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Social impact of high-tech enterprises in an emerging market

Stephan J Lamprecht

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management specialising in Entrepreneurship and New Venture Creation

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ABSTRACT

The successful commercialisation of high-tech products and services require an appreciation of the social context in which such products and services are introduced. The market for high-tech products and services in emerging markets are drawing increasing involvement of small and medium sized firms that are either developing high-tech products and services, or selling such products and services imported from developed markets.

The need for basic services at the citizen level in emerging markets necessitate firms to adapt the commercialisation strategies and ultimate sales of products and services to address basic needs.

Drawing on the theory of social impact measurement, social enterprise self-efficacy and entrepreneurial orientation, this research aims to assess the way in which emerging market firms – using primarily South African firms in the research sample offering high-tech products and services - have had to adjust commercialisation strategies, so as to take cognisance of the social context specific to the target markets.

Data was collected from a number of high-tech firms operating in, or offering high-tech products and services to emerging markets. The data was subsequently analysed based on the social impact measures, social enterprise self-efficacy and entrepreneurial orientation constructs found in literature, to assess the overall social impact of high-tech SMEs in an emerging market, being predominantly South Africa. The researcher introduced a tailor-made variable, Success by drawing on various data items collected from respondents, such as the age of the firm, and changes in recent employment and turnover figures.

The results point to a positive and statistically meaningful relationship between the Success of such firms in the final sample, and the need to demonstrate social impact considerations in the business strategies of such firms offering high-tech products and services in an emerging market. The research outputs align with theory in so far as social impact not being the primary driver of such high-tech

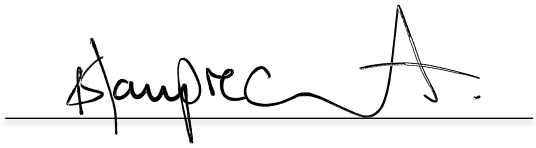
firms, but rather a necessary by-product of ensuring sustainability and success, and the need to adapt to the contextual realities present in an emerging market.

This is one of the first studies to test the social impact of high-tech firms in an emerging market, especially in so far as outlining the need to expand commercialisation strategies to incorporate social impact awareness. By applying the theory of self-efficacy to social impact, the findings point to the need for high-tech firms in emerging markets to not only take note of social needs, but to adapt firm strategy to integrate social impact considerations into the commercialisation strategies, so as to be successful. In other words, to be successful, such high-tech firms need to both talk-the-talk, and walk-the-walk.

The implications of the research extend to the way high-tech SMEs approach commercialisation in emerging markets, as well as the team composition of such high-tech firms in order to integrate the necessary skills and experienced resources beyond those necessary for technological commercialisation, thereby having also human resources with the necessary skills and experience needed to take cognisance of, and adapt to relevant social impact contexts.

DECLARATION

I, Stephanus Jakobus Lamprecht, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Stephanus Jakobus Lamprecht

Signed at Knysna

On the 2nd day of August 2016

DEDICATION

To my mother (1941 to 2014), who inspired and challenged me to always seek my own way whilst building on the shoulders of giants.

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To my loving wife, for her on-going support, unwavering belief, and excitement towards the prospect of completing this dissertation.

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CHAPTER 1: INTRODUCTION

Social entrepreneurship (SE) and social impact have been studied widely and the concept of SE is becoming more prominent in the development of the South African economy (Weerawardena and Mort, 2006). This is due en large to the enormous need for finding new economic development and especially entrepreneurship models so as to ensure social redress and driving economic transformation. Building on available SE literature, some researchers have linked the concept of self-efficacy as applied to entrepreneurship (Bandura, 1986, 1997, 2001), to the field of SE (Urban, 2015). Similarly have several researchers explored Entrepreneurial Orientation as far back as the 1980s (Miller, 1983) to expand the different dimensions of entrepreneurial orientation to include innovativeness, risk-taking and proactiveness, last-mentioned notably also by Covin and Slevin in 1989 and Venkataraman in the same year.

However, very little research can be found that links the domain of SE and EO, specifically in the context of emerging market firms that specialise in a sub-sector of entrepreneurship, namely high-tech or technopreneurship.

1.1 Purpose of the study

Emerging markets offer exponential growth opportunities for new high-tech products and services, given the fact that most such markets are under- or undeveloped (Economist, 2010). Such products and services are not limited to those typically associated with developed markets, as many of the needs in emerging markets stem from dealing with basic challenges related to social and environmental problems (Urban, 2015).

Forecasts for growth extrapolate from this to show that Africa's growth will be outpacing that of other markets like China and India, and expectations are that this trend will accelerate owing to the development of market structures, expansion of the middle classes, and general growth in the number of new consumers (Hazelhurst, 2010). Lower barriers to entry spearheaded by the Internet and increased investments in science, technology and innovation by emerging markets

have opened the door for rapid use and market uptake of high-tech products and services in emerging economies (www.accenture.com).

But such markets are characterised by a lack of sophistication and huge income disparity, resulting in dire social challenges stemming from a mixture of extreme wealth and extreme poverty. Many developing markets are primarily survivalists in nature (Hart, 1996; Bastagli et al, 2012). Can one operate in Africa and similar emerging markets without cognisance of the extreme social needs of its citizens – the world's future customers?

Traditionally, Africa and emerging markets were the domains of either multinationals and government donor-funded activities on the one hand, that were driven by own resource and strategic interests to enter such markets (e.g. resource extraction/acquisition value proposition), or on the other hand the domain of social-minded activists that were motivated primarily by visible social needs of the continent and the interest to address these (e.g. social value proposition) (Glennie, 2012; Kuponen, 1993).

