-called “sustainable growth wall” and need to implement various entrepreneurial initiatives to overcome this “wall” (Morris & Kuratko, 2002:8-13). From the discussion it may be seen that entrepreneurial behaviours would change as firms age. Thus it could be expected that age would influence CE. Management also exerts a strong influence on CE activities, but the question arises whether top or middle management has the greatest influence on the level of CE prevalent within an organisation?

3.5 THE INFLUENCE OF MANAGERIAL LEVEL ON CE

As discussed in Chapter 1 (Section 1.4.4), this study views entrepreneurship as a behavioural construct. A behavioural approach is appealing, because behaviour is manageable and measurable (Covin & Slevin, 1991). If managers know what types of behaviours are appropriate to create an entrepreneurial climate, they are able to adjust their behaviour accordingly.

CE involves fostering entrepreneurial behaviours within an established organisation (Echols & Neck, 1998:38). Existing CE research promotes entrepreneurial behaviour for managers, who are in turn expected to be innovative, risk-taking and proactive. It would seem that organisations that embrace corporate entrepreneurship should cultivate managers who are entrepreneurial in their behaviours (Pearce *et al.*, 1997:149).

Role models and managerial examples of how a problem “should” be approached often shape the behaviour of employees. Support for this argument is provided by Pearce *et al.* (1997:158) who found in their study of an electric utility system that managers who are entrepreneurial in their behaviour have a positive impact on their subordinates. Results indicated that as entrepreneurial behaviours increased, subordinates’ satisfaction with their supervision increased. Subordinates of entrepreneurial managers reported high levels of satisfaction with their supervisors. Conversely, the majority of subordinates of bureaucratic managers reported low levels of satisfaction with their supervisors. They concluded that managers who engage in entrepreneurial behaviours would witness better performance from their subordinates than bureaucratic managers.

Even though Thornberry (2003:342-344), in his studies of four large organisations, proved that through management education and action learning programmes, managers could be trained to act like entrepreneurs, most managers do not receive formal training. In addition, he concludes that the central issue remains that managers are expected to behave entrepreneurially without being given specific guidance on how to influence group or individual level behaviours. Corporate entrepreneurs need to know how to manage others to develop the entrepreneurial agenda of the organisation. The next section will discuss the influence of top and middle management on the corporate entrepreneurial process.

3.5.1 TOP MANAGEMENT INFLUENCE

Enterprises with entrepreneurial top management teams are more successful at implementing innovative, entrepreneurial strategies and obtain a better return on their investments (Amit, Brigham & Markman, 2000:84-85). This statement is supported by earlier research of Cooper and Schendel (1976) who indicated that managerial decisions and ensuing organisational actions regarding innovation had important strategic implications. Both theoretical discussions and empirical investigations indicated that organisational acceptance and endorsement of innovation require top management support and involvement (e.g. Drucker, 2002; Ireland & Hitt, 1999; Barringer & Bluedorn, 1999; Goosen, 2002). A few studies (e.g. Hambrick & Mason, 1984; Papadakis and Bourantas, 1998; Srivasta & Lee, 2005; Elenkov *et al.*, 2005) confirmed that members of

the top management team (TMT) additionally play a critical role in innovation processes in organisations.

The role of the TMT has its theoretical and empirical foundation in the upper echelon (UE) perspective of Hambrick and Mason (1984). The premise of this perspective is that the organisation and its performance will be a reflection of its top managers. This perspective provides a basis for studying underlying team dynamics by demographic proxy. In other words, by examining the demographic characteristics of the TMT, underlying team dynamics are identified. At its core, the UE perspective centres on executive cognitions, values, and perceptions and their influence on the process of strategic choice and resultant performance outcomes. The TMT will thus influence a range of strategic variables, from innovation to response time, and these are in turn expected to reflect the executive team's characteristics (Carpenter, Geletkanycz & Sanders, 2004: 750-751).

The literature shows that top management could indeed influence the entrepreneurial process in a number of ways. Firstly, strategic leaders, because of their positions, have a unique and comprehensive view of CE activities (Zahra, 1991). They are capable of identifying environmental trends that could affect the organisation's future (Elenkov *et al.*, 2005), could perceive threats and formulate appropriate responses (Srivastava & Lee, 2005:454) and are able to provide more effective communication to the rest of the organisation, which all lead to higher levels of organisational innovation (Papadakis & Bourantas, 1998). Thus top managers are recognised as key entrepreneurial resources of the enterprise (Penrose, 1959) who influence CE activities and the overall entrepreneurial intensity of the enterprise.

Secondly, great organisations are driven by clear, inspiring visions (discussed in Section 3.2.1). It is important that top management should conceptualise, create and communicate an exhilarating vision of the future for innovation (Elenkov *et al.*, 2005). Similarly Auh and Menguc (2005) suggested that top management should develop and institute a strategic vision for promoting innovation and entrepreneurial activity for all employees. Vision comes from the top, while employees implement entrepreneurial concepts throughout the enterprise (Morris & Kuratko, 2002:161).

Thirdly, strategic leaders may influence innovation through the selection, promotion and ongoing support of change champions (Kanter, 1985). Champions are those individuals who display enthusiasm and confidence about the success of an innovation, persist under adversity and have a talent for getting the right people involved (Howell *et al.*, 2005:642). Top management support is essential to create an internal climate in which champions may succeed (Srivasta & Lee, 2005). Goosen *et al.*, 2002:40 concur that entrepreneurial role models (champions) should be identified and encouraged (see Section 3.2.4).

Fourthly, entrepreneurial TMTs also need to promote an empowering corporate culture. The enterprise should develop individuals to think and act with entrepreneurial autonomy (Srivastava & Lee, 2005:454). In such an entrepreneurial culture productive workers are rewarded and productive relationships are built and enhanced (Shamir, House & Arthur, 1993; Podsakoff, MacKenzie & Bommer, 1996; Avolio, 1999; Elenkov *et al.*, 2005:669).

Fifthly, there is some limited, but encouraging, empirical support for the notion that the behaviour of the TMT influences organisational innovation processes. For example, Elenkov *et al.* (2005:677) found that strategic leadership behaviours had a strong positive relationship with executive influence on product-market and administrative innovations. They concluded that effective strategic leadership had a pervasive effect on organisational innovation. The TMT, with a relatively diverse range of terms (tenure heterogeneity), moderated the relationship of strategic leadership behaviours with executive innovation influence for both product-market and administrative innovations. Srivastava and Lee (2005:477-479), in line with the upper echelon perspective, attempted to relate demographic characteristics of the TMT to the order and timing of new product moves (a form of CE) made by firms. Firms with larger TMTs were more likely to be first movers. However, in terms of other demographic characteristics, significant differences were found between industries. The difference between industries emphasises that there is not a single set of managerial characteristics leading to new product development success in all contexts. The variance in the order and timing of new product moves explained by top management characteristics varied across industries. Additionally, the above authors found that TMT strategic choices, proxied through demography, impact on a specific form of entrepreneurial activity, the order and timing of

new product moves, but established that the effect was not strong. Organisational tenure (i.e. term) was by far the most relevant predictor of new product moves.

However, several researchers contend that in addition to top management, managers on different levels of the hierarchy are usually involved in instigating and implementing CE (e.g. Pinchot, 1985; Burgelman & Sayles, 1986; Kanter, 1989). Consequently to take into account merely the role of top management would provide an incomplete view of the CE phenomenon.

3.5.2 MIDDLE MANAGEMENT INFLUENCE

The importance of the contribution by middle managers to strategy and innovation is increasingly being recognised by several researchers (e.g. Kanter, 1985; Floyd & Wooldridge, 1997; Hornsby *et al.*, 2002; Boyett & Currie, 2004). Bower (1970) was among the pioneers to draw attention to middle managers as agents of change in contemporary organisations. However, over the years little systematic research has been undertaken to define the character and extent of middle managers' contributions to a company's innovation and entrepreneurship activities. This situation has changed to some extent, as the interest among practitioners and academics has grown regarding the role middle managers play in the intrapreneurial process of creating organisational change (Peters & Waterman, 1982; Kanter, 1983; Drucker, 2002; Hornsby *et al.*, 2002).

Floyd and Wooldridge (1992) developed a typology (see Figure 3.1) to explain the role of middle managers in crafting strategy. They argued that middle management should actively participate in "thinking" as well as the "doing" of strategy. Middle managers' influence varies in terms of their upward and downward roles as well as divergent and integrative activities.

	Upward	Downward
Divergent	Championing Alternatives Q2	Facilitating Adaptability Q3
Integrative	Synthesising Information Q1	Implementing Deliberate Strategy Q4

Figure 3.1: Four quadrant typology illustrating middle manager influence

Source: Floyd and Wooldridge, 1992

As suggested in Figure 3.1, the ability of middle managers to make an improved contribution to strategy and innovation depends on their ability to bridge the gap between the boundaries of the enterprise and the environment. Middle managers do not simply implement plans formulated by top management. As indicated in Figure 3.1, quadrant 1, they firstly need to synthesise information about the environment upward to top management, who can then process it to connect with their strategic intentions. In doing so, middle managers are likely to infuse it with their interpretation, which may then lead them to champion alternatives that adjust top management’s original intentions in the light of real environmental realities (Boyett & Currie, 2004:53), reflected in quadrant 2. Similarly, Cohen (2002:9) pointed out that middle managers could boost radical innovations, indicated in Figure 3.1, quadrant 3, by facilitating adaptability. This facilitation process entails acting as “champions, patrons, provocateurs and shapers of culture” that promote radical innovation. Additionally he argued that they are able to promote an entrepreneurial mind-set; establish and cultivate internal networks, establish supportive project supervisory boards, recruit multifunctional, committed people to project teams; and provide career development and rewards to potential innovators, thereby creating an entrepreneurial work environment.

Nonaka and Takeuchi (1995) provide another interesting perspective on the influence of middle managers relating to innovation. They focused on how innovations are shaped and new knowledge created. These researchers suggested that most innovations originate from the middle of the organisation and those that show potential are then sent to upper management for further analysis and evaluation. Those innovations that meet the principles set by the TMT are then returned to middle managers, who then share

them with employees. In this model of innovation, as indicated in Figure 3.1, quadrant 4, middle managers actively implement deliberate strategy by conscientiously gathering innovation ideas from within and outside the organisation. Middle managers cooperate with suppliers, observe the market and analyse the competition. As a result, they are in a good position to identify opportunities for risk-taking and innovation. Middle managers are also aware of the innovation efforts of suppliers and competitors. Frequently middle managers transfer this knowledge to others in their organisation. Another significant feature of their model is that it recognises that middle managers normally hone their ideas, often in close collaboration with employees, hoping to refine them and to determine their potential. This initial, though informal, testing process may help shape ideas while creating the administrative structure needed to cultivate them (Hornsby *et al.*, 2002:257).

Even though limited empirical studies have been undertaken on the influence of middle management on strategy and innovation, there is support for these arguments. For example, Boyett and Currie (2004) document a case of how a group of middle managers moved beyond just the implementation of their firm's set strategy for developing an international venture. They analysed a case of an Irish company launching a mobile telecommunications network in Jamaica and examined the role middle managers played in the process. They argued that the actions of middle managers resulted in eventual success. Although they were not responsible for implementing the original strategy, they devised an emergent strategy which afforded the company better, more profitable results than their original projections. Floyd and Wooldridge (1992; 1997) provided empirical support that significant involvement in strategic decisions by middle management is important for defining and executing a strategy. Hornsby *et al.* (2002) validated their CE scale using middle managers. They identified several internal organisational factors that influence middle managers to advance entrepreneurial activity within established companies. Boyett and Currie (2004) also pointed out that the capacity of middle managers to influence strategic innovative behaviours depends on their functional role, as well as their willingness to make a contribution to strategy.

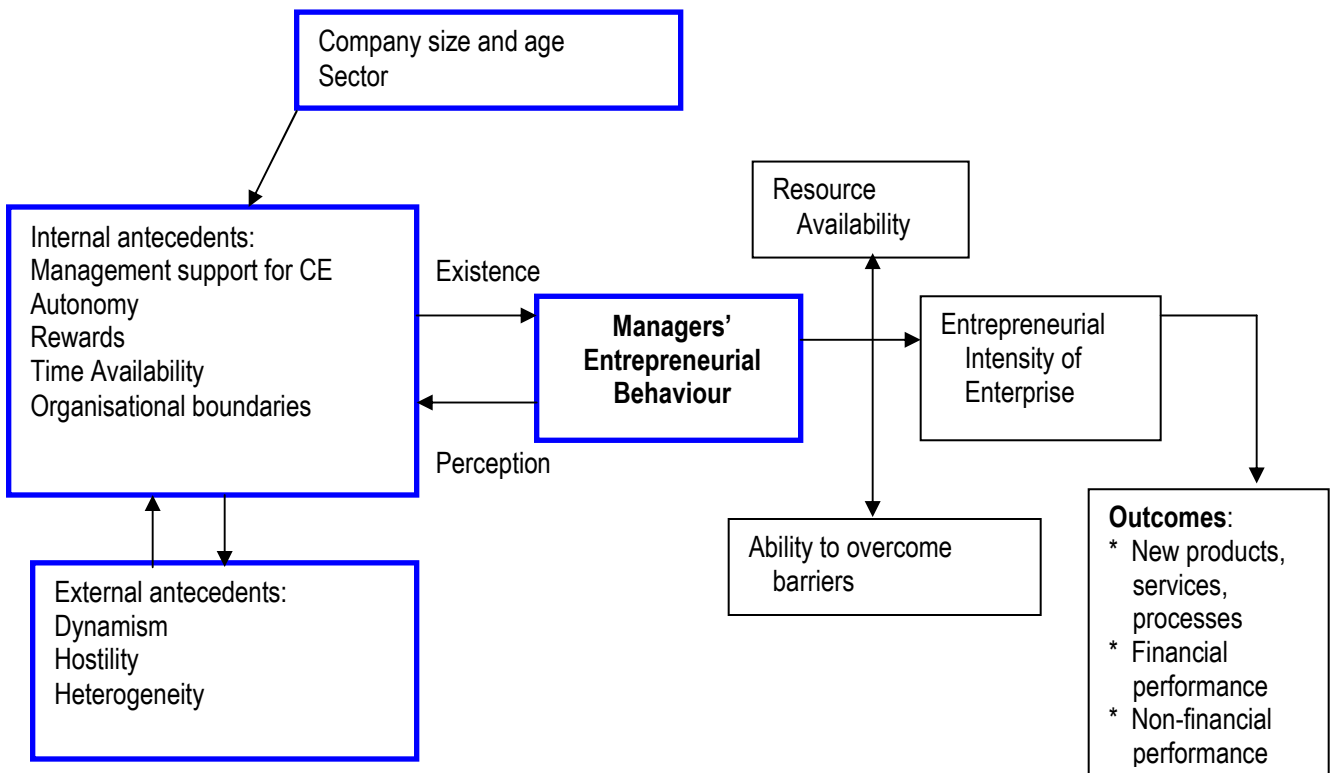
Both top and middle management play an important role in the CE process, but the question still remains: which specific antecedents influence corporate entrepreneurship, resulting a in specific level of entrepreneurial intensity² of an enterprise? (Entrepreneurial

² Entrepreneurial intensity is a function of the degree of entrepreneurship and the frequency of entrepreneurship (refer to Section 1.3.2 or Chapter 4).

intensity is a function of the degree of entrepreneurship and the frequency of entrepreneurship (refer to Section 1.3.2 or Chapter 4.)

3.6 PROPOSED MODEL OF ANTECEDENTS IMPACTING ON CORPORATE ENTREPRENEURSHIP

Figure 3.2 provides a model to illustrate the conceptual ideas of this chapter. It shows that the internal antecedents, namely management support, autonomy, reward systems, time availability and organisational boundaries, influence CE. The external factors of dynamism, hostility and heterogeneity interact with the internal antecedents, so that they collectively influence the levels of entrepreneurial behaviour in the enterprise.



[Discussed in this chapter](#)

Figure 3.2: A proposed model of Corporate Entrepreneurship

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

This model shows that the context of the firm, namely the size and age of a firm and the industry in which it operates; influence the internal antecedents to CE. It serves to

emphasise the need to record the extent to which managers perceive the various internal factors to impact on corporate entrepreneurship. The influence of the external antecedents is also accentuated. Once the influence of these factors on entrepreneurial intensity is understood, the stage is set for examining how these influences translate into different levels of CE behaviour found within enterprises. The next chapter will analyse the concept of entrepreneurial intensity. Subsequently this model (Figure 3.2) was also used to formulate hypotheses regarding the relationship between internal and external antecedents to CE and entrepreneurial intensity.

3.7 SUMMARY

This chapter discussed the influence of top and middle management on the corporate entrepreneurship process. Certain internal conditions – named internal antecedents and the internal context of an enterprise – influence the levels of intrapreneurial behaviour. The opportunities, threats and levels of turbulence in the external environment also influence the necessity for intrapreneurial behaviour in the enterprise. It was shown that country differentials may exist with regard to the antecedents of CE.

By reviewing the literature five internal antecedents were identified. Management support for entrepreneurship, autonomy of employees, effective reward systems, time availability and a flexible organisational structure positively influence entrepreneurial behaviour of enterprises. In conjunction, external antecedents also compel enterprises to act entrepreneurially. Munificent, hostile, heterogeneous environments force successful enterprises to constantly innovate and renew themselves, in other words to implement corporate entrepreneurship. Furthermore the size and age of a firm influence the internal environment of the firm. Top and middle managers also play a crucial role in shaping the CE activities found in each firm.

The next chapter will analyse the “entrepreneurial intensity” construct within organisations. “Entrepreneurial intensity” views entrepreneurship as a variable and not as a characteristic of an organisation. The chapter will analyse the frequency and the degree of entrepreneurship, consisting of innovativeness, proactiveness and risk-taking. Finally, the combination of degree and frequency and their implications will be discussed.

CHAPTER 4

ENTREPRENEURIAL INTENSITY: LEVELS OF ENTREPRENEURSHIP IN ORGANISATIONS

4.1 INTRODUCTION

In the increasingly turbulent global environment of the knowledge-economy, innovation, risk-taking and proactiveness have often been cited (Covin & Slevin, 1991; Zahra *et al.*, 1999; Schilling, 2007) as crucial for an enterprise's survival and eventual success (Knight, 1997:214; see Section 1.2.1). These three dimensions collectively have often been used to define the general construct of firms' entrepreneurial orientation or degree of entrepreneurship (Khandwalla, 1977; Miller, 1983; Covin, 1991; Morris & Sexton, 1996). As discussed in Chapter 2, many business leaders and academics acknowledge corporate entrepreneurship, as an attribute or internal process, being a decisive aspect of enterprise success (e.g. Zahra, 1991, 1993, 1995; Antoncic & Hisrich, 2001; Goosen, 2002; Planting, 2004; Venter, 2005).

Chapter 3 examined how several internal and external antecedents influence the entrepreneurial behaviour exhibited by an enterprise. However, it is vital to acknowledge that entrepreneurship is not a characteristic, but a variable. There are different levels of entrepreneurship in every organisation. Even in large parastatal organisations, elements of entrepreneurial behaviour may be found within a particular context in a part of the organisation. The question thus becomes one of determining how entrepreneurial a given organisation is at a certain point in time. Morris and Kuratko (2002:39) and Barringer and Bluedorn (1999) view this concept as "entrepreneurial intensity".

This chapter will analyse the concept of "entrepreneurial intensity" by discussing in detail its two components, namely frequency and degree of entrepreneurship. The three dimensions of the degree of entrepreneurship, namely innovativeness, proactiveness and risk-taking, will be discussed separately and then in combination with each other, to explain how they culminate in the degree of entrepreneurship.

Finally, this chapter will elucidate the implications of “entrepreneurial intensity” by clarifying the “entrepreneurial grid”, discussing its application to enterprises and explaining the proposed approach to managing EI.

4.2 ENTREPRENEURIAL INTENSITY

As explained in Chapter 1 (Section 1.3.2), there are certain levels of entrepreneurship in every organisation. The challenge is to determine how entrepreneurial a given organisation is at a certain point in time. Entrepreneurial intensity (EI) is a function of the degree of entrepreneurship and the frequency of entrepreneurship, as shown in the “entrepreneurial grid” in Figure 4.1 (Morris & Kuratko, 2002:48).

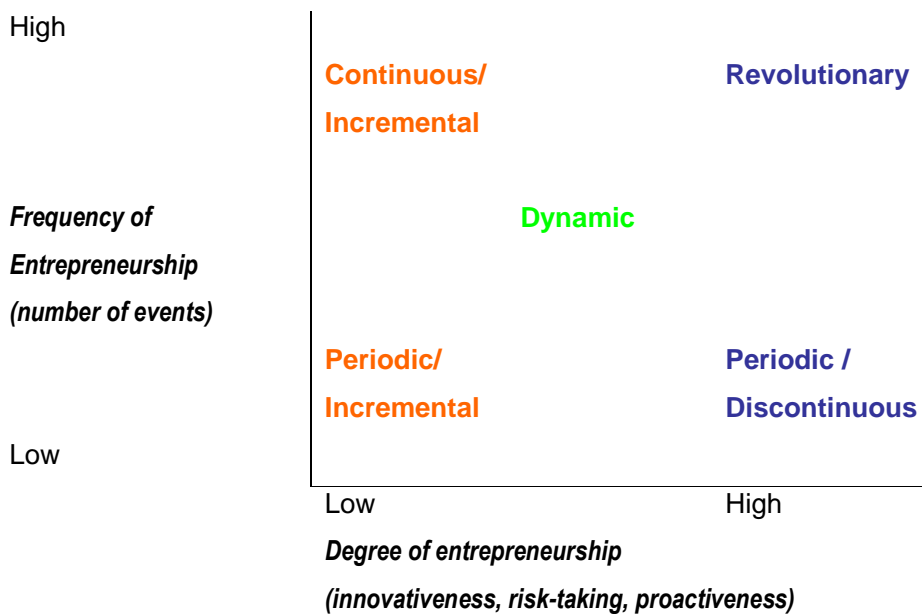


Figure 4.1: The entrepreneurial grid

Source: Morris and Kuratko, 2002:48

As shown in the entrepreneurial grid, organisations may vary in their degree of entrepreneurial behaviour and frequency of entrepreneurship. Three key dimensions determine the degree of entrepreneurship: innovativeness, risk-taking, and proactiveness. This view of Morris and Kuratko (2002:48) is supported by a number of other authors, such as Morris and Sexton, (1996:6); Morris, (1998) and Antoncic and Hisrich, (2001:198-499). The first dimension, innovativeness, refers to the

creation of new products, services and technologies. The second dimension, risk-taking, involves the willingness to commit significant resources to opportunities having a reasonable chance of costly failure. These risks are typically calculated and manageable. The third dimension of entrepreneurship, proactiveness, reflects top management's orientation in pursuing enhanced competitiveness and includes initiative, competitive aggressiveness and boldness. Entrepreneurial firms will act, rather than react to their changing environments (Morris, 1998). These three dimensions combine to form the degree of entrepreneurship exhibited by enterprises.

Frequency refers to the number of times an organisation acts entrepreneurially (e.g. develops new products), and thus an organisation may also vary in terms of the frequency of entrepreneurship (Morris & Sexton, 1996). Figure 4.1 illustrates five sample positions which combine different levels of the degree and frequency of entrepreneurship. These sample positions will be discussed in Section 4.4.

Before these dimensions are critically analysed it is important to acknowledge that theorists' understanding of EI is in its infancy. In the literature review it was established that few authors have specifically conducted empirical research using the term *entrepreneurial intensity* (for example, Morris & Sexton, 1996; Barringer & Bluedorn, 1999; Gundry & Welsh, 2001; Brizek & Khan, 2006). Gundry and Welsh (2001) use the term to refer to the level of motivation of individual entrepreneurs, which they operationalise as the degree of commitment of the entrepreneur. Barringer and Bluedorn (1999) equate *entrepreneurial intensity* with entrepreneurial orientation. Brizek and Khan (2006) associate *corporate entrepreneurship intensity* with the organisation's culture. Only Morris and Sexton (1996) have attempted not only to measure the degree of entrepreneurship (entrepreneurial orientation), but also the frequency of entrepreneurship. If so little research has been conducted on this phenomenon critics may rightly ask, "Does EI matter? Do companies with stronger entrepreneurial orientations perform better?" (Morris & Kuratko, 2002:52).

From the research available and a recent literature review by Scheepers and Van den Berg (2005:11) the answer is in the affirmative. Empirical evidence strongly supports the relationship between CE and financial performance, although the strength of the relationship depends on the time period used for measurement. The

relationship between EI and performance appears to be especially strong for companies that operate in increasingly turbulent environments (Morris & Kuratko, 2002:53). As discussed in Chapter 3, rapid rates of change and hostile events in the external environment force enterprises to discover ways to be more entrepreneurial.

Nevertheless Morris and Kuratko (2002:54) stress that more entrepreneurship is not always better. They speculate that there are norms for entrepreneurial intensity in every industry. Such norms suggest that there is no “best place to be in the entrepreneurial grid – the ideal point is industry- and market-specific”. Further, as noted below, it is also time-specific. The better performing firms are those that demonstrate a stronger entrepreneurial orientation than their counterparts in the same industry. But norms for industries vary widely. One could expect a grocery retail chain to be higher on frequency, lower on degree, with a heavier emphasis on process innovation than on product innovation. Alternatively, leading pharmaceutical companies could possibly occupy the *dynamic* sector of the grid (see Figure 4.1), with high frequency of new products and a portfolio of innovations that include both incremental advances and breakthrough products.

Another very important observation by Morris and Kuratko (2002:54) is that within companies EI could be expected to differ considerably between divisions, units, departments and geographical areas within the same enterprise. For example some divisions’ or units’ primary responsibility within enterprises may be to pursue new business opportunities, such as a Business Development Unit, while other units are expected to implement initiatives or maintain the status quo, such as the Human Resource Unit. In addition, some geographical areas could be located in growth markets, while others could be located in markets that are declining. Additionally EI could also vary between the efforts of managers.

As indicated earlier, the concept of EI is in its infancy. There is much that is unknown, such as the influence of external antecedents on the degree and frequency of entrepreneurship; the conditions under which the internal conditions and strategy of the company lead to various combinations of EI, and the influence in turn if EI on the external environment and internal conditions (Morris, 1998; Morris, Kuratko & Covin,

2008:74). This thesis will attempt to fill a void in the literature by providing more clarity on these ambiguities.

Also so far unspecified are the conditions under which degree versus frequency more strongly contributes to company performance, and the influence of failures on the frequency of entrepreneurship. Finally, it is not clear that high levels of EI are sustainable. It may be that there are patterns to a company's entrepreneurial performance over time. One theory is that companies alternate or "cycle", between fairly dynamic periods of higher EI and periods where innovations are more incremental and intensity is lower (e.g. Slevin & Covin, 1992). During these less intense periods the focus is more on combination, strengthening and managerial control. Yet, there are companies, such as 3M, that sustain a given level of entrepreneurship for extended periods (Morris & Kuratko, 2002:56). Multiple entrepreneurial events can be measured with the frequency dimension of EI.

4.2.1 FREQUENCY

Morris and Sexton (1996) argue that the number of times an enterprise acts entrepreneurially would determine the frequency of entrepreneurship. They further emphasise that a given individual or organisation is capable of producing a number of entrepreneurial events over time. As discussed in Chapter 2, CE may be applied to many different areas, including new products, services, processes, and new businesses. A greater number of new products, services, processes or the pursuit of business opportunities implies a higher frequency of entrepreneurship. For example, an individual intrapreneur working within an established enterprise pursuing a single project does not constitute a high frequency of entrepreneurship. However, multiple entrepreneurial events generated within a corporate venturing unit suggest higher frequency levels of entrepreneurship (see Covin & Slevin, 1991; Zahra, 1993; Kreiser *et al.*, 2002) In other words, some enterprises may have a greater tendency to behave entrepreneurially than others.

Covin and Slevin (1991) view entrepreneurial enterprises as those in which CE behavioural patterns recur. Davidsson (1989) uses the term "continued entrepreneurship" to describe a tendency he found among individuals and

enterprises that are more entrepreneurial to pursue novel business opportunities on a continuous basis. Kreiser *et al.* (2002) concur and argue that an organisation is entrepreneurial if it develops a “higher than average number of new products or new markets within that industry”. Zahra (1993:47) adds that a “distinguishing characteristic of an entrepreneurial company is its strong commitment to creating and introducing new products to the market, especially well before the competition”. The work of Zahra (1993) and Kreiser *et al.* (2002) is consistent with that of Covin and Slevin (1991) and others (e.g. Morris & Sexton, 1996). All these authors focus on a growth orientation as the defining characteristic of firm-level entrepreneurship. Thus a firm that produces a single entrepreneurial business, such as a “spin-off” from its existing business over a long period of time, is not considered a particularly entrepreneurial enterprise. Rather, a continued effort to develop new products, services, markets, processes and so forth is indicative of a highly entrepreneurial enterprise. However, as Morris and Kuratko (2002:49) point out, the frequency of entrepreneurship is relative and may vary over time and over the life cycle of the enterprise.

To summarise, the number of entrepreneurial events (new products, services, processes and businesses) in which an enterprise engages could be termed its entrepreneurial frequency. Similarly, the extent to which the event is innovative, risky and proactive may be termed the degree of entrepreneurship (Morris, 1998:37).

4.2.2 DEGREE OF ENTREPRENEURSHIP

Chapter 2 demonstrated many definitional uncertainties regarding CE and how it is conceptually defined and operationally measured. Certain authors (Zahra, 1991, 1993, 1995; Zahra & Covin, 1995; Zahra & Garvis, 2000; Barrett, Balloun & Weinstein, 2000) use the term *corporate entrepreneurship*, while others (Lumpkin & Dess, 1996; Wiklund, 1999; Kreiser *et al.*, 2002) prefer the term *entrepreneurial orientation*. The three common dimensions of these different conceptualisations seem to be innovativeness, proactiveness and risk-taking. These three dimensions will be discussed in detail in the following section (see Section 4.2.2.1-4.2.2.3), but it needs to be mentioned that Zahra and Garvis, (2000) and Lumpkin and Dess (1996) have suggested that the conceptual domain of “firm-level entrepreneurship” may

have two additional dimensions. These dimensions are *autonomy* and *aggressive competitive action*.

Lumpkin and Dess (1996:140-142) view *autonomy* as a separate dimension of the entrepreneurial orientation of a firm. They regard autonomy as the “independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion”. However, as discussed in Chapter 3 (Section 3.2.2), this thesis takes the view that the autonomy and discretion that employees are allowed in decision-making and pursuing of novel projects can be regarded as an internal antecedent to CE, and not part of the entrepreneurial orientation of an enterprise. This view is supported by Morris *et al.* (2006:4) and others (Antoncic & Hisrich, 2001; Goosen, 2002; Hornsby *et al.*, 2002) who argue that autonomy is a “contextual variable that enables entrepreneurial behaviour”, in other words an antecedent to CE.

The dimension of *competitive aggressiveness* is described by Lumpkin and Dess (1996:148) by referring to a “firm’s propensity to directly and intensely challenge its competitors to achieve entry or improve position, that is, to outperform industry rivals in the marketplace”. Zahra and Garvis (2000) support this view and emphasise that this kind of behavioural stance may lead the enterprise into direct confrontation with other industry competitors. However, other authors (Covin & Slevin, 1991; Antoncic & Hisrich, 2001; Goosen, 2002; Morris *et al.*, 2006) view these types of behaviour as part of the proactiveness dimension of entrepreneurial orientation, as will be elaborated on later in Section 4.2.2.2. The type of industry also strongly influences the type of competitive strategies in which industry players engage.

This thesis, in line with the views of Morris and Sexton, (1996), Barringer and Bluedorn (1999); Zahra (1993, 1995) and Morris *et al.* (2006), concentrates on the three components of the degree of entrepreneurship emphasised in the large majority of conceptual and empirical research studies. These three components (innovativeness, proactiveness and risk-taking) will be discussed in the sections to follow.

4.2.2.1 Innovativeness

For business leaders, innovation is an invariable concern (Von Oetinger, 2004:35). Innovation fuels growth and has also been considered to be at the heart of entrepreneurship (Covin & Miles, 1999). Entrepreneurship, in turn, has been referred to as the “parent of innovation” because it serves as the innovative change agent that drives business growth (Kreiser *et al.*, 2002). Entrepreneurial firms tend to seek innovative and flexible ways to make the most of opportunities and achieve set objectives (Miles & Arnold, 1991:51). Therefore, innovativeness serves as evidence of a high degree of entrepreneurship. This section will (a) define innovativeness and innovation, (b) discuss their importance and (c) reveal their relationship with creativity.

a) Defining innovativeness and innovation

In Chapter 1, *innovativeness* was defined as the creation of new products, services and technologies. However, the above-mentioned definition focuses only on the outcome of innovativeness. Knight (1997:214) and Kreiser *et al.* (2002:68) expand on this definition. They regard the *innovativeness* dimension of entrepreneurship as referring to the capability, capacity and willingness of an enterprise to support creativity and experimentation to solve recurring customer problems. Mueller and Thomas (2000:53) point out that innovation is not simply about generating creative ideas, but also involves the commercialisation, implementation and the modification of existing products, systems and resources. Antoncic and Hisrich (2001:498) link the innovativeness dimension with technological leadership, supported by R&D, in developing new products, services and processes.

The outcome or application of *innovativeness* includes the development or enhancement of products and services, new administrative processes, techniques and technologies for performing organisational functions (e.g. production, marketing, sales, and distribution), as well as new strategies and business development (Morris, 1998). The first most commonly identified outcome is usually new product development (Srivistava & Lee, 2005). New product development (NPD) refers to the repositioning of existing products,

product improvements, additions to product lines and new category entries as well as new-to-the-world products (Crawford, 1994). NPD has become a prerequisite of doing business in the new economy and is often cited as evidence of a market and entrepreneurial orientation (Bhuiyan *et al.*, 2005).

In addition to new products, the second outcome – new services and/or improved services – also serves as evidence of innovation. In fact, given their intangible nature and the ease with which they can be replicated, services lend themselves to continuous innovation and improvement (Morris & Kuratko, 2002:40). The third innovation outcome is process innovation, i.e. finding new and/or better ways to accomplish a task or function. Many entrepreneurial ventures offer products that are fairly standard and certainly not unique. However, they unearth highly innovative process innovations that are major sources of competitive advantage, i.e. they result in lower costs, faster operations, rapid delivery, improved quality or better customer service (Morris & Kuratko, 2002:41). Examples include innovative production techniques, distribution approaches, selling methods, purchasing programmes or administrative systems.

The fourth outcome of innovation is cultivating new business opportunities and/or revolutionising an enterprise's business model. Numerous scholars have emphasised the importance of business innovation and creating new customer value propositions. Offering "value innovation" (Kim & Mauborgne, 1999) or pursuing "strategic innovation" (Charitou & Markides, 2003) means competing in an entirely different way in an existing business by offering fundamentally new and superior buyer value, often enabling the creation of new markets. In the past ten years it was increasingly observed that the traditional boundaries of a company have become more permeable, enabling innovation and knowledge to move easily between the firm and its surrounding environment (Leibold, Voelpel & Tekie, 2004:62-63).

The literature on innovation (Kuczmarski, 1996; Christensen, 1997; Kanter, Kao & Wiersema, 1997; Grulke & Silber, 2001) classifies innovations into different

categories, depending on the level and intensity of change brought about by the innovation. Table 4.1 shows different classifications of innovations.

Table 4.1:

Types of innovations applied to product-market and technological space

Innovation Space	Explanation	Product-market innovation examples	Technological innovation examples
Focus		Design, market research, advertising and promotion	Engineering, R&D, emphasis on technical expertise and industry knowledge
Imitation	Copying or adapting innovations of others	E.g. copy similar marketing campaign	Introduce similar technology in products as competitor
Incremental continuous innovations	Relatively small modifications, or refinements to pre-existing solutions	New packaging	Adding safety feature to machine tool / Energy-saving
Dynamically continuous innovations	Dramatic improvement over existing solution.	Home delivery of goods purchased over internet	Laptop computer over desktop
Radical discontinuous innovations	Breakthrough, departure from current solution in design, application or process	Banking at retailing outlet	Integrated circuit, cellular telephone, first microwave

Sources: Adapted from: Christensen, 1997; Grulke and Silber, 2001; Morris *et al.*, 2008

Although innovations may vary in their degree of “radicalness,” innovativeness represents a basic willingness to depart from existing technologies or practices. In Table 4.1 the first distinction is between product-market innovation and technological innovations. Product-market innovativeness suggests an emphasis on product design, market research, advertising and promotion, while technological innovativeness consists primarily of product and process development, engineering, research and an emphasis on technical expertise and industry knowledge (Lumpkin & Dess, 1996:146-147). Even though a

distinction is made between product-market and technological innovativeness, there is a substantial overlap between the two, as in the case of technologically sophisticated new products designed to address specific gaps in market demand. In either case, innovativeness is an important component of entrepreneurial orientation (EO), because it reflects an important means by which firms pursue new opportunities.

Innovations may also be distinguished in terms of the degree of change that they involve. From Table 4.1 it could be seen that enterprises may imitate or copy the actions of competitors, could incrementally improve their own products and technologies, may dramatically improve them or may create breakthrough innovations. Incremental innovations consist of relatively small modifications to pre-existing solutions and may be considered less “creative” than dynamically continuous or discontinuous innovations. However, over time a number of incremental improvements may yield an end result that could be considered a substantial innovation (Brazeal & Herbert, 1999:37-38). Dynamically discontinuous innovations represent dramatic improvements over existing solutions, such as the first laptop computer or the blackberry handheld cellular device. Discontinuous or radical innovations result in new solutions that address unsolved customer needs (Morris & Kuratko, 2002:124). For example, the integrated circuit, cellular telephone and first microwave ovens were radical innovations that were quantum leaps in theory and application, rather than the linear, progressive changes embodied in incremental innovations (Brazeal & Herbert, 1999:38).

At the core of the CE process is the innovation process, specifically radical innovation. Whereas incremental innovation is necessary for short-term advantage, radical innovation changes the competitive arena and is, therefore, critical to long-term competitiveness (Kelley, Neck, O'Connor & Paulson, 2002:1-2). The capacity to innovate is among the most important factors that impact on business performance (Hult, Hurley & Knight, 2004:429).

b) Importance of innovation

In addition to the impact of innovation on business performance, Covin and Miles (1999) theorise that innovation is the single most significant factor in defining CE. They argue that after considering “the various dimensions of firm-

level EO identified in the literature ... innovation, broadly defined, is the single common theme underlying all forms of CE". While they do not dismiss the existence of other dimensions of EO, they are of the opinion that these other dimensions are consequences or correlates of innovation. However, they conclude: "Without innovation there is no entrepreneurship, regardless of the presence of these other dimensions" (Covin & Miles, 1999:51).

Innovativeness has become an imperative for enterprises against the backdrop of the ever-increasing "discontinuous" change taking place in the business environment. These changes often obliterate the competence of current industry players, forcing them to acquire new skills, abilities and knowledge. In other words, traditional sources of competitive advantage on their own have become inadequate. This situation creates gaps for new entrants and unexpected competitors previously thought to be in a different line of business (or industry) to make an impact with innovative and radical business models (Leibold *et al.*, 2004:61). Inherently linked to innovation is creativity.

c) The relationship between innovativeness and creativity

Innovation, innovativeness and creativity are inherently interrelated (Brazeal & Herbert, 1999:32). Innovation is traditionally defined as the successful implementation of creative ideas. Creativity is the starting point for innovation; it is a necessary, but not sufficient, condition for innovation to occur (Amabile, Conti, Coon, Lazenby & Herron, 1996). The creativity process is used to generate ideas that still need to be developed and changed into a product, service or process (Couger, 1995:18).

Innovation may be conceptualised as either a process or an outcome. As a process, innovation could be depicted as continuous and cyclical, involving the stages of awareness, appraisal, adoption, diffusion and implementation (Damanpour, 1991). As an outcome innovation is applied to the product, service, process or business model spaces.

When focusing on innovation the emphasis is on to what extent the enterprise is engaged in activities that are novel, unique or different. The core of the matter is thus the relative emphasis on concepts or activities that represent a change from the way they are currently practised. The question is really: does

the concept attend to a need that has not previously been addressed? Does it change the user's behaviour? Cellular telephones, for example, have altered people's lifestyles (Morris & Kuratko, 2002:122). Furthermore, the question focuses on the degree of improvement over conventional solutions, such as Toyota's hybrid Prius, with an integral system of an electric motor and petrol engine. On an individual level, assigning the role of innovator to intrapreneurs or champions implies that the potential intrapreneur has to be able to demonstrate creativity and innovativeness to implement his or her "idea" (Antoncic & Hisrich, 2001).

In summary, innovativeness is the first dimension of degree of entrepreneurship. Innovativeness represents the willingness of enterprises, large and small, to depart from the known and to explore solutions in unknown spaces. Innovation may be applied to products, services, processes and strategies, and varies in terms of its departure from existing solutions from incremental innovations to discontinuous radical innovations. Innovation also implies a certain proactive search for opportunities and unmet customer needs.

4.2.2.2 Proactiveness

The second dimension of degree of entrepreneurship, proactiveness, is less easy to define. The term reflects an action orientation. While numerous studies have examined the roles that innovation and risk-taking assume in determining a firm's level of EO, the concept of proactiveness as opposed to reactivity has received less attention from entrepreneurial scholars (Kreiser *et al.*, 2002:78). This section will firstly define proactiveness, then discuss its attributes and finally elucidate its relationship with innovativeness.

a) Defining proactiveness

Earlier researchers associated proactiveness with assertiveness (Miller, 1983), that is, entrepreneurial enterprises would rather act than react to their environments. Recently, Kreiser *et al.* (2002:78) defined proactiveness as the aggressive execution and follow through of actions to drive an enterprise toward the achievement of its objectives by whatever reasonable means are required. As such, proactiveness has certain underlying attributes, such as the enterprise's disposition towards its competitors, organisational pursuit of

favourable business opportunities, and its attitude to being a pioneer or fast follower and a high regard for the initiative of employees (Stevenson & Jarillo, 1990; Knight, 1997; Lumpkin & Dess, 2001; Fay & Frese, 2001).

b) Attributes

Certain attributes could be cited as examples of how proactive an enterprise is. The proactive dimension of the degree of entrepreneurship reflects an action orientation and these attributes of proactiveness are discussed subsequently:

- **Competitive aggressiveness:** In the early literature (Covin & Slevin, 1989:79) the strategic posture of entrepreneurial firms was conceptualised as “characterised by frequent and extensive technological and product innovation, *an aggressive competitive orientation*, and a strong risk-taking propensity by top management”. Porter (1980) supported this view and posited that in certain situations firms would utilise proactive behaviours in order to increase their competitive positioning relative to other firms. Most authors (Zahra, 1993, 1995) support this view of proactiveness.

A characteristic of a proactive enterprise, therefore, involves aggressive tactics toward rival enterprises in the same market segment. Several unconventional tactics may be used by such an enterprise, such as analysing and attacking a competitor’s weaknesses (Macmillan & Jones, 1984), intense price competition (Venkatraman, 1989) or aggressive campaigns relative to competitors to improve marketing, product, service, and quality, or manufacturing capacity (MacMillan & Day, 1987). The speed of new product or market entries may also serve as evidence of an aggressive posture (pioneer or fast follower) (Lumpkin & Dess, 1996:148-149).

Furthermore Lumpkin and Dess (1996:149) point out that enterprises that react to competitors’ strategies are not proactive, but passive. However, this thesis takes the position that for enterprises to formulate a response to attack a competitor or to improve on the products of competitors can

still be regarded as proactive, although it may demonstrate a lower degree of proactiveness.

- **Opportunity-seeking:** Many authors (Lumpkin & Dess, 2001:431; Kreiser *et al.*, 2002:78;) also view proactiveness as an opportunity-seeking, future-orientated perspective aimed at solving customer problems before competitors. Additionally it involves the anticipation of future demand and developing products and services to satisfy customer needs, thereby influencing and shaping the environment. As such, proactiveness may be crucial to an entrepreneurial orientation because it suggests a forward-looking perspective that is accompanied by innovative or new-venturing activity. Earlier Miller and Friesen (1978:923) argued that the proactiveness of a firm's decisions is determined by answering the question: "Does it shape the environment by introducing new products, technologies, administrative techniques, or does it merely react?"

Echols and Neck (1998:40-41) divide opportunity-seeking behaviour into three categories. Firstly it involves the detection of opportunities, secondly the motivation to pursue an opportunity and thirdly opportunity facilitation. Firstly, *opportunity detection* requires the intrapreneur and enterprise to be well informed and to have access to different information sources, which is usually derived from networks. Secondly, the *motivation to pursue an opportunity* emphasises that a champion or intrapreneur needs to have a willingness to change and motivation to pursue the opportunity. Thirdly, *opportunity facilitation* involves creating an organisational climate supportive to entrepreneurship. Enterprises that are highly entrepreneurial could, therefore, be expected to pursue business opportunities that the enterprise deems to be positive or favourable and that would be in line with their strategy and environment (Beer, Voelpel, Leibold & Tekie, 2005). The

creation of a favourable organisational climate is regarded as an antecedent to proactiveness.

- **First-mover advantages:** Another characteristic of proactiveness is the tendency to be a first-mover into a market or industry. First-mover enterprises tend to lead rather than follow in the development of new procedures and technologies and the introduction of new products or services (e.g. Miller, 1983; Covin & Slevin, 1989; Lumpkin & Dess 1996:148).

Numerous authors have emphasised that enterprises that are first to enter a market or industry may gain first-mover advantages. These advantages are seen as the ability of pioneering firms to earn higher economic profits through such advantages as technological leadership and increased buyer-switching costs. Thus, by taking the initiative by anticipating and pursuing new opportunities, first-mover enterprises have become associated with entrepreneurship (Lieberman & Montgomery, 1988). However, as Boulding and Christen (2001:21) point out, the notion of being first to enter the market is sometimes romanticised. An enterprise may be creative, progressive and fast without necessarily always being first. Furthermore, the costs of being first sometimes outweigh the advantages. In their study of 84 strategic business units (SBUs), Miller and Camp (1985), found that the second firm to enter a new market was as pioneering as the first entrant and just as likely to achieve success via proactiveness. Thus a proactive firm is a leader rather than a follower, because it has the will and foresight to seize new opportunities, even if it may not always be the first to do so (Lumpkin & Dess, 1996:146-147).

- **Initiative:** Another attribute of proactiveness is initiative. Economic scholars since Schumpeter have emphasised the importance of initiative in the entrepreneurial process (Lumpkin & Dess, 1996:146). The attribute is strongly focused on the

individual (i.e. intrapreneur or champion) who drives the entrepreneurial process. Fay and Frese (2001:97) define personal initiative (PI) as a behaviour syndrome that results in an individual taking an active and self-starting approach to work goals and tasks and persisting in overcoming barriers and setbacks. One of the consequences of such an active approach is that the environment is changed by the individual (even if ever so slightly). Anticipating future demands and preparing for them or preventing problems are typical goals of initiative. Hence research on proactive forms of work has been strongly linked to personal initiative. This approach to proactiveness is one that fits well with CE – namely that people are able to intentionally and directly change their current circumstances, including aspects of their work environment (Morris & Kuratko, 2002:45).

Therefore, proactive enterprises are seen to be competitive-aggressive in their posture to other industry players, to be opportunity-focused, often first to the market, and to show initiative. These attributes of proactiveness also reflect a strong relationship with innovativeness.

c) *The relationship of proactiveness with innovativeness*

The emphasis on initiating activities equated with proactiveness, is closely related to innovativeness and is likely to fluctuate with it, as in the case of new product introductions. In an exploratory study Kreiser *et al.* (2002) showed that the dimensions of innovativeness and proactiveness are strongly related. However, Morris and Paul (1987) found – when they conducted a factor-analysis on a 12-item innovativeness, risk-taking, proactiveness scale – that the products and services that firms proactively bring to the market may be imitative or reflect low innovativeness. Again this finding is consistent with the idea that CE can vary in intensity.

In essence proactiveness is concerned with implementation, taking responsibility and doing whatever is necessary to bring an entrepreneurial concept to fruition. It usually involves considerable perseverance, adaptability and a willingness to assume responsibility for failure. Not all entrepreneurial

strategies would necessarily result in successes and enterprises should be prepared for some entrepreneurial tactics to fail (Morris & Kuratko, 2002:45). In the corporate world failure is often the result of risk-taking, which in turn forms the third and final dimension of the degree of entrepreneurship, and will be discussed in the following section.

4.2.2.3 Risk-taking

The concept of risk-taking has long been related to entrepreneurship (Kreiser *et al.*, 2002:74). Any new project or situation involves risk, or the probability that the actual outcome could deviate from expectations (Morris, 1998:38). This section will (a) define risk-taking; (b) discuss the approaches companies may have towards risk and (c) examine the relationship between risk-taking and innovativeness and performance.

a) Defining risk-taking

Early definitions of entrepreneurship concentrated on the willingness of entrepreneurs to engage in considered business-related risks. In the 1800s John Stuart Mill argued that risk-taking was the dominant characteristic of entrepreneurs. This view of the entrepreneur as risk-taker gained support throughout the 20th, century as McClelland posited “practically all theorists agree that entrepreneurship involves, by definition, taking risks of some kind” (Kreiser *et al.*, 2002:74-75). Risk-taking may be defined as the willingness to pursue opportunities that have a reasonable likelihood of producing losses or significant performance discrepancies. The emphasis is on *moderate, calculated* risks, not on excessive uncontrollable risks (Morris & Kuratko, 2002:42).

Despite scholars crediting risk-taking as a characteristic of entrepreneurs, Palich and Bagby (1995:426) found that entrepreneurs tend to categorise business situations as possessing less risk than do non-entrepreneurs. In other words, even though entrepreneurs may not regard themselves as being risk-takers, they are inclined to cognitively classify business situations more positively than non-entrepreneurs.

The literature identifies many different types of risks, such as financial, technical, market and personal risks. As a term in financial analysis, risk is used in the context of the well-known risk-return trade-off, where it refers in particular to the likelihood of a loss or a negative result. It could be argued that all business endeavours involve some degree of risk; hence to claim that there is “no risk” in a situation would be a fallacy. Thus the range of risk-taking behaviour extends from some nominal level – “safe” risks, such as depositing money in a bank, investing in gilt-edged stocks, or restocking the shelves – to highly risky actions, such as borrowing heavily, investing in unexplored technologies, or introducing new products into new markets. Beyond this general point of agreement, however, the methods of accounting for and measuring risk vary widely (Lumpkin & Dess, 1996:144).

b) Approach to risk

Even though in some industries, such as financial services, there is an inherent negative association with risk, Morris and Kuratko (2002:42) emphasise that enterprises need to take a balanced view of risk. On the risk continuum there are enterprises that take “wild” risks, such as incurring large debts or making large resource commitments in the interest of obtaining high returns by seizing opportunities in the marketplace, which may have a reasonable chance of resulting in a costly failure. But on the other side of the continuum some enterprises are so risk-averse that they pursue very few new-product, service, technology or business projects. They move slowly and cautiously and aim to perfect new concepts until they are certain that the new concept will be successful. Unfortunately these enterprises often find themselves overtaken by less competent competitors who are faster and reach customers first.

Furthermore, Morris and Kuratko (2002:43) recommend that entrepreneurial enterprises should take moderate risks. These risks can be managed in a better way by the focus on frequent, lower-risk market attacks with a variety of new product and service options targeted to different segments and niches. By engaging in many experiments, test markets and trial runs, the entrepreneurial enterprise should focus on learning why some endeavours are successful, while others are not. Such accelerated learning may come at the expense of minor failures, but is also likely to ensure more sustainable successes in the long run (Morris & Kuratko, 2002:40).

c) The relationship between risk-taking and innovativeness

The relationship between risk-taking and innovativeness is not a direct relationship, but rather a curvilinear relationship, as shown in Figure 4.2.

In Figure 4.2 risk and innovativeness are shown as a curvilinear function. Enterprises that engage in little innovation and disregard new product and service opportunities are in fact taking high risks. Enterprises that do not innovate are faced with a higher risk of not perceiving market and technology shifts that are exploited by competitors. However, enterprises that pioneer radical innovations that result in the creation of new markets and industries are also taking high risks (Morris, 1998).

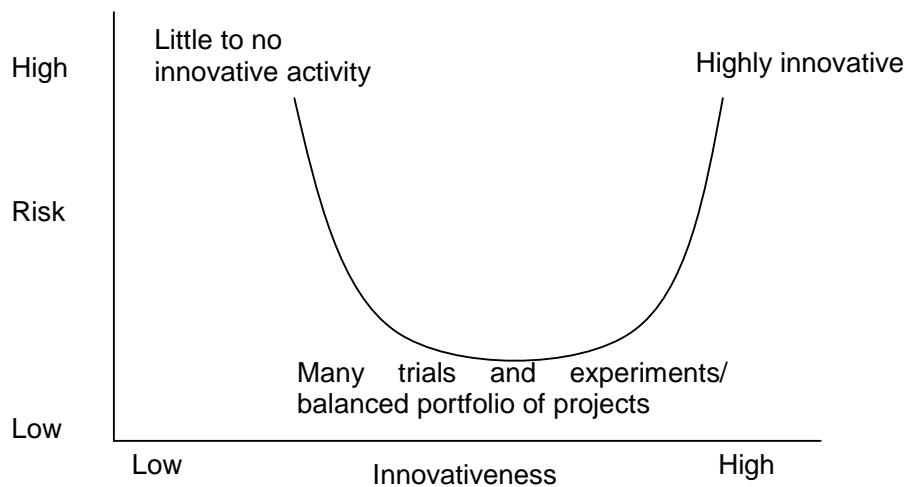


Figure 4.2: Graphical representation relating risk to innovativeness

Source: Morris and Kuratko, 2002:43

The “ideal” risk position in which to be is, therefore, engaging in incremental innovations linked to a manageable number of trials and experiments that are consistently pursued. In other words, enterprises should in effect have a balanced *portfolio of innovation* projects being pursued (Trott, 2005:355). The portfolio of innovation refers to a number of set projects that should be under way at any point in time. For example, 10 percent of corporate innovation should be focused on radical discontinuous innovation, 40 percent on dynamic continuous innovations, such as new product lines and line extensions, and the rest on continuous innovations, such as product revisions. The key is a balance across projects. High-risk, high-return projects could be balanced against lower-

risk, lower-return projects. Thinking in terms of a portfolio implies a different perspective on failure. This kind of mindset acknowledges that some projects would be highly successful, others moderate successes and others failures (Morris & Kuratko, 2002:136-137).

Thus risk-taking refers to the willingness to pursue opportunities that could result in failure. However, as this section has shown, failure may arise from inactivity, as well as pursuing too many high-risk projects. The entrepreneurial view thus places an emphasis on moderate, calculated risks, not excessive uncontrollable risks. As discussed in the previous section innovativeness and risk-taking are interrelated, but the question arises as to how they relate to proactiveness? The next section will discuss these three dimensions in combination.

4.3 COMBINATIONS OF THE DIMENSIONS: THE CONCEPT OF DEGREE

Different combinations of these three dimensions (innovativeness, proactiveness and risk-taking) are possible. A given entrepreneurial event (new product, service or process) may be highly or seemingly innovative, entail significant or limited risk, and may require considerable or relatively little proactiveness. Accordingly, the “degree of entrepreneurship” refers to the extent to which events are innovative, risky and proactive. This does not mean that more of each of the three dimensions of entrepreneurship is necessarily better (Morris & Kuratko, 2002:45). It rather implies that entrepreneurship is ideally a balanced process, and that the appropriate degree depends on the situation.

Researchers question whether EO is best approached as a uni-dimensional construct comprised of innovativeness, risk-taking, and proactiveness components or whether it should be viewed as a multi-dimensional construct in which the underlying components vary independently of one another. Researchers using the EO construct have generally operationalised it using a collective measure that includes all three dimensions. Morris *et al.* (2006) argue that the reason for this approach is that research has consistently demonstrated significant correlations among innovativeness, risk-taking and proactiveness. However, some researchers, such as Lumpkin and Dess (1996), argue that each of these three sub-dimensions may make a unique contribution to the entrepreneurial nature of a firm. Kreiser *et al.* (2002) produced empirical evidence of significant independent variance between the three dimensions.

In their multi-country study to clarify the psychometric properties of the entrepreneurial orientation (EO) measure, Kreiser *et al.* (2002) utilised data from 1067 firms in six countries. Their research focused on a number of research questions. The first question dealt with dimensionality and explored whether EO achieved the best model fit when structured as a one-, two- or three-dimensional measure. The results of a confirmatory factor analysis supported modelling EO with three dimensions: innovation, proactiveness and risk-taking. The second question focused on the extent to which the three dimensions of the entrepreneurial orientation measure co-varied with one another. Correlation analysis showed that the three dimensions of EO were able to vary independently of one another in many situations. Thus Covin and Slevin's (1989) conclusion that the three dimensions of the entrepreneurial orientation co-vary with one another was rejected in their study.

The independence of the three dimensions supports the claim by Lumpkin and Dess (1996:150) that any "attempt to limit entrepreneurial behaviour to only those cases in which high levels of all EO dimensions are evident falls short of explaining many types of entrepreneurship". The view of Morris and Kuratko (2002) regarding EI and the degree of entrepreneurship coincides with this view. Although an aggregated measure of the three dimensions is used to determine the degree of entrepreneurship, enterprises that exhibit lower levels are still considered "entrepreneurial", even though the intensity of the entrepreneurship may be lower. Lumpkin and Dess's (1996) concern about excluding these "lower levels of entrepreneurship" is, therefore, unjustified in the case of this thesis.

Kreiser *et al.* (2002:86) also argue that there are cases where aggregated measures of "entrepreneurial orientation" or the "degree of entrepreneurship" could be used. One such instance is where a differential relationship is not expected between the three dimensions of EO and other key variables being examined in a particular research model, as is the case in this study. They (Kreiser *et al.*, 2002: 87) conclude that even though the results of their study suggest that the three dimensions of EO may vary independently, collective measures of EO could still be used effectively in organisational research.

However, Morris *et al.* (2006) argue that the fundamental question is conceptual, as opposed to empirical. They view EO as a "formative construct where some level of all three components is necessary in order for an organisation to be considered entrepreneurial ... each component is necessary, and, while each can operate independently, each is not sufficient without the other two components. To be

entrepreneurial is to simultaneously demonstrate innovativeness, risk-taking and proactiveness”. The degree and frequency of entrepreneurship could be graphically represented on the entrepreneurial grid. The next section discusses the different positions that enterprises may occupy on this grid.

4.4 DIFFERENT POSITIONS ON THE ENTREPRENEURIAL GRID

In Section 4.2 it was pointed out that entrepreneurship is a variable. An entrepreneurial event varies in the degree of entrepreneurship (Section 4.2.2) and in the frequency of entrepreneurship (Section 4.2.1). The entrepreneurial grid (Figure 4.1) shows that enterprises may occupy different positions on the grid, depending on how innovative, risk-taking or proactive they are, as well as the number of times they act entrepreneurially. For the purpose of illustration, Morris and Kuratko (2002:48) identified five positions on the grid and these were labelled Periodic/Incremental; Continuous/Incremental; Periodic/Discontinuous; Dynamic; and Revolutionary.

These five positions reflect the variable character of entrepreneurial intensity.

- The *Periodic/Incremental* position represents a modest level of EI. Enterprises that are represented by this position will typically produce few entrepreneurial events, which are only nominally innovative, risky or proactive.
- The *Revolutionary* position is representative of enterprises that are responsible for numerous entrepreneurial events that are highly innovative, risky or proactive. Thus enterprises that fit into this segment of the entrepreneurial grid are expected to exhibit the highest levels of EI (Morris & Kuratko, 2002:49). Between these two extremes are also other positions on the grid.
- Enterprises that frequently improve their products and services may fit into the *Continuous/Incremental* position, such as manufacturers of fast-moving consumer goods.
- Enterprises that are extremely “entrepreneurial”, such as pharmaceutical companies who register patents on “new” medicines, but may only do so once every three or five years, would fit into the *Periodic/Discontinuous* position.
- The *Dynamic* position on the grid represents enterprises that are consistently viewed by the marketplace as highly innovative. These companies consistently improve their products, and are pioneers in dynamically continuous innovations.

While Figure 4.1 portrays five discrete segments, it is important to note that these segments have been randomly identified to provide an example of how EI may fluctuate. Amounts and degrees of entrepreneurship are relative, and absolute standards do not exist. Furthermore, any given enterprise could be highly entrepreneurial at some point in time and not very entrepreneurial at other points in time. Consequently, the same enterprise could occupy different positions on the grid at different points in time (Morris & Kuratko, 2002:49).

4.5 PROPOSED APPROACH TO MANAGING ENTREPRENEURIAL INTENSITY

Figure 4.3 shows how the context of the enterprise, internal and external antecedents is able to influence the perceptions of managers and their resulting behaviour. Depending on individual managers' ability to overcome barriers, such as organisational politics, and to secure sufficient resources for the project, different levels of EI may be discerned (see Sections 3.2-3.4).

As discussed in Section 4.2, EI consists of two main constructs: frequency and degree of entrepreneurship. Enterprises may be entrepreneurial on a product-, service-, process- and business level, and depending on the number of times they are entrepreneurial, this will determine the overall picture of the frequency of entrepreneurship of an enterprise. Degree of entrepreneurship, as discussed in Section 4.2.2, is seen as consisting of innovativeness, proactiveness and risk-taking. A composite score of degree of entrepreneurship was in this study compiled by adding innovativeness, proactiveness and risk-taking collectively, and calculating a mean value.

This study focuses on determining the influence of internal and external antecedents on EI. As mentioned previously, theorists' understanding of EI is in its infancy. The gaps in the knowledge field of EI addressed in this study are to determine whether there are different norms for EI among JSE companies in the arena of e-business, compared with the EI of ICT companies. Furthermore, the argument that there are different positions (five sample positions) on the entrepreneurial grid needs to be verified empirically. This thesis will attempt to fill a void in the literature by providing more clarity on these ambiguities.

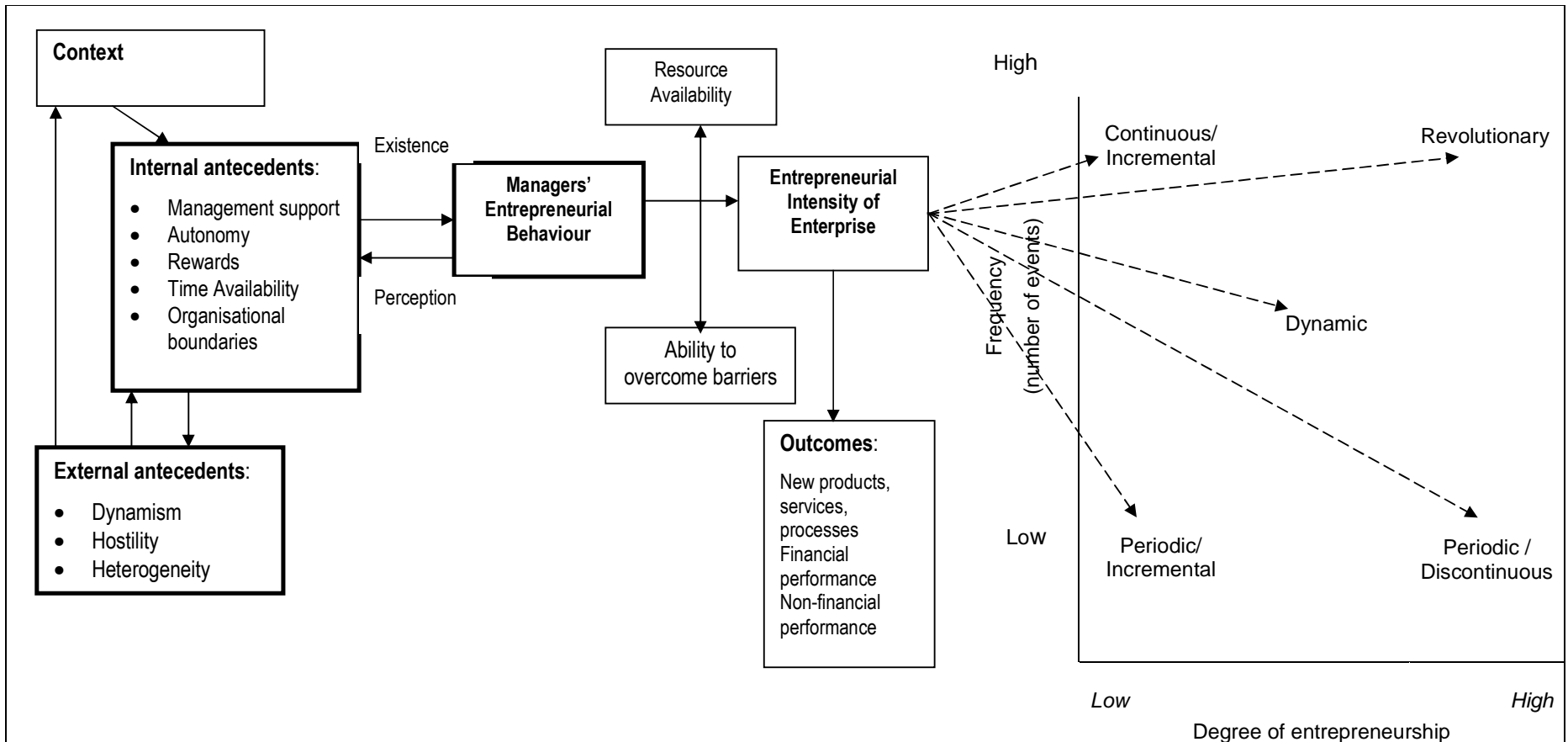


Figure 4.3: A proposed approach to managing entrepreneurial intensity

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

(innovativeness, risk-taking, proactiveness)

4.6 SUMMARY

This chapter analysed the concept of “entrepreneurial intensity” by discussing its two dimensions: frequency and degree of entrepreneurship. The three dimensions of the degree of entrepreneurship, namely innovativeness, proactiveness and risk-taking, were discussed separately and then in combination to explain how they contribute to the degree of entrepreneurship. Finally, the implication of *entrepreneurial intensity* for enterprises was elucidated by clarifying the *entrepreneurial grid* and its application to enterprises.

It was also pointed out that theorists’ understanding of EI is in its infancy. Up to now, very few researchers have specifically used the term “entrepreneurial intensity”, and only one published article to date has used the entrepreneurial grid as part of its literature review. Therefore, this thesis focuses on EI and will add to the existing body of knowledge on this topic.

Nevertheless, Morris and Kuratko (2002) stress that more entrepreneurship is not always better. They speculate that there are norms for entrepreneurial intensity in every industry. Such norms suggest that there is no “best place to be in the entrepreneurial grid – the ideal point is industry and market specific”. They add that the position into which an enterprise “fits” on the entrepreneurial grid would depend on a number of internal and external factors and the industry in which the enterprise operates. Chapter 3 emphasised that CE is more prevalent where the managerial leadership supports innovation, company structures are flexible and flatter, reward systems promote intrapreneurship, jobs are broad in scope, many employees function autonomously and time is given to employees to work on a balance of job-related problems and wider organisational problems. Taking external antecedents into account, enterprises that operate in highly dynamic, turbulent and hostile environments are more likely to be entrepreneurial.

The next chapter outlines the research methodology, highlights the research problem and hypotheses, discusses the research design, data collection and data analysis, and finally reviews the reliability and validity issues.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 INTRODUCTION

As discussed in the literature review of this thesis, and detailed in Chapters 2 to 4, the main objective of this study is to determine how the antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa (being the target population).

The secondary aims of the thesis are the following:

- To establish whether certain company characteristics influence EI
- To ascertain the nature of the relationship between degree and frequency of entrepreneurship, which in turn determines EI
- To establish how internal antecedents to CE influence EI
- To determine how external antecedents to CE influence EI
- To determine the relationships between various constructs, namely internal and external antecedents to CE and EI

In order to address the above research problem and objectives, a structured research methodology was followed. As Welman and Kruger (2002:2) state: "Research involves the application of various objective methods and techniques to create scientifically obtained knowledge". This view explicitly requires that a research project should be well designed and unbiased to achieve the goal of the study. Perry (1998:76-79) concurs and recommends that this chapter should be written in such a manner that another "reasonably knowledgeable colleague" should be able to replicate the research. Additionally the writer needs to provide sufficient detail to supply evidence of his or her knowledge regarding the methodology, procedures, underlying assumptions and reasons for the relevant choices made. The methodology needs to be justified and not merely described.

In order to fulfil these requirements, the aim of this chapter is to restate the research problem and to formulate hypotheses, and explain the research design; data collection process; and data analysis conducted in Chapter 6. Finally the reliability and validity of the measurement instrument are discussed in order to assess a model of the entrepreneurial intensity prevalent in firms active in e-business and operating in South Africa.

5.2 RESEARCH PROBLEM AND HYPOTHESES

A research objective provides a broad indication of what a researcher wishes to achieve in the research study. The definition of the research problem is of considerable importance since it guides subsequent actions. As stated in Chapter 1, the *purpose* of the study is ***to determine how the antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa.***

When a proposition is formulated as a statement for empirical testing or assessment, it is referred to as a hypothesis. According to Terre Blanche and Durheim (2002:117) and Sekaran (1992:72), hypotheses are educated guesses about a problem's solution, or expectations about groups in a population expressed in empirical testing. The nature of a hypothesis is tentative and conjectural. The functions of hypotheses are to provide a framework for and give direction to the study. Additionally, hypotheses create certain boundaries or limits within which a problem could be examined.

Key terms in the study, such as CE, EI, internal and external antecedents, and e-business were defined in Chapter 1 and critically analysed in subsequent chapters. As indicated in Section 1.4.2, EI is a function of the degree and frequency of entrepreneurship. Thus a composite value for EI was calculated, consisting of the degree and frequency of entrepreneurship. In Chapter 6, relating to empirical research, the following underlying hypotheses will be assessed on the basis of this composite value.

Hypothesis 1:

Company characteristics³ influence the level of entrepreneurial intensity (EI) prevalent in a company.

Hypothesis 2:

A relationship exists between frequency and degree of entrepreneurship.

Hypothesis 3:

A relationship exists between the internal antecedents to CE, i.e. management support for CE; autonomy; rewards; resource and time availability; and flexible organisational boundaries and EI.

Hypothesis 4:

A relationship exists between the external antecedents to CE, i.e. munificent environments (dynamic, technological opportunities and demand for new products) and hostile environments (unfavourable change and competitive rivalry) and EI.

These hypotheses are empirically assessed in Chapter 6, according to the research design set out below.

5.3 RESEARCH DESIGN

According to Malhotra (2004:86), a research design is a framework or a detailed blueprint to guide a research project towards its objectives. Babbie and Mouton (2003:97-98) advise that although research design occurs at the beginning of a research project, it involves all the steps of the subsequent project.

As a number of authors (Tull & Hawkins, 1993:51-197; Saunders *et al.*, 1997:72-273; Hair *et al.*, 2000:34-44; Welman & Kruger, 2002:32-170) have proposed, the methodology section addresses the following decision stages: the type of study, the target population and sample, the data collection method, the research instruments

³ Company characteristics refer to the size of companies (measured in terms of the number of full-time employees), age of companies (years in existence); and sample group (JSE or ICT companies).

used and how the collected data are analysed. Figure 5.1 depicts the components of the research design and illustrates how these components are discussed in this chapter, starting with the introduction; research problem and hypotheses; the research design stages; data collection and analysis; and reliability and validity issues, followed by the summary.

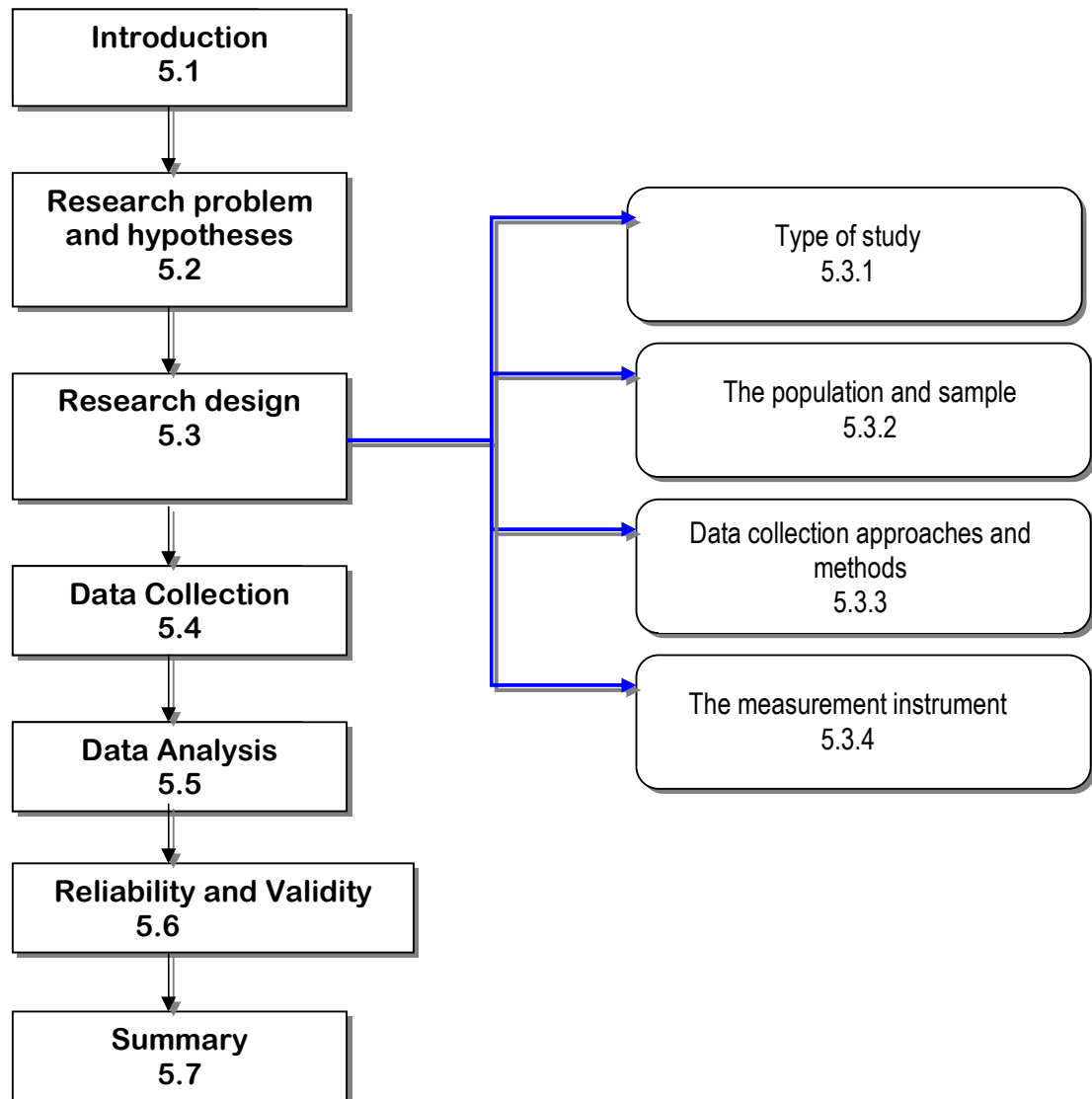


Figure 5.1: A graphical representation of the structure and layout of the research methodology

5.3.1 TYPE OF STUDY

This study was an exploratory, descriptive study of CE in South Africa. A cross-sectional survey was used to determine how antecedents to CE influence the EI of firms active in e-business operating in South Africa. A survey design allows for the collection of a large volume of data from a sizeable population in a highly economical way. Mail surveys in particular can be used to collect data from a substantial number of geographically dispersed respondents. However, a common problem relating to mail surveys is the low response rate (Tull & Hawkins, 1993:188) and, therefore, it was decided to conduct a series of telephone surveys. These interviews were conducted after identifying the key informant in each firm, as discussed in the next section.

5.3.2 THE POPULATION AND SAMPLE

A population is the total collection of elements about which inferences are to be made (Cooper & Schindler, 2006:164). A research frame refers to all the elements from which information may be gleaned to solve a research problem (McDaniel & Gates, 2001:328). The population selected for this study was companies that use e-business systems operating in South Africa. A non-probability, judgement sample was selected from this population to study companies who use e-business systems extensively for information, administrative or commercial purposes, since better insights can be gained from companies that are extensive users of e-business systems. However, no comprehensive sampling frame of companies that use e-business systems were available.

The non-probability, judgement sample consisted of companies that are extensive users of e-business systems. These companies were identified as those in the ICT industry, and companies listed on the JSE, operating in South Africa. These companies also formed part of the sample of the annual e-business survey detailed in *The 2004 review of innovation at work in South African business*, published by Trialogue (Hartley & Worthington-Smith, 2004).

The sample was compiled from JSE listed companies at the end of 2004, as well as from the database of ITWeb, relating to ICT companies (Hartley, 2005; IT Web,

2005). JSE companies totalled 300 firms; while ICT companies totalled 424 firms. Nine companies appeared on both lists and, therefore, the sample comprised 715 companies. All the companies in the sample were contacted.

The key informant (respondent) for JSE companies was typically the CIO (Chief Information Officer) or IT (Information Technology) manager and for ICT companies, the CEO (Chief Executive Officer) or Sales Manager. These individuals' responsibilities allow them a unique and comprehensive view of e-business innovation and CE activities in their firms.

Reasons for deciding to focus on e-business corporate entrepreneurial activities of firms are fourfold. Firstly, the focus of the study had to be narrowed to CE in one arena, since CE is a multi-dimensional concept; secondly, respondents needed to be extensive users of e-business systems; thirdly, respondents needed to be aware of innovation practices and advances in e-business; and finally the researcher had to gain access to the firms in these sectors. Each of these reasons will be elaborated on below.

Concerning the first reason, CE is a multi-dimensional concept and it encompasses entrepreneurial behaviour at the individual, team and strategic level. Since it is very difficult to conduct an in-depth and industry-wide survey in all these areas and levels, it was decided to narrow the focus of this study by analysing entrepreneurial behaviour at the strategic level, and therefore the most senior individual in the relevant firms responsible for e-business activities was targeted. However, it should be borne in mind that entrepreneurial behaviour may be found in various functional areas of businesses (marketing, finance, sales, customer service, purchasing etc), and consequently it was decided to focus on e-business, since technological changes over the last five years have forced many enterprises to overcome technological challenges in innovative ways (Hartley & Worthington-Smith, 2004:4-17).

Concerning the second reason, companies had to be extensive users of e-business systems and incorporate e-business into their way of doing business. In this way, they would be able to identify possible problems and invest in innovative e-business solutions. Moodley (2002) found that since e-business systems required a significant

investment, JSE companies and companies employing more than 100 employees were more likely to make extensive use of e-business systems. Hartley (2005) concurs that these two groups are extensive users of e-business systems.

Concerning the third reason – awareness of innovation practices – the sample chosen for this study also took part in the annual e-business survey conducted by Trialogue (Hartley & Worthington-Smith, 2004). These companies have been participating in the annual e-business survey for the past five years and are aware of the growing role that technology plays within their businesses, even though they may find e-business a multi-faceted and unfamiliar topic. The e-business survey of Trialogue records the perceptions of the leaders in the industry and therefore they are aware of innovations in e-business and how they perform in comparison with the industry leaders (Hartley & Worthington-Smith, 2004:22-25). It was considered that their awareness of innovative e-business solutions would result in more thoughtful answers, as opposed to respondents who might not be aware of innovation practices.

Concerning the final reason for access to the sample; it was possible to interview the sample chosen by using accurate lists with contact information of companies listed on the JSE and the database of ITWeb.

Other lists of the study population that were considered included registers of the Bureau of Market Research (BMR) of Unisa and the Decision Makers Database (2005). These were, however, rejected for the following reasons. The BMR registers were rejected because many researchers from personal experience indicated that these lists were outdated; in addition the response rate obtained from these lists was very low (Maas, 2005; Visser, 2005; Terblanche, 2005). The Decision Maker Database was also considered, but the cost proved to be prohibitive. Furthermore, since this database is used for commercial purposes and compiled with other objectives in mind, it might not have provided a representative picture of the study population.

Following the aforementioned steps in the research process, a researcher has to consider which data collection method is the most appropriate in the context of the research objective and the particular population in question (Welman & Kruger 2002:127).

5.3.3 DATA COLLECTION APPROACHES AND METHODS

A variety of data collection methods could be used to collect data, such as observation, testing, analysis of secondary texts and surveys (Mouton 2001:105). As mentioned earlier, the researcher decided to use telephone surveys, since they allow for the collection of a large volume of data from a sizeable population in a highly economical way.

Three methods may be used to collect data in surveys, namely a mail (self-administered) questionnaire, a personal face-to-face interview and a telephone interview (Malhotra 2004:199; Babbie & Mouton, 2003:262-264). Each of these methods has its strengths and drawbacks, which need to be considered in relation to the goal of the study. These methods are compared and summarised in Table 5.1.

Self-administered (mail) questionnaires are only an option when the population being surveyed is literate and has recognisable addresses. Self-administered questionnaires are generally economical (needing limited resources in terms of cost and staff) and quicker to complete than face-to-face interviews, as indicated in Table 5.1. However, respondents are sometimes reluctant to report what they may consider as confidential information, for example, certain company procedures or the company culture. Alternatively respondents may omit answering certain questions if they face some hurdle in recalling certain details, such as: "How many new products have you developed in the last five years?" For these reasons incomplete questionnaires create "non-response errors" for the researcher. Additionally, response rates for corporate surveys are relatively low, typically in the range of 10 to 30% (Welman & Kruger, 2002:178; Dillman & Dillman, 2000). Therefore, self-administered mail surveys were ruled out as a data collection method.

Table 5.1
Comparison of the strengths and drawbacks of the three primary survey data collection methods

Type	Strengths	Drawbacks
Self-administered mail questionnaires	Economical (large amounts of data can be collected) Ease of administration Relatively short time to collect data	Need a literate population Recognisable addresses Respondents may be reluctant to divulge sensitive or confidential information Incomplete questionnaires Low response rate Wrong addresses
Face-to-face interviews	Higher number of completed questionnaires Effective regarding sensitive or complicated questions Appropriate respondent can easily be identified	High cost per questionnaire Need trained interviewers Need large number of staff to administer Long time to complete questionnaire
Telephone Interviews	In comparison to face-to-face interviews: Lower cost; Quicker Safer in high crime areas May be conducted from one central location Electronic administration can result in immediate data capturing	Biased towards those respondents who have phone numbers

Source: Babbie and Mouton, 2003:262

As indicated in Table 5.1, face-to-face interviews offer a number of advantages. They produce fewer incomplete questionnaires, the correct respondent can more easily be identified, the questions may be clarified and it is a more effective method than self-administered questionnaires for collecting “confidential” information. Additionally, interviewers are able to make important observations based on the quality of the interaction – whether the respondent had difficulty in answering certain questions, was hostile, and so forth. On the other hand, face-to-face interviews are very costly and require intensive monetary and non-monetary resources. Interviews are also very time-consuming.