With globalisation and increased competition in developed markets, many businesses, small and large, are considering emerging markets as the last frontier for new customers (Luiz & Stephan, 2011). Technology based businesses that do enter emerging markets are no longer limited to large multinationals only, given the advent of the Internet and the lowering of barriers to entry for SMEs to develop and/or offer technology based products and services (Kruger, 2007).

The following research aims to better understand the relationship between the strategy of small-and-medium sized (SME) high-tech firms in an emerging market being South Africa, and the social context and social needs embedded in said emerging market, by assessing the social impact considerations of high-tech SMEs in South Africa.

1.2 Context of the study

Commercialising high-tech products and services cannot be divorced from the social context in which the products and services will be used (Zemlickienė, 2011).

This is true also for emerging markets, whether or not commercialisation involves technology developed by emerging market entrepreneurs, or rolling out technology in emerging markets that was developed in first-world markets.

The following examples illustrate the context for commercialisation involving emerging markets.

Nompilo is a high-tech mobile phone based solution rolled out in South Africa to enable primary health care workers to serve the immediate medical needs of rural-based citizens that are located too remotely to meet such needs by normal doctors at existing medical facilities (Schneider & Leon, 2012). Another social challenge, being the large proportion of so-called unbanked citizens, is being addressed through a mobile banking solution implemented by a South African founded high-tech enterprise, Wizzit (Rangan & Lee, 2012).

Both instances involve engineer-founded high-tech enterprises operating in the market space of addressing basic human needs – respectively health care and financial inclusion – and both achieving profound social impact.

On the other hand is an initiative of the Massachusetts Institute of Technology (MIT)'s Media Lab developed to address the digital divide most visible in emerging markets, by developing the so-called One Laptop Per Child (OLPC) device, a low-cost, Internet-enabled, rugged laptop intended for rural conditions. This high-tech approach to addressing the basic need of education and access to information, failed to achieve impact in emerging markets, due to various reasons including failing to reach markets on time, failing to get teachers in emerging markets to adopt using OLTPs in classrooms, and failure to appreciate the lack of basic education amongst parents overseeing their children utilising OLTP (Nugroho & Lonsdale, 2010).

1.3 Problem definition

Social impact and social context are seemingly vital aspects to consider when attempting to develop and sell high-tech products and services in emerging markets.

But are high-tech firms, often started by scientists and engineers, appropriately skilled, and suitably mindful of the need to appreciate social impact, when commercialising high-tech products and services in emerging markets?

1.3.1 Main problem

Investigate the role of social impact considerations in the strategies of SMEs offering technology-based products and services in an emerging market such as South Africa.

1.3.2 Sub-problems

In order to address the main problem, it is imperative to answer a number of sub-problems, including:

- Are SMEs offering high-tech products and services in emerging markets, consciously engaging with social needs so as to be successful?
- Do such SMEs offering high-tech products and services in emerging markets, consider themselves to be entrepreneurs, technopreneurs and/or social entrepreneurs?
- Is social consciousness of such SMEs a coincidental by-product of operating in an emerging market, or is it an intentional output that mirrors the self-efficacy of successful entrepreneurs?

1.4 Significance of the study

This research will probe the extent to which successful SMEs offering technology based products and services in emerging markets have had to adjust strategy, develop different business models, and/or accumulate new skills specifically to deal with social needs. This will be achieved by assessing the social impact considerations and social enterprise self-efficacy of SME firms offering high-tech products and services in an emerging market, using mainly South African firms as the research sample.

The results will aid to inform best practice, policy, education, support structures and literature in regards to the role and value of social impact in technology commercialisation, and in penetrating emerging markets with technology-based products and services. This research may point towards a different approach to commercialisation in emerging markets, and even shed light on the high failure rate amongst SMEs attempting to penetrate emerging markets with technology-based products and services.

1.5 Delimitations of the study

- Small and medium sized businesses.
- Firms that either develop or that roll out new technology-based products and services, in other words, high-tech businesses.
- Firms operating in an emerging market such as, but not limited to South Africa.

1.6 Definition of terms

BBBEE - Broad-based Black Economic Empowerment

CSI - Corporate Social Investment

DFI - Development Finance Institution

EO - Entrepreneurial Orientation

ICT - Information and Communication Technology

SA - South Africa

SE - Social Entrepreneur

SESE - Social Enterprise Self-Efficacy

SIM - Social Impact Measurement

SME - Small and Medium sized Enterprises

STI - Science, technology and innovation

SVP - Social Value Proposition

1.7 Assumptions

Large companies and multinationals have vast resources with which to enter new markets and to mitigate the risks of doing so. It is assumed that such businesses can enter emerging markets offsetting the risk through revenues from other markets. SMEs on the other hand don't have such resources and will face direct entrepreneurial threats and challenges in entering emerging markets, especially given that such efforts will in most cases take an 'all-or-nothing' approach (Markman & Baron, 2003). For this reason, this study is limited to SMEs only.

The study begins with a neutral stance on respondents in regards to success; are they successful or not? It further does not assume from the start that SMEs offering technology-based products and services are entrepreneurial, 'technopreneurial', nor that they may, or may not demonstrate character traits of social entrepreneurship (SE).

Rather does the study start from the basis that each respondent, as delimitated by the above, is in fact firstly an SME, and secondly offers products and services that involve a high degree of technology commercialisation. The analysis of the research data from respondents will attempt to draw conclusions in regards to entrepreneurial tendencies, technopreneurship and social entrepreneurship classification, and use existing entrepreneurship models to determine if such respondents can be considered successful or not.