The major strengths of telephone interviews are savings in time and money and the reduction of the potentiality for bias, as compared with personal interviews, reflected in Table 5.1. However, a critical limitation of the telephone interview relates to the limited volume of data that can be obtained, because it is normally shorter than a personal interview (Welman & Kruger 2002:159). Nevertheless, telephone interviews, especially in a corporate context, can be efficient for, firstly, identifying the correct respondent and secondly reaching respondents via a mobile telephone, even when they are not in the office. In this study it was decided to use telephone interviews, considering the research problem, type of population and resources. Another key advantage considered was that responses could be captured electronically while the interview was being conducted. The measurement instrument was adapted to be suitable for telephone interviews.

Data collection in this study was conducted in two stages as detailed in Figure 5.2. During *Stage one* the measurement instrument was pre-tested in a pilot study, modified and administered to the sample. Knight (1997) recommends that all measurement instruments should be cross-culturally validated. The measurement instrument measuring the EI and the internal antecedent constructs was validated in the South African context and could be used to assess the relationships between company characteristics and EI; frequency and degree of entrepreneurship; and the internal antecedents and EI. However, findings regarding the external antecedent constructs were inconclusive because of internal reliability problems with the external antecedent constructs. Therefore, during *Stage two*, items measuring the external antecedent constructs were refined and adapted to the South Africa context, pre-tested and then administered to the original respondents who participated in *Stage one* of the study. The findings in *Stage two* met internal reliability and validity requirements and could consequently be used to assess the relationship between the external antecedents and EI.

Stage one

Pilot Study one	Survey one
Purpose: Pre-test measurement instrument and construct reliability	Purpose: Collect data from sample
Conducted June – July 2005	Conducted August – November 2005
Result: Suitable internal reliability achieved for degree of entrepreneurship and internal antecedents. Internal reliability of frequency and external antecedents unsatisfactory. Items were adapted.	Result: Response rate: 42% Suitable internal reliability achieved for degree and frequency of entrepreneurship and internal antecedents. External antecedents – weak internal reliability
Sample: Similar to sample (n = 41)	Sample: Sample compiled (n = 315)

Stage two

Pilot study two	Survey two
Purpose: Pre-test questionnaire measuring external antecedents and degree of entrepreneurship	Purpose: Collect data from sample with reliable instrument for external antecedents
Conducted: May – June 2006	Conducted: July – November 2006
Result: External antecedents: suitable internal reliability	Result: Response rate: 20% Suitable internal reliability achieved for degree and frequency of entrepreneurship and internal and external antecedents.
Sample: Similar to sample (n = 43)	Sample: Subset of respondents who participated in survey one (n = 146)



Figure 5.2: Illustration of the purpose, duration, result and sample of Stage one and Stage two of data collection

5.3.4 THE MEASUREMENT INSTRUMENT

The measurement instrument⁴ was developed to assess the internal and external antecedents that influence the entrepreneurial intensity within enterprises focused on e-business operating in South Africa. In order to ensure the validity and reliability of the measurement instrument, it was essential to define the key variables accurately and clearly. For this purpose, items from existing measuring instruments that had proved to be reliable and valid in previous research studies were used where possible. These items were enhanced by questions formulated by the researcher (based on the literature) to ensure that each variable in the measurement instrument was represented by at least three items. (Refer to Table 5.2 for the main variables assessed.)

5.3.4.1 Scales of measurement

Four scales of measurement can be used when designing a questionnaire: nominal, ordinal, interval and ratio. The measurement scales used to measure company characteristics, EI and internal and external antecedents to CE were as follows:

- **Nominal scale:** A nominal scale uses numbers to identify and categorise objects or events (Babbie & Mouton, 2003:131). This type of scale was used to record data regarding the sample group, such as JSE or ICT company.
- **Ordinal scale:** In an ordinal scale the relative position of items on a characteristic can be indicated, but not the magnitude of the differences between positions (Tull & Hawkins, 1993:307). This type of scale was used to measure constructs such as firm size and firm age.
- **Interval scale:** In an interval scale, items can be ranked such that numerically equal distances on the scale represent equal distances in the property being measured. However, both the zero point and the unit of measurement are arbitrary (Tull & Hawkins, 1993:307). This type of scale was used to measure constructs such as the internal and external antecedents and the dimensions of entrepreneurial intensity, for which summated scores were used.

⁴ In this study the terms measurement instrument, measuring instrument and questionnaire are used interchangeably.

During the design of the questionnaire, attention was given to the wording of questions. The latter needed to be clear, simple and easy for respondents to understand, especially since data were collected using telephone interviews (Babbie & Mouton, 2001:258). Table 5.2 provides a summary of the questionnaire used in the study, the items measured and the relevant measurement scale used, detailed in Appendix 2 and 4.

Table 5.2
Summary of the variables, type of questions, purpose, question numbers and scales used in the questionnaire

Questions	Purpose, Appendix and Question Number	Scale
<i>Company Characteristics</i>		
Sample group	JSE or ICT company App ⁵ 2: Q4 (1)	Nominal
Company size in terms of number of permanent employees	Size App 2: Q5 (1)	Ordinal
Age in terms of years in existence	Age App 2: Q6 (1)	Ordinal
<i>Degree of Entrepreneurship</i>		
Emphasis on R&D or marketing of existing products, the number of new products and degree of change in product lines over last two years	Innovativeness App 2: Q7 (1); Q14(1), Q15(1)	Interval
Degree of risk (low vs. high) of projects, strategic posture (wait-and-see or bold and aggressive) and type of behaviour to achieve goals (cautious vs. bold)	Risk-taking propensity App 2: Q8 (1) to Q10(1)	Interval
Posture towards competitors (initiates action and competitive posture), first-to-market or follower strategy	Proactiveness App 2: Q11 (1) to Q13(1)	Interval

⁵ App is used as an abbreviation for Appendix in Table 5.2

Questions	Purpose, Appendix and Question Number	Scale
<i>Frequency</i>		
Degree of product improvements relative to own performance and competitors' and degree of change (improvements or "new-to-the-world" products)	Product App 2: Q16 (1) to Q18(1)	Interval
Degree of service improvements relative to own performance and competitors' and degree of change (improvements or services that did not previously exist in market)	Service App 2: Q19 (1) to Q21(1)	Interval
Degree of process improvements relative to own performance and competitors' and degree of change (improvements or processes not previously used in industry)	Process App 2: Q22 (1) to Q24(1)	Interval
Degree of business development relative to own performance and competitors' and degree of change (market penetration or market development)	New Business App 2: Q25 (1) to Q27(1)	Interval
<i>External Antecedents</i>		
Dynamic changes in the external environment, the number of technological opportunities in the firm's markets and the demand for new products in the market	Munificence App 4: Q1 (2) to Q26(2)	Interval
Unfavourable changes in the firm's environment and the degree of competitive rivalry in the industry	Hostility App 4: Q27 (2) to Q34(2)	Interval

Questions	Purpose, Appendix and Question Number	Scale
<i>Internal Antecedents</i>		
Willingness of organisation and management to adopt new ideas or methods, promotion possibilities linked to entrepreneurial behaviour, experience of managers with the innovation process, attitude towards risk and encouragement to develop new ideas	Management support for CE App 2: Q41 (1) to Q55(1)	Interval
Decision-making authority and responsibility of employees regarding tasks, mistakes made, freedom to use initiative	Autonomy App 2: Q56(1) to Q64(1)	Interval
Non-monetary rewards, such as increase in responsibilities, recognition, removal of obstacles and monetary rewards linked to performance	Rewards App 2: Q65 (1) to Q69(1)	Interval
The amount of time employees have to work on wider organisational problems, other than simply their job responsibilities and workload	Time Availability App 2: Q70 (1) to Q74(1)	Interval
Certainty of employees regarding job expectations, standard procedures, performance standards and outcomes of tasks.	Organisational Boundaries App 2: Q75 (1) to Q79(1)	Interval

5.3.4.2 Operationalising the variables

As explained, items of existing measurement instruments were combined, expanded, adapted or reduced as required to achieve the goals of the study, taking the prerequisites of validity and reliability into account. The measurement instrument needed to measure:

- Entrepreneurial intensity (dependent variable)
 - Frequency of entrepreneurship [refer to Appendix 2 questions 16(1)-27(1)]
 - Degree of entrepreneurship [refer to Appendix 2 questions 7(1)-15(1)]
- Company characteristics [refer to Appendix 2 questions 1(1)-6(1)]
- Antecedents to corporate entrepreneurship
 - Internal antecedents to CE [refer to Appendix 2 questions 41(1)-79(1)]
 - External antecedents to CE [refer to Appendix 4 questions 1(2)-34(2)]

a) The dependent variable: Entrepreneurial intensity

In this study *entrepreneurial intensity* (EI) is defined as a function of degree and frequency of entrepreneurship. As discussed in Chapter 4, frequency refers to the number of times an organisation acts entrepreneurially, while three key dimensions determine the degree of entrepreneurship: innovativeness, risk-taking, and proactiveness.

Frequency, which refers to the number of entrepreneurial events, may be applied to many different areas, including the introduction of new products, services, processes, as well as new businesses. The Entrepreneurial Performance Instrument (EPI) questionnaire, used by Morris and Sexton (1996) contained a number of items to measure frequency. These items were related to new product, new service and new process introductions. Since this study viewed new business development as a part of CE, the questionnaire was expanded to include this dimension as well.

The dimensions innovativeness, proactiveness and risk-taking, which together indicate the degree of entrepreneurship as discussed in Chapter 4.2.2, are briefly reviewed:

- **Innovativeness:** this propensity is reflected in a strong emphasis on R&D, technological leadership and innovation, introducing many new lines of products or services and dramatic changes in product or service lines within an enterprise.
- **Proactiveness** is reflected in an enterprise's stance towards competitors (competitive posture); competitive strategies; and actions and the development of new techniques for the improvement of the enterprise's operations and performance.
- **Risk-taking** is measured by an enterprise's risk-taking proclivity, environmental boldness and attitude towards high-risk projects (Kreiser *et al.*, 2002).

The questionnaire was adapted and changed after the *Stage one pilot study*, based on the feedback of respondents who participated in the pilot study, and considerations of the internal consistency of constructs, discussed in Section 5.6.

b) Company characteristics

Company characteristics measured included the sample group into which companies could be categorised, i.e. JSE or ICT companies, the size of the company measured by the number of permanent employees, and the age of the company, measured by the number of years the company had been in existence. As discussed in Section 3.4, the innovation literature highlights industry characteristics, company size and company age as characteristics that have a differential impact on entrepreneurial behaviour in companies, therefore these characteristics were measured.

c) The independent variables

The internal and external antecedents to CE are independent variables which influence entrepreneurial intensity.

- **Internal antecedents to CE [See Appendix 2 questions 41(1)-79(1)]**

In Chapter 3 (Section 3.2) a number of internal factors that influence the success of CE activities were identified and discussed. These internal factors were organisational leadership, culture and values, structure, people, systems and resources as internal antecedents. However, a number of key academics (DeConing, 2005; Terblanche, 2005; De Villiers, 2005) advised the researcher that developing items to measure each of these antecedents would involve a separate study on each, which is not the purpose of the present study. Therefore, the researcher attempted to identify a measurement instrument that could capture the most salient internal antecedents. The Corporate Entrepreneurship Assessment Instrument (CEAI), developed by Hornsby *et al.* (2002), synthesised these internal antecedents to five factors.

Hornsby *et al.* (2002) argue that while the literature illustrates a wide variety of CE factors, there are a few elements that are consistent throughout the writings in this field, namely management support for CE, work discretion and autonomy, rewards, resource and time availability and organisational boundaries. The relationship between the antecedents was discussed in Section 3.2 and these factors are shown in Table 5.3.

Table 5.3

A summary of the relationship between internal antecedents and synthesised five factors

Factors identified by Hornsby <i>et al.</i> (2002)	Internal Antecedents
Management support for CE (19 items)	Organisational Leadership: Strategy Culture and value system People – champions and skills
Autonomy / Work Discretion (10 items)	Culture and value system
Rewards / Reinforcement (5 items)	Systems – Reward and control systems
Resources and Time Availability (6 items)	Availability of resources
Organisational Boundaries (6 items)	Structure and processes

The CEAI was developed and refined over a number of years, with Kuratko *et al.* (1990) initially developing a multi-dimensional scale (the Intrapreneurial Assessment Instrument [IAI]). Two years later Hornsby *et al.* (1993) revised the IAI and renamed it the CEAI. Hornsby *et al.* (1999; 2002) validated the scale cross-culturally on American and Canadian managers. In addition, Adonisi (2003) validated the CEAI instrument in the South African context, using a convenience, non-random quota sample of managers from the economic, life assurance, information technology, technikon and transport sectors. The five factors identified by Hornsby *et al.* (2002) are summarised below.

- *Management support for CE*: is a function of strategy, culture and how employees are viewed and treated by management (see Section 3.2.1 to 3.2.3). This factor indicates the willingness of managers to assist and encourage entrepreneurial activity in the enterprise (Hornsby *et al.*, 1999:10-12; Goosen, 2002).
- *Autonomy / Work discretion*: This factor refers to the discretion and intrapreneurial freedom of workers to the extent that they are able to make decisions about performing their own work in the way they believe is most effective (Hornsby *et al.*, 2002).

- *Rewards / reinforcement for CE:* Rewards and reinforcement develop the motivation of individuals to engage in innovative behaviour (Kanter, 1985; Fry, 1987; Goosen, 2002).
- *Time availability:* This factor identifies resources (such as time, people and equipment) and their availability for entrepreneurial activity as a key internal antecedent to CE. For new and innovative ideas to thrive, individuals should have time to incubate their ideas (Hornsby *et al.*, 2002).
- *Flexible organisational boundaries:* The final factor is the existence of a supportive organisational structure and flexible boundaries (Hornsby *et al.*, 2002:253-273).

The internal consistency of these constructs is discussed in Section 5.6.

- ***External antecedents to CE [See Appendix 4 questions 1(2)-34(2)]***

In Chapter 3, Section 3.3, a number of external factors that influence the success of CE activities were identified and discussed. In *Stage one* of the study the external antecedents used were measured by the constructs: dynamism, hostility and heterogeneity. These constructs are reviewed below:

- *Dynamism:* refers to the perceived instability of an enterprise's market, because of the rate of change, unpredictability of change and persistence of change in the enterprise's external environment (see Section 3.3.1).
- *Hostility:* refers to environmental conditions in which changes are unfavourable, creating threats to a firm's mission (see Section 3.3.5)
- *Heterogeneity:* refers to the existence of multiple market segments with varied characteristics and needs that the firm serves (see Section 3.3.6).

The above-mentioned dimensions, when measured in *Stage one* of the study, showed that the internal consistency of the scale was unsatisfactory (see Section 5.6). The researcher reworded and improved some of the statements, based on the feedback of respondents in the pilot study. After data collection during the survey of *Stage one*, the external antecedent dimensions still obtained low Cronbach alpha coefficient values. Antoncic and Hisrich (2001) found the measurement instrument orientated towards the culture and perceptions in the United States of America (USA) and not Slovenia, where they tested it. Furthermore, they remarked that it appeared that the antecedents to CE were different between different countries, as discussed in Section 3.3.7. Similarly, it seems that the questionnaire was also not appropriate in a developing country, such as South Africa, since the perceptions of managers regarding the external environment in which they operate differ from the perceptions of managers in the USA.

Therefore, it was decided to re-examine the literature and measure external antecedents again in *Stage two* of the study. The dimensions of munificence and hostility were re-examined and more than 10 items were developed for each dimension. Heterogeneity was excluded, since the study focuses on e-business activities of companies, which represent companies operating in a market with similar needs, rather than many different, heterogeneous segments. The two external antecedent constructs were redefined in *Stage two* of the study as:

- *Environmental munificence* reflects the richness of opportunities for CE in an industry. As a multi-dimensional concept it embodies dynamism, the abundance of technological growth opportunities and the demand for new products in the environment (see Sections 3.3.1--3.3.4).
- *Hostility* refers to competitive rivalry and the unfavourability of change (see Section 3.3.5). These dimensions yielded higher internal consistency scores in

the pilot study during *Stage two* and were therefore used in the *second survey* of the sample.

As stated before, these variables were pre-tested using pilot studies in both stages of the research. The process of pre-testing is discussed in the following section.

5.3.4.3 Pre-testing the questionnaires

Pre-testing questionnaires is a critical activity that should be conducted prior to administering any but a completely routine questionnaire (Tull & Hawkins, 1993:361). The purpose of a pilot study is to ensure that respondents have no difficulties in answering the questions and that there will be no problems in recording the data (Saunders *et al.*, 1997). As other researchers (Tull & Hawkins, 1993:360-362; Welman & Kruger, 2002:141; Babbie & Mouton, 2003) suggest, the pilot study needs to determine

- how long the questionnaire took to complete
- the clarity of questions
- which, if any, questions were unclear or ambiguous
- which, if any, questions the respondent felt uneasy about answering
- whether in their opinion there were any significant topic omissions
- whether the layout was clear and attractive
- any other comments.

As shown in Figure 5.2, questionnaires were pre-tested in both pilot studies (*Stage one and two*), before surveys were administered. In the first pilot study during *Stage one* the questionnaire was tested by first presenting it to knowledgeable academics in the CE field and soliciting their input. The necessary changes were made and the questionnaire was then pre-tested in a pilot study with 41 respondents (middle and senior managers of large enterprises) in the Gauteng area active in e-business. In *Stage two*, during the second pilot study, the second questionnaire was also presented to academics and their suggestions were incorporated. The questionnaire was adapted and then pre-tested with 42 respondents (senior managers or owner-managers of enterprises) in the Cape Peninsula area.

Based on the feedback of respondents, adjustments were made to the final questionnaire. Changes made include the following:

- **Length of the questionnaire:** In *Stage one* the first questionnaire took between 30 and 40 minutes to complete. Most respondents as business people felt that their time was too valuable to spend this amount of time on the completion of a questionnaire. Attempts were therefore made to shorten the questionnaire where possible to prevent respondent fatigue and to respect the time of executives.
- **Items that measure frequency:** A number of respondents remarked that these questions were ambiguous and difficult to answer. Their suggestions were incorporated to reword and simplify these items.
- **Items that measure the external antecedents:** In *Stage one*, after the first pilot study, the items that measured external antecedents were reworded and South African examples were included in the items, as shown in Appendix 2. When it became clear from the results of the *first survey* that this was insufficient, further effort went into refining these dimensions and adapting them to the South African environment, during *Stage two* of the study.

During *Stages one and two*, once the questionnaires had been refined, they were piloted by telephone interviews with 10 respondents of the sample, adapted where necessary, and then administered to the sample.

5.4 DATA COLLECTION

In this stage of the research process, the survey methodology was implemented and interviewers collected the data. As shown in Figure 5.2, data collection took place in two stages. The data collection was outsourced to a professional firm specialising in telephone interviews.

Since the quality of the data collected using telephone questionnaires is affected by the competence⁶ of the interviewer and firm conducting the interviews, a step-wise quality control procedure was agreed upon beforehand. The steps followed were:

1. The questionnaire was uploaded on a secure website and tested. Interviewers used this web-based interface to record the answers of respondents.
2. Where possible, respondents were contacted beforehand (by telephone) and 10-minute telephone appointments were made. With a view to enlisting the support of respondents, an introductory letter explaining the purpose of the research (see Appendix 1) was also made available in a format (e-mail or fax) requested by the respondent.
3. During the telephone interview all answers and details, such as the date and time of call and whether or not the questionnaire was completed, were recorded electronically. If necessary call-backs were arranged, for example if the call was disconnected or the respondent initially refused to participate.
4. If calls were unsuccessful or where there was no reply, the interviewer would try three more times, each at a different time and on a different day, and note the required information.

As indicated in Figure 5.2, during *Stage one*, telephone interviews took place from the middle of August to the middle of November 2005. The purpose of this survey was to collect data from the sample to inform the research problem. Even though the interview process progressed relatively smoothly, interviewers experienced a major challenge in that it was very time-consuming to identify and contact the correct respondent, since IT directors, CIOs, CEOs and Sales Managers were very busy, and were often in meetings or even overseas. Consequently, after attempts had been made to contact all the companies listed on the sample, 315 interviews were completed. Despite the difficulties, the response rate was 42%. The results of the survey yielded data which showed suitable internal reliability for the degree and frequency of entrepreneurship and the internal antecedents. However, the internal reliability of the external antecedents was weak. These results were unsatisfactory. It was consequently decided to develop a reliable research instrument to measure the

⁶ "Competence" refers to the opening of the interview, using appropriate language, questioning, listening, testing and summarising understanding, behavioural cues and recording of data (Saunders *et al*, 1997:225).

perceptions of South African managers regarding external antecedents in the local business environment.

During *Stage two* a measurement instrument was developed between February and April 2006, which was pre-tested in May and June 2006, as shown in Figure 5.2. The second survey was conducted from the middle of July to the middle of November 2006. The 315 respondents who participated in the first survey were contacted again to record their perceptions regarding the external antecedents. However, a number of problems were experienced during this survey with regard to the response rate of the original respondents. In Table 5.4 the responses and non-responses, as well as reasons, are summarised.

Table 5.4
Summary of the response results from the 315 respondents who participated in Stage one, who were contacted again during the survey of Stage two

Response result	Number	Percentage of original sample n = 315
Completed surveys	146	46.35%
Refusal to participate	38	12.06%
Respondent requested call-back	53	16.83%
Problem with telephone number	21	6.67%
Company no longer existed	7	2.22%
Original respondent left the company	50	15.87%
Total	315	100%

Difficulty was experienced during *Stage two* of the research study in obtaining responses from all the respondents who had participated in *Stage one*. The final response rate was 46.35% of the 315 respondents of *Stage one*, representing a response rate of 20.42% of the total sample (715 companies).

Table 5.4 summarises various reasons for the low response rate in the response result column. The reasons were that 12.06% of the original respondents refused to participate; 16.83% kept requesting the survey company to phone them back, but never completed the survey; 6.67% of respondents' telephone numbers were out of order, 2.22% of the relevant companies no longer existed; and 15.87% of original

respondents had left the company and no suitable respondents could be identified to complete *Stage two* of the survey.

In this study missing data values were encountered regarding some questions, such as a respondent not being aware of exactly how many years the company had been in existence. These values were left blank and the statistical program (Statistica 7.1) only used the data points where data were available to complete the relevant analysis. In other cases, such as frequency of entrepreneurship, respondents were not necessarily active on all four dimensions (product, service, process and business innovations). Therefore, statistical analyses could only be performed regarding those cases where all the data values were available.

5.5 DATA ANALYSIS

During this stage of the research process, data collected are converted into a format that can be used to inform the research problem. When data are processed, they need to be prepared and then analysed. Data preparation is the process of extracting data from questionnaires so that these can be read and manipulated by computer software. During data preparation the data are validated, edited, coded, entered and then cleaned (Hair *et al.*, 2000:499-501). In this study numerical responses were entered into an electronic spreadsheet file as respondents answered the questions. Interviewers recorded responses online, using a web-based interface. Efforts were made to minimise errors by providing interviewers with a pro-forma web page, where they had to “click” on the correct alternative, thus capturing the data. These files were returned to the researcher when the surveys were completed.

Since nominal, ordinal and interval data were used in the study, various descriptive and inferential statistical analyses could be performed. Table 5.5 indicates the applicable statistical test for the measurement scales used.

Table 5.5

A summary of the permissible descriptive and inferential relevant statistical tests used in the study on nominal, ordinal and interval scales

Measurement Scale	Permissible Statistics	
	Descriptive Statistics	Inferential Statistics
Nominal Scales	Frequency; Mode	
Ordinal Scales	Frequency, Median, Mean, Standard Deviation, Coefficient of Variation Correlation Analysis One-way ANOVA Repeated Measures ANOVA Mann-Whitney Test Kruskal-Wallis Test	
Interval Scales	Frequency, Median, Mean, Standard Deviation, Coefficient of Variation Correlation Analysis	Best subset multiple regression Confirmatory Factor Analysis Structural Equation Modelling

Source: Saunders et al., 1997

As indicated in Table 5.5, researchers have two options when analysing data. Descriptive statistics are used to describe data, and inferential statistics are used to determine significance levels of relationships between independent and dependent variables. Descriptive statistics will be discussed in the next section, followed by inferential statistics.

5.5.1 DESCRIPTIVE STATISTICS

Descriptive statistics describe the characteristics of the respondents. As indicated in Table 5.5, descriptive statistics use frequencies, means, modes, medians, standard

deviations and coefficients of variation to summarise the characteristics of large sets of data. In this study, the following descriptive statistics were used:

- **Frequencies:** Frequencies refer to the actual number or percentage of responses to certain questions. These may be presented by way of bar charts or tables.
- **Mean:** A mean is the sum of the values for all observations of a variable divided by the number of observations. It measures the central tendency – in other words, the average response of respondents.
- **Standard deviation:** The standard deviation is the measure of average dispersion of the values in a set of responses around their mean.
- **Coefficient of variation:** The coefficient of variation is also called the relative standard error and can be calculated by dividing the standard deviation by the mean. This coefficient compares the extent to which data values differ from the mean between variables. A comparison may thus be drawn between the values of this statistic. The distribution with the largest coefficient of variation has the largest relative spread of data (Saunders *et al.*, 1997:311).

Correlation analysis, analysis of variance, and the Mann Whitney U-test were used to describe the relationships between the independent and dependent variables.

5.5.1.1 Correlation analysis

Correlation analysis refers to the degree to which changes in one variable are associated with changes in another (McDaniel & Gates, 2001:448). In other words, it determines whether a linear relationship exists between variables. The most frequently used measure of relationships is the Pearson product moment correlation (Hair, Black, Babin, Anderson & Tatham, 2006:530). This technique is normally used when two or more scales measure on an interval or ratio scale. The Spearman correlation coefficient is used for ordinal data, and was used in this study for company characteristics such as firm age and size.

The descriptive measure coefficient or correlation (r) is a measure of the degree of association between two variables and indicates the estimated extent to which the

changes in one variable are associated with changes in the other on a range of +1.00 to –1.00. A correlation of +1.00 indicates a perfect positive relationship; a correlation of 0.00 indicates no relationship and a correlation of 1.00 a perfect negative relationship (Saunders et al., 1993:321). As a rule of thumb, a correlation of –0.3 indicates a weak negative correlation between two variables, while –0.7 indicates a strong negative correlation. Similarly a correlation of +0.3 indicates a weak positive correlation and +0.7 a strong positive correlation. In the case of a positive correlation between two variables, a higher score on one variable tends to indicate a higher score on the other. If the correlation is negative, a higher score on one variable tends to indicate a lower score on the second variable (Saunders et al., 1993:320-322).

In Sections 6.5 to 6.8 correlations were used to assess the nature and strength of the relationship between the various dimensions, as hypothesised in Section 5.2. The probability statistic (p) was used to determine whether the correlations were statistically significant.

5.5.1.2 Analysis of variance (ANOVA)

Analysis of variance (ANOVA) is the most common approach to test for differences among means (Saunders *et al.*, 1993:640). ANOVA tests the null hypothesis that the means of several independent samples are equal. Several ANOVA tests could be performed. In this study one-way ANOVA, repeated measures ANOVA and the Kruskal-Wallis one-way ANOVA by ranks were used.

One-way analysis of variance uses a single-factor, fixed-effects model to compare the effects of one *factor* (JSE or ICT company) on a continuous dependent variable (EI). In a fixed effects model, the levels of the factor are established in advance, and the results are not generalisable to other levels of treatment (for example other types of companies).

ANOVA calculates both an F -ratio and a p -value. A p -value of 0.05 or less is considered significant. If the null hypothesis is true, there should be no difference between the sample means, and the ratio should be close to 1. If the sample means are not equal, the numerator should manifest this difference, and the F ratio should

be greater than 1. The *F*-distribution determines the size of the ratio necessary to reject the null hypothesis for a particular sample size and level of significance (Cooper & Schindler, 2006:560-561). In this study one-way ANOVA was used to test hypothesis 1, since it was possible to determine the observed differences between the EI means of two groups (JSE or ICT companies). Repeated measures ANOVA was used to test the stability-reliability of the degree of entrepreneurship-scale, since this test is appropriate when respondents are subjected to repeated measures.

The Kruskal-Wallis one-way analysis of variance by ranks is a non-parametric method for testing equality of sample medians among groups. It is similar to a one-way analysis of variance with the data replaced by their ranks. It is an extension of the Mann-Whitney *U* test to three or more groups. Since it is a non-parametric method, the Kruskal-Wallis test does not assume a normal distribution of the population, unlike one-way analysis of variance. A p-value of less than 0.05 is considered significant and rejects the null hypothesis that the differences between the medians occur by chance (McLaughlin, 1999). The Kruskal-Wallis test was used to assess whether the EI and internal antecedent medians differed significantly for the different age groupings of companies if their ages were ranked from younger than three years to older than 50 years (refer to Table 6.13).

5.5.1.3 Mann Whitney *U*-test

The Mann-Whitney *U* test (also called the Mann-Whitney-Wilcoxon (MWW), Wilcoxon rank-sum test, or Wilcoxon-Mann-Whitney test) is a non-parametric test for assessing whether there are significant differences between two sample means. The null hypothesis is that the two samples are drawn from a single population and, therefore, that their probability distributions are equal. It requires the two samples to be independent, and the observations to be ordinal or continuous measurements. The test involves the calculation of a statistic, referred to as *U*, whose distribution under the null hypothesis is known. The *U*-statistic will be accompanied by a z value (normal distribution variate value), and the respective p-value (Tull & Hawkins, 1993:629). The Mann Whitney *U*-test was used to test whether significant differences existed between the means of the EI, internal and external antecedent constructs of JSE and ICT companies.

5.5.2 INFERENCE STATISTICS

Cozby (2004:142) states that inferential statistics allow researchers to make inferences about the true differences in the population on the basis of the data. A basic tenet of statistical inference is that it is possible for numbers to be different in a mathematical sense, but not significantly different in a statistical sense (McDaniel & Gates, 2001:413). Statistical differences are defined by the selected significance level. When performing statistical tests most researchers use significance levels of 5% to 1%. For the purpose of this research, significance levels of 5% and smaller were considered sufficient.

Inferential statistics may be used to test hypotheses. The purpose of a hypothesis test is to determine the probability that the difference between the value of a variable as estimated from a sample, and the value of that same variable as estimated from another sample, is the result of random characteristics of the sample (Tull & Hawkins, 1993:628).

The hypothesis testing process could be split into seven steps: (1) To test a hypothesis a null hypothesis (H_0) should firstly be formulated; the null hypothesis implies that there will be no change or difference in the value of the population parameter. (2) The alternative hypothesis is stated (H_A); the H_A (or test hypothesis) summarises what will be the case if the null hypothesis proves to be false. (3) Specify what level of significance is to be used (α). A selected significance level should always be compared with the p-value statistic. The lower the p-value, the stronger the evidence will be against the stated statistical finding (Steyn, Smit, Du Toit, & Strasheim, 2003:420). (4) Identify the rejection area. If the test statistic falls into this range, the H_0 will be rejected. The critical values are expressed in the same measurement units as the test statistic (z or t statistic). (5) Calculate the test statistic. (6) State the decision rule: the decision rule is a statement that indicates the action to be taken, that is to accept H_0 or reject H_0 . (7) Finally the conclusion should be stated in the context of the problem, and the level of significance should be included. By accepting the H_0 the researcher takes the position that there is not sufficient statistical evidence to reject it. Nevertheless, it has not been proven that H_0 is true.

As long as conclusions are based on sample data, there is a possibility that an error could be made (Steyn *et al.*, 2003:466).

As indicated in Table 5.5, when testing statistical significance, the appropriate test needs to be used because not all tests are equally relevant. Best subset multiple regression and structural equation modelling are used in this study to determine how antecedents to CE influence EI and in what ways EI is influenced.

5.5.2.1 Best subset multiple regression

Best subset multiple regression analysis was used in this study to determine which antecedents are the best predictors of EI.

Best subset regression, logarithmic transformation, forward and backward stepwise regression and nonlinear squares are all part of first-order multiple regression models. The process of calculating a regression coefficient using many independent variables is normally termed multiple regression. According to Hair *et al.* (2006:179), the elements of a multiple regression model to be taken into account in determining its significance include the coefficient of determination (R^2); the model F statistics; the individual regression coefficients for each independent variable and their associated t statistics. The appropriate procedure to follow in evaluating the results of a regression analysis is as follows: (1) assess the statistical significance of the overall regression model using the F statistic and its associated probability; (2) evaluate the obtained R^2 to see how large it is; and (3) determine the individual regression coefficients and their t statistics⁷ to establish which are statistically significant. Taken together, these elements provide a comprehensive picture of the relationships between the dependent and independent variables.

Stepwise regression, forward selection and backward elimination are approaches for choosing a regression model by adding or deleting independent variables one at a time. None of them guarantees that the best model for a given number of variables

⁷ The t statistic should be compared with the critical value of the t -distribution to determine whether the null hypothesis may be accepted. Hatcher (1994:323) recommends that the critical value should be $-1.96 < t < + 1.96$. T -tests are appropriate for not only smaller sample sizes, but also larger sample sizes, where $n > 30$ (McLaughlin, 1999).

will be found. Hence these one-variable-at-a-time methods are properly viewed as heuristics for selecting a good model (Gunst & Mason, 1980:268). Some software packages, such as Statistica 7.1 (Statsoft, 2007) use a procedure called best subset regression that enables the user to find, given a specified number of independent variables, the best regression model. The criterion used in determining which estimated regression equations are the best for only a number of predictors is the value of the coefficient of determination (R^2) (Hair *et al.*, 2006).

The coefficient of determination (R^2) can assume any value between zero and one. The R^2 measures what proportion of the total variation of the dependent variable is explained by the combination of independent variables. The closer R^2 is to one the better; the independent variables explain the variation apparent in the dependent variable (Babbie & Mouton, 2003:464).

One of the major limitations of multiple regression models is that the technique can only represent a single relationship between the dependent and independent variables at a time and not multiple relationships between variables (Hair *et al.*, 2006:705). Therefore, it was decided to use structural equation modelling to assess a model which depicts the proposed influence of antecedents to CE on EI.

5.5.2.2 Structural equation modelling

Structural Equation Modelling (SEM) is a family of statistical models that seek to explain the relationships among multiple variables. In doing so, it examines the structure of interrelationships expressed in a series of equations, similar to a series of multiple regression equations. SEM is known by many names: covariance structure analysis, latent variable analysis, and is sometimes is even referred to merely by the name of the specialised software package used, for example a LISREL- or AMOS-model. Three characteristics of SEM are: (1) the estimation of multiple and interrelated dependence relationships; (2) an ability to represent unobserved concepts in these relationships and to correct for measurement error in the estimation process; and (3) a focus on explaining the covariance among the measured items (Hair *et al.*, 2006:711).

SEM may be conceived as a combination of factor analysis and multiple regression analysis. The measurement model part is similar to factor analysis in that it also demonstrates how measured variables load on a smaller number of factors (i.e., constructs). Several different regression analogies apply, but key among them is the fact that key outcome or endogenous⁸ constructs are predicted, using multiple other constructs in the same way that independent variables predict dependent variables in multiple regression (Hair *et al.*, 2006:759).

SEM has strict requirements with regard to statistical identification and sample size. Statistical identification deals with the question of whether enough information exists to identify a solution to a set of structural equations. Many problems associated with confirmatory factor analysis (CFA) and SEM in general, including identification and convergence problems, result from two sources: insufficient sample size and insufficient number of indicator variables per construct. Hair *et al.* (2006:741) recommend that an adequate sample based on the model conditions is used and that every construct is measured by at least three or four items. In general, SEM requires a larger sample relative to other multivariate approaches. Some of the statistical algorithms used by SEM programs are unreliable with small samples. The minimum sample size for a particular SEM model depends on several factors, including the model complexity and communalities (average variance extracted among items) in each factor. SEM models containing five or fewer constructs, each with more than three items, and high item communalities (0.6 or higher) can be adequately estimated with samples as small as 100 to 150. When the number of factors is larger than six, some of which have fewer than three measured items as indicators, and multiple low communalities (variance extracted) are present, sample size requirements may exceed 500 (Hair *et al.*, 2006:740-744).

a) Confirmatory factor analysis (CFA)

The widespread use of confirmatory factor analysis (CFA) has greatly improved quantitative measurement in social sciences. CFA is a way of testing how well

⁸ Endogenous constructs are also called latent, multi-item constructs equivalent to dependent variables. An endogenous construct is represented by a variate of dependent variables. In terms of a path diagram, one or more arrows lead into the endogenous construct (Hair *et al.*, 2006:707).

measured variables represent a smaller number of constructs. The main purposes of factor analytic techniques are to reduce the number of variables, and to detect structure in the relationships between variables, i.e. to classify variables. In this study, CFA was performed to determine whether the dimensions of degree and frequency of entrepreneurship, internal antecedents and the external antecedents represented distinct constructs and whether these constructs were interrelated.

CFA can be differentiated from exploratory factor analysis (EFA). EFA explores the data and provides the researcher with information about how many factors are needed to best represent the data. The distinctive feature of EFA is that the factors are derived from statistical results, not from theory, so they can only be named after the factor analysis is performed. EFA can be conducted without knowing how many factors really exist or which variables should be grouped with which constructs. In this respect, CFA and EFA are not similar concepts. (Hair *et al.*, 2006:773).

A key advantage of CFA is that it cannot be conducted appropriately unless the researcher has a sound theoretical model to test. Therefore, the researcher needs to specify both the number of constructs that exist within the data to be analysed and which specific measures should be assigned to each of these constructs. CFA statistics indicate to researchers how well their *a priori* pattern of factor loadings represents the actual data. Thus CFA is used to provide a confirmatory test of the measurement theory. SEM models involve both a measurement theory and a structural theory. A measurement theory specifies how measured variables logically and systematically represent constructs involved in a theoretical model (Hair *et al.*, 2006:778).

Another advantage of CFA is that it enables a researcher to determine how well the theory fits the data. Once a measurement model is correctly specified, a SEM model is estimated to provide an empirical measure of the relationship among variables and constructs represented by the measurement theory. The results enable the researcher to compare the theory against the reality as represented by the sample data. Generally speaking, models fit well when the

predicted covariance matrix becomes similar to the actual covariance matrix computed from the raw data. Multiple fit statistics should be reported to help understand how well a model truly fits. These include the χ^2 goodness-of-fit statistic and degrees of freedom, Joreskog Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and the Non-Normed Fit Index (NNFI) among others. One of these indices should also be a badness-of-fit indicator like the RMSEA (Root Mean Square Error of Approximation). No absolute value for the various fit indices suggests a good fit; only guidelines are available for this task. Table 5.6 provides guidelines for some of these indices.

Table 5.6
A summary of the guidelines for CFA and SEM model fit indices

Fit index	Guideline
Joreskog Goodness of Fit Index (GFI)	Good fit is indicated by values between 0.90-0.95, depending on model complexity and sample size
Comparative Fit Index (CFI)	Good fit is indicated by values higher than 0.90
Normed Fit Index (NFI)	Good fit is indicated by values higher than 0.90
Non-normed Fit Index (NNFI)	Good fit is indicated by values higher than 0.90
Adjusted Population Gamma Index	Good fit is indicated by values higher than 0.95
Root Mean Square Error of Approximation (RMSEA)	Values below 0.10 – lower values indicate better fit

Sources: Compiled from Hair *et al.* (2006:747-767); Statsoft (2007)

The values associated with acceptable models vary from situation to situation and depend on the sample size, number of measured variables, and the communalities of the factors. Compared with EFA, only CFA provides an assessment of fit (Hair *et al.*, 2006:772). Another key advantage of CFA results combined with construct validity tests is that they give researchers a thorough understanding of the quality, reliability and validity of their measures. Validity is discussed in Section 5.6.

Visual diagrams, or path diagrams, are useful tools in helping to translate measurement theory into something that could be tested using standard CFA

procedures. SEM programs use these path diagrams to reveal how constructs are related to measured variables. Good measurement practice suggests that a measurement model should be congeneric, meaning that each measured variable should load on only one construct. Unless some strong theoretical reason indicates doing otherwise, all constructs should be linked with a two-headed, curved arrow in the path diagram indicating that the correlation between constructs will be estimated. The confirmatory factor analysis performed for this study is discussed in Section 6.4.

b) The SEM-model

As stated in the introduction to SEM, the technique enables researchers to explain relationships among multiple variables. Before compiling a SEM-model, a well-developed theoretical model should be specified, with relationships that define the model and establish causation, especially when cross-sectional data are used.

Theory may be defined as a systematic set of relationships providing a consistent and comprehensive explanation of a phenomenon. SEM has become the most prominent multivariate tool for testing behavioural theory. SEM's history emanated from the desire to test causal models. Theoretically, four conditions need to be present to establish causality (dependence relationship of cause and effect): (1) covariation; (2) temporal sequence; (3) non-spurious association; and (4) theoretical support. Firstly, SEM can establish evidence of covariation through the tests of relationships represented by a model. Secondly, SEM cannot, as a rule, demonstrate that cause occurred before the effect, because cross-sectional data are most often used in SEM. SEM models using longitudinal data could help demonstrate temporal sequence. Thirdly, evidence of non-spurious (non-misleading) association between a cause and effect may be supplied, at least in part, by SEM. If the addition of other alternative causes does not eliminate the relationship between the cause and effect, then the causal inference becomes stronger. Fourthly, theoretical support can only be supplied through reason. Empirical findings alone cannot render a relationship sensible. Thus, SEM may be useful in establishing causality, but simply using SEM on any given data does not mean that causal inferences can be established (Hair *et al.*, 2006:720-724).

The process of testing a SEM model involves six decision stages, as set out below:

- I. **Determine the individual constructs:** Theory identifies the items to be used as measurement variables. In this study, EI was identified as consisting of frequency and degree of entrepreneurship; the internal antecedents as consisting of management support, autonomy, rewards, time availability and organisational boundaries; and the external antecedents as munificence and hostility in the external environment. Hair *et al.* (2006:720) recommend that theoretical constructs should be operationalised from scales of prior research or through new scale development. Pre-testing of measures is advisable. The process of operationalising the constructs and pre-testing was discussed in Section 5.3.
- II. **Develop and specify the measurement model:** With the scale items specified, the researcher now needs to specify the measurement model. Hair *et al.* (2006:741) recommend that a path diagram should be drawn to represent the measurement model. A path diagram is a visual representation of the entire set of relationships that constitutes a SEM model. Each type of relationship is conventionally represented with a different type of arrow and abbreviated with a different character. In a path diagram latent⁹ constructs are represented by ovals and measured variables are represented by rectangles. In this study the path diagram indicates how an exogenous¹⁰ construct is related to an endogenous construct and represents a causal inference in which the exogenous construct is a cause and the endogenous construct is an effect (see Figure 5.3).
- III. **Designing a study to produce empirical results:** With the basic model specified, the researcher should turn his or her attention to research design and estimation. During the research design decision-making process, the type of data to be analysed, missing data and the adequacy of sample size need to be considered.

⁹ Latent construct refers to the operationalisation of a construct in SEM. It cannot be directly observed or measured, but may be represented by one or more variables or indicators.

¹⁰ Exogenous constructs are latent, multi-item variables equivalent to independent variables. They are constructs determined by factors outside of the model (Hair *et al.*, 2006:707)

- IV. **Assessing the measurement model validity:** When the measurement model is specified and sufficient data gathered, the researcher needs to determine whether the measurement model is valid. As was discussed in the section regarding CFA (refer to Section 5.5.4.2a), the fit and construct validity of measurement model needs to be examined. Multiple fit indices give an indication of model fit, but the critical role of theory should also be taken into account.
- V. **Specify structural model:** Specifying the measurement model (i.e. assigning indicator variables to the constructs they should represent) is a critical step in developing a SEM model. Thereafter in stage five the structural model should be specified by assigning relationship from one construct to another based on the proposed theoretical model. Hypotheses specify the relationships in the model. In this study the literature review led to the conceptual model shown in Figure 5.3.
- VI. **Assess structural model validity:** The final stage involves efforts to test the validity of the structural model and its corresponding hypothesised relationships. A second assessment of fit is conducted to provide information in the form of the overall fit and the individual parameter estimates for the structural paths (Hair *et al.*, 2006:726-736).

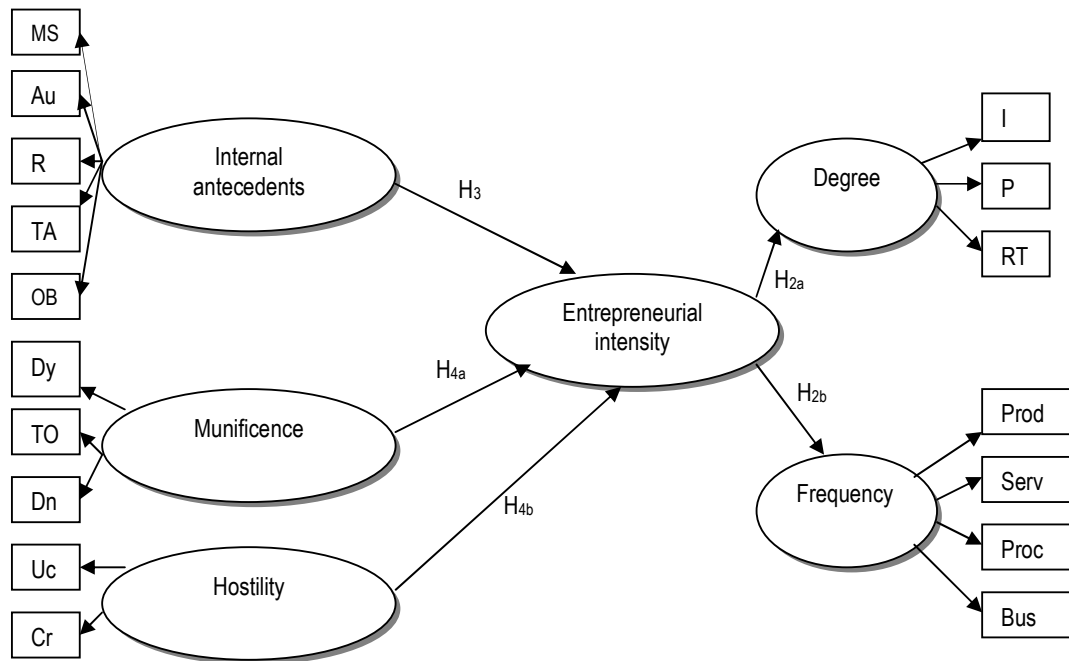


Figure 5.3: An illustration of the conceptual structural equation model of EI and its antecedents

Figure 5.3 illustrates the influence of the internal antecedents and two external antecedents (munificence and hostility) as exogenous constructs on the endogenous construct, EI. The internal antecedents are measured by management support for CE (MS); autonomy of employees (Au); rewards for CE (R); time availability (TA); and organisational boundaries (OB). Munificence is measured by dynamism (Dy); technological opportunities (TO), and demand for new products (Dn). Hostility is measured by only two indicators: unfavourable change (Uc) and competitive rivalry (Cr). These three exogenous constructs influence the endogenous variable EI, which consists of degree, measured by innovativeness (I), proactiveness (P), risk-taking (RT); and frequency, measured by e-business product innovations (Prod); service innovations (Serv); process innovations (Proc); and business innovations (Bus). These hypothesised relationships are assessed in Chapter 6, Section 6.11.

5.6 RELIABILITY AND VALIDITY

A measurement instrument needs to be evaluated applying three criteria: practicality, reliability and validity (Cooper & Schindler, 2006:210).

- Practicality is concerned with a wide range of factors, such as resource availability, cost-effectiveness, convenience and interpretability.
- Reliability is an assessment of the degree of consistency between multiple measurements of the same variable. It is, therefore, concerned with whether alternative measurements at different times would reveal similar information.
- Validity refers to the extent to which a measure or set of measures correctly represent the constructs of study. It is thus concerned with how well the construct is defined by the measure(s).

Variables differ in “how well” they could be measured, i.e. how much measurable information their measurement scale is able to provide. There is some measurement error involved in every measurement, which determines the “amount of information” that can be obtained. Another factor that determines the amount of information that a variable may provide is its “type of measurement scale.” According to Babbie and Mouton (2003:152), the data gathered in a research survey need to be reliable and valid if the survey results are to be credible. Although this is extremely important in any social research, Nueman (2003:178) argues that perfect reliability and validity are virtually impossible to achieve.

5.6.1 RELIABILITY

According to Welman and Kruger (2002:139) and McDaniel and Gates (2001:254), reliability refers to the consistency and stability of a score from a measurement scale, i.e. whether the results in the survey could be duplicated in similar surveys.

Reliability is said to be particularly important when latent variables are calculated from underlying item scales. Since these scales consist of a group of interrelated items designed to measure underlying constructs, it is important to establish whether the same set of items would extract the same responses if they were re-administered to the same sample group on more than one occasion. Variables derived from test instruments are only said to be reliable when it is clear that they elicit stable

responses over multiple measurements of the instrument (Bearden & Netemeyer, 1999:158).

There are several approaches for establishing reliability. These include the following.

- ***Equivalent form reliability*** is a characteristic of measurement in which two instruments which are as similar as possible are used to measure the same object during the same test period. Parallel forms could be employed and results correlated. If a high correlation exists, then the instrument will have demonstrated equivalence.
- ***Internal consistency-reliability*** is a characteristic of measurement in which an instrument measures consistency among responses of a single respondent. Cronbach's alpha coefficient and split-half methods may be used to ascertain whether the measuring instrument has internal consistency. Cronbach's alpha coefficient is a measure used to determine the degree to which items (on a questionnaire) are homogeneous and reflect the same underlying constructs. The more items there are in a scale designed to measure a particular concept, the more reliable the measurement instrument will be.
- ***Test-retest reliability*** ensures consistent results with repeated measurements of the same person with the same instrument. The correlation between the first and second tests is then examined.

Internal-consistency reliability and test-retest reliability were used in this study and are discussed in the following section.

5.6.1.1 Internal consistency reliability in this study

Cronbach's alpha coefficient was used as a measure of internal consistency reliability of the scale used in this study. Cronbach's alpha is a measure of internal reliability for multi-item summated rating scales. Its values range between 0 and 1, where the higher the score, the more reliable the scale. Although Cronbach's alpha coefficient is a widely used measure of reliability, there is no fixed rule with regard to what score of reliability should be considered acceptable. Nunnally (1978) recommended that the minimally acceptable reliability for exploratory research should be in the range of 0.5 to 0.6, while higher values, such as 0.80, generally indicate that the measure is highly reliable (Sekaran, 1992:284, 287).

Hair *et al.* (2006:137) continue to indicate that the value of alpha to be considered acceptable has to be related to the purpose of the research: lower scores are acceptable for exploratory research, but even then these scores should be used only as an indication rather than a test of reliability. Since this study is a case of exploratory research on the topics of CE and EI in South Africa, a score of 0.5 or higher was considered to be an acceptable score for reliability.

a) Entrepreneurial Intensity

The internal consistency of the scale of Entrepreneurial Intensity is shown in Table 5.7. The columns in the table show the various Cronbach alpha scores obtained by Morris and Sexton (1996); Barringer and Bluedorn (1999) and the researcher during the pilot study and survey of *Stage one* of the study.

Table 5.7

A summary of Cronbach alpha coefficient values to determine the internal consistency of EI from the literature and *Stage one* of the study

Construct	Cronbach Alpha Coefficient Values		
	Authors	Pilot study 1	Survey 1
Frequency Product	Morris & Sexton (1996) Not available	0.49	0.68
Frequency Service		0.50	0.74
Frequency Process		Insufficient items	0.77
Frequency Business		Insufficient items	0.67
Frequency		Insufficient items	0.79
Innovativeness			0.80
Risk-taking	Barringer & Bluedorn, 1999 Scale = 0.87	0.88	0.69
Proactiveness		0.77	0.46
Degree of Entrepreneurship		0.88	0.66

As shown in Table 5.7, no Cronbach alpha coefficients could be calculated for frequency of entrepreneurship. Changes were made to the questionnaire after

problems were identified in the first pilot study during *Stage one*. Items which proved to be problematic were, for example: “What was the number of new products your company introduced last year?” Items such as this one created problems of recall, non-applicability, and other measurement problems (units, percentages etc). The researcher reworded and improved some of the statements, based on the feedback of respondents in the pilot study. Since the primary focus (goal) of this study was not to develop and validate a measurement instrument for the frequency of entrepreneurship and external antecedent constructs, it was decided to use the “improved” items in *Survey one*. Regarding the degree of entrepreneurship, the researcher decided to use the items from the ENTRESALE (Khandwalla, 1977; Miller & Friesen, 1983; Knight, 1997; Kreiser *et al.*, 2002), which corresponded closely to measures of entrepreneurial orientation. The Cronbach alpha coefficient score for degree of entrepreneurship was 0.88, compared with a Cronbach alpha coefficient of 0.80 obtained for the EPI measure. The questionnaire that the researcher used for the survey conducted during *Stage one* is provided in Appendix 2.

b) Internal antecedents

The internal consistency of the scale for internal antecedents is reflected in Table 5.8. The values of the Cronbach alpha coefficients obtained by various researchers in earlier studies, such as Hornsby *et al.* (2002), Adonisi (2003) and the researcher during the pilot study in *Stage one* are indicated in Table 5.8. Since acceptable levels of internal consistency were obtained with Cronbach alpha coefficient values exceeding 0.5 during the first pilot study of *Stage one*, most of the items were retained for the final questionnaire as shown in Appendix 2. A more comprehensive discussion of the dimensions is provided in Chapter 6.

Table 5.8

A summary of Cronbach alpha coefficient values to determine the internal consistency of the internal antecedents quoted from selected authors and Stage one of the study

Construct	Cronbach Alpha Coefficient Values			
	Hornsby <i>et al.</i> (2002)	Adonisi <i>et al.</i> (2003) (n = 333)	Stage 1 Pilot study 1 (n = 41)	Stage 1 Survey 1 (n=315)
Management Support	0.92	0.88	0.87	0.92
Autonomy / Work Discretion	0.86	0.84	0.92	0.85
Rewards / Reinforcement	0.75	0.85	0.83	0.88
Resources and Time Availability	0.78	0.77	0.70	0.47
Organisational Boundaries	0.69	0.71	0.72	0.69
Internal Antecedents	-	-	0.56	0.70

c) External antecedents

The internal consistency of the scale for the external antecedents obtained in *Stage one* is shown in Table 5.9. The columns in the Table show the various Cronbach alpha coefficient values (refer Section 5.6.1.1) obtained by Zahra (1991) and the researcher during the first pilot study and survey in *Stage one*. Even though Zahra (1991) reported Cronbach alpha coefficients of 0.79 and higher, the researcher obtained very low (0.26) and negative (-0.21) Cronbach alpha coefficient values. The researcher reworded and improved some of the statements, based on the feedback of the respondents after the first pilot study conducted in *Stage one*. Since the primary goal of this study was not to develop and validate a measurement instrument for the external antecedents of CE, it was decided to use the “improved” items in *Survey one*, as shown in Appendix 2.

Table 5.9

A summary of Cronbach alpha coefficient values to determine the internal consistency of the external antecedents quoted from Zahra (1991) and Stage one of the study

Construct	Cronbach Alpha Coefficient Values		
	Zahra (1991)	Stage 1 Pilot Study 1	Stage 1 Survey 1
Dynamism	0.79	-0.21	0.36
Hostility	0.82	0.26	0.37
Heterogeneity	0.85	0.75	0.50
External Antecedents	-	-	0.16

From Table 5.9 it can be gleaned that the data for the external antecedents obtained during the survey in *Stage one* could not be used for further statistical analyses, since the internal consistency of these items was unacceptable. These findings seem to indicate a similar situation experienced by Antoncic and Hisrich (2001), who pointed out that entrepreneurship research instruments usually have an American bias and need to be validated in different countries before they can be used. They experienced problems with the hostility dimensions, especially the perceived unfavourability of change and competitive rivalry in Slovenia, in contrast to the USA. Miller (1993:710) also found that certain macroeconomic and market uncertainties were explained by country differences.

A questionnaire was developed during *Stage two* to reflect the external antecedents in the South African context more accurately. The internal consistency of the scale for the external antecedents obtained in *Stage two* is shown in Table 5.10.

Table 5.10

A summary of Cronbach alpha coefficient values to determine the internal consistency of the external antecedents

Construct	Cronbach Alpha Coefficient Values		
	Literature	Stage 2 Pilot Study 2	Stage 2 Survey 2
Dynamism	Zahra (1993); Zahra & Bogner (1999) 0.79	0.73	0.87
Technological Opportunities	Zahra (1993) 0.80	0.69	0.85
Demand for New Products	Zahra (1993) 0.71	0.68	0.86
Munificence	Kreiser <i>et al.</i> (2002) 0.77	0.59	0.74
Unfavourable Change	Zahra & Bogner (1999) 0.74	0.58	0.82
Competitive Rivalry	Zahra (1993) 0.72	0.66	0.81
Hostility	0.82	0.54	0.63¹¹

Table 5.10 shows the various Cronbach alpha coefficient values (refer Section 5.6.1.1) obtained by Zahra (1993); Zahra and Bogner (1999); Kreiser *et al.* (2002) and the researcher during the second pilot study and survey of *Stage two*. After the adaptation and rewording of the items the questions proved more reliable during *Stage two*. Appendix 4 provides more detail on the questionnaire.

5.6.1.2 Test-retest reliability in this study

Test-retest reliability ensures consistent results with repeated measurements of the same person with the same instrument, by comparing correlations. High correlations indicate test-retest reliability.

The degree of entrepreneurship was measured in *Stage one* (2005) and *Stage two* (2006), to determine the consistency of the scale over time. Table 5.11 shows the two measurements over time on a standardised scale, with the mean values,

¹¹ Hostility was only calculated from two constructs. Cronbach alpha coefficients require three constructs (Sekaran, 1992). This accounts for the lower score, despite the high Cronbach alpha coefficient values of unfavourable change and competitive rivalry.

standard error, 95% confidence interval and repeated measures ANOVA (F -statistic and p -value) to determine whether there is a significant difference between the means.

Table 5.11 reveals that no significant differences existed between innovativeness and proactiveness measured in 2005 and 2006, which shows the test-retest reliability of the measurement items. However, there are significant differences between the risk-taking measures of 2005 and 2006 ($p < 0.01$). It appears as if the risk-taking propensity of the respondents increased from 0.55 to 0.63 in 2006. Regarding the degree of entrepreneurship measured in 2005 and 2006, the mean score of respondents in 2005 was 0.63 compared to the mean score in 2006 of 0.65. The difference between the means is not significant at the 95%-confidence level ($p > 0.05$), but it is significant at the 90%-confidence level ($p < 0.10$). The difference could be explained by the increase in the mean value of risk-taking from 2005 to 2006.

Table 5.11

A summary of the descriptive statistics of degree of entrepreneurship measured in 2005 and 2006 to determine the consistency of the scale

Dimension	N	Mean	Std Deviation	Std Error	95% confidence interval	F- value	P- value
Innovativeness ₂₀₀₅	131	0.64	0.18	0.02	0.60-0.67	2.14	0.15
Innovativeness ₂₀₀₆	131	0.66	0.20	0.02	0.63-0.70		
Proactiveness ₂₀₀₅	131	0.69	0.15	0.01	0.66-0.71	1.82	0.18
Proactiveness ₂₀₀₆	131	0.66	0.20	0.01	0.63-0.69		
Risk-taking ₂₀₀₅	131	0.55	0.20	0.02	0.52-0.59	13.57	0.00
Risk-taking ₂₀₀₆	131	0.63	0.20	0.02	0.59-0.66		
Degree ₂₀₀₅	131	0.63	0.13	0.01	0.60-0.65	3.02	0.08
Degree ₂₀₀₆	131	0.65	0.25	0.01	0.65-0.68		

For test-retest reliability the requirement is that the difference in the mean between groups should not be significant if respondents are tested for a second time “under relatively similar conditions” (Bearden & Netemeyer, 1999:158). In the case of structured telephone interviews, these conditions imply that respondents should not remember what they answered the first time and should be tested a short period after they were interviewed for the first time. In other words, the conditions under which

they were being interviewed the first time would still remain the same. In the case of this study, the “retest” took place a year after the initial “test” and, therefore, it is difficult to state whether the increase in the mean score of risk taking is due to poor test-retest reliability or because of changes in the risk-taking propensity after a longer period of time. Morris and Kuratko (2002) suggest that the EI of companies may change over time, as discussed in Section 4.2. This implies that the dimensions of degree of entrepreneurship may change over time. More research is needed regarding the measurement instrument to determine test-retest reliability.

5.6.2 VALIDITY

The extent to which a particular measure is “free from both systematic and random error indicates the validity of the measure” (Tull & Hawkins, 1993:316). Validity could be defined as the extent to which differences in observed scale scores reflect true differences between objects on the characteristics being measured, rather than systematic or random error (Neuman, 2003:183). In other words, validity is the extent to which a set of measured items actually reflects the theoretical latent construct that those items are designed to measure (Hair *et al.*, 2006:724).

Validity is essential in confirming a measurement model. Multiple components of validity can be identified. These include the following (Neuman 2003:183-184, McDaniel & Gates 2001:259-260; Hair *et al.*, 2006:807-812):

- **Convergent validity:** If an instrument is measuring what it is supposed to measure, it should relate positively to other measures of the same construct, i.e. they all should be converging on the same trait or share a high proportion of variance in common. An instrument is said to have convergent validity if in numerous cases it is statistically shown that there is agreement on the rating (Statsoft, 2007). When using SEM and CFA, several ways are available to estimate the relative amount of convergent validity among item measures, such as factor loadings, variance-extracted estimates, and construct reliabilities. Standardised factor loading estimates should ideally range from 0.5 to 0.7 or higher; the variance extracted should be 0.5 or greater and the construct reliability

should be 0.7 or higher. All these indicators provide evidence of good convergent validity (Hair *et al.*, 2006:807-808).

- **Discriminant validity** is the extent to which a variable or construct is distinct from other variables or constructs. A test is to compare the variance extracted percentages for any two constructs with the square of the correlation estimate between these two constructs. The variance-extracted should be greater than the squared correlation estimate (Hair *et al.*, 2006:808).
- **Face validity** is established when the measurement items are conceptually consistent with the definition of a variable, and this type of validity has to be established prior to any theoretical testing. At a basic level, face validity is established by developing measures from well-grounded theory (Antoncic & Hisrich, 2001).
- **Nomological validity** is supported to the extent that a construct relates to other constructs in a theoretically consistent way (Hair *et al.*, 2006:811-812).

5.6.2.1 Validity in this study

Pre-testing of a questionnaire can assist in determining construct validity, or the degree to which a measuring instrument measures what it is supposed to. In the present study the questionnaires of both stages were pre-tested with experts in the academic and business community and 41 employees of companies. As indicated earlier, their comments led to adjustments to the questions in both stages of the research. The measurement instrument was pre-tested for content, criteria and construct validity. Instrument reliability and stability were also pre-tested. Special attention was given to order of questions, question content, and wording of questions. Pre-testing allowed for the identification and removal of problems. Further tests of construct validity are discussed in Section 6.4 where CFA was performed on the data and the variance-extracted and construct reliability are shown.

Face validity was achieved through a thorough literature review and by developing and using theoretical definitions and validated measurement instruments. However, it is important to recall that although entrepreneurship is a well-established topic, the

resurgence of interest in entrepreneurship is a fairly recent phenomenon (Wortman, 1987). Thus, although the CE and internal antecedent construct measures have good reliability and have performed well in previous studies, they are based on a stream of literature that is still developing (Antoncic & Hisrich, 2001; Hornsby *et al.*, 2002). Similarly, the external antecedents and measures of EI included in the study are based on recent literature (Zahra, 1991; 1993; 1995; Morris & Sexton, 1996). As a result, the theoretical validity of CE constructs is still in a formative stage.

5.7 SUMMARY

This chapter discussed the research methodology followed in this study to determine how the antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa. The research objective and hypotheses were stated. The hypotheses formulated were that company characteristics, such as size, age and company group (JSE or ICT) influence EI; a relationship exists between frequency and degree of entrepreneurship; supportive internal antecedents for CE should lead to higher levels of entrepreneurship; and finally EI should increase in munificent and hostile environments.

The research design used to test these hypotheses was an empirical cross-sectional telephone survey of JSE and ICT companies active in e-business, operating in South Africa. The key informant for JSE companies was typically the CIO or IT Manager, and for ICT companies the CEO or Sales Manager. The responsibilities of these individuals gave them a unique and comprehensive view of e-business innovation and CE activities. The study was conducted in two stages. During *Stage one* the measurement instrument was pre-tested in the pilot study, refined and administered to the sample. During *Stage two* the external antecedent constructs that had to be further refined and adapted to the South African context were pre-tested and then administered to the same respondents who participated in the first survey. The questionnaires detailed in Appendix 2 and 4 were compiled from the EPI questionnaire, ENTREscale, the CEAI, the CE-scale and items formulated by the researcher, based on the literature. The response rate obtained in the first survey was 42%; and for the second survey it was 20%.

Descriptive and inferential statistics were explained in the last section of this chapter. Chapter 5 concluded with a discussion and assessment of reliability and validity criteria. The constructs used in the study were evaluated against these criteria.

In Chapter 6 descriptive statistics are used to describe the data, while the inferential statistics – such as best subset multiple regression, confirmatory factor analysis and structural equation modelling – are used to assess the relationships between the independent variables (internal and external antecedents) and the dependent variable (EI). Furthermore, the next chapter focuses on the findings of the study and works towards achieving the objectives and aim of the study.

CHAPTER 6

FINDINGS AND DISCUSSION OF RESULTS

6.1 INTRODUCTION

As discussed in Chapter 5 and illustrated in Figure 5.2, this study was conducted in two stages. During *Stage one* the measurement instrument was pre-tested, adapted and then administered to the sample. The findings of *Stage one* could be used to assess the relationships between company characteristics and EI; frequency and degree of entrepreneurship; and the internal antecedents and EI. However, findings regarding the external antecedent constructs were inconclusive owing to internal reliability problems with the questions measuring these constructs. Therefore, during *Stage two* the external antecedent constructs were further refined and adapted in an attempt to reflect the South African context more accurately; pre-tested and then administered to the original respondents who participated in *Stage one* of the study.

In this chapter the results of both stages of the empirical studies are reported. Figure 6.1 shows the statistical techniques used in this chapter and the intended outcome of each technique. The first part of the chapter presents the profile of the sample, followed by the descriptive analysis. The descriptive statistics included means, standard deviations and coefficients of variation to describe the internal and external antecedents and the dimensions of entrepreneurial intensity. Spearman correlations were used to determine the influence of sample characteristics on EI and its antecedents; the relationship between frequency and degree of entrepreneurship; and the influence of the antecedents on EI. As shown in Figure 6.1, the confirmatory factor analysis was conducted to confirm CE theory and determine the validity of constructs.

Best subset regression analyses were used to determine which internal and external antecedents have the strongest relationship with EI. Finally, structural equation modelling (SEM) was used to construct a model of the multiple influences of antecedents to CE on EI. The strength of SEM as a statistical technique compared with multiple regression analysis is that it is able to represent multiple relationships between variables at a time, whereas multiple regression analysis only represents a single relationship between the dependent and independent variables at a time (Hair *et al.*, 2006:705).

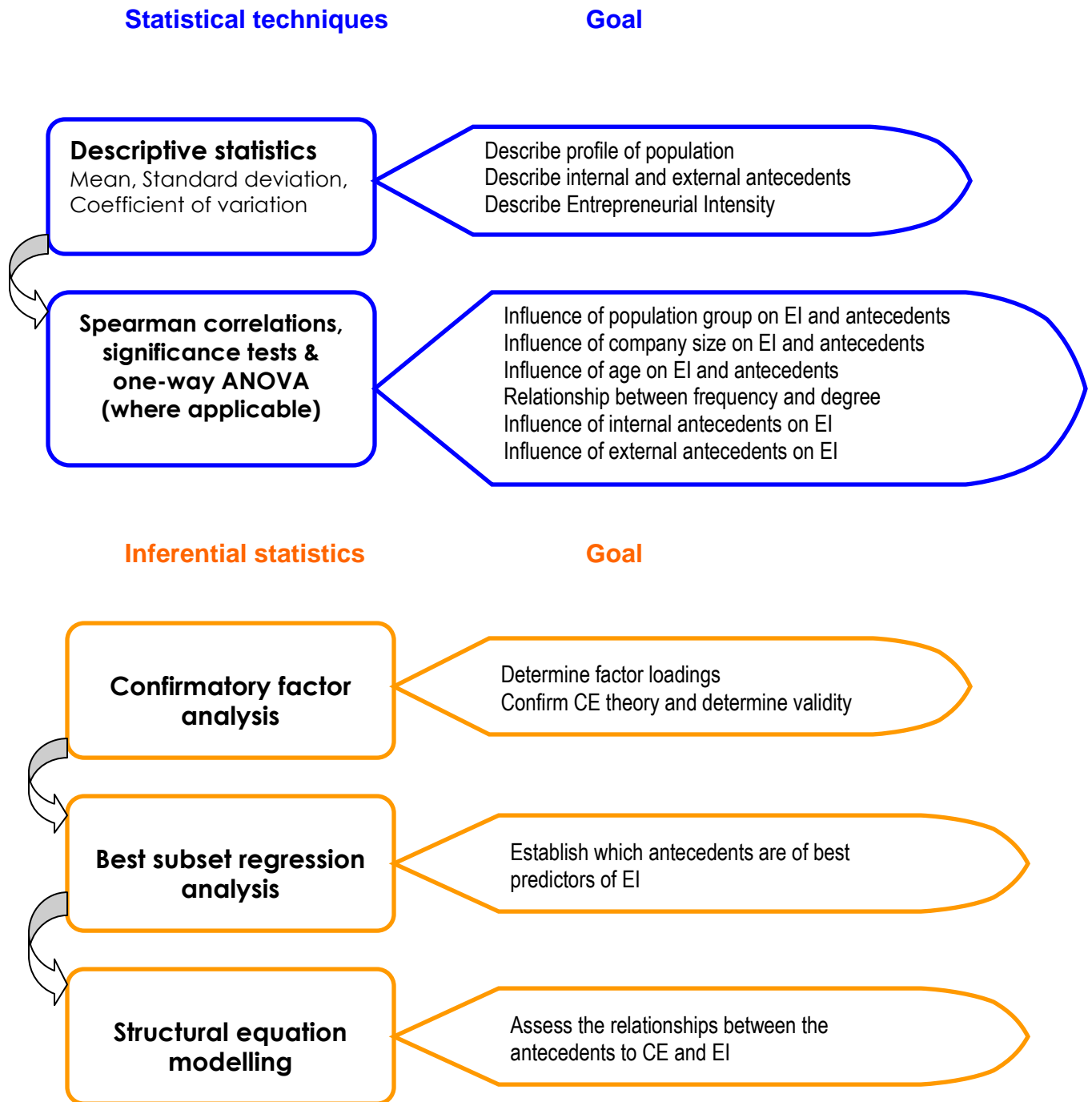


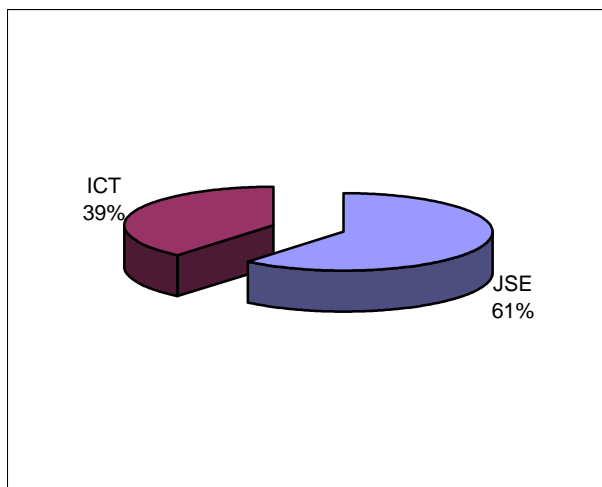
Figure 6.1: A graphical representation of the statistical techniques used in Chapter 6

6.2 PROFILE OF THE SAMPLE

The profile of the sample is discussed in terms of three characteristics: sample group (JSE or ICT), size and age of companies. As discussed in Section 3.4, the innovation literature highlights these characteristics as having an impact on entrepreneurial behaviour.

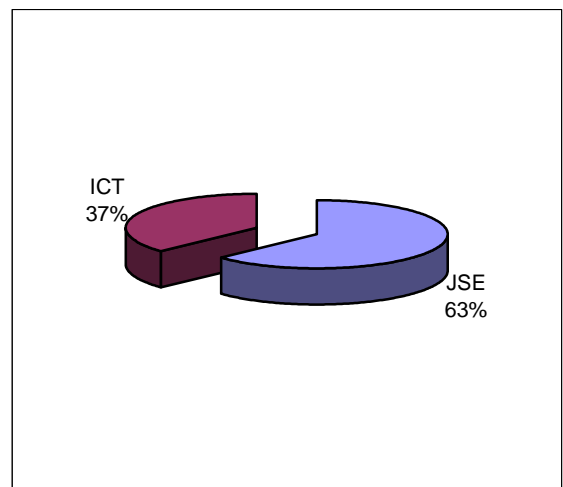
6.2.1 GROUP OF COMPANIES

The study was conducted in two stages. Figure 6.2 shows the profile of JSE and ICT companies that participated in *Stage one* and *Stage two* of the study.



n = 315

Figure 6.2 (a): Stage One



n = 146

Figure 6.2 (b): Stage Two

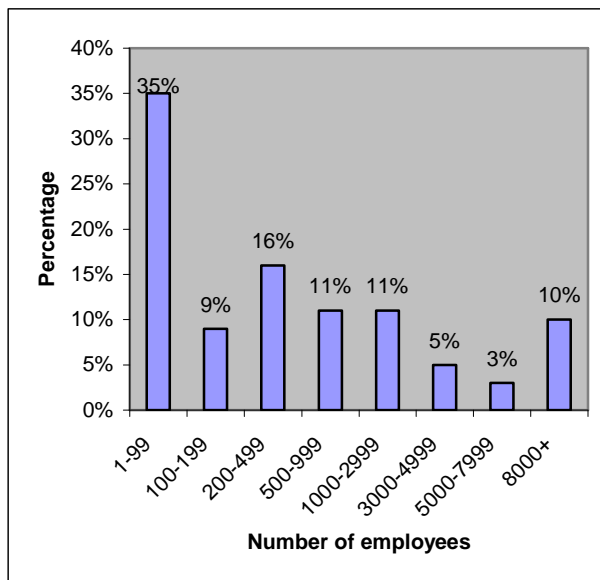
Figure 6.2: Pie charts of the split between JSE and ICT companies in Stage one and Stage two of the study

More JSE companies (61%) participated in the survey than ICT companies (39%), during *Stage one* of the research, as indicated in Figure 6.2(a). A similar pattern of responses was obtained during *Stage two* of the study, with 63% of JSE companies and 37% of ICT companies participating, as shown in Figure 6.2(b). As discussed in Section 5.3.2, JSE and ICT companies were chosen because their e-business activities are comparable. In the analyses above, nine companies were both active in the ICT sector

and listed on the JSE Securities Exchange. These companies were grouped with the ICT companies for the analyses that follow, since their strategies, internal culture and perceptions of the external environment are more likely to be similar to unlisted ICT companies in the same industry, as opposed to other listed companies in different industries (McGahan & Porter, 1997; Sutcliffe & Huber, 1998).

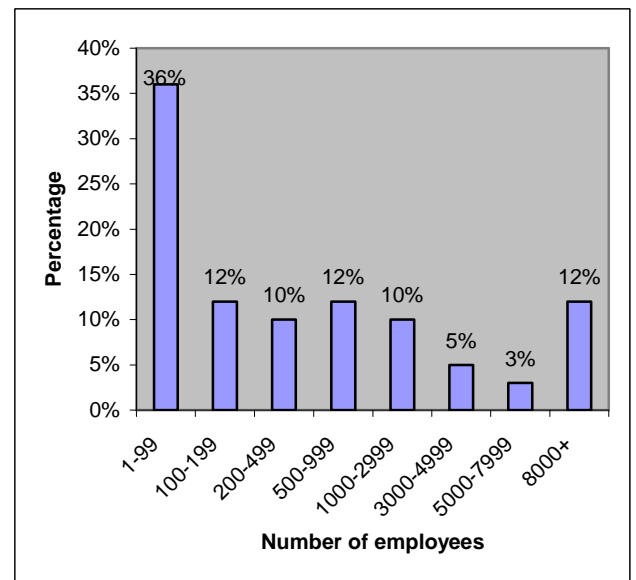
6.2.2 SIZE OF COMPANIES

Company size was determined by the number of permanent employees. The replies of respondents were categorised into eight response categories, as shown in Figure 6.3.



n = 315

Figure 6.3 (a): Stage One



n = 146

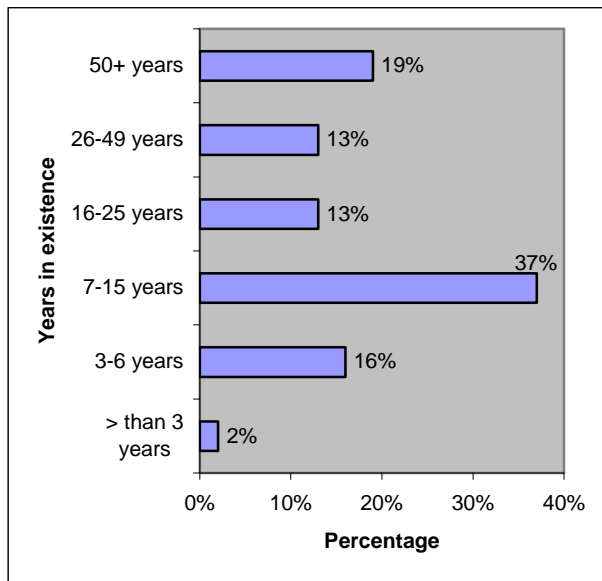
Figure 6.3 (b): Stage Two

Figure 6.3: Bar charts representing the size of companies in terms of the number of employees, during Stage one and Stage two

As shown in Figure 6.3 (a) during *Stage one*, the largest category was companies with 1-99 employees, which represented 35% of the respondents. However, when the categories above 200 employees were taken into account, 56% of the respondents employed 200 or more employees. Similarly, shown in Figure 6.3 (b) in *Stage two*, companies with 1-99 employees represented 36% of the respondents, while the categories above 200 employees represented 52% of the respondents.

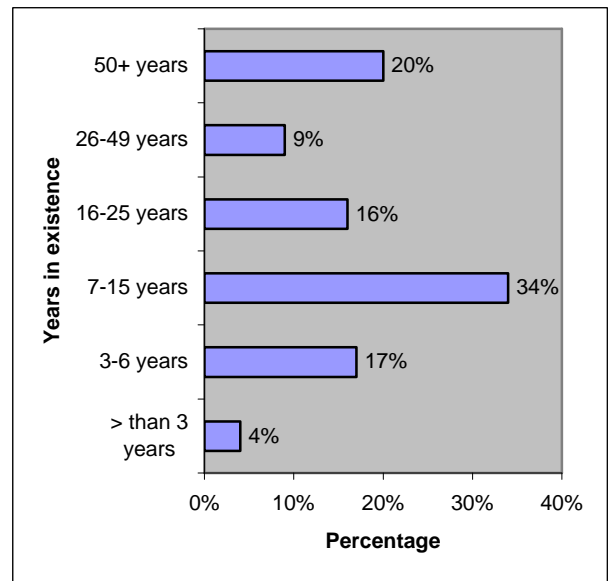
6.2.3 AGE OF COMPANIES

Companies were also categorised according their age, measured by years of existence. Respondents' answers were categorised into six response categories as shown in Figure 6.4.



n = 302; 13 non-responses

Figure 6.4 (a): Stage One



n = 146

Figure 6.4 (b): Stage Two

Figure 6.4: Bar charts representing the age of companies, measured in years in existence, during Stage one and Stage two of the study

During *Stage one* the largest segment (37%) of the respondents fell into the category 7-15 years, as indicated in Figure 6.4 (a). Companies younger than 7 years represented 18% of the respondents and companies older than 15 years were 45%. It should also be noted that only 2% (7 out of 302 companies) had been in existence for less than three years. Similar response patterns were found during *Stage two*, as shown in Figure 6.4 (b). In *Stage two* 34% of the respondents fell into the 7-15 years category, while 21% of the companies were younger than 7 years and 45% were older than 15 years.

The subset of the sample interviewed during *Stage two* reflected a similar profile to the respondents in *Stage one* with regard to group, size and age of companies. In the next section the constructs and their dimensions are described in statistical terms.

6.3 DESCRIPTIVE ANALYSIS

The perceptions of the antecedents to CE among senior managers involved with e-business are described in this section.

For each construct and dimension a composite score was obtained by totalling the individual scores of the relevant items and calculating the average. The various scores were then compared with one another to establish their relative status within the dataset. In other words, if the score for dimension A was lower than that of the average of all the scores, dimension A was said to have a low score relative to other dimensions, as will be shown in the subsequent graphs. In the sections that follow, each construct and dimension is discussed in terms of the mean scores and dispersion of the data.

6.3.1 DEPENDANT VARIABLE: ENTREPRENEURIAL INTENSITY

As described in Chapter 4, entrepreneurial intensity (EI) consists of degree and frequency of entrepreneurship, which are in turn subdivided into dimensions and indicators. Each of these is discussed below. Figure 6.5 illustrates how the scores of these different variables relate to one another; for example, most companies scored higher in terms of proactiveness (68%) than risk-taking (56%). Degree of entrepreneurship (Cronbach alpha coefficient = 0.66) was determined by the mean scores of innovativeness, proactiveness and risk-taking, while frequency of entrepreneurship (Cronbach alpha coefficient = 0.79) was determined by the mean scores of product, service, process and business frequency. The Cronbach alpha coefficients for the two constructs met the requirement of 0.5 specified in Section 5.6.1.1 for exploratory research (Nunnally, 1978).