CHAPTER 2: LITERATURE REVIEW

The purpose of the literature review is to assess existing literature in regards to the increasing opportunities for high-technology entrepreneurship in emerging markets. Furthermore, the literature review probes the role and impact of social considerations and what role social networks, social capital and social needs play towards stimulating the opportunities for high-tech entrepreneurship in emerging markets. A last section in the literature review includes three interviews with South African entrepreneurs, enumerating on the similarities and differences between normal high-tech entrepreneurship, and social entrepreneurship.

2.1 High-tech entrepreneurship in emerging markets

Following on the work of economists such as Joseph Schumpeter, Robert Solow and others, Romer has proposed a change to the neo-classical model by seeing technology (and the knowledge on which it is based) as an intrinsic part of the economic system. Knowledge has become the third factor of production in leading economies (Romer, 1986). Technology-based entrepreneurship is assumed to be one of the most important sources of economic value creation and development in Europe (Blanco, 2011). Firms today don't operate in vacuums either and have to consider not only economic realities (i.e. profits) but also the social environment (Byerly, 2013).

But this is true for emerging markets as well. Developing economies, particularly those that are heavily dependent on resource wealth (minerals, agriculture, land, etc.) are increasingly looking towards high-tech entrepreneurship as a means to transform their economies from resource to knowledge based (Mpahlwa, 2005), (Mangena, 2008).

Technology, especially ICT, has become a fundamental tool for businesses to ensure competitiveness, both locally and internationally (Dutta & Mia, 2007). Africa's market for mobile phones for example, has over the last few years grown at an above rate compared to other global markets and wireless/mobile phone-based access has become the primary means for emerging market citizens to

connect to the Internet. Dubbed “the least-wired region in the world”, the continent now has the highest ratio of mobile to total telephone subscribers on the planet (ITU, 2005).

African cultures are often recognised for strong social links, and verbal and community-based communication, and trust form the basis of social and business relationships in many African markets (Malony, 2007). Entrepreneurial models of explaining economic growth/business success recognise the importance of social capital and networks; one stating that the four strongest drivers of entrepreneurial success to be (i) self-efficacy, (ii) opportunity recognition, (iii) perseverance and (iv) *human and social capital and social skills* (Markman & Baron, 2003).

Social capital (defined as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by individual or social units” (Nahapiet & Ghoshal, 1998)) forms the platform from which the mission of a new venture is pursued (Liao & Welsch, 2003). Social capital to some extent dictates the entrepreneur’s access to knowledge and access to resources, directly impacting on entrepreneurial success (or failure) (Nahaplet & Ghoshal, 1998). Networks and social capital build towards collaboration and trust (Markman & Baron, 2003). This begs the question whether or not social skills are valued more highly in social-dominated cultures (e.g. Africa), above business and other skills.

African societies supposedly prioritise social capital (e.g. Ubuntu) and one can argue that new-generation entrepreneurs and business people in emerging markets are more aware of social capital than their peers in developed societies.

Venkataraman and Shane in 2000 similarly emphasised the need for social capital in the pursuit of profitable opportunities; and others continue to stress the importance of the entrepreneur’s networks towards enabling access to relevant knowledge about the market, ways to serve these markets, and ways to deal with customers (Elfring & Hulsink, 2002). Hills, Lumpkin and Singh (1997) found that 50% of entrepreneurs’ opportunities originated from their social networks.

2.2 Social Entrepreneurship and its status in South Africa

It is firstly important to appreciate the nature of social entrepreneurship, before that can be properly contrasted with high-technology firms and so-called technopreneurship.

The pursuit of opportunity is not limited to commercial entrepreneurs; increasingly, social entrepreneurs are adopting similar approaches when starting up new ventures, even though they may be differently motivated than their commercial peers (Sharir and Lerner, 2006). Social entrepreneurship (SE) is defined as a different approach to commercial entrepreneurship, wherein social or community goals are the prominent drivers of intent, and profits are typically reinvested in the social venture for growth and sustainability, rather than paid to shareholders as dividends (Harding, 2006). Commercial entrepreneurs are seen to thrive on profits, innovation and competition, whereas social entrepreneurs are engaged in the pursuit of innovation that changes the social context, social structure and social processes that underlie society (Jeffs, 2006; Urban and Shaw, 2010).

The primary debate around SE centres on two key dimensions, being firstly the discussion as to the definition of SE (so what is it really?) and secondly, how SE is different from, and/or how it relates to entrepreneurship in general.

2.2.1 Definition of social entrepreneurship and the social enterprise

The UK Department of Trade and Industry (DTI) accepted the above SE definition into its library of standard business forms and practices, stating that SEs are businesses with “primarily social objectives, whose surpluses are reinvested for that purpose in the business or in the community, rather than being driven by the need to maximise profit for shareholders and owners” or, in short-hand, “businesses trading for a social purpose” (DTI, 2006).

This brings to surface two key concepts being firstly that the primary purpose of SE is primed around ‘social objectives’, or the notion of a ‘Social Value Proposition’ (SVP) (Austin, Stevenson and Wei-skillern, 2006), and secondly the fact that one is talking about ‘businesses’ or ‘ventures’ or some form of

organisational entity from which social objectives are being driven. SE extends beyond mere social impact or social activism.

The SVP is to a large extent what differentiates SE from normal entrepreneurship as it builds the point of departure, or raison d'etre from which the business derives its identify, motivates its reason for existence, and outlines its primary mandate.

To what extent then is there a difference between a social business, social venture or social enterprise? In other words, if SE involves pursuing a SVP through the implementation of business activity, then how would one define the entity in which such business activity is conducted, i.e. a social enterprise?

The BC Centre for Social Enterprise, a Canadian Community Based Organisation, defines a social enterprise as a legal concern that pursues sustainability through activities related to social impact (community, environmental, religious, sports, recreation, etc.), and that generates revenues in the process of doing so (BC Centre for Social Enterprise, 2012).