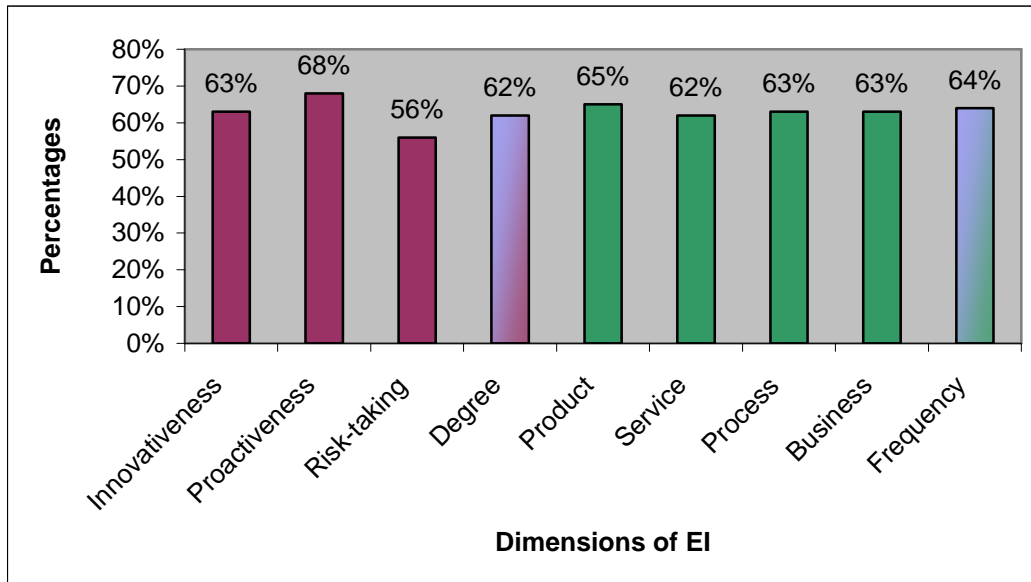


Figure 6.5: A bar chart representing the mean scores of the dimensions of EI: degree and frequency of entrepreneurship

Table 6.1 shows the descriptive statistics for EI and its dimensions. As discussed in Chapter 5 (Section 5.4), 315 companies participated in the survey and most respondents replied to all the questions, but since the questions relating to frequency of entrepreneurship made provision for the fact that a company may be active on only two or three of the frequency dimensions, the responses for these dimensions were in several instances lower than 315. Non-responses for some of the dimensions of frequency of entrepreneurship are plausible, since some companies may focus only on new product development and not services. Alternatively, some companies may engage only in new process development and not new business development.

The means, standard deviations and coefficients of variation are shown in Table 6.1.

Table 6.1

A comparison of the means, standard deviations and coefficients of variation for EI and its dimensions: degree and frequency of entrepreneurship

Dimension	N	Mean	Average Percentage	Standard Deviation	Coefficient of Variation
Innovativeness	315	16.94	63%	5.33	31.46
Risk-taking	315	14.99	56%	5.41	36.09
Proactiveness	315	18.33	68%	4.51	24.60
Degree of Entrepreneurship	315	16.75	62%	3.92	23.40
Product Frequency	273	17.63	65%	5.00	28.36
Service Frequency	276	16.82	62%	5.22	31.03
Process Frequency	280	16.98	63%	5.26	30.98
Business Frequency	278	16.92	63%	4.87	28.78
Frequency	230	22.95	64%	5.18	22.57

6.3.1.1 Degree of entrepreneurship

Degree of entrepreneurship consists of three dimensions: innovativeness, proactiveness and risk-taking. Together these dimensions were used as a measure of the level of entrepreneurial behaviour displayed by a particular enterprise. A low score for the degree of entrepreneurship suggests that an enterprise exhibited limited entrepreneurial behaviour, characterised by low levels of innovativeness, proactiveness and risk-taking. The mean score achieved for all respondents on this dimension was 62%. As discussed in Section 5.6.1.1 (see Table 5.7), the Cronbach alpha coefficient for this dimension was 0.66, which is acceptable, since it is above the threshold of 0.5 for exploratory research (Nunnally, 1978). The coefficient of variation (23.40) shows similar patterns of dispersion around the mean for degree and frequency of entrepreneurship, which suggested that respondents thought in similar terms about these two dimensions.

a) Innovativeness

As discussed in Chapter 4 (Section 4.2.2.1), innovativeness refers to the creation of new products, services and technologies. The average score for innovativeness was 63%, which suggested that respondents were active in the creation of new

products, services and technologies. As shown in Section 5.6.1.1 (see Table 5.7), the Cronbach alpha coefficient was 0.80 in the pilot study and 0.58 in the survey. When question 7(1) was deleted, the coefficient was elevated to 0.68.

Question 7(1) asked respondents whether their companies favoured a strong emphasis on the marketing of tried and tested products and services on the one hand or a strong emphasis on R&D, technological leadership, and innovation on the other hand (see Appendix 2). It appears that question 7(1) created problems for some respondents, since some companies interviewed were active in commodity markets and, therefore, traded commodities and not products or services. Furthermore, some companies may have marketed existing products while also focusing on R&D and technological improvements. Therefore, the components of the item may not represent accurate opposites. On the other hand the Cronbach alpha coefficient does meet the requirement of 0.5 for exploratory research set in Section 5.6.1.1 (Nunnally, 1978). The coefficient of variation (31.46) showed a wider dispersion around the mean for innovativeness, compared to proactiveness. The responses by companies that traded commodities differed from companies that sold products and services.

b) Risk-taking

The second dimension, risk-taking, involves the willingness to commit significant resources to opportunities having an uncertain outcome and return on the investment. These risks can be minimised by the knowledge an entrepreneur or company has of the opportunity or technology, unique capabilities of a company or networks the entrepreneur belongs to (see Section 4.2.2.3). The mean score for risk-taking was 56%, which was the lowest score recorded in the constructs of EI. The reason for this could be that companies that are accountable to external stakeholders and shareholders (especially JSE-companies) do not wish to be perceived as being “irresponsible” risk-takers. The Cronbach alpha coefficient of 0.69 was acceptable, since it exceeds the threshold of 0.5 set in Section 5.6.1.1 (Nunnally, 1978; also refer to Table 5.7). The coefficient of variation (36.09) showed a wider dispersion around the mean compared with innovativeness and proactiveness. This is indicative of diverse perceptions held by respondents regarding risk-taking.

c) Proactiveness

Proactiveness (see Section 4.2.2.2) reflects top management's orientation in pursuing enhanced competitiveness and includes initiative, competitive aggressiveness and boldness. The mean score for proactiveness was 68%, which is high relative to the other scores. The Cronbach alpha coefficient was 0.77 in the pilot study, but 0.46 in the survey (see Table 5.7). This coefficient did not improve when any of the questions were deleted. A number of respondents who participated in the survey, especially companies active in the resource and commodity sector of the JSE or those with unique technologies in the ICT sector, indicated that they experienced very little competition and, therefore, found questions relating to competitors very difficult to answer. Despite the low Cronbach alpha coefficient obtained in the survey (below the threshold of 0.5; Section 5.2.1.1.), proactiveness forms an important part of the construct of degree of entrepreneurship and, therefore, these items were retained for further analysis. The coefficient of variation (24.60) showed a narrower dispersion to the mean, which indicated that respondents' perceptions regarding proactiveness were more similar than was the case with the other dimensions of degree of entrepreneurship.

6.3.1.2 Frequency of entrepreneurship

Frequency of entrepreneurship is reflected in the number of times firms change, modify or introduce new products, services, processes and businesses. As may be seen from Table 6.1, the overall mean for frequency of entrepreneurship was 64%. The Cronbach alpha coefficient, which could not be determined in the pilot study, showed good reliability of 0.79 in the first survey, since values of 0.80 indicate that a measure is highly reliable (Sekaran, 1992). Table 5.7 summarises the Cronbach alpha coefficients obtained in *Stage one* of the study. The mean score of 64% was calculated on the basis of 230 responses from the total of 315 respondents. The reason was that only 230 respondents offered new (modified) products and services; improved their processes; and were active in new e-business development. The coefficient of variation showed a similar dispersion of the data, compared with the degree of entrepreneurship.

a) Product frequency

Product frequency, in other words new product introductions, refers to repositioning of products; product improvements; additions to product lines; new category entries as well as new-to-the-world products. Respondents were probed to focus on product modifications relating to e-business. A large number, 273 respondents, indicated that they produced or sold products and achieved a mean score for product frequency of 65%. As shown in Section 5.6.1.1 an acceptable Cronbach alpha coefficient of 0.68 was obtained for the three items that measure the product frequency dimension (see Table 5.7). This coefficient is above the 0.5 threshold. The coefficient of variation (28.36) showed a moderate dispersion around the mean compared with the other constructs.

b) Service frequency

Service frequency, referred to as new service introductions, includes modifications of existing services, additions and services not offered before. Respondents were probed to focus on service modifications relating to e-business. Many of the respondents (276) indicated that they offered services to their customers. The mean score achieved for service frequency was 62%. An acceptable Cronbach alpha coefficient of 0.74 was obtained for the three items that measure the service frequency dimension (refer Table 5.7), which is close to 0.80, which indicates a highly reliable measure (Sekaran, 1992). The coefficient of variation (31.03) showed the widest dispersion around the mean when compared with the other frequency constructs. This is indicative of divergent perceptions of respondents regarding service frequency.

c) Process frequency

Process frequency (i.e. new process introductions) occurs when process innovations are implemented. Examples of process innovations include: new systems for managing customer service or inventories, an improved process for collecting outstanding debtors, and a major new sales or distribution approach supported by innovative e-business processes. A great number, 280 respondents, indicated that they improved their processes and an overall mean score of 63% was recorded. An acceptable Cronbach alpha coefficient of 0.77 was obtained for the three items that measure the process frequency dimension (refer Table 5.7). A

Cronbach alpha coefficient value of 0.80 represents a highly reliable measure (Sekaran, 1992:284), and thus the construct process frequency is a reliable measure. The coefficient of variation (30.98) showed a similar dispersion around the mean to service frequency.

d) *Business frequency*

Business frequency refers to new business development. Examples of new business developments include market expansion, strategic alliances, acquisitions and mergers, internal ventures, spin-offs, e-business developments and any other tactics to diversify an enterprise's interests. Many respondents (278) indicated that they were active in new business developments and an average score of 63% was calculated. An acceptable Cronbach alpha coefficient of 0.67 was obtained for the three items that measure the business frequency dimension (see Table 5.7), which is above the threshold of 0.5 (Nunnally, 1978). The coefficient of variation (28.78) showed a similar pattern of dispersion to the product frequency construct, which suggested that perceptions of respondents were more similar for business and product frequency than for service and process frequency.

The degree of entrepreneurship and frequency of entrepreneurship constructs are influenced by certain independent variables, such as the internal and external antecedents, as outlined in the CE literature.

6.3.2 INDEPENDENT VARIABLES: INTERNAL ANTECEDENTS

As described in Chapter 5 (see Section 5.3.4.2c), internal antecedents consist of management support for CE, autonomy, rewards, time availability and organisational boundaries. The findings for each of these are discussed below.

Figure 6.6 illustrates how the scores of these different variables relate to one another. For example, the mean score for organisational boundaries was the lowest relative to the other internal antecedents, while rewards showed the highest mean score. However, all five dimensions contribute to the internal antecedent construct.

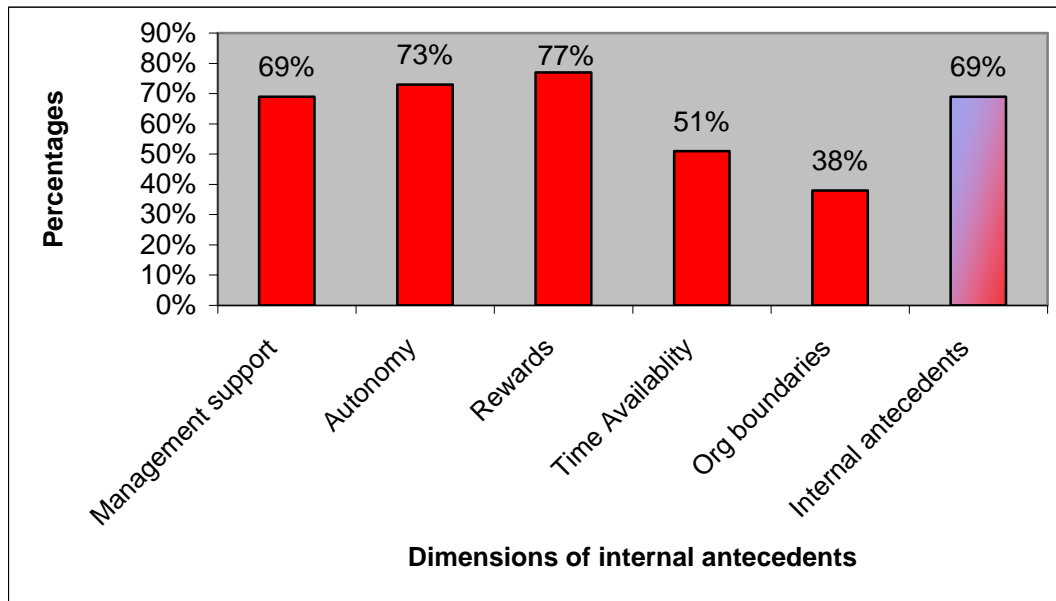


Figure 6.6: A bar chart representing the mean scores for the dimensions of the internal antecedents to CE

The descriptive statistics for the internal antecedents are shown in Table 6.2. All 315 respondents answered these questions. The mean scores, standard deviations and coefficients of variation are reflected in Table 6.2 and discussed in the subsequent section.

Table 6.2

A comparison of the means, standard deviations and coefficients of variation for the internal antecedents to CE

Dimension	Mean		Average (%)	Standard Deviation		Coefficient of Variation	
	1st half	2 nd half		1st half	2 nd half	1st half	2 nd half
Split half ¹²							
Management Support (15 items)	41.86	50.89	69%	10.73	11.52	25.63	22.63
Autonomy (9 items)	32.87	26.06	73%	6.42	6.32	19.53	24.51
Rewards (5 items)	34.47		77%	7.97		23.12	
Time Availability (5 items)	23.09		51%	5.66		24.51	
Organisational Boundaries (5 items)	16.97		38%	7.60		44.78	
Internal Antecedents	30.85		69%	4.71		15.27	

n=315

The internal antecedents achieved an above-average score of 69%, while an acceptable Cronbach alpha coefficient of 0.70 was recorded (refer Table 5.8), since the threshold is 0.5 (Nunnally, 1978). The internal antecedents are discussed in the subsequent sections.

¹² Split-half reliability involves administering two equivalent batteries of items measuring the same construct in the same measurement instrument to the same respondents, since Cronbach alpha coefficient values increase as the number of items in the scale increases (Trochim, 2006).

6.3.2.1 Management Support

In general it is expected that in enterprises where management supports CE and innovation, higher levels of EI are prevalent. The overall mean score for management support was 69%. The 19 items of the original CEAI instrument used to measure management support were reduced to 15 items to prevent respondent fatigue. The Cronbach alpha coefficient for management support was 0.92 (see Table 5.8). Since Cronbach alpha coefficient values increase as the number of items in the scale increase, items were randomly split into two groups and split-half reliability analysis was performed. Split-half reliability, which measures equivalence, is also called parallel forms reliability or internal consistency reliability. It involves administering two equivalent batteries of items measuring the same construct in the same measurement instrument to the same respondents (Trochim, 2006). Four coefficients were generated in the analysis: Guttman split-half reliability coefficient: 0.88, Split-half reliability: 0.88, correlation first- and second half 0.79 and the Cronbach alpha coefficient for the full scale: 0.92. The items that measured this component were thus deemed very satisfactory, since values of 0.80 indicate that a measure is highly reliable (Sekaran, 1992). The coefficient of variation of the two halves (25.63 and 22.63) showed a dispersion of data similar to the other internal antecedents. In other words, respondents' perceptions of management support for CE were similar to those of the other internal antecedent constructs.

6.3.2.2 Autonomy

Autonomy, also referred to as work discretion or intrapreneurial freedom, involves permitting employees to make decisions about performing their own work in the way they believe is most effective, and allowing them to use their initiative. The overall mean score for this dimension was high at 73%. The Cronbach alpha coefficient for the construct was 0.85 (see Table 5.8). The original 10 items were reduced to 9 items, since two of the items were perceived by respondents of the first pilot study as very similar. Since 9 items were used to measure autonomy, split-half reliability was also used to analyse the internal reliability of this dimension. The scores on the various coefficients were as follows: Guttman split-half reliability coefficient: 0.83, Split-half reliability: 0.83, correlation first- and second half 0.71 and the Cronbach alpha coefficient of the full-scale: 0.85 (refer Table 5.8). These items were consequently also viewed as good, reliable indicators of autonomy, since the Cronbach alpha coefficient (0.85) exceeds

0.80, seen as indicative of a highly reliable construct (Sekaran, 1992). The coefficient of variation of the two halves (24.51 and 19.53) showed a dispersion of data similar to the other internal antecedents. It seems that respondents held similar perceptions regarding autonomy.

6.3.2.3 Rewards

Theoretically speaking, enterprises that reward their employees' entrepreneurial efforts are expected to exhibit higher levels of EI. The mean score of the respondents on this dimension was above average: 77%. The reward dimension was measured by 5 items which showed a reliable Cronbach alpha coefficient of 0.88 (refer Table 5.8), which exceeds 0.80, seen as indicative of a highly reliable construct (Sekaran, 1992). The coefficient of variation (23.12) showed a dispersion of data similar to that of the other internal antecedents, and this was indicative of the convergence of respondents' perceptions.

6.3.2.4 Time availability

The literature review suggested that enterprises should support the CE initiatives by not only making resources available, but also allowing employees time to develop new ideas. At 3M, for example, employees are allowed to devote 15% of their time to the development of new ideas which are not part of their typical job description (Fry, 1987). The original 6 items in the CEAI instrument were reduced to 5 items, due to the redundancy of some questions. The mean score of the respondents on this item was 55%, which is low relative to the other dimensions. The Cronbach alpha coefficient of the construct was 0.70 in the pilot study, but only 0.43 in the survey, which is below the 0.50 recommended for exploratory research by Nunnally (1978) (refer Table 5.8). Most respondents who participated in the first survey generally experienced time pressures as a fact of business life and felt that these items were repetitive and unnecessary. These reasons may have had an impact on their responses. However, since the literature supports time availability as an important antecedent of CE, the construct was retained for analysis. The coefficient of variation (24.51) showed a dispersion of data similar to that of the other internal antecedents, which suggests that respondents view time availability in a comparable way.

6.3.2.5 Flexible organisational boundaries

The organisational structure and boundaries in an enterprise need to be supportive of entrepreneurship. Too rigid operating procedures and narrow job descriptions may inhibit creativity and CE. The mean score was a low 38% for this factor. Some of the items used to measure this construct asked about the level of uncertainty in respondents' jobs. The seniority of respondents in this survey required them to know exactly what their responsibilities and performance targets should be; and thus these respondents who participated in the first survey found these questions inappropriate. The Cronbach alpha coefficient of the 5 items was an acceptable 0.69, above the 0.50 threshold (see Table 5.8). The original 6 items were reduced to 5 items because of perceived repetition of items. The coefficient of variation (44.78) showed a very wide dispersion of the data around the mean, which indicates that respondents had divergent views regarding flexible organisational boundaries.

The five variables collectively represent the internal antecedents measured in this study. The following section discusses the external antecedents.

6.3.3 INDEPENDENT VARIABLES: EXTERNAL ANTECEDENTS

During *Stage one* of the research study (see Section 3.3.8), it was decided to measure external antecedents by using the constructs dynamism, hostility and heterogeneity, as described in Chapter 3. However, as discussed in Section 5.6.1.1(c), the items used to measure these constructs were inappropriate and low Cronbach alpha coefficients were obtained despite the adaptations and additions which were made to items after the first pilot study during *Stage one*.

In *Stage two* the measurement instrument used to measure external antecedents in the South African context was significantly revised and tested with a *second pilot study* before it was administered to the sample. The Cronbach alpha coefficients obtained in *Stage two* were acceptable and the subsequent statistical analyses provided more insight.

In this section, the results are presented by analysing the descriptive statistics of *Stage one* and the results of *Stage two* thereafter.

6.3.3.1 Stage one

Figure 6.7 illustrates the relative scores of the different variables. For example, it appeared as if respondents in the first survey did not perceive their environments as highly dynamic or hostile.

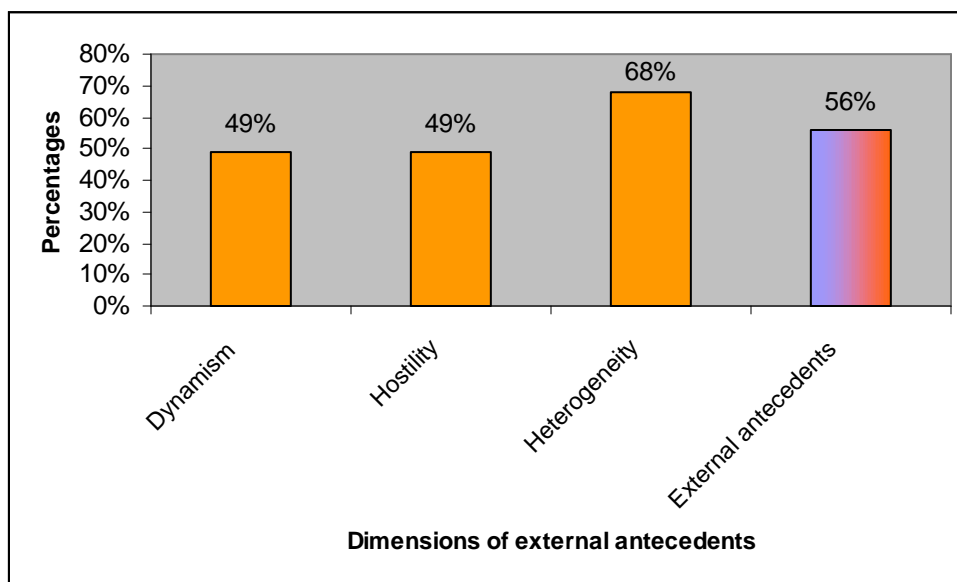


Figure 6.7: An illustration of the mean scores for the external antecedents to CE, measured in Stage one

The descriptive statistics for the external antecedents are shown in Table 6.3. All respondents answered these questions (n = 315). The means, standard deviations and coefficients of variation are shown in Table 6.3 and discussed in the subsequent section.

Table 6.3

A summary of the descriptive statistics for the external antecedents to CE, measured in *Stage one*

Dimension	N	Mean	Average Percentage	Standard Deviation	Coefficient of Variation
Dynamism	315	13.35	49%	4.67	34.98
Hostility	315	26.37	49%	6.45	24.46
Heterogeneity	315	18.46	68%	5.18	28.06
External Antecedents	315	15.00	56%	2.71	18.07

n = 315

The external antecedents perceived by respondents scored an average of 56%, with an unacceptable Cronbach alpha coefficient value of 0.16 (see Table 5.9). This Cronbach alpha coefficient suggested that the items used to measure the external antecedents showed poor internal consistency. It appears that the items measured different aspects of the external environment, which did not belong together. The coefficient of variation showed a narrow dispersion to the mean regarding the overall external antecedent construct. Dynamism, hostility and heterogeneity represented the external antecedents.

a) *Dynamism*

Theoretically speaking, dynamic environments (uncertain, changing constantly) compel enterprises to act entrepreneurially, thus leading to higher levels of EI. The mean score of this dimension was 49%, which is low compared with the mean scores obtained for other constructs, such as degree and frequency of entrepreneurship and the internal antecedents. Dynamism was measured by 3 items, which obtained an unacceptably low Cronbach alpha coefficient of 0.36 (refer Table 5.9) which is below the 0.50 threshold (Nunnally, 1978). The coefficient does not increase when any of the items are deleted.

The three items used to measure dynamism in the e-business industry are shown in Table 6.4 below (also see Appendix 2).

Table 6.4

A summary of the items measuring dynamism in *Stage one*

Number	Extreme of scale on one end		Extreme of scale on other end
28(1)	Our customers tend to look for new products and services all the time.	vs.	Our customers are happy with the products and services we offer them.
29(1)	The technology in our industry is changing rapidly.	vs.	Technological developments in our industry are rather minor.
30(1)	It is nearly impossible to forecast future scenarios and events	vs.	It is relatively simple to construct accurate future scenarios and events.

Respondents were requested to indicate to what extent their industry reflected the above conditions. From the responses obtained it appeared that even though these items may have reflected the dynamism of the industry, each item focused on a separate aspect thereof. Therefore, the items did not group together or focus on a single dimension. This may explain the low Cronbach alpha coefficient for this construct. The coefficient of variation (34.95) also showed the widest dispersion of data of all the antecedent constructs measured.

b) Hostility

Hostile environmental conditions are characterised by changes that are unfavourable and create threats to a firm's mission. Several American authors have empirically shown that hostile environments compel enterprises to act entrepreneurially, thus leading to higher EI levels (Zahra, 1993; Zahra & Bogner, 1999). The mean score for hostility was 49%. An unacceptable Cronbach alpha coefficient of 0.37 was obtained for the 6 items which were used as indicators of hostility (see Table 5.9). The coefficient did not increase when any of the items were deleted, again suggesting that the indicators did not measure one single construct.

The items used to measure hostility are shown in Table 6.5 below (also see Appendix 2).

Table 6.5

A summary of the items measuring hostility in *Stage one*

Number	Extreme of scale on one end		Extreme of scale on other end
31(1)	Competition in our industry is cut throat.	vs.	Our competitors react relatively slowly.
32(1)	Demand and consumer tastes are unpredictable.	vs.	Demand and consumer tastes are predictable.
<i>Major strategic challenges in our industry that may influence the direction of the company are:</i>			
33(1)	Declining markets for products / services	vs.	Growing markets for our products / services
34(1)	Price competition	vs.	Competition in our industry does not take place on price
35(1)	Government regulation is intensifying (more rules, regulations e.g. BEE, EE)	vs.	Very little government interference takes place in our industry
<i>The survival of our company:</i>			
36(1)	Is threatened by the business environment	vs.	Is hardly influenced by the business environment

Respondents were asked to indicate to what extent their industries were characterised by the first two items, and further about the major challenges in their industry. From the responses obtained it appeared that these items were perceived to enquire about four to six different aspects, such as attitude of competitors, predictability of consumer demand, stage of the product life cycle, the basis of competition, the role of government in the industry and finally the survival of the company. Therefore, these questions did not coalesce or focus on one single aspect of hostility, but on various different aspects. This would explain the low Cronbach alpha coefficient for this construct. The coefficient of variation (24.26)

showed that the data were not widely dispersed when compared with the other two external antecedent constructs.

c) Heterogeneity

Heterogeneity refers to the existence of multiple customer segments with varied characteristics and needs which are being served by the firm. Theoretically speaking, the more complex or heterogeneous a firm's market is, the more entrepreneurial it would be. The mean score for heterogeneity was 68%. Since the survey was focused on e-business in JSE and ICT companies, most respondents necessarily operated in a single industry, namely e-business. Furthermore, ICT companies, which constituted 39% of the respondents, operate in one industry, the information and communication technology industry. The Cronbach alpha coefficient for this dimension was 0.45, but if item 37(1) was deleted, it increased to 0.77 (refer Table 5.9). The reason for this could be that items 38(1) and 39(1) both focus on the changes in markets and changes in customer habits within the industry on which this study focused, namely e-business. Table 6.6 shows the items used to measure heterogeneity (also see Appendix 2).

Table 6.6

A summary of the items used to measure heterogeneity in Stage one

Number	Extreme of scale on one end		Extreme of scale on other end
37(1)	We are a highly diversified conglomerate and operate in unrelated industries	vs.	We are a focused firm that operates in a single industry
Respondents needed to indicate their agreement or disagreement with the items below.			
38(1)	Customers' buying habits vary a great deal from one line of our business to the other		
39(1)	Market instability and uncertainty vary a great deal from one line of our business to the other		

As indicated by the average score, most respondents disagreed with the above statements. The coefficient of variation (28.06) showed moderate dispersion of the data, in comparison with the other constructs.

Problem and subsequent course of action

Since the internal consistency of the items measuring the external antecedent constructs was unacceptable, it was decided to improve the items and survey the same sample. One should bear in mind that, as discussed in Section 3.3.7 and Section 5.6.1.1c, entrepreneurship research instruments usually have an American bias. The second survey would thus involve a validation of the scale for the external antecedents with an application to the South African environment.

6.3.3.2 Stage two

During *Stage two* the measurement instrument was revised. It was firstly decided to omit the *heterogeneity* construct, since the study's focus was on the e-business market. Secondly the *hostility* construct was expanded by 5 items dealing with the *unfavourability of change* and 4 items dealing with *competitive rivalry*. Thirdly the *dynamism* construct was reconsidered and revised. It was decided that the construct of dynamism was too limited to reflect the richness of opportunities in the external environment. Therefore, this construct was expanded to *munificence*.

Munificence reflects the richness of opportunities for corporate venturing and renewal in an industry. As a multi-dimensional concept, it embodies dynamism, the abundance of technological opportunities, industry growth and demand for new products in the environment (Zahra, 1993). The adapted scale included 15 items to measure *dynamism*, 3 items to measure *technological opportunities* and 6 items to measure the *demand for new products* in the industry. The items were measured on a 5-point Likert scale, as shown in Appendix 4. The results of *Stage two* are presented in Figure 6.8 and Table 6.7.

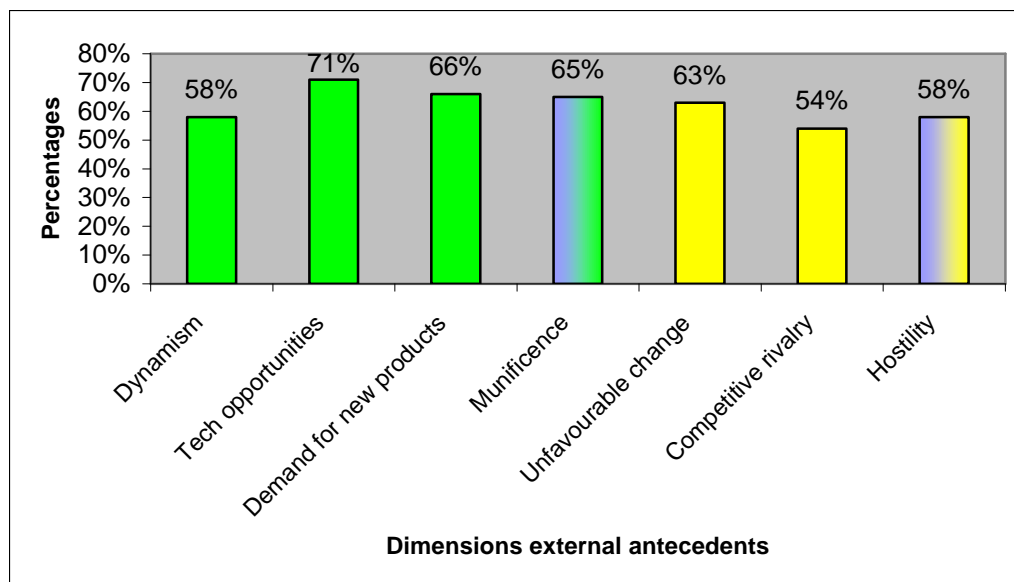


Figure 6.8: An illustration of the mean scores for the external antecedents to CE measured in Stage two

The descriptive statistics for the external antecedents are reflected in Table 6.7. All respondents answered these questions (n = 146). The means, standard deviations and coefficients of variation are shown in Table 6.7 and discussed thereafter.

Table 6.7

A comparison of the means, standard deviations and coefficients of variation for the external antecedents to CE measured in Stage two

Dimension	N	Mean ¹³	Average Percentage	Standard Deviation	Coefficient of Variation
Dynamism	146	2.89	58%	0.79	27.32
Technological opportunities	146	3.55	71%	1.11	31.42
Demand for new products	146	3.31	66%	0.94	28.30
Munificence	146	3.25	65%	0.85	26.25
Unfavourable change	146	3.13	63%	0.91	29.21
Competitive rivalry	146	2.67	54%	1.06	39.34
Hostility	146	2.91	58%	0.84	29.01

¹³ Items were measured on a 5-point Likert scale.

The external antecedents represented by munificence and hostility and perceived by respondents scored an average of 65% and 58% respectively. The Cronbach alpha coefficient for munificence was an acceptable 0.74 and 0.63 for hostility (see Table 5.10). It should be taken into account that the coefficient for hostility was only calculated from two dimensions: unfavourability of change and competitive rivalry. Since Cronbach alpha coefficients require the use of three dimensions, they account for the lower score, despite the high internal consistency of both dimensions (Trochim, 2006). The dimensions are discussed in more detail below.

a) *Munificence*

Munificence reflects the richness of opportunities in the external environment. Respondents' perceptions of opportunities obtained an above average mean score of 62%, which showed that respondents were positive about opportunities in their business environments. The Cronbach alpha coefficient was an acceptable 0.74 (see Table 5.10). Munificence consists of three dimensions, dynamism, technological opportunities and the demand for new products, which are discussed below.

i) *Dynamism*

In theory, uncertain and changing environments compel enterprises to change their strategies and act entrepreneurially, thus leading to higher levels of EI. The mean score of this dimension was 58%, which shows relatively high levels of uncertainty, compared with the mean scores obtained for other constructs such as degree and frequency of entrepreneurship, and the internal antecedents.

Dynamism was measured by 15 items on a 5-point Likert scale. The Cronbach alpha coefficient for dynamism in *Stage two* was 0.87 (see Table 5.10). Since Cronbach alpha coefficient values increase as the number of items increases, split-half reliability analysis was performed for the items (Trochim, 2006). Four coefficients were generated in the analysis: Guttman split-half reliability coefficient: 0.79, Split-half reliability: 0.79, correlation first and second half 0.66 and the Cronbach alpha coefficient of the full-scale: 0.86. The items that measured this component were thus deemed reliable, since a Cronbach alpha

coefficient which exceeds 0.80 serves as an indication of a highly reliable construct (Sekaran, 1992). The coefficient of variation (0.27) showed a wider dispersion of data than the internal antecedents and entrepreneurial intensity constructs, which indicated a wider spread of perceptions of respondents.

ii) Technological opportunities

According to the theory, technological opportunities in the environment compel enterprises to act entrepreneurially, thus leading to higher levels of EI. The mean score of technological opportunities was 71%, which is high compared with the mean scores obtained for other external antecedent constructs such as dynamism, competitive rivalry and unfavourability of change. In other words, respondents perceived many technological opportunities to exist in the external environment. The Cronbach alpha coefficient for technological opportunities was 0.85 (refer to Table 5.10), which indicates a highly reliable measure, against the 0.80 guideline recommended by Sekaran (1992). The coefficient of variation (31.42) showed a wider dispersion of data than other constructs.

iii) Demand for new products

Theoretically speaking, demand for new products in an industry leads to increased consumer demand, which compels enterprises to act entrepreneurially, thus leading to higher levels of EI. The mean score of this dimension was 66%, which is comparable to the mean scores obtained for other external antecedent constructs. The Cronbach alpha coefficient for demand for new products was 0.86, as indicated in Table 5.10. The measure is highly reliable against the 0.80 recommended by Sekaran (1992). The coefficient of variation (28.30) showed a wide dispersion of data compared with other constructs.

b) Hostility

Hostility reflects the perceptions of respondents regarding threats to a company's survival. The mean score of 58% indicates that respondents perceived threats and unfavourable change in the external environment as moderately high. An acceptable Cronbach alpha coefficient of 0.63 was recorded (see Table 5.10). Hostility consists of two dimensions: unfavourability of change and competitive rivalry in an industry, which are discussed below.

i) Unfavourability of change

Theoretically speaking, unfavourability of change in a firm's external environment could compel enterprises to act entrepreneurially by modifying their strategies to minimise the threats in the external environment, thus leading to higher levels of EI. The mean score of this dimension was 63%, which is comparable to the mean scores obtained for other external antecedent constructs and showed that respondents perceived moderately high levels of unfavourable change in the external environment. The Cronbach alpha coefficient for unfavourability of change was 0.82, as shown in Table 5.10. This coefficient value indicates high reliability, against the 0.80 guideline recommended by Sekaran (1992). The coefficient of variation (29.21) showed a wide dispersion of the data in comparison with other constructs.

ii) Competitive Rivalry

Theoretically speaking, competitive rivalry in a firm's external environment will create threats to a company's survival and may compel enterprises to invent innovative ways to differentiate themselves from their competitors. In this way competitive rivalry can compel enterprises to act entrepreneurially, thus leading to higher levels of EI. The mean score of this dimension was 54%, which means that respondents were divided regarding the competitive rivalry they experience. The coefficient of variation (39.34) also showed the widest dispersion of data in comparison with the other external antecedent constructs, which indicates that respondents have divergent views regarding competitive rivalry. The Cronbach alpha coefficient for competitive rivalry was 0.81 (refer to Table 5.10). The competitive rivalry measure meets the 0.80 guideline of Sekaran (1992) for a highly reliable measure.

6.4 CONFIRMATORY FACTOR ANALYSIS

Factor analysis is used for simplification and classification of variables and the detection of structures (underlying dimensions) in a set of variables, as mentioned in Chapter 5 (see Section 5.5.2.2). In this study *confirmatory factor analysis* (CFA) was used to determine construct validity.

Construct validity may be determined by CFA, because it establishes whether the number of factors and the loadings of measured (indicator) variables on them conform to what is expected on the basis of pre-established theory. Three measures provide an indication of the validity of the measurement model. Firstly, high, statistically significant factor loadings indicate that items converge on a common point. A rule of thumb is that standardised loading parameter estimates should be statistically significant ($p < 0.05$) and have a value of 0.5 or higher, but ideally 0.7 or higher. Secondly, CFA results indicate the average percentage of variance extracted among a set of construct items and provide a summary indicator of convergence. A good rule of thumb is that variance extracted of 0.5 or higher suggests adequate convergence (Hair *et al.*, 2006:777). Variance extracted of less than 0.5 indicates that on average, more error remains in the items than variance explained by the latent factor structure imposed on the measure. Finally, reliability is also a good indicator of convergent validity. Although considerable debate continues on what reliability estimates are best, Hair *et al.* (2006:777) recommend reliability estimates of 0.7 or higher as indicators of good reliability. These rules of thumb are summarised in Table 6.8.

Table 6.8

A summary of rules of thumb for determining construct validity in CFA

Indicators	Rule of Thumb
Standardised loading parameter estimates	Should be 0.5 or higher Ideally 0.7 or higher
Variance Extracted (VE)	Should be 0.5 or higher
Construct reliability	Should be 0.7 or higher

Source: Hair *et al.* (2006:779)

In this study the measurement instrument was based on a pre-established theoretical measurement model as shown in Figure 5.3. The measurement instrument was designed to measure innovativeness, proactiveness and risk-taking, which when added together produced a score for degree of entrepreneurship. The cumulative frequency of entrepreneurship was determined by product, service, process or business improvements or changes. Internal antecedents were measured by management support, autonomy, rewards, time availability and organisational boundaries. External antecedents (in *Stage two*) were measured by munificence and hostility. The munificence construct consisted of dynamism, technological opportunities and demand for new products and the hostility dimension included unfavourability of change and competitive rivalry.

A confirmatory factor analysis was conducted on the final 146 completed interviews obtained in *Stage two* to test the homogeneity of underlying constructs. This resulted in the identification of the following primary factors shown in Table 6.9:

- degree of entrepreneurship – 3 factors
- frequency of entrepreneurship – 4 factors
- internal antecedents – 5 factors
- external antecedent: munificence – 3 factors
- external antecedent: hostility – 2 factors

The construct validity of the measurement model was assessed by considering the parameter estimates, p-values, variance extracted and construct reliability scores to the rules of thumb recommended by Hair *et al.* (2006:779) and summarised in Table 6.8. Furthermore fit indices (refer Table 5.6) also provided an indication of the 'goodness of fit' of the measurement model.

Table 6.9

A summary of the confirmatory factor analysis model estimates, variance extracted and construct reliability

Dimensions	Model Estimates			Overall Model	
	Parameter Estimate	Std Error	Prob Level	Variance Extracted	Construct Reliability
Degree of Entrepreneurship				0.37	0.79
Degree of Entrepreneurship - Innovativeness	0.59	0.10	0.00		
Degree of Entrepreneurship - Risk-taking	0.62	0.10	0.00		
Degree of Entrepreneurship – Proactiveness	0.61	0.10	0.00		
Frequency of Entrepreneurship				0.48	0.79
Frequency of Entrepreneurship – Product	0.61	0.08	0.00		
Frequency of Entrepreneurship – Service	0.83	0.06	0.00		
Frequency of Entrepreneurship – Process	0.73	0.06	0.00		
Frequency of Entrepreneurship – Business	0.58	0.08	0.00		
Internal Antecedents				0.37	0.72
Internal Antecedents - Management Support	0.75	0.06	0.00		
Internal Antecedents – Autonomy	0.72	0.06	0.00		
Internal Antecedents – Rewards	0.76	0.06	0.00		
Internal Antecedents - Time Availability	0.28	0.09	0.00		
Internal Antecedents - Organisational Boundaries	0.31	0.09	0.00		
External Antecedents: Munificence				0.71	0.89
Munificence – Dynamism	0.87	0.03	0.00		
Munificence – Technological Opportunities	0.85	0.03	0.00		
Munificence – Demand for New Products	0.81	0.04	0.00		
External Antecedents: Hostility				0.57	0.80
Hostility – Unfavourability of Change	0.94	0.06	0.00		
Hostility - Competitive Rivalry	0.49	0.07	0.00		

6.4.1 ENTREPRENEURIAL INTENSITY

6.4.1.1 Degree of entrepreneurship

The model estimates of the confirmatory factor analysis (CFA) provided evidence of supporting the measurement of CE theory. The standardised loading parameter estimates for innovativeness, risk-taking and proactiveness were 0.59, 0.62 and 0.61 respectively. The parameter estimates of all three indicators were statistically significant ($p < 0.01$). The parameter estimates exceed the factor loading parameter threshold of 0.5 recommended by Hair *et al.* (2006:779) as shown in Table 6.8.