Although many would assume that social enterprises don't have profit as a motive, social enterprises like any other enterprise needs to generate revenues, and do so profitability to ensure sustainability. The difference appears to be in the fact that profit is not the primary purpose, but rather the vehicle with which to ensure sustainable social impact.

Early definitions limited social enterprises to non-profits ('… applying business expertise and market-based skills in the non-profit sector' (Austin, Stevenson and Wei-skillern, 2006)), but it is now widely accepted that SE is not limited to taking one specific business and/or legal form (i.e. not-for-profits), but social enterprises can take any format (e.g. for-profits, not-for-profits, sole proprietorships, etc.).

The definition of social enterprises itself therefore has no bearing on the form of legal status taken by the enterprise. But are the definitions for SE and social enterprises as simple as that? Many would argue that any business in its truest sense has a social objective and that it's impossible for a business to achieve sustainability, if it does not have some form of social impact (Drucker, 1986). No one can argue that one of the highest, if not the highest current social priority in

South Africa is equitable job creation. Thus, should one consider those businesses that create jobs to operate in the domain of social impact, even when their boards and investors clearly show and communicate a single-minded pursuit for shareholder returns? Likewise, if all businesses have a social mandate, how does this differ from that of a social enterprise?

The argument returns to the need to demonstrate the dominance of an SVP as the highest ambition of the SE and that the SVP should form the basis from which social enterprises are distinguished from their purely commercial peers.

A different point of view in regards to the difference between SE and normal entrepreneurship emanates from the fact that enterprises, social and others, don't function in vacuums and are increasingly learning from each other. Through so-called 'sector-bending', for-profits and not-for-profits are increasingly adopting one-another's best practices and business approaches by sharing resources (i.e. contractors, consultants, services providers, employees, etc.), competing with each other, collaborating, and sometimes collectively creating new industries (Dees and Anderson, 2003).

This trend has possible negative implications in the sense that SE is perceived to be moving closer and closer to the commercial side on the enterprise spectrum, creating ever bigger distance from the traditional view of SE as charitable do-gooders. One view put forward involves the argument that such trends result in 'marketisation' where SE is viewed more through the lens of an entrepreneur (thus emphasising the individual over the community and giving preference to self-interests), rather than focusing on the social and the SVP (Eikenberry and Kluver, 2004). Fears arise that SE is losing its status as a civil society platform, and is becoming disconnected from social good and democratic accountability.

Others again argue that SE needs to have an impact beyond rattling the cage, but rather transforming the current status of society, or as stated by Martin and Osberg, creating a 'new equilibrium'. In their view, most businesses that would otherwise be classified as social entrepreneurial ventures, are in fact 'social service provisioning' (Martin and Osberg, 2007).

This appears to be too harsh. Their research, mentioning legendary entrepreneurial successes like Apple, FedEx and Ebay, already points to the fact that entrepreneurship itself can surely not be limited to instances of radical market-impacting and once-in-a-generation cases like Apple. Such a narrow definition of entrepreneurship would obfuscate or even deny the significant contribution of small entrepreneurial ventures, and the work of start-ups in the global economy. Witness the enormous role of the Mittelstand in Germany (CBI, 2011) or the impact of ICT start-ups on the US market since 1968 (Greenwood and Jovanovik, 1999).

Zadek and Thake simply define social entrepreneurship around the constructs of creating social value (i.e. relating back to the concept of the SVP), and secondly demonstrating activities related to innovation, or the creation of something new. In other words, SE has two main components being the focus on entrepreneurship as per normal definitions in literature, and secondly the presence of a clear SVP (Zadek and Thake, 1997).

Considering the previous paragraphs, it is therefore necessary when pondering the definition of SE, to consider the definition of entrepreneurship, as SE is a modification or extension of the concept of entrepreneurship. Again, various definitions for entrepreneurship abound, but critical agreements centre on the presence of opportunity, personal inputs, sacrifices and talent with which to pursue the stated opportunity, and lastly the development of an outcome (Austin, Stevenson and Wei-skillern, 2006).

Social Entrepreneurship, as outlined above can be defined therefore as a wide scope of activities that have the following in common: entrepreneurial effort and vision applied in the pursuit of opportunity where the primary drive is centred around some form of Social Value Proposition, and where the SVP is either embedded in the nature of the opportunity, or achieved through the benefits accrued from, and/or reinvested in the venture.

2.2.2 The context for social entrepreneurship in South Africa

SE is certainly not new to South Africa and SE research shows that societal propensity for SE amongst South African citizens falls within the global average (Visser, 2011). Research from Urban and others show a multitude of SE activities in all expected spheres of South African society (Urban, 2013).

In support of this, one would argue, given South Africa's well-documented income disparity and social challenges, that South Africa would be virgin territory for social entrepreneurship.

But does the South African context welcome SE and offer the necessary support structures and economic climate to foster SE? It appears that the South African government has not to date embraced SE as a means to address various service delivery and social redress challenges (Urban, 2013).

Urban points to the fact that the status of SE in South Africa cannot be discussed without exposing the raw-debate on government (non) service delivery and highlighting the ever-increasing plight of the poor.

This points towards a perceived immaturity in the SA context for SE, despite there being clear forces of SE supply (e.g. suitable propensity for SE amongst the SA population) and demand (e.g. visible social challenges and opportunities for SE). This statement is made in the context of the strong stance of government to be the custodian of the social context that in itself is not necessarily incorrect, but is a problem if government sees itself to be both custodian and solution provider. In other words, the environment in which all players in the SE continuum needs to operate is perceived to be disconnected, showing insufficient understanding and appreciation of the respective roles and values of each partner in said continuum.