A summary indicator of convergence shows that 37% of the variance of degree of entrepreneurship is explained by innovativeness, risk-taking and proactiveness. The variance extracted (0.37) is lower than the recommended threshold of 0.50 (Hair *et al.*, 2006:777). This level of variance indicates that on average, a higher residual value remains in the terms of innovativeness, proactiveness and risk-taking than variance explained by the latent factor structure imposed on degree of entrepreneurship. This level of measurement needs to be refined in future studies. The construct reliability of the three items is 0.70 and meets the recommended threshold of 0.70 (Hair *et al.*, 2006). In conclusion, degree of entrepreneurship showed acceptable convergent validity, since it met two of the three threshold norms, but the items measuring degree of entrepreneurship should be improved to increase the variance extracted score.

6.4.1.2 Frequency of entrepreneurship

The confirmatory factor analysis (CFA) of product, service, process and business innovation frequency provided a summary of the parameter estimates, variance extracted and reliability. Product, service, process and business innovation frequency showed acceptable standardised loading parameter estimates of 0.61, 0.83, 0.73 and 0.58 respectively, all above the recommended threshold of 0.5 (Hair *et al.*, 2006:777). The items' parameter estimates loadings of the four factors for frequency of entrepreneurship were statistically significant ($p < 0.01$). The variance extracted, 0.48, is just below the threshold of 0.50 (Hair *et al.*, 2006:777). This was an indication that a

residual value remains in the items that should explain the variance in frequency of entrepreneurship.

As shown in Table 6.9, the construct reliability of 0.79 was higher than the value of 0.7 recommended by Hair *et al.* (2006:778) and supported the internal consistency (Cronbach alpha coefficient) results discussed in Section 5.6.1.1a. Frequency of entrepreneurship showed acceptable convergent validity, measured against the norms recommended in Table 6.8.

6.4.2 INTERNAL ANTECEDENTS

As can be seen from Table 6.9, management support, autonomy and rewards achieved high and significant ($p < 0.01$) parameter estimate loadings on the internal antecedent construct, with parameter values of 0.75, 0.72 and 0.76 respectively. Hair *et al.*, (2006:777) state that standardised parameter estimates of 0.70 are ideal. However, time availability and organisational boundaries achieved poor parameter estimate loadings of 0.28 and 0.31 respectively. The variance extracted was 0.37, which means that more residual value remains in the internal antecedent items than variance explained by the latent factor structure for this construct. The reason for this may be the poor factor loadings of time availability and organisational boundaries. The construct reliability of the 0.72 for the internal antecedents was acceptable and met the 0.70 threshold recommended by Hair *et al.* (2006:778) for construct reliability.

6.4.3 EXTERNAL ANTECEDENTS: MUNIFICENCE

The CFA results summarised in Table 6.9 indicate that the parameter estimate loadings of dynamism, technological opportunities and demand for new products were 0.87, 0.85 and 0.81 respectively. The parameter estimates of these items were all statistically significant ($p < 0.01$) and exceed the “ideal” threshold of 0.70 (Hair *et al.*, 2006:777). The variance extracted for munificence was 0.71 and indicates that the items explain 71.2% of the variance in munificence. The variance extracted exceeds the recommended guideline of 0.5 (Hair *et al.*, 2006). The items measuring munificence also showed good construct reliability, with a score of 0.88, exceeding the recommended threshold of 0.70 Hair *et al.* (2006:778). Thus the munificence construct showed good convergent

reliability, since it exceeded the threshold norms for factor loadings, variance extracted and construct reliability.

6.4.4 EXTERNAL ANTECEDENTS: HOSTILITY

The parameter estimate loading for unfavourability of change was 0.94 ($p < 0.01$) and for competitive rivalry was 0.49. Both factor loadings were statistically significant ($p < 0.01$). The parameter estimate of unfavourability of change exceeds the “ideal” threshold of 0.70, but competitive rivalry was just below the threshold 0.50 (Hair *et al.*, 2006:777). The variance extracted for hostility was 0.57, above the threshold of 0.50. Good construct reliability (0.80) results were obtained, in comparison with the recommended threshold of 0.70 (Hair *et al.*, 2006:778). Overall, in comparison with the thresholds, hostility shows convergent validity.

In addition to the parameter estimates, level of significance, variance extracted and construct reliability; indices of fit also need to be considered for the measurement model.

6.4.5 INDICES OF FIT FOR THE CONSTRUCTED MEASUREMENT MODEL

Multiple fit indices are used to assess model fit, as discussed in 5.5.2.2a, (see Table 5.6). Table 6.10 summarises six fit indices for EI, the internal and external antecedents to CE, and recommended threshold values.

The six fit indices reported in Table 6.10 are Joreskog GFI (goodness-of fit index), NFI (normed fit index), NNFI (non-normed fit index), CFI (comparative fit index), adjusted population gamma fit index, and RMSEA (root-mean-square error of approximation). NFI, NNFI, and CFI are not sensitive to sample size (Bentler, 1990). Indices close to 0.90 or higher indicate good model fit. For RMSEA, values less than 0.10 indicate good model fit (Hair *et al.*, 2006), as discussed in 5.5.2.2a.

Table 6.10

A summary of the multiple fit indices of EI, internal and external antecedents to CE and recommended thresholds for the overall CFA model

Single Fit Indices	EI Overall Model	Internal	External	Recommended
		Antecedents Overall Model	Antecedents Overall Model	Thresholds (Hair <i>et al.</i> , 2006)
Joreskog GFI	0.93	0.96	0.96	Higher than 0.95
NFI	0.84	0.92	0.95	Higher than 0.90
NNFI	0.84	0.91	0.90	Higher than 0.90
CFI	0.90	0.95	0.96	Higher than 0.90
Adjusted Population Gamma Index	0.93	0.93	0.93	Higher than 0.95
RMSEA	0.09	0.11	0.11	Lower than 0.10

Examining the multiple fit indices for entrepreneurial intensity and the internal and external antecedents against the recommended thresholds shown in Table 6.10, the model showed moderate to good fit.

Entrepreneurial intensity was just below the Joreskog GFI threshold (threshold 0.95) and the NNI and NNFI (threshold 0.90) and over the threshold of CFI. The RMSEA value of EI was 0.09, below the threshold of 0.10. These fit indices indicate moderate to good fit, since they met most of the recommended threshold values. Internal antecedents showed better fit, with most values above the recommended thresholds (Joreskog GFI = 0.96, NFI = 0.92, NNFI, = 0.91 and CFI = 0.95). The adjusted population gamma index was below, but close to the threshold of 0.95, but slightly above the RMSEA threshold of 0.10 with a value of 0.11. For the external antecedents the model also showed moderately good fit with most values above the recommended thresholds (Joreskog GFI = 0.96, NFI = 0.95, NNFI, = 0.90 and CFI = 0.96). The adjusted population gamma index was below, but close to the threshold of 0.95, while the RMSEA indicated a value of 0.11, above the recommended threshold of 0.10 of Hair *et al.* (2006:746-747).

The confirmatory factor analysis indicated moderately good fit and support was found for convergent validity, but items measuring degree of entrepreneurship and the internal antecedents could be improved with regard to the variance explained by these latent

variables in the overall construct. The four hypotheses formulated in Section 5.2 will be assessed and discussed in the subsequent sections.

6.5 THE INFLUENCE OF SAMPLE CHARACTERISTICS ON ENTREPRENEURIAL INTENSITY AND THE ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP

In this section the focus is on determining whether certain company characteristics influence EI and its dimensions; and ascertaining the nature and strength of the relationship between degree and frequency of entrepreneurship; and the relationships between the internal and external antecedents and EI.

Correlations analysis provided indications of the nature and strength of the relationships between certain variables. One-way analysis of variance (ANOVA) was used to determine the observed differences in the EI means of the sample group (JSE or ICT companies), as discussed in Section 5.5.1.2. In addition the Mann Whitney *U*-test was also used to determine whether there were significant differences between the means of the EI, internal and external antecedent constructs of JSE and ICT companies, as discussed in Section 5.5.1.3. Furthermore the Kruskal-Wallis one-way analysis of variance by ranks test was used to assess whether the EI and internal antecedent medians differed significantly for the different age groupings of companies, if their ages were ranked from younger than three years to older than fifty years, as discussed in Section 5.5.1.2.

Overall, the nature and strength of the relationships between the independent variables company characteristics (such as the group, size and age of companies) and the following dependent variables were assessed:

- Entrepreneurial intensity (i.e. frequency and degree of entrepreneurship)
- Internal antecedents
- External antecedents

6.5.1 THE INFLUENCE OF SAMPLE GROUP ON ENTREPRENEURIAL INTENSITY AND ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP

The sample groups compared in this section are JSE and ICT companies. In Table 6.11 the mean scores of each group and the associated 95% confidence intervals, F-statistic, and probability values are shown. There was a significant difference ($p < 0.05$) between JSE and ICT companies with regard to their entrepreneurial intensity scores. The mean score for the JSE companies was 11.10 (10.73 lower limit - 11.47 upper limit; 95% confidence level). However, the ICT companies as a group achieved a higher score, with a mean score of 11.68 (11.26 lower limit - 12.11 upper limit; 95% confidence level).

Table 6.11

A comparison of the means, 95% confidence intervals, F-statistic and p-values of JSE and ICT companies with regard to EI and the internal and external antecedents to CE

Sample groups compared	n	Score (mean)	95%-confidence intervals	Difference F-statistic	P-value
JSE EI	230	11.10	10.73 - 11.47	F = 4.13	0.043*
ICT EI	230	11.68	11.26 - 12.11		
JSE EI vs. ICT EI	230				
JSE Frequency	230	5.71	5.48 - 5.94	F = 0.02	0.88
ICT Frequency	230	5.73	5.47 - 6.00		
JSE vs. ICT Frequency	230				
JSE Degree	315	5.35	5.17 – 5.53	F = 11.88	0.001**
ICT Degree	315	5.87	5.64 – 6.10		
JSE vs. ICT – Degree	315				
JSE Internal Antecedents	315	6.08	5.95- 6.22	F = 5.58	0.019*
ICT Internal Antecedents	315	6.34	6.17 – 6.52		
JSE vs. ICT – Internal Antecedents	315				
JSE Munificence	146	3.08	2.91 – 3.25	F = 10.316	0.002*
ICT Munificence	146	3.53	3.31 – 3.76		
JSE vs. ICT Munificence	146				
JSE Hostility	146	2.85	2.67 – 3.02	F = 1.34	0.24
ICT Hostility	146	3.01	2.79 – 3.24		
JSE vs. ICT Hostility	146				

*Significant $p < 0.05$

**Significant $p < 0.01$

There was no significant difference ($p = 0.88$, thus $p > 0.05$) between JSE and ICT companies with regard to the frequency of entrepreneurship. The mean score of JSE companies on the frequency dimension was 5.71 (5.48 lower limit - 5.94 upper limit; 95% confidence level) while the ICT mean score was 5.73 (5.47 lower limit - 6.00 upper limit; 95% confidence level).

The significant difference between the two sample groups was clear when the degree of entrepreneurship was examined. A significant difference was revealed between JSE and ICT companies ($p < 0.01$) with regard to the degree of entrepreneurship. JSE companies, as a group, achieved a score of 5.35 (lower limit 5.17 - upper limit is 5.53; 95% confidence level), while ICT companies achieved a higher score of 5.87 (lower limit 5.64 - upper limit is 6.10; 95% confidence level), as may be seen in the two dimensional box-plot in Figure 6.9¹⁴.

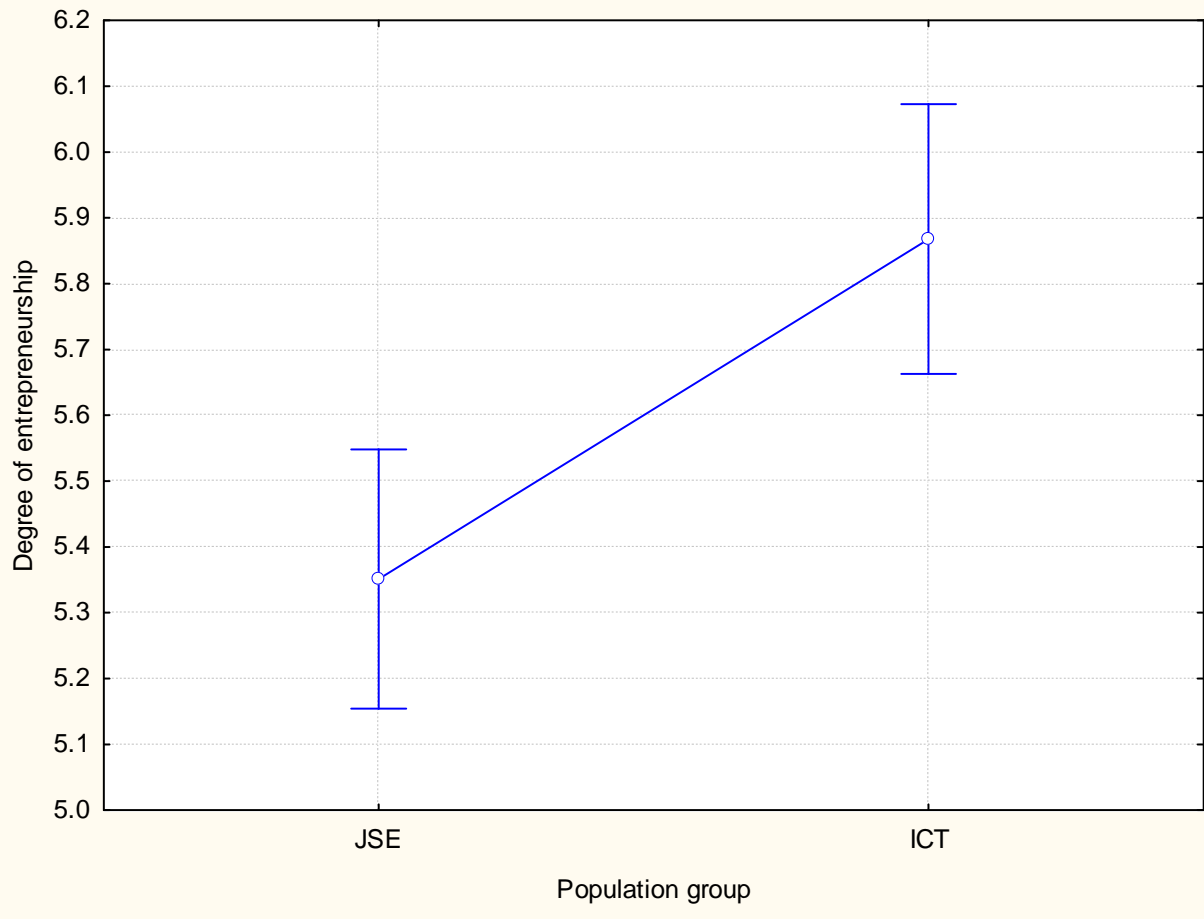


Figure 6.9: A box-plot representing a comparison of degree of entrepreneurship between JSE and ICT companies

¹⁴ A two dimensional box-plot provides a visual representation of the significant differences in the means of JSE and ICT companies with regard to degree of entrepreneurship. The 95% confidence intervals, which are represented by the vertical bars, do not overlap; this therefore indicates significant differences between the means of the two groups.

As would be expected from the degree of entrepreneurship, there are significant differences between JSE and ICT companies with regard to the internal antecedents for CE. JSE companies achieved a mean score of 6.08 (lower limit 5.95 - upper limit 6.21; 95% confidence level), while ICT companies achieved a higher mean score of 6.35 (lower limit 6.18 - upper limit 6.52 – 95% confidence level).

Table 6.11 also indicates that there were differences between the two groups when external antecedents were examined. Significant differences existed between JSE and ICT companies with regard to munificence; that is, dynamism, technological opportunities and demand for new products. JSE companies achieved a mean score of 3.08 (lower limit 2.91, upper limit 3.25, 95% confidence level), while the ICT companies achieved a higher mean score of 3.53 (lower limit 3.31, upper limit 3.76, 95% confidence level). These differences are shown in Figure 6.10 below.

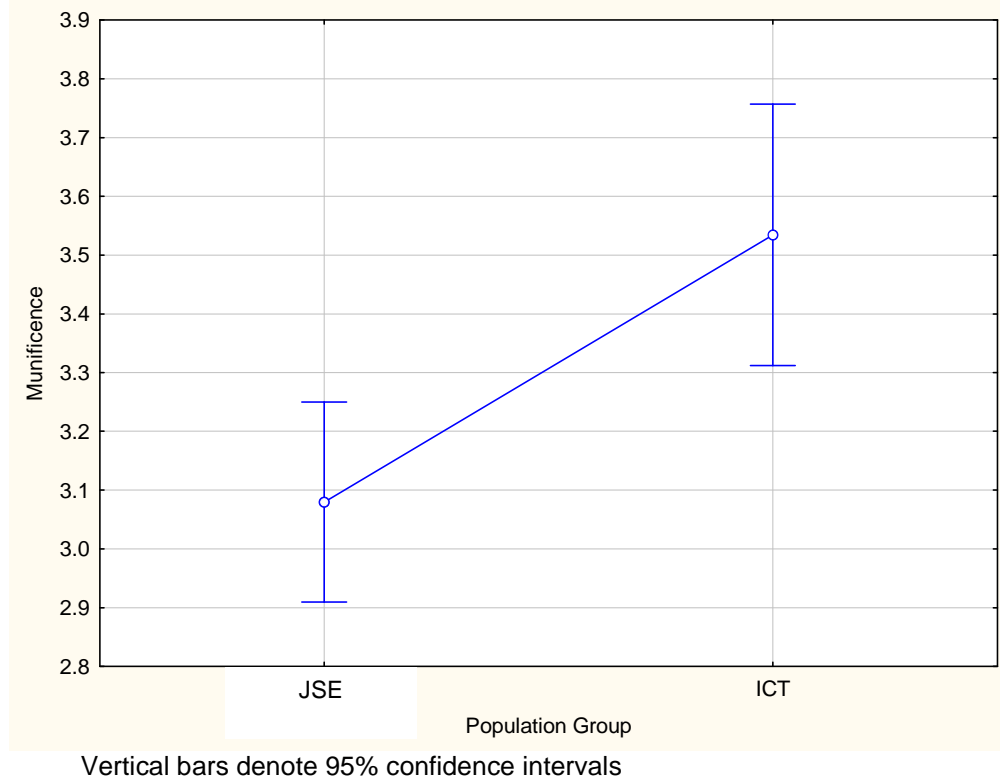


Figure 6.10: A box plot representing a comparison of munificence between JSE and ICT companies

No significant difference is apparent between JSE and ICT companies ($p = 0.20$, and $p > 0.05$) with regard to hostility. JSE companies achieved a mean score of 2.85 for hostility (2.67 lower limit – 3.02 upper limit; 95% confidence level), while ICT achieved a mean score of 3.01 (2.79 lower limit – 3.24 upper limit; 95% confidence level). It seems that both groups perceived the environment as having similar levels of unfavourable change and competitive rivalry.

6.5.2 THE INFLUENCE OF COMPANY SIZE ON ENTREPRENEURIAL INTENSITY AND THE ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP

Company size was determined by the number of full-time employees. Spearman correlation coefficients were calculated to determine whether relationships existed between company size and EI and the antecedents to CE. Spearman correlations are suitable for ordinal data and do not require the assumption of normality. No significant correlation was found between company size (see Table 6.12) and EI or its dimensions: frequency and degree of entrepreneurship; the internal antecedents; or munificence. This finding is supported by Goosen (2002), who also found that company size did not have an influence on the entrepreneurship levels within South African manufacturing companies. In the case of the external antecedent hostility, a very weak but significant correlation was found between hostility and company size ($p < 0.05$). Although the correlation is very weak ($\rho = 0.16$) (Saunders *et al.*, 1997:321), and the literature does not support a relationship between company size and hostility, the finding is noted.

Table 6.12

A summary of the correlation analysis of company size compared with EI and the internal and external antecedents to CE

Company size compared	n	Spearman Correlation (ρ)	P-value
Company size vs. EI	239	0.08	0.26
Company size vs. Frequency	230	0.09	0.19
Company size vs. Degree	315	-0.01	0.82
Company size vs. Internal Antecedents	315	-0.03	0.63
Company size vs. Munificence	146	0.11	0.20
Company size vs. Hostility	146	0.16	0.05

* Significant $p < 0.05$

** Significant $p < 0.01$

6.5.3 THE INFLUENCE OF COMPANY AGE ON ENTREPRENEURIAL INTENSITY AND THE ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP

Company age was measured by the number of years the company had been in existence. Spearman correlation coefficients were calculated to determine whether relationships could be determined between company age and EI and the antecedents to CE. The use of Spearman correlations is possible since the data collected were ordinal data and no assumptions of normality are needed.

When looking at the relationship between company age, EI and the antecedents to CE, the following observations could be made. As shown in Table 6.13, company age showed no correlation with the external antecedents munificence and hostility, while company age showed a weak negative correlation with EI, which was significant at the 10% significance level. The negative correlation between company age and frequency was not significant. However, company age and degree of entrepreneurship showed a negative correlation that is highly significant at 99%-confidence level. Furthermore a negative correlation also existed between company age and internal antecedents at the 95% significance level.

Table 6.13
A summary of the correlation analysis of company age compared with EI and the internal and external antecedents to CE

Company age compared	n	Spearman Correlation (ρ)	P-value
Company age vs. EI	230	-0.13	0.07
Company age vs. Frequency	230	-0.03	0.64
Company age vs. Degree	315	-0.20	0.00**
Company age vs. Internal Antecedents	315	-0.12	0.03*
Company age vs. Munificence	146	-0.05	0.59
Company age vs. Hostility	146	0	0.95

* Significant $p < 0.05$

** Significant $p < 0.01$

Since significant differences existed with regard to degree of entrepreneurship and the internal antecedents, the next question that arose was whether there were significant differences between the various age categories with regard to the dependent and independent variables.

Table 6.14 indicates the various age categories, the mean scores obtained relative to EI, frequency, degree of entrepreneurship and the internal antecedents.

Table 6.14

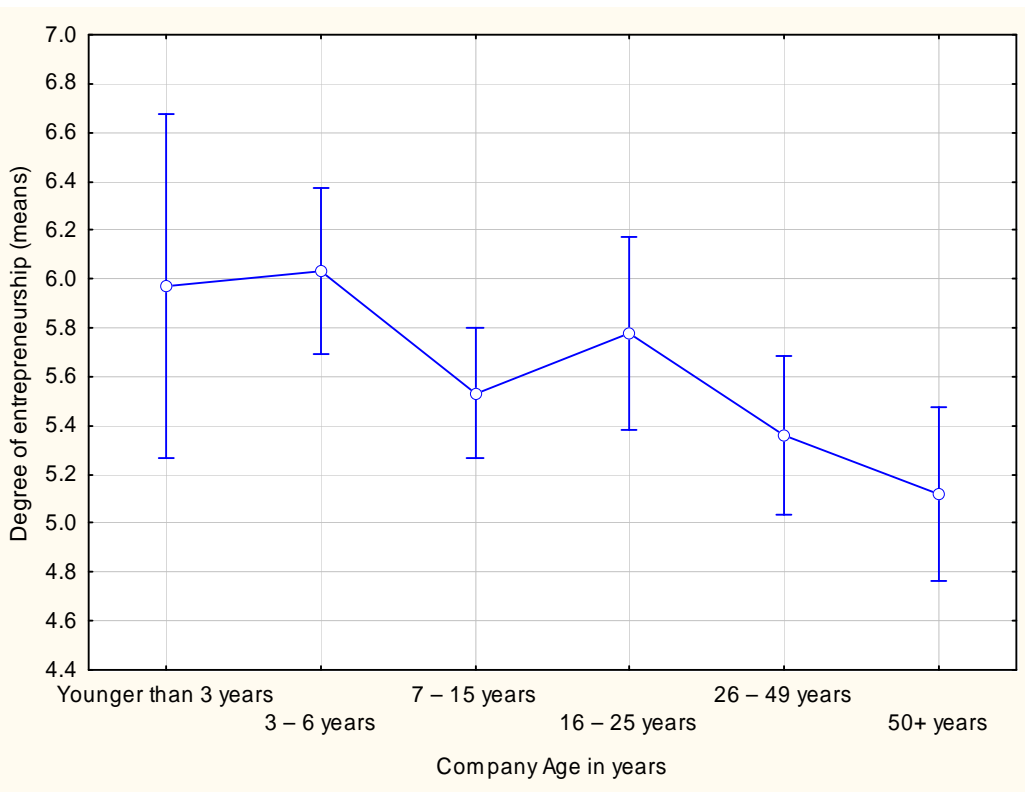
A summary of the company age categories compared with EI and the internal antecedents to CE

Age	n	EI	Frequency	Degree	Internal Antecedents
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
N		230	230	315	315
F-statistic		1.03	0.36	3.19	1.66
P-Value		0.40	0.88	0.01*	0.15
Kruskal-Wallis					0.04*

* Significant $p < 0.05$

** Significant $p < 0.01$

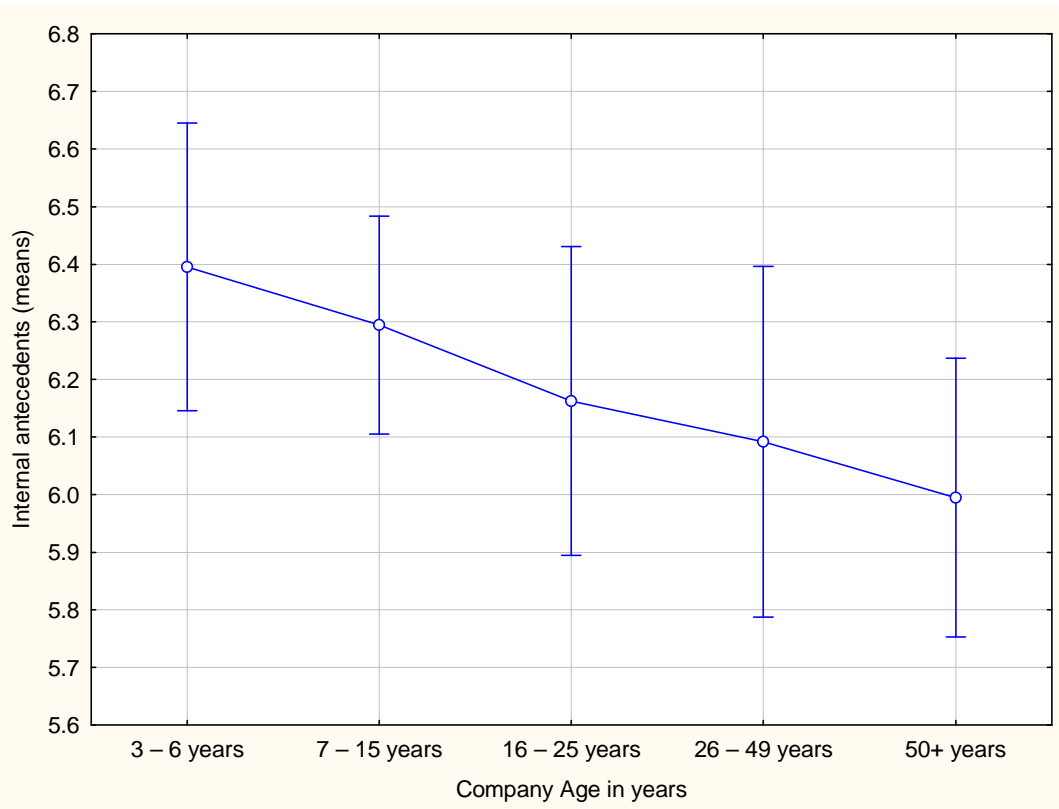
As can be seen in Table 6.14, no significant differences could be detected between the various age categories with regard to EI and frequency. However, there were significant differences between the various age categories when the degree of entrepreneurship was analysed ($p < 0.05$). Figure 6.11 shows the various age categories and the declining trend of *degree of entrepreneurship* as companies grow older. Therefore, it seems that as companies grow older, their ability to function entrepreneurially declines.



Vertical bars denote 95% confidence intervals

Figure 6.11: A graphic representation of the means of company age categories in relation to the degree of entrepreneurship

When company age categories were compared with the *internal antecedents*, the probability value indicated that the differences in the age groupings were not significant. The Kruskal-Wallis one-way analysis of variance by ranks (Kruskal-Wallis test) was used to determine the observed differences of ordinal data between six ranked independent samples. Since the Kruskal-Wallis test does not assume a normal population (non-parametric) and allows for the testing of equality of population means among the ranked means of groups, it was suitable for this type of analysis (McLaughlin, 1999). The Kruskal-Wallis test indicated that there were significant differences at the 95% confidence level ($Kruskal-Wallis < 0.05$) between company age and the internal antecedents. The fact that only seven companies among the respondents were younger than three years may have distorted the findings. Therefore, another analysis was performed excluding these seven companies. The result is shown in Figure 6.12.



Vertical bars denote 95% confidence intervals

Figure 6.12: A graphic representation of the means of company age categories older than three years, compared with the internal antecedents

Even though this graph still showed that the internal antecedent differences between the age groupings of companies were not significant at the 95% confidence level ($p = 0.16$), a clear declining trend is discernible. In other words, as companies increase in age the internal antecedents in companies seem to become less supportive for CE.

Hypothesis one, concerning the influence of company characteristics (sample group^a, i.e. JSE or ICT, size^b and age^c) on the level of EI in a company, can be assessed on the basis of the preceding statistical analysis. As discussed in Section 5.2, the null hypothesis (H_{01}) asserts that company characteristics (sample group^a, i.e. JSE or ICT, size^b and age^c) do not influence the level of entrepreneurial intensity (EI) prevalent in a company. The alternative hypothesis (H_{A1}) is, therefore, that company characteristics (sample group^a, i.e. JSE or ICT, size^b and age^c) influence the level of EI prevalent in a

company. The level of significance for this study is 5%, as discussed in Section 5.5.2. In terms of the sample group ($H_{0_{1a}}$) the observed mean values for JSE and ICT are not equal ($p < 0.05$, refer Table 6.11) and, therefore, the null hypothesis is not supported. As shown in Section 6.5.1, ICT companies showed significantly higher levels of EI than JSE companies. One reason for the difference between ICT and JSE companies may be that both groups 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 adapting quickly to changing market conditions. A second reason may be that there are different EI norms for different industries, as argued by Morris and Kuratko (2002).

Concerning the null hypothesis $H_{0_{1b}}$ relating to company size, the implication is that there is no significant relationship between company size and EI. In Table 6.12 the correlation coefficient ($r = 0.08$) between company size and EI is not significant ($p = 0.26$) and there is insufficient reason to reject the hypothesis of no relationship between company size and EI at the 5% level of significance. Thus company size does not influence EI in the context of this study.

A negative correlation ($r = -0.13$) exists between company age and EI, but it is not statistically significant at the 5% significance level ($p = 0.07$) as shown in Table 6.13. Therefore there is not enough reason to reject the null hypothesis, which suggests that there is no relationship between company age and EI.

6.6 NATURE OF THE RELATIONSHIP BETWEEN FREQUENCY AND DEGREE OF ENTREPRENEURSHIP

Different combinations of degree and frequency of entrepreneurship are possible, as discussed in Chapter 4 (see Figure 4.1 and sections 4.2 to 4.4). When discussing the entrepreneurial grid (Figure 4.1, Section 4.4) Morris and Kuratko (2002) pointed out that companies could exhibit a low degree of entrepreneurship scores while simultaneously exhibiting high frequency scores. Similarly companies could exhibit high degrees of entrepreneurship scores while simultaneously exhibiting low frequency scores. In fact five sample positions (low frequency, low degree; high frequency, low degree; mid-frequency, mid-degree; low frequency, high degree; and high frequency, high degree)

are shown on the entrepreneurial grid (Figure 4.1). Figure 6.13 shows the relationship between degree of entrepreneurship and frequency. The data from the study showed that a weak positive relationship existed between the frequency and degree of entrepreneurship at the 99% confidence level ($r=0.375$; $p<0.01$). Saunders *et al.* (1997:321) remark that a correlation of $+0.3$ indicates a weak positive correlation and $+0.7$ a strong positive correlation. The correlation coefficient of 0.375 does not indicate a strong relationship and the respondents illustrated in Figure 6.13 do not cluster in close proximity to the trend line. However, these findings suggest that the more frequently companies act entrepreneurially, the higher their level of degree of entrepreneurship is likely to be.

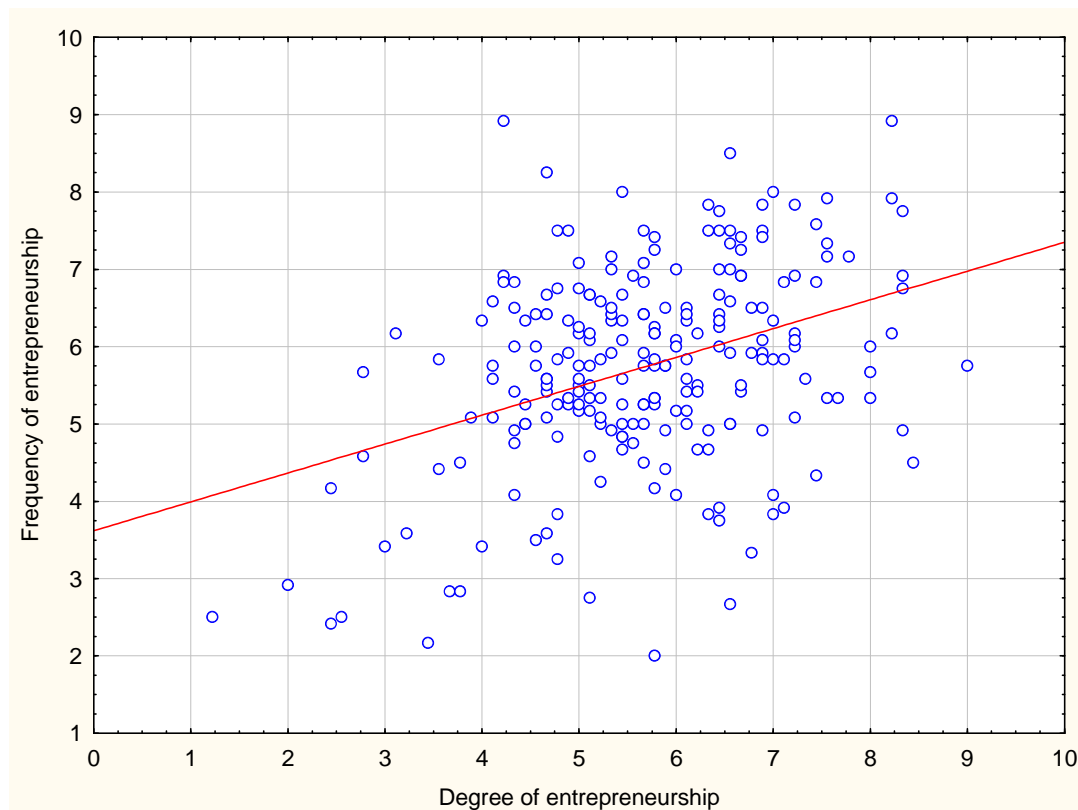


Figure 6.13: A scatter plot representing the nature and strength of the relationship between frequency and degree of entrepreneurship

Based on the correlation analysis and scatterplot shown in Figure 6.13, hypothesis two can be assessed. Null hypothesis two (H_{O2}) contends that no relationship exists between frequency and degree of entrepreneurship. The alternative hypothesis (H_{A2}) is, therefore, that a relationship exists between frequency and degree of entrepreneurship.

As indicated in Figure 6.13, there is a weak, positive, statistically significant relationship between frequency and degree of entrepreneurship at the 1% significance level ($\rho = 0.375$; $p < 0.01$). Based on this finding the null hypothesis is not supported. The trend line between frequency and degree of entrepreneurship suggests only three “sample positions” on the entrepreneurial grid (see Figure 4.1): periodic/incremental; dynamic; and revolutionary, filled by companies in the sample. By implication, the number of times an enterprise acts entrepreneurially is related to the degree of risk-taking, innovativeness and proactiveness.

This finding is supported by the CE literature. Morris and Kuratko (2002) argue that a company cannot simply produce a highly entrepreneurial product each time, but it also needs to experiment, in other words increase the frequency of entrepreneurship. The works of Zahra (1993), Covin and Slevin (1991), and Kreiser *et al.* (2002) are consistent with the argument of 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. Thus firms that produce a single entrepreneurial business, such as a single invention over a long period of time, are not considered particularly entrepreneurial. Rather, a continued effort to develop new products, services, markets, processes and so forth is indicative of a highly entrepreneurial enterprise.

The influence of the internal and external antecedents on EI will be assessed by correlation analyses in the following section.

6.7 THE INFLUENCE OF INTERNAL ANTECEDENTS ON ENTREPRENEURIAL INTENSITY

Theoretically speaking, the various internal antecedents – management support, autonomy, rewards, time availability and organisational boundaries – should exert a strong effect on EI and its dimensions. These relationships were examined by means of correlation analysis.

The results of the correlation analyses are shown in Table 6.15. A summary of Spearman correlation coefficients (ρ) and p-values of the separate dimensions of the internal antecedents and the antecedents overall are shown with EI, frequency and degree of entrepreneurship.

Overall, the internal antecedents showed statistically significant correlations with EI ($\rho = 0.35$), frequency ($\rho = 0.28$), and degree of entrepreneurship ($\rho = 0.25$). The dimension of the internal antecedents that showed the strongest statistically significant correlations with EI, frequency and degree of entrepreneurship was management support for CE ($p < 0.01$). The Spearman correlation coefficients were 0.43, 0.32 and 0.38 for EI, frequency and degree of entrepreneurship, respectively.

Autonomy of employees and rewards for CE also showed statistically significant correlations with EI, frequency and degree of entrepreneurship ($p < 0.01$). Organisational boundaries showed a weak, but statistically significant relationship with frequency of entrepreneurship ($p < 0.01$).

Table 6.15

A summary of the Spearman correlation coefficients (r) and p-values, comparing the dimensions of the internal antecedents with EI, frequency and degree of entrepreneurship

Dimensions of Internal Antecedents	n	Spearman Correlation (ρ)	P-value
Internal Antecedents vs. EI	230	0.35	0.00**
Management Support vs. EI	230	0.43	0.00**
Autonomy vs. EI	230	0.31	0.00**
Rewards vs. EI	230	0.31	0.00**
Time Availability vs. EI	230	0.01	0.84
Organisational Boundaries vs. EI	230	0.10	0.10
Internal Antecedents vs. Frequency	230	0.28	0.00**
Management Support vs. Frequency	230	0.32	0.00**
Autonomy vs. Frequency	230	0.22	0.00**
Rewards vs. Frequency	230	0.25	0.00**
Time Availability vs. Frequency	230	0.01	0.91
Organisational Boundaries vs. Frequency	230	- 0.18	0.01*
Internal Antecedents vs. Degree	315	0.25	0.00**
Management Support vs. Degree	315	0.38	0.00**
Autonomy vs. Degree	315	0.27	0.00**
Rewards vs. Degree	315	0.27	0.00**
Time Availability vs. Degree	315	0.05	0.37
Organisational Boundaries vs. Degree	315	0.02	0.68

* Significant $p < 0.05$

** Significant $p < 0.01$

The statistically significant correlations of the internal antecedents with EI are supported in the literature (Hornsby *et al.*, 1993; 1999; 2002; Goosen, 2002; Zahra & Covin, 1995). The findings indicate that certain managerial practices support entrepreneurial behaviour, such as management support for CE, autonomy and rewards for CE. The two other internal antecedents – time availability and organisational boundaries – do not lead to higher levels of EI or degree of entrepreneurship, but organisational boundaries show a weak, but negative relationship with frequency of entrepreneurship. The correlation

coefficient is very weak (-0.18), according to Saunders *et al.* (1997:321). Saunders *et al.* (1997:321) recommend that the strength of the coefficient should be interpreted together with the level of significance, and thus very little could be inferred from such a weak correlation.

The influence of the external antecedents on EI is assessed by means of correlation analysis in the next section.

6.8 THE INFLUENCE OF EXTERNAL ANTECEDENTS ON ENTREPRENEURIAL INTENSITY

In theory the external antecedents, namely munificence and hostility, influence levels of EI and its dimensions, frequency and degree of entrepreneurship. In munificent (opportunity-rich) environments, EI is expected to increase. In hostile, threatening environments, it is expected that enterprises would formulate creative responses to overcome threats, and thus EI should increase. These relationships were examined by means of correlation analyses.

The results of the correlation analyses are shown in Table 6.16. A summary of the Spearman correlation coefficients (ρ) and p-values of munificence and dynamism overall and their separate dimensions' correlations are shown with EI, frequency and degree of entrepreneurship.

As may be seen from Table 6.16 overall, munificent environments showed statistically significant correlations at the 1% significance level with EI ($\rho = 0.32$), frequency ($\rho = 0.27$), and degree of entrepreneurship ($\rho = 0.23$). The dynamism dimension of munificence showed the strongest statistically significant correlations with EI, frequency and degree of entrepreneurship ($p < 0.01$). The Spearman correlation coefficients were 0.38, 0.35 and 0.23 for EI, frequency and degree of entrepreneurship, respectively. The implication of this finding is that uncertain, opportunity-rich environments show the strongest relationship with EI and its dimensions.

Table 6.16

A summary of the correlation analysis of the external antecedents compared with EI, frequency and degree of entrepreneurship

External Antecedents and Dimensions compared	Spearman Correlation (ρ)	P-value
Munificence vs. EI	0.32	0.00**
Dynamism vs. EI	0.38	0.00**
Technological Opportunities vs. EI	0.25	0.01*
Demand for New Products vs. EI	0.26	0.01*
Munificence vs. Frequency	0.27	0.01*
Dynamism vs. Frequency	0.35	0.00**
Technological Opportunities vs. Frequency	0.15	0.12
Demand for New Products vs. Frequency	0.17	0.08
Munificence vs. Degree	0.23	0.00**
Dynamism vs. Degree	0.23	0.01*
Technological Opportunities vs. Degree	0.24	0.00**
Demand for New Products vs. Degree	0.21	0.01*
Hostility vs. EI	0.16	0.09
Unfavourability of Change vs. EI	0.31	0.00**
Competitive Rivalry vs. EI	0.01	0.88
Hostility vs. Frequency	0.14	0.14
Unfavourability of Change vs. Frequency	0.28	0.01*
Competitive Rivalry vs. Frequency	-0.03	0.76
Hostility vs. Degree	0.14	0.10
Unfavourability of Change vs. Degree	0.19	0.02*
Competitive Rivalry vs. Degree	0.05	0.57

* Significant $p < 0.05$; ** Significant $p < 0.01$; $n = 146$

Furthermore, the correlation coefficients, as summarised in Table 6.16, indicate that technological opportunities and demand for new products show statistically significant relationships with EI and the degree of entrepreneurship ($p < 0.05$). Technological developments and market opportunities enable innovative, risk-taking and proactive behaviours in enterprises. Technological developments create new possibilities and

solutions which were not available before. Linked to these technology “push” factors is market demand, which acts as a “pull” force. Collectively these forces stimulate the degree of entrepreneurship and in turn EI.

When considering the relationship between hostility and entrepreneurial intensity, the following observations could be made. The correlation coefficients in Table 6.16 indicate that hostility, consisting of unfavourability of change and competitive rivalry, shows no correlation with EI or its dimensions, frequency and degree of entrepreneurship. However, unfavourability of change shows a statistically significant relationship with EI ($\rho = 0.31$), frequency ($\rho = 0.28$) and degree of entrepreneurship ($\rho = 0.19$) at the 5% significance level. Competitive rivalry shows no correlation with EI and its dimensions. These findings are similar to the findings of Antoncic and Hisrich (2001). These authors also experienced a problem with the measurement of competitive rivalry (using the CE-scale of Zahra, 1993) in Slovenia, which was not cross-culturally comparable. They formulated two possible explanations for this finding. Firstly, they argued that the scale may be outdated because of the increased importance of global competition, and secondly they argued that the items in the scale for competitive rivalry may simply be a country-specific scale because of differences of importance of domestic versus international competition in different countries. They remarked that Slovenia had a small domestic market and an industrial structure with few domestic competitors, whereas the pressure from foreign competitors was strong. In the United States, where the scale was developed, both foreign and domestic competitors were important. Miller (1993:710) also found differences in competitive uncertainties between different countries. These findings seem to indicate that the nature of competition is different in different countries.

6.9 BEST SUBSET REGRESSION ANALYSES

The various antecedents and their influences on EI were examined in sections 6.5 to 6.8, but from a managerial perspective the question arises: which internal and external antecedents are the strongest predictors of EI? To answer this question, best subset multiple regressions were conducted in which the antecedents to EI, degree and frequency of entrepreneurship were analysed.

6.9.1 ANTECEDENTS WHICH HAVE THE STRONGEST INFLUENCE ON ENTREPRENEURIAL INTENSITY

The best subset multiple regression analysis conducted to determine the best predictors of the antecedents for EI is shown in Table 6.17.

Table 6.17

A summary of the best subset regression analysis conducted to determine the most relevant internal and external antecedents of EI

	Beta	Std.Err. of Beta	B	Std.Err. of B	t (101)	P-level
Intercept / Constant			6.18	1.17	5.28	0.00
Munificence	0.32	0.09	0.04	0.01	3.54	0.00
Management Support	0.24	0.12	0.02	0.01	2.04	0.04
Autonomy	0.23	0.11	0.04	0.02	2.09	0.04
Rewards	-0.18	0.12	-0.05	0.04	-1.48	0.14
Hostility	Excluded					
Time Availability	Excluded					
Organisational Boundaries	Excluded					

F-test (4,101) = 7.42, p = 0.00, Standard error of the estimate = 1.70

R² = 0.23 Adjusted R² = 0.20

The regression analysis summarised in Table 6.17 indicates that munificence, management support and autonomy are statistically significant contributors to the variance in EI at the 95% confidence level. The constant value is significant ($t = 5.28$; $p < 0.00$) and not equal to zero, thus munificence, management support and autonomy collectively are the most significant predictors of EI ($p < 0.05$). When examining the t -statistics for munificence ($t = 3.54$), management support for CE ($t = 2.04$), and autonomy ($t = 2.09$), these values exceed the critical value of the t -distribution at the 95% confidence level of $t = 1.96$ (Hatcher, 1994:393; refer discussion Section 5.5.2.1).

The antecedents that show the strongest statistically significant relationship with EI are munificence, management support for CE and autonomy.

The coefficient of determination (R^2) indicates that munificence, management support for CE and autonomy explain 22.7% of the variance in EI (adjusted $R^2 = 0.20$). As discussed in sections 6.7 and 6.8, the present study is exploratory and is an attempt to quantify the antecedents of CE and examine their influence on EI. The role of the individual intrapreneur, the CE team, managerial level and other entrepreneurial process factors also influence EI.

These findings suggest that environmental factors such as uncertain, changing, opportunity-rich environments provide the biggest incentive for companies to act in an entrepreneurial manner. Should positive economic conditions change; companies need to put more effort into developing their entrepreneurial capabilities. From a managerial point of view it is preferable that management should create an environment conducive to entrepreneurial behaviour by providing support for CE and giving employees autonomy to solve problems in entrepreneurial ways.

6.9.2 STRONGEST ANTECEDENT INFLUENCE ON DEGREE OF ENTREPRENEURSHIP

The best subset multiple regression analysis conducted for the antecedents and degree of entrepreneurship indicates that munificence ($\beta=0.16$; $p<0.05$) and management support for CE ($\beta=0.32$; $p<0.01$) showed the strongest statistically significant relationship with degree of entrepreneurship at the 95% confidence level. The constant value is significant ($t = 4.86$; $p<0.00$) and not equal to zero, and thus munificence and management support for CE are the most significant predictors of the degree of entrepreneurship ($p<0.05$). The t -statistics for munificence ($t = 2.08$) and management support for CE ($t = 3.54$) exceed the critical value of the t -distribution at the 95% confidence level of $t = 1.96$ (Hatcher, 1994:323). Therefore, the antecedents which show the strongest statistically significant relationship with the degree of entrepreneurship are munificence and management support for CE. The coefficient of determination (R^2) indicates that munificence and management support for CE explain 19,5% of the variance in degree of entrepreneurship (adjusted $R^2 = 0.17$).

The implications are similar to those for EI, in that munificent environments provide the biggest incentive for companies to act in entrepreneurial ways. However, the risk is that changes in the environment that are beyond the control of the enterprise could adversely influence the degree of entrepreneurship. The findings also confirm that management support for CE facilitates CE behaviours in enterprises. Since these antecedents only explain 19.5% of the variance in degree, there are many other factors, such as the entrepreneurial process followed in companies, which also influence this dimension.

6.9.3 STRONGEST ANTECEDENT INFLUENCE ON FREQUENCY OF ENTREPRENEURSHIP

The best subset regression analysis conducted for the antecedents of CE and frequency of entrepreneurship indicate that munificence showed the strongest statistical significant relationship with frequency at the 99% confidence level. The constant value is significant ($t=3.15$; $p<0.01$) and not equal to zero, and supports the finding stated above. The t -statistic for munificence ($t = 2.79$) exceeds the critical value of the t -distribution at the 95% confidence level of $t = 1.96$ (Hatcher, 1994:323). However, the coefficient of determination (R^2) indicates that munificence only explains 13% of the variance in frequency of entrepreneurship (adjusted $R^2 = 0.09$). Thus there are many other factors that also influence frequency of entrepreneurship and still need to be researched.

6.10 STRUCTURAL EQUATION MODELLING

The final objective of this study was to determine the relationships between various constructs, namely internal and external antecedents to CE and EI. Figure 5.3 illustrates a conceptual model (path diagram) that was constructed of the predetermined factors (according to CE theory) that could influence EI. In this section the conceptual model is assessed.

The hypothesised model in Figure 5.3 was tested by structural equation modelling using Statistica 7.1 (StatSoft, 2007), LISREL and PLS. The complexity of the model and small sample size made it necessary for the researcher to make certain decisions based on previous statistical analyses, to retain only the relevant constructs. The hypothesised

model shown in Figure 5.3 could not be tested, since complete data were only available for 106 cases (only 106 respondents were active on all four frequency dimensions).

Based on the CE literature and empirical findings, it was decided to construct a model only for degree of entrepreneurship. As discussed in Chapter 4, the CE literature strongly supports the notion of an 'entrepreneurial orientation,' which consists of innovativeness, risk-taking and proactiveness, in other words degree of entrepreneurship. Furthermore, the empirical analyses show that the antecedents have more significant relationships with degree of entrepreneurship, as opposed to frequency of entrepreneurship. Data for 146 cases were available to construct the SEM. Figure 6.14 shows the conceptual model constructed for the degree of entrepreneurship.

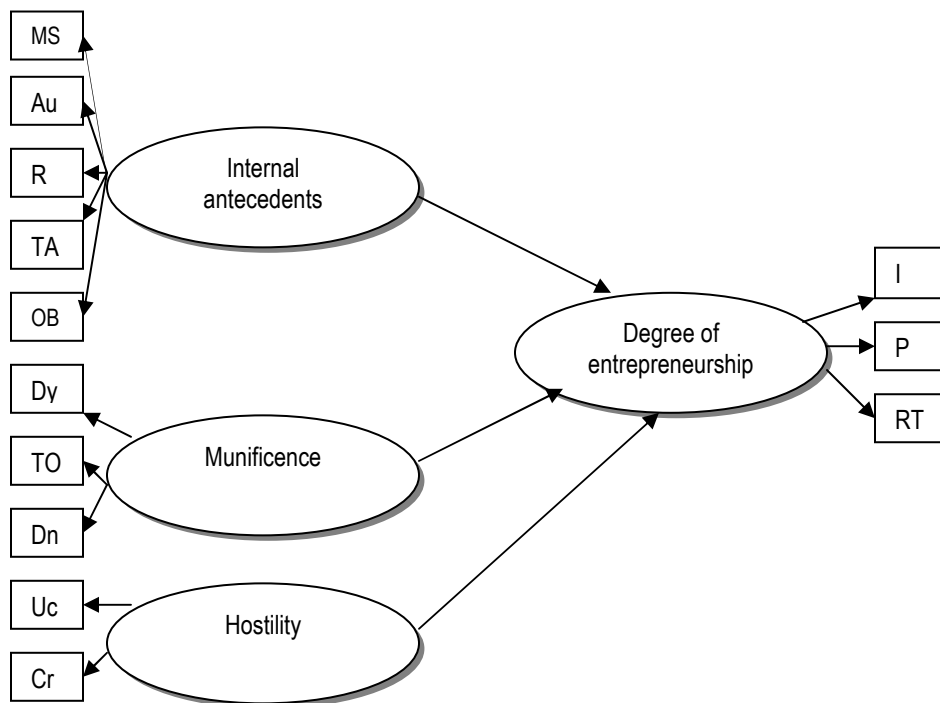


Figure 6.14: An illustration of the theoretical model of relationships between degree of entrepreneurship and its antecedents

Figure 6.14 shows the influence of the internal antecedents and two external antecedents (munificence and hostility) as exogenous constructs on the endogenous construct, degree of entrepreneurship. The internal antecedents are measured by management support for CE (MS); autonomy of employees (Au); rewards for CE (R);

time availability (TA); and organisational boundaries (OB). Munificence is measured by dynamism (Dy); technological opportunities (TO), and demand for new products (Dn). Only two indicators measure hostility: unfavourable change (Uc) and competitive rivalry (Cr). These three exogenous constructs influence the endogenous variable degree of entrepreneurship, measured by innovativeness (I), proactiveness (P), and risk-taking (RT).

The model shown in Figure 6.14 was tested, using Statistica 7.1 (Statsoft, 2007), LISREL and PLS. The proposed SEM model's fit indices indicated a weak fit. One possible explanation for the weak fit achieved could perhaps be incorrect model specification. Measures which indicated low parameter estimates were time availability and organisational boundaries for the internal antecedent construct. Hostility as a construct showed low path scores.

It was decided to modify the theoretical model, by omitting the measures which did not contribute significantly to a construct, for example time availability and organisational boundaries, which were eliminated as measures of internal antecedents. Other studies have also shown that these two measures are sometimes problematic (Adonisi, 2003). Furthermore, the hostility construct was also omitted in the next round of model-estimation, since earlier analyses revealed ambiguous results with this construct. The subsequent model generated is shown in Figure 6.15.

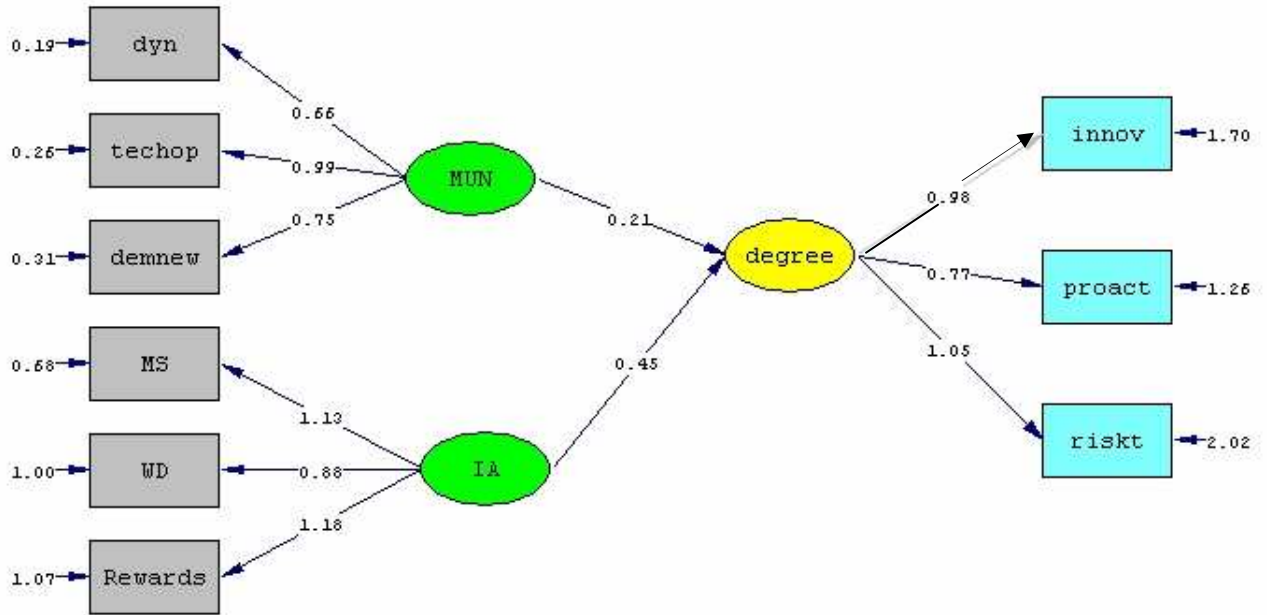


Figure 6.15: A representation of the modified SEM for degree of entrepreneurship and the internal and munificence antecedents

In Figure 6.15 (constructed in LISREL with unstandardised values) it is shown that management support (MS), work discretion or autonomy (WD) and rewards contribute significantly to measuring the internal antecedents (IA), since the paths from these variables exceed the 0.70 threshold (Hair *et al.*, 2006). Munificence (MUN) is measured by dynamism (dyn), technological opportunities (techop) and the demand for new products (demnew). The paths from technological opportunities (0.99) and demand for new products exceed the threshold of 0.70, while dynamism is just below the 0.70 threshold (Hair *et al.*, 2006). Degree of entrepreneurship is measured by innovativeness (innov), proactiveness (proact), and risk-taking (riskt), whose paths also exceed the 0.70 threshold recommended by Hair *et al.*, (2006:747). The internal antecedents construct has a higher influence (0.45) on the degree of entrepreneurship than the munificence construct (0.21). This finding suggests that that the degree of entrepreneurship is a construct that could be managed and improved by focusing on the internal antecedents of management support for CE, rewards for CE and allowing employees to have work discretion and to function autonomously.

Table 6.18 provides a summary of the non-standardised and standardised parameter estimates and *t*-values for the various paths in the SEM of the model shown in Figure 6.15. obtained in the LISREL (2007) program.

The measures on the degree of entrepreneurship (innovativeness, risk-taking and proactiveness) indicated significant parameter estimates, with *t*-statistics exceeding the critical value of 1.96 (Hatcher, 1994 :323). Hair *et al.* (2006 :777) state that ideal parameter estimates should be 0.70 and above, but the measures of degree of entrepreneurship standardised parameter estimates are under the 0.70 threshold level.

The internal antecedents measures showed significant parameter estimates, with *t*-statistics exceeding the critical value of 1.96 (Hatcher, 1994 :323), with standardised parameter estimate values for management support, autonomy and rewards for CE being 0.81, 0.66 and 0.75 respectively. The internal antecedent measures are close to the threshold of 0.70; even though autonomy is just below the threshold (0.66), it is still statistically significant, with a *t*-value of 8.02, exceeding the critical value of 1.96 (Hatcher, 1994 :323). Thus the results are indicative of a suitable measurement model, since it is close to the threshold criteria.

Munificence measures achieved high significant standardised parameter estimates of above 0.80, compared with the 0.70 threshold recommended by Hair *et al.* (2006 :777), with *t*-statistics exceeding the critical value of 1.96 (Hatcher, 1994 :323). The standardised parameter estimate values of dynamism, technological opportunities and demand for new products were 0.84, 0.89 and 0.80 respectively. This is indicative of a suitable measurement model underlying the munificence construct.

The paths towards the degree of entrepreneurship confirm that internal antecedents (0.45) have a more significant influence on the endogenous variable degree of entrepreneurship than munificence (0.21).

Table 6.18

A summary of the dimensions and model estimates of the structural equation model for the influence of the internal antecedents and munificence on degree of entrepreneurship

Dimensions	Model Estimates			
	Unstandardised Parameter Estimates	Standardised Parameter Estimates	Std error	t-statistic
Degree of Entrepreneurship				
Degree of Entrepreneurship – Innovativeness*	0.98	0.60		
Degree of Entrepreneurship - Risk-taking	0.77	0.57	0.18	4.20
Degree of Entrepreneurship – Proactiveness	1.05	0.59	0.25	4.25
Internal Antecedents				
Internal Antecedents - Management Support	1.13	0.81	0.11	10.07
Internal Antecedents – Autonomy	0.88	0.66	0.11	8.02
Internal Antecedents – Rewards	1.18	0.75	0.13	9.29
External Antecedents: Munificence				
Munificence – Dynamism	0.66	0.84	0.06	11.77
Munificence – Technological Opportunities	0.99	0.89	0.08	12.88
Munificence – Demand for New Products	0.75	0.80	0.07	11.15
Antecedents - Degree of Entrepreneurship				
Internal Antecedents – Degree of Entrepreneurship	0.45	0.45	0.075	3.38
Munificence – Degree of Entrepreneurship	0.20	0.21	0.12	1.78

* *For technical reasons, neither LISREL nor STATISTICA 7.1 calculates the standard error or t-statistic for innovativeness*

The multiple fit indices of the SEM for degree of entrepreneurship influenced by the internal antecedents to CE and munificence, compared with recommended guidelines, are shown in Table 6.19. Because some of the fit indices evaluate different aspects of fit,

it is important to evaluate fit based on multiple fit statistics, so that judgments will not be an artefact of analytical choice (Grimm & Yarhold, 2000).

Table 6.19

A summary of multiple fit indices for the SEM model and recommended guidelines for the fit indices

Single Fit Indices	Overall Model	Recommended Guideline Hair <i>et al.</i> (2006:747)
Joreskog GFI	0.96	0.95
NFI	0.94	0.90
NNFI	0.99	0.90
CFI	0.99	0.90
Adjusted Population Gamma Index	0.99	0.95
RMSEA	0.03	Below 0.05 - 0.10

Examining the multiple fit indices in Table 6.19, the modified SEM model showed good fit. The overall model achieved a value of 0.96 for the Joreskog GFI, which meets the threshold of 0.90. The values for NFI, NNFI and CFI were 0.94, 0.99 and 0.99 respectively. These values exceed the recommended threshold of 0.90. The Adjusted Population Gamma Index was 0.99, which exceeds the recommended threshold for this fit index of 0.95. Finally, the RMSEA value of the overall model was 0.03, which is below the recommended threshold value of being below 0.05 to 0.10 (Hair *et al.*, 2006:747). To summarise, all the fit indices indicated exceed the recommended guidelines for good fit and, therefore, it could be concluded that the model reflects good measurement and statistical fit.

The previous statistical analysis aids in assessing hypotheses three and four as stated in Section 5.2. Hypothesis three (Ho₃) states that a relationship exists between the following internal antecedents: management support for CE^a, rewards^b, resource and time availability^c, autonomy^d and loose organisational boundaries^e; and EI. In Section 6.7 the correlation analysis summarised in Table 6.15 indicates that management support for CE, autonomy and rewards show statistically significant relationships with EI ($p < 0.05$) respectively. Therefore the hypothesis of no relationship (Ho_{3a}, Ho_{3b}, and Ho_{3d})

is not supported at the 5% significance level. The best subset regression analysis indicated that management support for CE and autonomy are higher than the critical value. The SEM indicated that management support for CE, rewards and autonomy as internal antecedents show a significant relationship with degree of entrepreneurship.

The correlation coefficients for the relationship between time availability and organisational boundaries were not statistically significant ($p > 0.05$). Therefore, based on the correlations analyses the null hypotheses for time availability (H_{03c}) and organisational boundaries (H_{03e}) can not be rejected at the 5% significance level. The best subsets regression analysis and SEM results also showed that time availability and organisational boundaries did not show significant relationships with EI or degree of entrepreneurship. It appears that management support for CE, rewards and autonomy are the significant contributors to internal antecedents for CE.

Hypothesis four (H_{04}) can now be assessed; it states that a relationship exists between the external antecedents: munificent^a (dynamic, technological opportunities and demand for new products) and hostile environments^b (unfavourable change and competitive rivalry) and EI.

In Section 6.8 the correlation coefficient of munificence indicates a statistically significant relationship with EI ($\rho = 0.32$; $p < 0.01$). The null hypothesis (H_{04a}) of no relationship between munificence and EI was not supported. The best subset regression analysis also showed munificence as a significant predictor of EI ($t = 3.536$; $p < 0.01$). These findings were supported by the SEM results. The dimensions of munificence: dynamism, technological opportunities and the demand for new products also showed positive statistically significant correlations with EI. The implication of this finding is that uncertain, opportunity-rich environments should lead to higher levels of entrepreneurship. Technological opportunities and the demand for new products should also lead to higher levels of entrepreneurship, since technological developments and market demand act as “push” and “pull” factors for EI.

Regarding hostility (H_{04b}) and EI, the different dimensions of hostility reflect different influences on EI. Unfavourability of change shows a statistically significant relationship with EI ($\rho = 0.31$ and $p < 0.01$), but competitive rivalry shows no correlation with EI (ρ

=0.01). Overall, hostility reveals a weak correlation with EI ($\rho = 0.16$) at the 10% significance level ($p = 0.09$). However, the norm for significance is 5% for hypothesis testing in this study and, therefore, there is insufficient reason to reject the null hypothesis (H_{04b}). The different influences of unfavourability of change and competitive rivalry are similar to the findings of Antoncic and Hisrich (2001). They argued that the competitive rivalry scale was a country-specific scale and developed for the United States (US). The nature of competition in South Africa differs from that in the US with regard to domestic competitors and foreign competitors.

6.12 SUMMARY

This chapter dealt with the findings of the research study. The profile of the sample indicated that a ratio of 60:40 JSE to ICT companies participated in the study. More than half of the respondents (above 52%) employed more than 200 employees. More than a third of the respondents indicated that their companies were between 7 and 15 years old, while 45% of companies were older than 15 years.

Descriptive analysis was used to describe the data by comparing and discussing the mean scores, standard deviations and coefficients of variation for the constructs: EI and the antecedents to CE.

Confirmatory factor analysis was used to determine whether the number of factors and factor loadings of measured variables conformed to what would be expected on the basis of CE theory. The constructs – degree and frequency of entrepreneurship, internal antecedents to CE and external antecedents to CE – all showed acceptable construct reliability, but the variance extracted for degree and frequency of entrepreneurship and for the internal antecedents were below the threshold of 0.50. This indicates that the items representing these constructs could be improved.

The findings in Section 6.5 revealed significant differences between JSE and ICT companies with regard to EI, degree of entrepreneurship, internal antecedents to CE and munificence. In general, ICT companies were more entrepreneurial than JSE companies. The internal antecedents in ICT companies were more supportive of CE activities and ICT companies perceived the environment as more munificent than did

JSE companies. Correlation analysis indicated that there was no relationship between company size and EI, but it seemed that companies became less entrepreneurial and their internal environment less supportive of entrepreneurial behaviour as they became more established.

The relationship between frequency and degree of entrepreneurship was assessed in Section 6.6. The relationship between the two variables indicated a weak, positive, but statistically significant relationship at the 99% confidence level. The findings seem to indicate that should companies act entrepreneurially more frequently, their degree of entrepreneurship should also increase.

The relationship of the internal and external antecedents to EI was assessed by correlation analysis. The most salient internal antecedents which influence EI are management support for CE, rewards for CE and the autonomy of employees. Best subset regression analysis was used to determine the most important antecedents as predictors of EI (see Section 6.9). The analysis showed that munificence, management support for CE and autonomy as a group are the most significant predictors of EI and account for 22.7% of the variance in EI.

Finally a structural equation model was defined to assess the relationships between the internal antecedents to CE (management support, rewards and autonomy) and munificence with the degree of entrepreneurship. The model showed significant parameter estimates and acceptable fit indices, compared with recommended guidelines. The implication of the SEM model is that the degree of entrepreneurship can be managed through management of the internal antecedents to CE (management support, rewards and autonomy).

In the next chapter, the process, methodology of the present study and main findings are summarised, conclusions drawn and recommendations made based on the research findings.

CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

Over the past thirteen years numerous economic and political reforms in South Africa have created a turbulent and rapidly changing environment for South African business executives. Corporate entrepreneurship (CE) literature suggests that hostile and multi-faceted environments serve as stimuli for enterprises to act in entrepreneurial ways in order to capitalise on new opportunities and to create value. However, the management of innovation and CE is complex, challenging and difficult to implement. Limited research has thus far been conducted on the influence of external and internal antecedents on levels of CE within organisations. Therefore, as explained in Chapter 1, the purpose of this study was to address the research gap in the CE field in South Africa by determining how antecedents to CE influence the entrepreneurial intensity of firms active in e-business operating in South Africa.

In this chapter, a synopsis of the study is provided, the findings are summarised and conclusions are drawn. The focus then shifts to the recommendations and opportunities for further research. The chapter concludes with an overview of the contribution of the study, being the assessment of CE-theories in the South African context.

7.2 OBJECTIVES OF THE STUDY

The main objective of the study was to address the research gap in the CE field, by answering the research question: ***How do the antecedents to corporate entrepreneurship influence the entrepreneurial intensity of firms active in e-business operating in South Africa?***

By means of the literature review and empirical study, the study aimed to:

- ascertain whether certain company characteristics (group, size, age) influence EI

- determine the nature of the relationship between degree and frequency of entrepreneurship, which in turn determines EI
- establish how internal antecedents to CE influence EI
- determine how external antecedents to CE influence EI
- determine the relationships between various constructs, namely internal and external antecedents to CE and EI.

When the study commenced, limited previous research had been conducted in South Africa, and no previous doctoral study focused on the external antecedents or entrepreneurial intensity of firms operating in South Africa. The planned contribution of this study was to provide managers with a clearer perspective on how entrepreneurial behaviour in companies could be managed and how it is influenced by the external environment.

7.3 THEORETICAL OVERVIEW

A literature review was conducted to construct a theoretical model of the internal and external antecedents to CE. Subsequently, hypotheses were formulated to assess how these antecedents would influence EI.

It was established that despite the importance and growth of CE as a research field, CE is an emerging field of academic inquiry. Thus Chapter 2 analysed several research paradigms, and discussed the paradigm which served as the foundation for this study. CE was defined as **a multi-dimensional process through which formal and informal creative activities are encouraged and intangible resources are managed. Additionally CE is aimed at creating new products, services, innovations, processes, strategies and business units, with the objective of improving and sustaining a company's competitive position and financial performance.** It was shown that despite the importance of CE, firms nevertheless struggle to implement CE, with implementation taking different forms in existing enterprises. Firms may decide to focus their efforts on one, or a combination, of the following forms: traditional R&D; ad-hoc venture teams; acquisitions and take-overs; corporate venturing; intrapreneurship; outsourcing, or a combination of the listed forms. Despite limited research on CE in South Africa, it was argued that South African companies exhibit entrepreneurial capabilities.

Chapter 3 identified the internal and external antecedents to CE, discussed the context of the firm, and analysed managerial influence on entrepreneurial activities. CE literature identifies a large number of variables that may affect a company's pursuit of CE. From these factors the most salient internal antecedents were identified. These factors were: management support for CE, autonomy of employees, rewards for CE, resource and time availability and flexible organisational boundaries. Factors that create opportunities and threats for enterprises were identified as key external antecedents. Munificent environments offer opportunities and are characterised by dynamic, changing conditions, the abundance of technological opportunities, industry growth and the demand for new products. Hostile environments create threats through competitive rivalry and the unfavourability of change. In theory, threats should urge enterprises to formulate entrepreneurial responses in order to survive. Furthermore, the influence of the size and age (or life-cycle) of an enterprise and different levels of management, such as top and middle management, may also influence entrepreneurial activities. Chapter 3 concluded with a proposed approach of the influences to CE, shown in Figure 3.2.

Chapter 4 analysed the concept of entrepreneurial intensity (EI), defined as a function of frequency and degree of entrepreneurship. Frequency refers to the number of times organisations act entrepreneurially (e.g. develop new products, services, processes or businesses), while degree refers to the innovativeness, proactiveness and risk-taking tendencies of organisations. Different combinations of frequency and degree of entrepreneurship provide a depiction of the EI of an enterprise, which can be shown on the entrepreneurial grid, as represented in Figure 4.1. Chapter 4 concluded by linking the internal and external antecedents of CE to the EI displayed by an enterprise. The rationale behind this model was that enterprises with supportive internal antecedents should produce higher levels of EI. Enterprises faced with munificent and hostile environments should also exhibit increased levels of EI, since many opportunities exist for CE and entrepreneurial responses need to be formulated to overcome threats.

7.4 RESEARCH METHODOLOGY

The research problem was investigated by applying the methodology outlined in Chapter 5. This study was an empirical cross-sectional telephone survey conducted in two stages.

During *Stage one* the measurement instrument was pre-tested, adapted and then administered to the sample. The findings of *Stage one* were used to assess the relationships between company characteristics and EI; frequency and degree of entrepreneurship; and the internal antecedents and EI. Findings regarding the external antecedent constructs were inconclusive because of internal reliability problems with the items and constructs. Therefore, during *Stage two* the external antecedent constructs were refined and adapted to the South African context, pre-tested and then administered to the original respondents who had participated in *Stage one* of the study.

The sample selected for this study was companies active in e-business operating in South Africa. The sample was drawn from two groups of companies involved in e-business activities, namely JSE and ICT companies. The following criteria were employed to select the sample: (1) awareness of innovation practices and processes; (2) being extensive users of e-business systems; and (3) accessibility of firms. The final sample consisted of 715 companies. The key respondent targeted in JSE companies was the Information Technology (IT) Manager or the Chief Information Officer (CIO), while the Chief Executive Officer (CEO) or Sales Manager was the key respondent in ICT companies. These individuals' knowledge of e-business innovations enabled them to provide a comprehensive view of the company's CE activities and the external environment. A total of 315 companies participated in *Stage one* of the survey, while 146 companies participated in *Stage two* of the survey. Thus the response rate was 20.4%, which is comparable to other empirical studies of this nature.

The development of the questionnaire is detailed in Section 5.3.4. The collected data were analysed by descriptive and inferential statistics. The inferential statistics used to assess the hypotheses and achieve the objectives of the study included best subsets regression, as well as structural equation modelling. Reliability and validity issues were addressed in Section 5.6.

7.5 SUMMARY OF MAIN FINDINGS

The main findings are summarised in this section and address the hypotheses and objectives of the study.

7.5.1 THE INFLUENCE OF COMPANY CHARACTERISTICS ON ENTREPRENEURIAL INTENSITY

The sample groups compared in this study were JSE and ICT companies. ICT companies showed significantly higher levels of EI compared with JSE companies. Against this background, ICT companies also achieved significantly higher scores on the following constructs: degree of entrepreneurship; internal antecedents that support CE; and the external antecedent: munificence, compared with JSE companies.

Higher levels of entrepreneurial intensity exhibited by ICT companies are linked to a specific configuration of other factors. The higher entrepreneurial intensity could be ascribed to the higher degree of entrepreneurship (innovativeness, risk-taking and proactiveness) ICT companies exhibit, since the frequency of entrepreneurship of JSE and ICT companies did not differ significantly. In other words, ICT companies were more likely to behave in innovative ways; more likely to take calculated, manageable risks, and more likely to take action before their competitors did. These findings could be linked to the accelerated development of new technologies; rapid product obsolescence; shortening product life cycles; and greater difficulty in protecting intellectual property (Schilling, 2007:2; Morris, Kuratko & Covin, 2008:205) experienced by ICT companies. Furthermore, new technological opportunities, perceived by ICT companies, create a “technological push” which stimulates CE in the ICT sector. Companies with an entrepreneurial posture could consequently exploit these technological opportunities. In addition, the demand for new products from the market creates a “demand pull.” The combination of push and pull factors creates a strong impetus for entrepreneurial behaviour in ICT companies.

In this study, **size**, as a company characteristic did not influence EI or the antecedents to CE. The innovation literature on the influence of size on the levels of entrepreneurship and innovation is ambiguous. Some studies support the viewpoint that larger firms are better at innovation (Acs & Audretsch, 1988; Graves &

Langowitz, 1993; Harrison, 1994), while another group of studies have found that smaller firms are better at innovation (Gilder, 1988; Stock *et al.*, 2002). Researchers such as Antoncic and Hisrich (2001:521) and Goosen (2002) found that organisational size did not have a meaningful influence on the CE levels of the firms they studied. The findings of this study thus support the findings of Goosen (2002) and Antoncic and Hisrich (2001), since size, in the sample of this study, did not influence EI.

The **age** of companies showed a negative relationship with EI, degree of entrepreneurship and the internal antecedents to CE. It appears that as companies become older and more established, their EI levels, based on their degree of entrepreneurship, decline, and internal factors become less supportive of entrepreneurial behaviour. Company age may be linked to the venture life cycle, discussed in Section 3.4. Enterprises move through different stages, from start-up activities, growth and maturity to the decline or innovation stage. Each of these venture life cycle stages requires different sets of managerial competencies to ensure the survival and success of the enterprise (Kuratko & Hodgetts, 2001; Morris & Kuratko, 2002). The findings of this study suggest that in general, companies do not plan these transitions from one stage to another since their creativity, innovativeness, risk-taking propensity and proactiveness suffer and decline over time, resulting in lower levels of EI.

7.5.2 THE RELATIONSHIP BETWEEN FREQUENCY AND DEGREE OF ENTREPRENEURSHIP

The relationship between frequency and degree of entrepreneurship was found to be a positive statistically significant relationship, in which respondents do not cluster in close proximity to the trend line, as shown in Figure 6.13. This finding is in contrast to the theory of the entrepreneurial grid (see figure 4.1), where companies could occupy five sample positions with regard to EI. In the case of this study, however, there was only evidence of three “positions” on the entrepreneurial grid: periodic/incremental, dynamic and revolutionary. This may be due to the sample studied, but it appears that the more frequently enterprises act entrepreneurially, the higher their degree of entrepreneurship should be. In other words, companies “practise” entrepreneurial behaviour, rather as a child would “practise” riding a bicycle. The more one “practises” a skill, the better one should become at it.

This finding reinforces the argument of Morris and Kuratko (2002) that a company cannot simply produce a highly entrepreneurial product each time, but it also needs to experiment, in other words increase the frequency of entrepreneurship for continued growth. The weak correlation between frequency and degree of entrepreneurship is comparable to the study of Morris and Sexton (1996), who empirically showed that optimal levels of entrepreneurial intensity consist of 30% frequency and 70% degree of entrepreneurship. In other words, simply “practising” entrepreneurial behaviour is not enough; the right techniques also need to be incorporated to develop the relevant capability, i.e. corporate entrepreneurship.

7.5.3 THE INFLUENCE OF INTERNAL ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP ON ENTREPRENEURIAL INTENSITY

Overall, the internal antecedents showed statistically significant correlations with EI, frequency and degree of entrepreneurship. This finding is consistent with the literature in this regard (Hornsby *et al.*, 1992; 1999; 2002; Zahra & Covin, 1995; Goosen, 2002). The conclusions indicate that supportive managerial practices are related to higher levels of entrepreneurial behaviour. Management support for CE, autonomy and rewards for CE showed the strongest statistically significant correlations with EI, degree and frequency of entrepreneurship. The other two antecedents – time availability and organisational boundaries – do not lead to higher levels of EI or degree of entrepreneurship, but organisational boundaries showed a weak, but negative relationship with frequency of entrepreneurship.

Amongst all the internal antecedents, **management support for CE** showed the strongest significant relationships with EI, degree and frequency of entrepreneurship. Management support for CE may assume various forms, such as championing new ideas or methods; promotion possibilities linked to entrepreneurial behaviour; experience of managers with the innovation process; and also attitude towards risk and encouragement to develop new ideas. This type of organisational climate is, therefore, conducive to repeated entrepreneurial behaviours.

Autonomy showed consistent significant relationships with EI, degree and frequency of entrepreneurship. In theory autonomy refers to work discretion and intrapreneurial freedom of employees (Goosen, 2002), to the extent that they are able to make

decisions about performing their own work in the way they believe is most effective. The study lends support to the theory that this type of work environment encourages entrepreneurial behaviour.

Rewards also showed significant relationships with EI, degree and frequency of entrepreneurship. CE literature emphasises the role of rewards and reinforcement to develop the motivation of individuals to engage in innovative behaviour (Kanter, 1985; Fry, 1987; Arnoldi, 1999; Goosen, 2002). The findings in this study bolster the theory that the use of appropriate rewards increases the motivation level of employees to engage in entrepreneurial behaviour.

Time availability did not show significant relationships with EI, degree or frequency of entrepreneurship. Even though the literature discussed in Section 3.2.6 emphasised the importance of resource availability as a cue on which employees base their beliefs that an enterprise is serious about innovative projects (Chandler *et al.*, 2002), the study did not find support for this assertion. This may be because of the items used in the CEAI-instrument, in terms of which resource availability was reduced to time availability, since new and innovative ideas cannot be developed if individuals do not have time to incubate their ideas. The respondents in this study saw these items in the scale as irrelevant to the CE issue; this, together with the fact that this factor showed no such relationship with the dimensions of entrepreneurial behaviour, could be the reason for the poor internal consistency achieved by this item. Furthermore, some intrapreneurs thrive under pressure and, therefore, do not perceive “more time” to work on non-job related issues as a key factor before they may engage in entrepreneurial behaviour.

Flexible organisational boundaries did not show significant relationships with EI or degree of entrepreneurship, but showed a very weak, negative (-0.18) significant relationship with frequency of entrepreneurship. The theory discussed in Section 3.3.3 showed that a supportive organisational structure and flexible boundaries encourage entrepreneurial behaviour (Lumpkin & Dess, 1996; Morris, 1998; Goosen, 2002). However, the items on the CEAI-instrument seemed to be problematic to the senior respondents of this study, since they did not reflect cooperation between units, but focused on the roles of individuals within the process.

7.5.4 THE INFLUENCE OF EXTERNAL ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP ON ENTREPRENEURIAL INTENSITY

Limited research has been conducted on the influence of external antecedents to CE and the entrepreneurial behaviour of firms. Most of the studies conducted in the USA on external antecedents and their influence on CE are dominated by Zahra (see Section 3.3). A study by Antoncic and Hisrich (2001), conducted in Slovenia, suggested that the external antecedent scale may well be country-specific. Findings of *Stage one* seem to lend support to this finding, since the internal consistency of the CE-scale for the external antecedents yielded poor internal reliability. Therefore, in *Stage two* a scale was developed to measure the external antecedents in the South African business environment pertaining to e-business. The scale focused on measuring munificence as a function of dynamism, technological opportunities and the demand for new products; and hostility as a function of competitive rivalry and the unfavourability of change. This scale yielded satisfactory internal reliability and construct validity scores.

Overall, **munificence** showed statistically significant correlations with EI, frequency and degree of entrepreneurship. Munificence refers to dynamism, technological opportunities and the demand for new products, as discussed in Section 3.3.

Dynamism showed significant relationships with EI, degree and frequency of entrepreneurship. In theory, enterprises in dynamic, changing environments are able to identify gaps and opportunities in the market, which urge them to engage in entrepreneurial activities. The findings of this study support the theory and empirical evidence found in the literature.

Technological opportunities showed significant relationships with EI and degree, but not frequency of entrepreneurship. CE literature argues that technological opportunities create a technology “push” from the firm’s side, which could lead to increased innovative, risk-taking and proactive behaviour in enterprises, which in turn culminates in higher levels of EI. The findings of this study support the literature (Schilling, 2007:23; Morris *et al.*, 2008:206).