The state of SE in SA is not limited only to macro issues as alluded to above. Visser points out that NGOs in South Africa have not embraced SE to the extent of its peers, and speculates as to possible reasons for this, some of which corroborates Urban's comments mentioned above. They include lack of leadership, lack of financial resources and poor vision (Visser, 2011).

But the status quo may very well contribute to an increased awareness of, and need for SE in South Africa. The Mail and Guardian runs an annual award that recognises SE and associated activities. In a 2010 article, the M&G states that corporate social investment and SE may be one of the biggest development trends in SA for the foreseeable future (McLeod, 2010).

The article points towards a positive future for SE based on a combination of factors, including increased social needs, the development of equitable financial instruments focused on social impact, and more and more success stories of SE-type activities, role models and investments; upwards of R17bn in private donations flowed towards 'good causes' in 2009, citing said article in the Mail & Guardian newspaper.

2.2.3 Aspects of social enterprise strategy

One can argue that social enterprises need to consider the same, or similar issues compared to normal enterprises, given the need to ensure performance against the double-bottom line. However, social enterprises appear to operate in more constrained market conditions than normal enterprises, given the 'limiting' mandates of SE and the associated SVP, more restrictive funding avenues compared to normal enterprises (a generalisation), and the fact that social enterprises may find it harder to scale given a multitude of factors including geographic restrictions, access to talent, difficulty to replicate the SVP beyond the founder's community, complex tax issues, etc.

One of the first challenges pertains specifically to growing the social enterprise beyond the initial attempts of the SE. The process of scaling the social enterprise should proceed along the concept of the "Five R's", being readiness, receptivity, resources, risk and returns (Dees, Anderson and Wei-skillern, 2004).

SEs depend very much on the development of, and participation in networks (Austin, Stevenson and Wei-skillern, 2006). Such networks are vital towards ensuring access to funding, talent and impact. Networks are also critical in the process of developing and fine-tuning strategy. Boschee points to the value of

learning from peers and utilising best practices as invaluable lessons for strategy (Boschee, 2006).

Some of these include pursuing earned income, focusing efforts and resources, refraining from getting hands dirty in unrelated business activities (thus, focus), fostering a culture counter to the stigma of non-profits to include taking risks, relinquishing control, etc.

2.2.4 The evaluation of social ventures

The market space has evolved and one cannot disconnect the issues of profitability and sustainability of working as a social entrepreneur. Increasingly, donors and funders are obsessed with sustainability criteria and ensuring that their money is spent responsibly. This means that SE is increasingly looking like normal entrepreneurship in the sense of how organisations are shrewdly and competently managed and measured/evaluated (Hanna, 2010).

After all, normal supply and demand will also apply to SE: with an increase in the uptake of social entrepreneurs, donors are facing the 'luxury' of having to choose between different stakeholders when issuing funds and support. This means that they are becoming more sophisticated in how they select, evaluate and negotiate with social entrepreneurs.

Hanna points to the need for SEs to prioritise along accountability demands, so as to ensure that maintaining the double bottom line is measureable, practical and doable. The double bottom line focuses on two aspects of measurement, one being accountability (primarily related to financial return on investment), and the second on the performance of the social enterprise in the implementation of its SVP (in other words social impact).

Many social enterprises are simply pulled in too many different directions by different parties, making monitoring and evaluation a task that overshadows the work of the SE, and possibly negatively detracts from the achievement of the SVP.

Most social enterprises are focused primarily on measuring (and reporting) on financial inputs and outputs to address the accountability requirements of donors,

trustees, stakeholders and communities. As this is the easiest to measure, it takes up most (if not all) of the available management time of most social enterprises.

But what about impact? SEs cannot measure everything. Some aspects of a social enterprise's SVP is easy to measure, such as the number of gang members counselled through a community-based call centre. But others are more difficult to measure, such as whether or not the counselling of gang members has had a positive impact on the social welfare of the community as a whole.

SEs should focus when attempting to measure social impact, on what is measurable and doable (Ebrahim and Rangan, 2010). The authors posit that there are various tools and methodologies, but that the SE sector in general is plagued by the fact that there are few cross-sector indexes and rating agencies that give a comprehensive and credible view on the social impact status of social enterprises.

For this reason, SEs should ensure good rapport with investors and stakeholders to define a workable metric for measuring and reporting on impact. In line with the above, Emerson points towards the need to appreciate that investment and return should not be approached as a trade-off between financial impact and social impact (accountability versus SVP performance) but are essentially two sides of the same coin (Emerson, 2003). However, pursuing the challenges of on-going measurement and shifting benchmarks is not the business for any SE, especially in South Africa where social enterprises are often understaffed, underfunded and under talented.

2.3 Linking commercial and social entrepreneurship

Entrepreneurship forms and approaches are primarily shaped by individuals (Markman & Baron, 2003). People are attracted to work settings that are consistent with their values and fulfil their needs (Cable & Judge, 1996), regardless of training and education. Although social entrepreneurs are known to prioritise the social mission or vision of their organisations, sector-bending (i.e. increasing overlap between for-profit and non-profit ambitions due to market forces and scalability demands) has resulted in rethink amongst entrepreneurs that are integrating social impact into their values (Dees & Anderson, 2003).

Most grants from DFIs are allocated to social impact projects owing to the source of their funding, being mostly non-trade related or non-discretionary grant funding (Busiinge, 2008). Because of this emphasis, more entrepreneurs are inclined towards social impact technology (www.HowwemadeitinAfrica.com).

2.4 Social impact and emerging market high-tech firms

“The information is disproportionally skewed towards social impact. People are getting the idea that African tech is all about social impact,” states Barnwell in a recent online discussion on the nature of technology entrepreneurship in Kenya (www.howwemadeitinafrica.com).