Demand for new products showed a significant relationship with EI and degree, but not frequency of entrepreneurship. Demand for new products stimulates the supply of

new products and is driven by industry growth forces and customer needs for new products. These forces lead to a “demand pull” by the market and they stimulate the entrepreneurial behaviour of enterprises. The findings of this study support the literature (Schilling, 2007:23; Morris *et al.*, 2008:206).

The combination of technological opportunities and demand for new products create technology-“push” and market-“pull” factors, which drive entrepreneurship. Companies with an entrepreneurial posture are thus able to exploit the dynamic opportunities in the external environment.

Hostility was measured by unfavourability of change and competitive rivalry. These forces create threats to a firm’s mission and strategy. However, the findings of this study showed no significant relationship between hostility and EI, degree or frequency of entrepreneurship. The reasons for these findings are summarised below.

Unfavourability of change showed a statistically significant relationship with EI, degree and frequency of entrepreneurship. Theoretically, unfavourable change creates threats, which could motivate managers to consider bold strategic actions and entrepreneurial behaviours to outperform market expectations. It seems that the perceptions of managers in this study also prompted their firms to formulate and implement frequent entrepreneurial strategies and tactics, thus leading to higher levels of EI. The findings of this study support the findings of studies in the USA with regard to unfavourability of change. Antoncic and Hisrich (2001), however, point out that there are CE differentials between countries. In their study on intrapreneurship in Slovenia, they found that unfavourability of change had a negative relationship with intrapreneurship. This anomaly in the model suggests the need for further cross-country comparative studies.

Competitive rivalry shows no correlation with EI, degree or frequency of entrepreneurship. In theory, competition between enterprises could lead to higher levels of CE. However, the present study does not seem to indicate that this is the case in South Africa. Antoncic and Hisrich (2001) obtained similar results in Slovenia with the competitive rivalry dimension. They concluded that the competitive rivalry scale was a country-specific scale and developed for the USA. It stands to reason that the nature and structure of competition is different in different countries. In South Africa the number and actions of domestic competitors and views of foreign competitors are from those in the USA.

7.5.5 SALIENT ANTECEDENTS AND ENTREPRENEURIAL INTENSITY

From a management perspective, the identification of salient antecedents may simplify the management of CE and, therefore, the study also aimed to determine the key antecedents which were the strongest predictors of EI.

In order to provide clarity on this subject matter, best subset regression analysis was undertaken. The findings showed that munificence, management support for CE and autonomy had the strongest significant relationship with the entrepreneurial intensity displayed by companies. These antecedents accounted for 22% of the variance of EI.

Munificence: The relevance of munificence to EI (referring to technological opportunities, a dynamic environment and the demand for new products) underlines the importance of a positive economic climate and perceptions of businesses regarding economic conditions. Another measure of businesses' perceptions of the external environment is the South African Chamber of Commerce's (SACOB) business confidence index (BCI) (SACOB BCI, 2007). At the time of the study the BCI was generally high and increased in the subsequent months. High levels of the BCI reflect positive expectations regarding the business and economic environment. However, since this study was conducted, business confidence has declined, in other words businesses' perceptions of the external environment have changed from optimistic to cautious.

The implications of these findings are that uncertain, changing, opportunity-rich environments provide an essential incentive for companies to act in entrepreneurial ways. Although the BCI indicates positive economic conditions, business owners' perceptions thereof could change. Companies should be prepared for changes in the business environment, and if their entrepreneurial capabilities are developed, they should be able to turn threats into opportunities and be able to perform better in hostile environments.

Management support and autonomy: From a managerial point of view, support for CE and an environment in which employees enjoy autonomy create a work environment conducive to entrepreneurial behaviour. The involvement of top and middle management in CE activities provides vital cues to employees as to the importance of CE activities. For example, when instituting a corporate venturing

programme, at least one of the members of the executive level of management should be part of the new venture committee to sanction entrepreneurial behaviour. If employees are not convinced that these initiatives have a long-term objective, they will not risk changing their behaviour. If management support is lacking, the EI levels in a company might not change substantially.

While the antecedents measured in this study only explained 22% of the variance of the data of EI, several reasons may have contributed to this finding. Firstly, the decision to focus on EI in e-business at a strategic level may not have captured the variance of a multi-dimensional, complex process of interactions. As an outcome, EI is the result of a large number of persons' actions, the organisational climate, the level of trust in an organisation, and the economic climate in the business environment of a country. Secondly, the theory discussed in Section 2.6 highlights that CE can be implemented in seven different forms (e.g. new product development, ad-hoc activities, corporate venturing, R&D, intrapreneurship, outsourcing, acquisitions and take-overs and hybrid forms), which were not measured in this study. The design of the study focused on the perceptions of senior management using structured telephone interviews, and not middle managers, who may well be more directly involved with the CE process. Thirdly, as shown in Figure 3.2, managers' behaviour and perceptions; resource availability; and barriers to CE would also influence the EI levels in enterprises. However, this study chose a specific focus, and contributed to the expansion of CE knowledge in South Africa.

7.5.6 AN INTEGRATED MODEL OF THE INFLUENCE OF ANTECEDENTS TO CORPORATE ENTREPRENEURSHIP ON DEGREE OF ENTREPRENEURSHIP

A structural equation model was used to determine which antecedents showed the strongest relationship with entrepreneurial intensity. The complexity of the model and small sample size led to a model being constructed for the degree of entrepreneurship, rather than EI.

The literature and statistical analysis showed that degree of entrepreneurship (also known as entrepreneurial orientation) is more strongly influenced by the antecedents measured in this study than is frequency of entrepreneurship.

After two iterations, the final SEM model (see Figure 6.15) showed that management support, autonomy and rewards contributed significantly to measuring the internal antecedents which significantly influence the degree of entrepreneurship. Munificence, measured by dynamism, technological opportunities and the demand for new products, contributed significantly to degree of entrepreneurship. The model further illustrated that the degree of entrepreneurship could be altered in a firm through management interventions. The managerial implications of the SEM model are summarised in Figure 7.1.

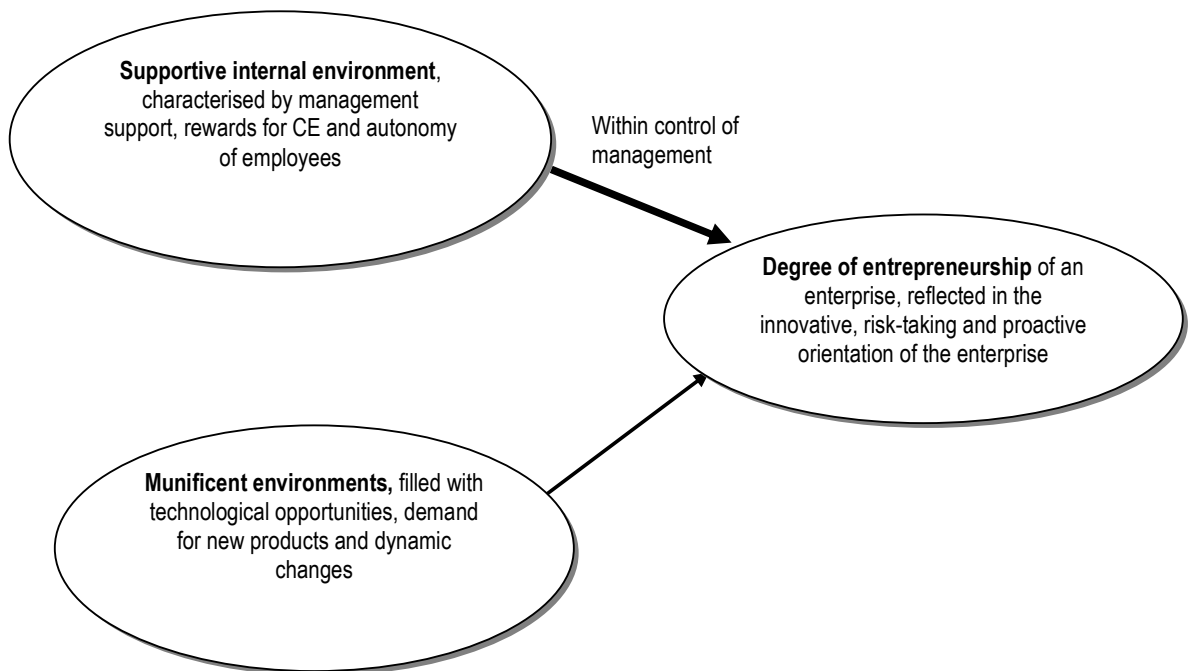


Figure 7.1: An illustration of the managerial implications of the SEM model, showing how a supportive internal environment and munificent environments influence degree of entrepreneurship

The model in Figure 7.1 illustrates the managerial implications of creating an entrepreneurial environment. The thicker arrow suggests that internal antecedents have a significantly stronger influence on degree of entrepreneurship than munificent external factors.

Several options are available to top and middle managers in order to create a supportive environment for CE. Some of the actions that top and middle managers could consider include championing of innovative ideas; recognition of employees

who articulate and implement ideas; and formalising the implementation of ideas by establishing venture committees, with top or middle management being part of these committees. Furthermore, a climate should be created in which employees feel they may commit errors when innovating without being disciplined. In such a climate there should be a willingness among managers to adopt workable ideas put forth by employees.

A supportive organisational climate for CE should encourage trust and provide employees with decision-making authority in terms of tasks for which they are responsible, as illustrated in Figure 7.1. Employees should have the freedom to make decisions and manage the consequences. Monetary and non-monetary rewards could be provided to encourage employees to act in entrepreneurial ways. Rewards may take many different forms and should be varied. Examples of rewards are certificates; gifts which recognise and motivate employees; and “fun trips” for a department which succeeds in successfully implementing a new initiative. In addition an employee’s job responsibilities could be increased or, where applicable, promotions may well follow. These rewards serve as signals to employees that the company values their entrepreneurial behaviour.

The thinner arrow in Figure 7.1 illustrates the influence of external munificent environments on the degree of entrepreneurship. Technology-push factors and demand for new products-pull factors from the market stimulate entrepreneurial behaviour.

7.6 RECOMMENDATIONS

This study contributes to supplementing CE theory in the South African context. The managerial value is found in the following recommendations underpinned by the findings of this study.

The findings of this study underline the importance of providing a supportive climate for CE in enterprises pursuing a growth strategy. Enterprises which would like to improve their degree of entrepreneurship need to create a climate in which employees feel safe to take such risks. Such an environment would be characterised by management support for the type of CE in which the enterprise would wish to engage, employees who function autonomously in their jobs, and rewards for and recognition of entrepreneurial behaviour. It is recommended that top and middle managers form an integral part of formalising the CE process. For example, if a

corporate venturing programme is initiated, at least one senior manager, and also representatives from top and middle management level, should be members of this process. In this way the intentions of management are articulated in actions.

Companies should increase their efforts to develop their entrepreneurial capabilities to succeed in the marketplace. The findings indicate that dynamic, opportunity-rich, munificent environments lead to increased levels of entrepreneurial behaviour. However, it seems that as the business climate changes and becomes hostile and filled with threats, an entrepreneurial strategy is not seen as a viable strategy by the companies participating in this study. In an environment where opportunities abound and markets are growing, it is not difficult for enterprises to act in entrepreneurial ways. However, since external environments change and can present threats for the firm, companies should be prepared to develop and deploy their CE capabilities in hostile environments.

- Managerial interventions to improve levels of innovation and entrepreneurial intensity need to focus on the antecedents verified in the study. These antecedents are management support for innovation; rewards for CE; and allowing employees to act autonomously within the company. These behavioural aspects can be measured and therefore can be managed.
- Managers, management consultants, industry bodies and other researchers should use the measurement instruments developed and verified in the study to measure these phenomena in the South African context. The questionnaire developed to measure the antecedents to CE in the e-business and technology industry in South Africa was shown to be reliable.
- Future research in the CE field of study should focus on developing norms of EI for different industries. The findings suggest that there are different norms on the entrepreneurial grid for different industries; for example ICT companies were more entrepreneurial in the e-business arena than companies listed on the JSE.
- Entrepreneurship theories developed in first-world countries need to be assessed and adapted in the South African business environment before their validity is accepted. This proved to be the case in the measurement of the

external environment, where external antecedents seem to exhibit country-specific relationships. For example, in South Africa unfavourable change and competitive rivalry showed divergent relationships with EI compared with Slovenia and the USA. It is recommended that further comparative cross-country studies be carried out to provide clarity on this issue.

- Finally, future research should refine the measurement of the internal antecedents to CE and degree of entrepreneurship. Improved measures could lead to better model specification. Even though the confirmatory factor analysis indicated a moderately good fit, existing measures can be refined.

7.7 LIMITATIONS OF THE STUDY AND OPPORTUNITIES FOR FUTURE RESEARCH

Although the present study aimed to make a significant contribution to the body of knowledge on entrepreneurial intensity and the influence of antecedents to CE on entrepreneurial intensity, certain areas still need to be explored or expanded. Based on the outcome of this research, the following limitations are stated and opportunities for future research on corporate entrepreneurship and entrepreneurial intensity are outlined:

- Using only one respondent per company was a limitation of this study, since it is possible that the use of more respondents in different departments per company could have provided a different picture of the entrepreneurial behaviour of a company. Resource limitations only allowed for data collection from one respondent per company. This study is nevertheless a step towards providing insight into the entrepreneurial behaviour of established businesses in South Africa and the influence of internal and external antecedents. Future research should triangulate the views of one respondent with secondary sources, or use multiple respondents on different levels of management and different departments per company.
- Using a large-scale empirical survey in this study necessitated the focus on e-business, since CE is such a multi-dimensional concept. ICT and JSE companies' practices were compared, since few earlier surveys focused on the entrepreneurial intensity of a large number of companies in South Africa.

However, caution should be exercised in generalising the findings. Future research should test these findings across sectors, company size and age.

- Since the outcomes and effect of CE can only be observed over the longer term, it is recommended that longitudinal surveys should also be conducted to ascertain whether high levels of entrepreneurial intensity are sustainable over time.
- The findings of the study showed that hostility, measured by unfavourability of change and competitive rivalry, did not lead to increased levels of entrepreneurial intensity, even though it did so in other developed countries. In the USA, firms' entrepreneurial behaviour increases in hostile environments. However, research completed in Slovenia also showed that hostility, as measured by the USA scale, did not influence levels of intrapreneurship. It is recommended that the scale measuring hostility be expanded through qualitative research in the South African context. It is first necessary to determine which factors are perceived by managers to pose major threats in the business environment. After completion of this process, the measurement instrument can be refined, tested in South Africa and then tested in other emerging economies. An unanswered question remains: are external antecedents country-specific or specific to the level of development of an economy (i.e. developed, transition or emerging)?
- It would be useful to replicate this study in other emerging economies to verify to what extent the antecedents to CE influence EI in these countries and explain differences between these countries. It is worth pursuing the question: to what extent culture itself affects levels of entrepreneurial behaviour within countries.
- This study focused only on entrepreneurial intensity in the broad sense and did not take into account the influence of individual managers on the CE process. It is recommended that future research include managers in different departments and at different levels to determine their perception of internal and external antecedents.

- Future research should refine the model of the antecedents' influence on EI. The antecedents only explain 22% of the variation of the data in EI. Future research should enhance the predictive power of the model by measuring other internal factors, such as the influence of the individual in the CE process; the type of CE practised by a company; organisational culture; the value system of an organisation; and its control systems -- all of which may well influence EI.
- Future research should also focus on the barriers to CE and their influence as a moderating factor on the EI of companies.
- Another avenue of research that should be pursued in future is the outcome of levels of entrepreneurial behaviour on the financial performance of an enterprise. Although Goosen (2002) showed that there is a relationship between CE and financial performance, views of performance have been expanded to include value creation, as measured by economic value added (EVA) and cash flow return on investment (CFROI). Future research should focus on how EI contributes to wealth creation, value created and the growth companies pursue.

7.8 CONCLUSION

The main contribution of this study is the assessment of CE theories in the South African context. The managerial implications of the behavioural model constructed in the study are that top and middle management are able to create a supportive environment for CE by ensuring management support for CE, autonomy of employees and rewarding entrepreneurial behaviour. A positive business climate, as reflected in munificent environments, creates both technology-push and market-pull factors to encourage entrepreneurial behaviour.

This study suggests that country differentials exist with regard to CE and the external antecedents which influence CE. When measuring the external antecedents, the measurement instrument needs to be adapted to the perceptions of managers in the country where the study is being conducted. Moreover, the effects of the external antecedents show different results in different countries. Further research is needed to clarify the influence of business environmental factors.

This study also supplemented the theory surrounding the entrepreneurial intensity debate by suggesting that if companies increase the frequency of their entrepreneurial activities, the degree of entrepreneurship would probably also increase. Furthermore, support was provided for the supposition that norms for entrepreneurial behaviour exist in different industries, by showing that the ICT industry reflected higher levels of EI than JSE companies. It was also shown that these higher levels of EI are linked to a specific combination of internal and external antecedents. It was interesting to note that company size did not influence EI, but company age did. The study concluded that companies' entrepreneurial behaviour decreases as they become mature and established. In addition their internal antecedents become less supportive of CE.

The study also identified several avenues of further research by using different research methods and examining the EI construct in different contexts. Future researchers should examine EI longitudinally and expand the internal antecedent construct to reflect the "richness of meaning" needed in order to better understand the influences on EI. Cross-disciplinary research will offer interesting avenues for future researchers, such as the relationship between EI and value creation, the role of human resource policies and strategies on entrepreneurial behaviour and the importance of a market orientation and entrepreneurial orientation to ensure sustainable growth over the long term.

CE constitutes an important component of a country's capacity to innovate and has the ability to contribute to economic growth in the South African economy. Entrepreneurial enterprises experience improved international competitiveness and an improved ability to build sustainable competitive advantage, in comparison with less entrepreneurial enterprises. This study has shown that business managers are able to create a supportive environment for entrepreneurial behaviour, thus overcoming the "organisational paradox" or "innovation gap" discussed in Chapter 1.

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APPENDICES

APPENDIX 1: UNIVERSITY OF STELLENBOSCH LETTER



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

12 August 2005

To Whom It May Concern:

SURVEY: CORPORATE ENTREPRENEURSHIP AND INNOVATION 2005

During the last decade the importance of improving economic growth, international competitiveness, and building South Africa's capacity to innovate have been identified as top priorities by several agencies. Government, the private sector and the popular business press view the capacity to innovate as crucial. However, large companies find it particularly difficult to implement innovation practices. Given the magnitude of the problem and the limited research available on this topic, it was decided to focus this study on the factors that facilitate corporate entrepreneurship and innovation in large companies operating in South Africa.

Against this background, Mrs. Retha Scheepers, a PhD student at the University of Stellenbosch is conducting research in an endeavour to develop a model of corporate entrepreneurship for companies operating in the corporate and information and communication technology sectors in South Africa. It is envisaged that such a model could assist companies to develop and enhance their innovation capabilities.

The interview and accompanying questionnaire has been designed for easy completion and should take between 9 and 13 minutes to complete. We are aware that this will entail a sacrifice on your part. Your willingness to participate in this survey would therefore be greatly appreciated. The questionnaire consists of three parts.

- Part 1 deals with the entrepreneurial orientation and outcomes thereof in your particular company.
- Part 2 focuses on the external factors that influence your company's strategic choices.
- Part 3 consists of questions regarding your workplace and organisation in general.

Your honest responses in answering the questions would be greatly appreciated. All responses will be treated with the utmost confidentiality. Should you have any additional queries, please do not hesitate to contact Brian Cooper or Retha Scheepers at mjs@sun.ac.za.

A copy of the final research report will be available on the website, via a secure username and password, to all respondents. If so required, the research report could be followed up with a detailed analysis of your company in comparison with the industry. We truly appreciate your valuable contribution to the knowledge base on corporate entrepreneurship and innovation in South Africa.

Sincerely,

Prof J Hough
Promoter
Department of Business Management
University of Stellenbosch

CORPORATE ENTREPRENEURSHIP AND INNOVATION IN SA COMPANIES

This questionnaire forms part of a PhD study and will be used for **academic purposes ONLY**. Your responses will be kept confidential and used as data for model assessment. The name of your company will not be used. Your responses will not be published in any way that the company or you can be identified.

1 (1) Name of company:	
2 (1) Name of respondent	
3 (1) Job designation of respondent	
4 (1) JSE or ICT company	

5 (1) Indicate company size in terms of the number of permanent employees

1 – 99	100-199	200-499	500-999	1000-2999	3000-4999	5000-7999	8000+
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6 (1) Indicate the number of years the company has been in existence:

Less than 3	3-6	7-15	16-25	26-49	50+
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The following statements are meant to identify the *collective management style* of your firm’s key decision-makers. Please indicate which response *most closely matches* the management style of your business’s key managers.

	In general, the top managers of my firm favour:										
7(1)	A strong emphasis on the marketing of tried and true products and services	1	2	3	4	5	6	7	8	9	A strong emphasis on R&D, technological leadership, and innovation
8(1)	Low-risk projects with normal and certain rates of return	1	2	3	4	5	6	7	8	9	High-risk projects with chances of very high returns
9(1)	A cautious, “wait and see” posture in order to minimise the probability of making costly decisions when faced with uncertainty	1	2	3	4	5	6	7	8	9	A bold, aggressive posture in order to maximise the probability of exploiting potential when faced with uncertainty
	In general, the top managers of my firm believe that:										
10(1)	Owing to the nature of the environment, it is best to explore gradually via cautious behaviour.	1	2	3	4	5	6	7	8	9	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm’s objectives
	In dealing with its competitors, my firm:										
11(1)	Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	8	9	Typically initiates actions to which competitors then respond
12(1)	Is very seldom the first firm to introduce new products /services, operating technologies etc.	1	2	3	4	5	6	7	8	9	Is very often the first firm to introduce new products / services, operating technologies etc.
13(1)	Typically seeks to avoid competitive clashes, preferring a “live-and-let-live” posture	1	2	3	4	5	6	7	8	9	Typically adopts a very competitive, “undo-the-competitor” posture

	How many new lines of products or services has your firm marketed since 2002?										
14(1)	No new lines of products or services	1	2	3	4	5	6	7	8	9	Many new lines of products or services
15(1)	Changes in product or service lines have mostly been of a minor nature	1	2	3	4	5	6	7	8	9	Changes in product or service lines have usually been quite dramatic

The following questions refer to the number of new products, services, processes or businesses your company has developed or entered into in the e-business landscape, or as a result of the advent of the internet. Answer only the questions that are applicable to your business; e.g. if you do not sell services, indicate "N/A"

	New product introductions: New product introductions refer to repositioning of e-business products, product improvements, and additions to product lines, new category entries as well as new-to-the-world products.										
	<i>Do not sell products = N/A</i>	Significantly Less			Same			Significantly More			
16(1)	How many product improvements or revisions did you introduce during the past two years, in comparison to the last five years?	1	2	3	4	5	6	7	8	9	
17(1)	How does the number of new product introductions at your organisation compare to those of your major competitors?	1	2	3	4	5	6	7	8	9	
		Not at all						To a great extent			
18(1)	To what degree did these new product introductions include products that did not previously exist in your markets ("new to the SA market")?	1	2	3	4	5	6	7	8	9	
	New service introductions (for those who sell services) New service introductions include modifications of existing e-business services, additions and services not offered before										
	<i>Do not sell services = N/A</i>	Significantly Less			Same			Significantly More			
19(1)	How many existing services did you significantly revise or improve during the past two years, in comparison to the last five years?	1	2	3	4	5	6	7	8	9	
20(1)	How does the number of new service introductions at your firm compare to those of your major competitors?	1	2	3	4	5	6	7	8	9	
		Not at all						To a great extent			
21(1)	To what degree did these new service introductions include services that did not previously exist in your markets ("new to the SA market")?	1	2	3	4	5	6	7	8	9	

	New process introductions Examples of process innovations include: new e-business systems for managing customer service or inventories, an improved process for collecting outstanding debtors, a major new sales or distribution approach etc.											
	<i>Not Applicable</i>			Significantly Less			Same			Significantly More		
22(1)	How many process improvements or revisions did you introduce during the past two years, in comparison to the last five years?			1	2	3	4	5	6	7	8	9
23(1)	How does the number of new process introductions at your firm compare to those of your major competitors?			1	2	3	4	5	6	7	8	9
				Not at all						To a great extent		
24(1)	To what degree did these new process improvements include processes that were not previously used in your markets ("new to the SA market")?			1	2	3	4	5	6	7	8	9
	New businesses Examples of new e-business businesses include acquisitions and mergers, internal ventures, spin-offs.											
	<i>Not Applicable</i>			Significantly Less			Same			Significantly More		
25(1)	How many new businesses did your firm enter into during the last two years, in comparison to the last five years?			1	2	3	4	5	6	7	8	9
26(1)	How does the number of new businesses entered at your organisation compare to those of your major competitors?			1	2	3	4	5	6	7	8	9
				Not at all						To a great extent		
27(1)	To what degree did these new businesses include businesses that did not previously exist in your markets ("new to the SA market")?			1	2	3	4	5	6	7	8	9

The following questions relate to the way your organisation views the industry and the external environment. Please indicate the number that most accurately represents your perception of your industry.

The number 1 indicates that more emphasis is placed on the left and 9 more emphasis on the right.

	In general, in our industry:														
28(1)	Our customers tend to look for new products and services all the time.			1	2	3	4	5	6	7	8	9	Our customers are happy with the products and services we offer them		
29(1)	The technology in our industry is changing rapidly.			1	2	3	4	5	6	7	8	9	Technological developments in our industry are rather minor.		
30(1)	It is nearly impossible to forecast future scenarios and events.			1	2	3	4	5	6	7	8	9	It is relatively simple to construct accurate future scenarios and events		
31(1)	Competition in our industry is cut-throat			1	2	3	4	5	6	7	8	9	Our competitors are relatively weak.		
32(1)	Demand and consumer tastes are unpredictable			1	2	3	4	5	6	7	8	9	Demand and consumer tastes are predictable.		

Major challenges in our industry are:											
33(1)	Declining markets for products / services	1	2	3	4	5	6	7	8	9	Growing markets for our products / services
34(1)	Price competition	1	2	3	4	5	6	7	8	9	Competition in our industry is not based on price.
35(1)	Government regulation is intensifying (more rules, regulations e.g. BEE)	1	2	3	4	5	6	7	8	9	Very little government interference takes place in our industry
The survival of our company:											
36(1)	Is threatened by the business environment	1	2	3	4	5	6	7	8	9	Is hardly influenced by the business environment
37(1)	We are a highly diversified conglomerate and operate in unrelated industries	1	2	3	4	5	6	7	8	9	We are focused firm that operate in a single industry
38(1)	Customers' buying habits vary a great deal from one line of our business to the other										
	Strongly agree	1	2	3	4	5	6	7	8	9	Strongly disagree
39(1)	Market dynamism and uncertainty vary a great deal from one line of our business to the other										
	Strongly agree	1	2	3	4	5	6	7	8	9	Strongly disagree

Section B

We are interested in learning about how you perceive **your workplace and organisation**. Using the scale below please indicate how much you agree or disagree with each of the statements. If you strongly agree, answer "9", if you strongly disagree, answer "1". There are no right or wrong answers to these questions so please be as honest and thoughtful as possible in your responses. All responses will be kept strictly confidential.

1 - Strongly disagree; 2 - Disagree; 3 – Disagree to some extent; 4 - Slightly disagree; 5 – Undecided; 6 - Slightly agree ; 7 –Agree to some extent ; 8 – Agree 9 - Strongly agree

Management support

41(1)	My organisation is quick to use improved work methods	1	2	3	4	5	6	7	8	9
42(1)	My organisations is quick to use improved work methods that are developed by workers	1	2	3	4	5	6	7	8	9
43(1)	In my organisation, developing one's own ideas is encouraged for the improvement of the corporation	1	2	3	4	5	6	7	8	9
44(1)	Upper management is aware of and very receptive to my ideas and suggestions	1	2	3	4	5	6	7	8	9
45(1)	Promotion usually follows the development of new and innovative ideas.	1	2	3	4	5	6	7	8	9
46(1)	Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track	1	2	3	4	5	6	7	8	9
47(1)	My top managers have been known for their experience with the innovation process.	1	2	3	4	5	6	7	8	9
48(1)	There are several options within the organisation for individuals to get financial support for their innovative projects and ideas	1	2	3	4	5	6	7	8	9

49(1)	Individual risk-takers are often recognised for their willingness to champion new projects, whether eventually successful or not.	1	2	3	4	5	6	7	8	9
50(1)	People are often encouraged to take calculated risks with new ideas around here.	1	2	3	4	5	6	7	8	9
51(1)	The term "risk taker" is considered a positive attribute for people in my work area.	1	2	3	4	5	6	7	8	9
52(1)	This organisation supports many small and experimental projects, realising that some will undoubtedly fail.	1	2	3	4	5	6	7	8	9
53(1)	A worker with a good idea is often given free time to develop that idea.	1	2	3	4	5	6	7	8	9
54(1)	There is considerable desire among people in the organisation for generating new ideas without regard to crossing departmental or functional boundaries.	1	2	3	4	5	6	7	8	9
55(1)	People are encouraged to talk to workers in other departments of this organisation about ideas for new projects.	1	2	3	4	5	6	7	8	9

Work discretion

56(1)	I feel that I am my own boss and do not have to double-check all of my decisions.	1	2	3	4	5	6	7	8	9
57(1)	Harsh criticism and punishment result from mistakes made on the job .	1	2	3	4	5	6	7	8	9
58(1)	This organisation provides the chance to be creative and try my own methods of doing the job.	1	2	3	4	5	6	7	8	9
59(1)	This organisation provides freedom to use my own judgment.	1	2	3	4	5	6	7	8	9
60(1)	This organisation provides the chance to do something that makes use of my own abilities.	1	2	3	4	5	6	7	8	9
61(1)	I have the freedom to decide what I do on my job.	1	2	3	4	5	6	7	8	9
62(1)	It is basically my own responsibility to decide how my job gets done.	1	2	3	4	5	6	7	8	9
63(1)	I have much autonomy on my job and am left on my own to do my own work.	1	2	3	4	5	6	7	8	9
64(1)	I seldom have to follow the same work methods or steps for doing my major tasks from day to day.	1	2	3	4	5	6	7	8	9

Rewards / reinforcement

65(1)	My manager helps me get my work done by removing obstacles.	1	2	3	4	5	6	7	8	9
66(1)	The rewards I receive are dependent upon my work on the job.	1	2	3	4	5	6	7	8	9
67(1)	My supervisor will increase my job responsibilities if I am performing well in my job.	1	2	3	4	5	6	7	8	9
68(1)	My supervisor will give me special recognition if my work performance is especially good.	1	2	3	4	5	6	7	8	9
69(1)	My manager would tell his boss if my work was outstanding.	1	2	3	4	5	6	7	8	9

Time availability

70(1)	During the past three months, my work load was too heavy to spend time developing new ideas.	1	2	3	4	5	6	7	8	9
71(1)	I have just the right amount of time and work load to do everything well.	1	2	3	4	5	6	7	8	9
72(1)	My job is structured so that I have very little time to think about wider organisational problems.	1	2	3	4	5	6	7	8	9
73(1)	I feel that I am always working with time constraints on my job.	1	2	3	4	5	6	7	8	9
74(1)	My co-workers and I always find time for long-term problem solving.	1	2	3	4	5	6	7	8	9

Organisational boundaries

75(1)	In the past three months, I have always followed standard operating procedures or practices to do my major tasks.	1	2	3	4	5	6	7	8	9
76(1)	On my job I have no doubt what is expected of me.	1	2	3	4	5	6	7	8	9
77(1)	There is little uncertainty in my job.	1	2	3	4	5	6	7	8	9
78(1)	My job description clearly specifies the standards of performance on which my job is evaluated.	1	2	3	4	5	6	7	8	9
79(1)	I clearly know what level of work performance is expected from me in terms of amount, quality, timeliness of output.	1	2	3	4	5	6	7	8	9

Thank you for your co-operation



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9 May 2006

To Whom It May Concern:

REPORT PRELIMINARY FINDINGS

SURVEY: E-BUSINESS INNOVATION AND CORPORATE ENTREPRENEURSHIP 2005

Thank you for your enthusiastic participation in the study on e-business Innovation and Corporate Entrepreneurship in South African companies. The response rate was high for surveys of this nature, close to 50%. It appears that the topic of innovation and corporate entrepreneurship is also of interest to you as it is to us.

During the first stage of the study you participated in, conducted last year (August to October 2005), levels of entrepreneurial behaviour and organisational factors influencing entrepreneurial behaviour were measured. A follow-up survey (duration: 3-5 minutes) is planned for this year (July to September 2006), during which the external factors in the business environment which influence entrepreneurial behaviour will be measured. We request your co-operation in this regard, since Mrs. Retha Scheepers, a PhD student at the University of Stellenbosch, is conducting research in an endeavour to develop a model of corporate entrepreneurship for companies operating in the corporate and information and communication technology sectors in South Africa. Without these data, the model – which could assist companies to develop and enhance their innovation capability – cannot be verified.

Accompanying this letter are two files containing information regarding the study. The Powerpoint-file highlights the key findings, while the Word-file provides more detail on the goal of the study, methodology and key findings. We hope that the key findings presented in this preliminary report will enable you and your firm to add value on a strategic level and enhance the competitiveness of your firm.

Kind regards,

Prof J Hough
Promoter
Department of Business Management
University of Stellenbosch

THE INFLUENCE OF THE BUSINESS ENVIRONMENT ON INNOVATION AND CORPORATE ENTREPRENEURSHIP

This questionnaire forms part of a PhD study and will be used for academic purposes ONLY. Your responses will be kept strictly confidential. The name of your company will not be used. Your responses will not be published in any way that the company or you can be identified.

Verify data in database obtained in 2005

Name of person	
Contact information (e-mail) / Tel	
Industry your company is active in:	
Job designation of person completing questionnaire	
Company size in terms of:	
Turnover	
Employees	

The questions that follow aim to determine the impact of

- technological changes,
- competitors and
- other environmental changes

may have had on your enterprise.

These changes often influence the strategic behaviour of enterprises.

Ask if respondent knows the term ICT* –

If yes, use ICT; If no ICT = Information- and Communication Technology

Section A = Question 1-15 = changes in ICT environment

Rate the IMPACT of <u>changes</u> that might have occurred in your business's <u>ICT* environment</u> over the last <u>3</u> years using the scale below:						
	Minor impact = 1					Major impact -5
	Technological changes					
1 (2)	The impact of <u>technological changes</u> in the ICT field <u>on our business</u> has been minor / major.	1	2	3	4	5
2 (2)	The impact of the <u>rate of innovation in e-business</u> and ICT fields on our business has been minor / major.	1	2	3	4	5
3 (2)	The impact of spending on <u>Research and Development (R&D)</u> in the <u>technological and e-business field</u> on our business has been minor / major.	1	2	3	4	5
4 (2)	The impact of technological change on <u>our market</u> (customers / clients) has been minor / major.	1	2	3	4	5
5 (2)	The number of <u>local/SA customers</u> we serve has <u>changed</u> in minor or major ways over the last 3 years.	1	2	3	4	5
6 (2)	The number of <u>international customers</u> we serve has changed in minor or major ways over the last 3 years.	1	2	3	4	5
7 (2)	Due to technological changes, we have seen minor / major <u>changes</u> in industry-wide <u>spending on advertising</u> .	1	2	3	4	5
8 (2)	<u>Government regulation</u> of the ICT industry e.g. BEE Charters, Electronic Communications Bill has had a minor / major impact on our business.	1	2	3	4	5
9 (2)	The number of <u>local competitors</u> in our industry has changed in minor / major ways.	1	2	3	4	5
10(2)	The number of <u>foreign competitors</u> in our industry has changed in minor / major ways.	1	2	3	4	5

With questions below *adapt* to take into account companies that have indicated in 2005 that they do not offer products or services, rather projects or what their core business activity may be.

Indicate how much you disagree / agree with the statements below with regard to your business's situation:		Strongly disagree = 1					Strongly agree= 5
11 (2)	Because of technological changes in the ICT and e-business field our <i>products / services</i> become <u>outdated</u> very quickly.	1	2	3	4	5	
12 (2)	Because of technological changes in the ICT and e-business field, our <u>methods of delivery / production change</u> often and in major ways.	1	2	3	4	5	
13 (2)	Our <u>markets (clients)</u> have undergone significant <u>changes</u> , because of changes in <u>consumer demographics</u> .	1	2	3	4	5	
14 (2)	Our markets (clients) have undergone significant changes because of <u>changes in the business / industrial market</u> .	1	2	3	4	5	
15 (2)	Because of technological changes in the ICT and e-business field, our business needs to <u>change the way we market our products/ services</u> .	1	2	3	4	5	

Section B: Technological opportunities

Indicate how much you disagree / agree with the statements below with regard to your business's situation:		Strongly disagree = 1					Strongly agree= 5
17 (2)	Changes in the technological and e-business environment, have led to many <u>opportunities for technological innovation</u> in our industry.	1	2	3	4	5	
18 (2)	Changes in the IT environment have led to <u>growth in the demand for new technology</u> in our industry.	1	2	3	4	5	
19 (2)	New technology is <u>needed</u> for growth in this industry.	1	2	3	4	5	

Section C: This section is about new products / processes in the industry

Indicate how much you disagree / agree with the statements below with regard to your business's situation:		Strongly disagree = 1					Strongly agree= 5
In this industry:							
21 (2)	There are <u>many opportunities for new</u> e-business products, services, processes and / or business development.	1	2	3	4	5	
22 (2)	<u>Customer demand</u> for new technological products is growing. <i>(I understand customer demand to mean those customers that are currently buying from the business.)</i>	1	2	3	4	5	
23 (2)	<u>Market demand</u> for new technological products is growing. <i>(I understand market demand to mean all customers buying from the business and competitors i.e. whole industry.)</i>	1	2	3	4	5	
24 (2)	Technology helps to <u>predict</u> our <u>customers' needs / tastes</u> .	1	2	3	4	5	
25 (2)	We are able to <u>predict decline</u> in our <u>primary target markets</u> due to technological advances.	1	2	3	4	5	
26 (2)	In our industry, <u>customers</u> always <u>want new technological products</u> .	1	2	3	4	5	

Section D: Change: Favourable vs. Unfavourable

Rate the changes that have taken place in the ICT environment on the scale below as favourable or unfavourable over the last 3 years.
Favourable (or conducive to) the success of your company vs. Unfavourable – threat for your company:

	Unfavourable = 1					Favourable - 5
27 (2)	In general <u>technological changes</u> in the ICT environment have been unfavourable / favourable for our business.	1	2	3	4	5
28 (2)	Changes in <u>our markets (customers)</u> have been unfavourable / favourable for our business.	1	2	3	4	5
29 (2)	Changes in the <u>number of local customers</u> have been unfavourable / favourable for our business.	1	2	3	4	5
30 (2)	Changes in <u>industry-wide spending on advertising</u> have been unfavourable / favourable for our business.	1	2	3	4	5
31 (2)	Changes in the <u>number of international competitors</u> have been unfavourable / favourable for our business.	1	2	3	4	5

Section E: Intensity of competition

Rate the intensity of competition your business has faced from the following groups over the last 3 years. Has competition from these groups been low in intensity or high in intensity?

	Low intensity= 1					High intensity-5
31 (2)	Competition from <u>established local producers/ providers</u> has been low / high in intensity.	1	2	3	4	5
32 (2)	Competition from <u>established international producers / providers</u> has been low / high in intensity.	1	2	3	4	5
33 (2)	Competition from <u>new local producers / providers</u> has been low/high in intensity.	1	2	3	4	5
34 (2)	Competition from <u>new international producers/ providers</u> has been low / high in intensity.	1	2	3	4	5

Section F: Management style of your firm’s decision-makers

The following statements are meant to identify the *collective management style* of your firm’s key decision-makers. Please indicate which response *most closely matches* the management style of your businesses key managers:

Strongly disagree = 1 Strongly agree- 5

In general, the top managers of my firm favour:

35 (2)	A strong emphasis on <u>Research & Development, technological leadership, and innovation.</u>	1	2	3	4	5
36 (2)	<u>High-risk projects</u> with chances of very high returns.	1	2	3	4	5
37 (2)	A <u>bold, aggressive posture</u> in order to maximise the probability of exploiting potential when faced with uncertainty (<i>I understand this to mean the attitude of management</i>).	1	2	3	4	5
38 (2)	In general, the top managers of my firm believe that owing to the nature of the environment <u>bold, wide-ranging</u> acts are necessary to achieve the firm’s objectives (<i>I understand this to mean they will take risks to achieve objectives</i>).	1	2	3	4	5

In dealing with its competitors, my firm typically:						
39 (2)	<u>Initiates actions</u> to which competitors respond.	1	2	3	4	5
40 (2)	Is very often the <u>first</u> firm to introduce new products / services, operating technologies etc*.	1	2	3	4	5
41 (2)	Adopts a very <u>competitive</u> , " <u>undo-the-competitor</u> " (Kill-the-competitor) posture / stance.	1	2	3	4	5
How many new lines of products* or services* has your firm marketed since 2003?						
42 (2)	<u>Many</u> new lines of products or services.	1	2	3	4	5
43 (2)	<u>Changes</u> in product or service lines have usually been quite dramatic.	1	2	3	4	5

* If mining company, or other company whose main focus is not products, refer to projects / services / processes or appropriate activity

If you must, include 0 as extra category for responses such as “refuse to answer”, “not applicable” or others.