Some analysts and practitioners are becoming conscious of a world where social impact amongst for-profit businesses are becoming the norm, including Sean Smith, analyst and manager of new investments at Invested Development, a fund focusing on alternative energy and mobile technology start-ups. Smith, quoted from the above online discussion on technology entrepreneurship in Kenya, argues that it is possible to have both social impact innovations and profit- driven businesses in the same ecosystem.

The previous sections in the Literature Review allude to various market demands, presence of and emphasis on social networks, leveraging of social capital, perceptions of the benefits of technology, and the blending of approaches between for-profit and non-profit entrepreneurship. These drivers are separately and collectively opening a new awareness of both technopreneurship, as well as social impact needs and associated opportunities in emerging markets.

2.5 Commercialisation for high-tech firms in emerging markets

But surely addressing market opportunities and capitalising on the above trends in the previous sections - i.e. pursuing technology and social impact business opportunities in emerging markets, and commercialising high-tech products and services - require different skills and/or business models compared to the models found in Western literature? (Lingelbach et al, 2004).

Literature shows that technopreneurship businesses are more often than not founded by entrepreneurs with relevant tertiary degrees, especially in high-tech areas like biotechnology, mobile telephony and ICT (Viviers et al, 2013). One study of researchers, scientists and engineers found that amongst respondents with entrepreneurial intentions, those with a strong technical anchor had greater intentions to start a business in their current field of technical expertise (Lee & Wong, 2004). Hindle and Yencken agreed with the need for technical skills, stating that the knowledge resource and skills of the technology champion in managing technology development are important (Hindle & Yencken, 2004).

But only 4% of social entrepreneurs in SA were found to have tertiary qualifications, and only 8% had post-matric education (GEM, 2009).

Blanco argues that the ability to recognise business opportunities is one of the first and major skills an entrepreneur should acquire (Therin, 2011). But are the opportunity recognition skills of emerging market entrepreneurs sufficient for technology-related entrepreneurial success if the incumbents don't have sufficient technical skills with which to capitalise on said opportunities?

Entrepreneurship is not innovation. Entrepreneurial-minded individuals often defy the textbook criteria for success by “relying mainly on their intuition and prior knowledge” (Therin, 2011). Is this why social networks and capital are critical: to shape intuition and prior knowledge? Bouchiki answers in that the outcome of the entrepreneurial process is emergent from a complex interplay between the entrepreneur, the environment, chance events, and prior performance (Bouchikhi, 2009).

If entrepreneurs offering high-tech products and services in emerging markets don’t have the same level of technical skills and education as their peers in developed markets, then how does this impact on the success of their ventures?

Entrepreneurship requires the participation of a customer and some contend that a customer-centric approach should be the main focus of all entrepreneurial efforts (Prodan, 2003). Many technopreneurs and technopreneurship models in literature leave thinking about the market as the final step in a mostly linear

commercialisation process. But the customer and the subsequent marketing processes should be paramount to any business, even more so for high-tech businesses where facing long R&D and market cycles is the norm (Traynor & Traynor, 2004).

It is safe to conclude that in emerging markets, the target customer may be neither a uniform and/or generic individual, nor reachable through established supply chains and/or formal marketing channels (Chan & Cui, 2002). This creates a challenge for entrepreneurs to access information about, and/or interface with their end-customers, as those may be reachable only through social impact projects and/or working through community hierarchies. The challenge is compounded for technopreneurs as the strength of social networks (that are often comprised of a select few in emerging markets) may prove to be an obstacle to commercialisation, as such strong ties may hamper the socio-political legitimacy building needed for gaining new product buy-in (Elfring & Hulsink, 2002).

Commercialisation is more difficult for high-tech type businesses as the "identification of the market opportunity, business concept and business model is much more demanding because of the greater uncertainty about the optimal product/market position". Sometimes there clearly is no real market opportunity (Lee & Wong, 2004).

Deployment of ICT in India, for example, cast valuable insights on commercialisation: successfully addressing customer needs in the end had little to do with the role and impact of technology, but came as a result of empowering the rural poor to reorganise themselves and adopt new practices (Bhatnagar, 2000).

Research in Tanzania demonstrated challenges in getting 'customer' buy-in to new technology, as trust and openness to participate in any type of formal engagement, including testing of, and using new technology were critical stumbling blocks (Maloney, 2007). Indeed, emerging markets often place significant emphasis on the 'localisation' of business opportunities, as opposed to a one-way transfer of technology. One research paper warns that those offering high-tech products and services in emerging markets will fail if not actively

ensuring that commercialisation efforts stimulate entrepreneurship, learning and new venture creation in the recipient country (Lado & Vozikis, 1997).

Previous sections alluded to the fact that many DFIs are placing emphasis on the social impact of funded projects in emerging markets. Lessons from Kenya offer valuable insights as to the downside of this, both impacting the funder as well as the sustainability of the funded venture: an overemphasis on social impact may ultimately distract the entrepreneurs from building viable technology enterprises.

> "I fear that the kind of entrepreneurs you see in the Kenyan environment as a young techie are not people who build businesses, but people who work as consultants, people who have small companies doing IT and giving talks. Then there are the entrepreneurs with social apps and they get a lot of media coverage. These are the people considered to be successful. *There is not enough focus on businesses that make money*," says Barnwell (www.HowwemadeitinAfrica.com). (Italics added by author).

Labels, such as the 'Africa's Silicon Valley' (referring to the boom of mobile ICT in Kenya and Tanzania) or the 'Silicon Cape' initiative (referring to the network of technopreneurs in Cape Town) often hide the absence of tangible economic impact and presence of financially successful businesses as are assumed of the real Silicon Valley.

2.6 Social enterprise self-efficacy and measuring social impact

The previous sections alluded to the observation that commercial entrepreneurs and social entrepreneurs are not driven by the same motivations, as social entrepreneurs typically prioritise social impact rather than profitability alone. But similarly are commercial entrepreneurs not operating in a vacuum devoid of social realities.

Various social impact measures and measurement constructs have been developed over time, to assess the success of social entrepreneurial ventures (Urban, 2015). Many of these measures cluster vision, social networking, innovativeness, sustainability and financial returns as the primary dimensions to

be considered, when assessing social impact of firms (Nga and Shamuganathan, 2010). Building on this, Urban in 2015 expanded theory by linking the self-efficacy construct found in entrepreneurial literature, to social entrepreneurs, and showed that higher levels of social enterprise self-efficacy (SESE) result in greater levels of Social Impact. He went further and demonstrated that measuring SESE prior to funding a social entrepreneurial venture, may increase the ultimate probability of success of such a venture (Urban, 2015).

But, the above measures are intended for use in evaluating the success and impact of social ventures. Will the academic constructs also apply when assessing the social impact of non-social enterprises, in other words, assessing the social impact of businesses where the primary driver is not social impact or a social value proposition, but rather pure commercial returns?

Erez and Earley (1993) found that people achieve the greatest self-efficacy and productivity when their personal orientation is aligned with that of their environments. In other words, if an entrepreneur is immersed in a social environment that screams for social impact, and that prioritises social transformation and addressing basic social redress over pure commercial objectives, then said entrepreneur will probably find greater self-efficacy and productivity, if his/her objectives are similarly influenced or informed by social impact as echoed by the society in which said entrepreneur functions, even if such an entrepreneur is not primarily driven by social impact but rather commercial objectives.

This means that entrepreneurs, be they commercial, technopreneurial or social entrepreneurs, may not necessarily identify themselves as social entrepreneurs, despite their activities, modus operandi and outputs collectively qualifying themselves as social entrepreneurs in common social entrepreneur literature (Rivera-Santos et al., 2015).

2.7 Discussing SE literature with real practitioners

The researcher conducted three interviews with prominent South African entrepreneurs to test the above concepts outlined in theory, and to add depth and

understanding pertaining to real-world context. The interviews were selected based on existing relationships of the researcher and the following observations and opinions are entirely subjective and qualitative in nature. The outputs from the conversations below should not be construed as a representative view as the three interviews by no means originate from a meaningful sample.

The purpose rather is to achieve a better understanding of the literature on the high-tech/social-entrepreneurship relationship by expanding and validating the researcher's own review of these topics as outlined in the preceding literature review, to include statements and views from practitioners participating in the interviews. The following section thus relates the literature on high-tech entrepreneurship in an emerging market such as South Africa, supplemented with the real experiences of three individuals.

The interviews were conducted in 2012 and the responses should be viewed within the context of the respective development status and business activities of said entrepreneurs at that time.

The principal interview below was based on Marlon Parker. The other two interviews involve Colin Abouchabki and Jacques de Vos, and are referred to in the discussion in later parts of this section.

The motivation for choosing Marlon is the fact that he is (in the opinion of the researcher) a textbook SE. Colin on the other hand has a long history of high-tech entrepreneurship (previously the Product Manager for Vodacom South Africa) and does not consider himself to be a SE, but works as the heart and mind of a prominent and successful social enterprise using mobile telephony to scale social impact in Africa.

Jacques de Vos, a biomedical and serial high-tech entrepreneur likewise doesn't consider himself to be an SE but his work, and the products and services of his company result in tangible social impact, making him an easy target for someone wanting to label him as a textbook SE.

2.7.1 Marlon Parker – Reconstructed Living Labs (RLabs)

Marlon Parker is a South African social entrepreneur active in the domain of community empowerment through social media, innovation and ICT. He was one of the first South Africans to establish a community based user-centred research facility (also known as Living Lab), where he promoted the involvement of the community in the development of mobile phone based products and services for the community. Marlon achieved notoriety by using the South African social media service MXit to counsel Cape Flats drug dealers and gang members (Nicholson, 2008).

Marlon complies with the traditional definition of a social entrepreneur, being someone with strong community ties, developing a solution to address specific community challenges and investing considerable personal effort, resources, credibility and time, all in the single-minded pursuit of social impact.

In doing so, he utilised technology and innovation to increase social impact, and later formulated his social value proposition around the use of social-media, mobile telephony and innovation. Marlon created an Impact Centre to expand his counselling to schools, which was later scaled in the form of a social enterprise that today is known as RLabs.

Reconstructed Living Labs is a registered social enterprise and is based on the use of a Living Lab concept to draw on, involve and impact on the community. Studying the RLabs website, and speaking with Marlon, one can clearly see the emphasis on the core social values and social value proposition of RLabs.

In recent times, RLabs has undergone significant expansion, based on rapid awareness of Marlon's success, with such awareness driven through social media and the success of MXit as a platform. RLabs itself has been heralded as a successful Living Lab in South Africa, which has been a challenge for other Living Lab efforts in South Africa.

Marlon did not start off considering himself a SE and focused primarily on his work as a social activist. He had to espouse the principles of entrepreneurship as a way

to sustain his work as an activist, and this gradually resulted in his transformation from social activist, to social entrepreneur.

So too did Marlon not start off pursuing technology and innovation per se, but rapidly found these to offer the desired ability to scale his efforts, and rapidly increase the social impact sought as part of his stated SVP. Marlon has cleverly approached the process of scaling, and the strategy employed is that of collaborating with other NGO's, universities, governments and the private sector, continuously aided by the increased capabilities of social-media and mobile telephony.

To ensure sustainability and staying true to his identify and the SVP of RLabs, Marlon has retained strong community oversight in all activities, with the community representatives forming the ultimate decision makers on issues of scaling, strategy and sustainability. This strategy necessitates a simultaneous and continuous review of performance along the double-bottom line, by ensuring that financial impact and social impact are balanced responsibly. So for example does the social enterprise always seek to maintain a 70/30 split between earned revenue and grants, ensuring that the proverbial water-and-lights can always be paid through earned income, even when the donor's check is still in the mail. Staying within the original SVP, and managing the challenges of sector blending, Marlon has ensured that the social enterprise (RLabs) can benefit both from strong community involvement and oversight, as well as entrepreneurial vision, energy and growth.

It appears from the short interview and later review of articles and media releases about RLabs, that the continued success on both financial and social impact basis will be maintained through a process by which Marlon has shared and in some instances handed over his passion, vision and responsibility for RLabs, to a next generation of 'middle managers'. In this way, he has successfully sidestepped one of the critical failures of entrepreneurs, being the inability to hand over responsibility when the venture grows beyond the founder's capabilities. The management team has grown substantially and RLabs has itself formed a type of social enterprise franchise, thereby empowering growth and replication through other entrepreneurs, social activists and visionaries.

2.7.2 Colin Abouchabki, Chief Operating Officer of the Praekelt Foundation

A full interview was held with Colin Abouchabki, COO of the Praekelt Foundation. The Praekelt Foundation is a not-for-profit South African based social enterprise, using mobile phone and ICT solutions to improve the health and wellbeing of people living in poverty.

2.7.3 Jacques de Vos, CEO GeoMed

GeoMed is a South African bio-medical engineering and health-informatics start-up, founded by Jacques de Vos. It develops mobile phone and ICT based solutions for monitoring community health workers, relaying health information between primary clinics and medical facilities, and empowering point-of-care preventative healthcare.

2.7.4 Conclusion from interviews with three entrepreneurs

The conclusion from the literature review in regards to the definition of social entrepreneurship (SE), clearly points towards the presence of both a dominant social value proposition (SVP), as well as the creation of a social enterprise based on entrepreneurial activities.

Applying the above conclusion to the case of Marlon Parker renders an easy-fit. Marlon formed a strong SVP based on community impact and addressing community challenges, but did so through the formation of a sustainable social enterprise that continuously generates both earned revenue and attracts donor grant funding.

Colin Abouchabki concurs in so far as pointing towards the need for an SE to generate social impact (i.e. services and/or products that ‘deliver social impact and speak to the needs of the socially disenfranchised’), but to do so in an environment that requires the SE to face the normal entrepreneurial challenges of risks, sustainability and the need to ensure both financial and social returns.

Applying this definition to the work of Jacques de Vos, leaves one with the conclusion that one can similarly brand him an SE. The work of GeoMed, a start-

up founded by Jacques de Vos (thus clearly entrepreneurial in every aspect), has had significant social impact. The researcher has spent several years working with Mr De Vos and regularly reflects on whether or not he is an entrepreneur, or a social activist, given the extent of time spent on promoting his vision to social workers, primary healthcare professionals and government.

Most of his time is spent not developing technology or running the financial affairs of GeoMed, but rather 'evangelising' the proposed benefits of community health works and preventative medicine on the African continent. It is not clear from studying Mr De Vos, as to whether or not the dominant driver is the inner entrepreneur, or the inner social activist.

But, when reflecting on this (as can be seen in the transcript of the interview), Mr De Vos takes significant issue with being labelled an SE. This raises issues pertaining to the perception of social entrepreneurs, especially amongst those that started off as cold-blooded commercially minded entrepreneurs.

The reality is that Mr De Vos, in scaling his business, has had to embrace the social context in which his business functions, which implies dealing with ministries of health and social welfare, hospitals, clinics in developing countries, and generally meeting with the poorest, disenfranchised patients on the African continent.

Does this make him an SE? No. Because his intentions and primary drivers are not based on a SVP, but rather on a commercial value proposition that sees social impact as a market opportunity.

Reflecting on the Mail and Guardian article referenced in the Literature Review, Africa (and the developing world) will increasingly offer commercial opportunities for entrepreneurs like Mr De Vos. This is good for Africa.

Does he consider himself an SE? Definitely not. His answer to this question phrases the challenges for SE on the African continent, where many have witnessed the handout mentality of some social activists and SEs. Mr De Vos sees the future of Africa in the hands of entrepreneurs that are serious about success, sustainability and value-add.

Successful entrepreneurs in his mind equate to a prosperous future for Africa. Is this different than the vision espoused by most SEs operating in Africa? Probably not. But the difference in this regard between Mr Parker and Mr De Vos, is the fact that the one sees social impact as the output of his efforts (thus the SVP), whilst the other sees social impact as a very necessary output, and a clear (and primary) indicator of success, but not as the primary objective of his firm.

The belief of the researcher is that more and more entrepreneurs in Africa will realise the rationale behind the second focus on social impact, being social impact as a necessary output of entrepreneurial activity, being a clear indicator of entrepreneurial success and sustainability.

Thus, integrating the notion of the double bottom line in the measurements and business affairs of non-social entrepreneurial ventures. One needs to ask the question of whether or not the academic debate around the definition of SE and social enterprises would have gone differently, if the majority of the market environments in developed countries offered the opportunities for social impact, as is the case in South Africa and Africa? In other words, an entrepreneur in Africa today cannot do business without understanding the norms and challenges pertaining to social impact of doing business. This is not necessarily the case in the US or in Europe, where social impact for most businesses is a very distant and indirect issue.

Marlon Parker is evolving along the expected trajectory of an SE having achieved success in Africa, by needing to grow activities to meet demand. These forces are shaping his future (and the future of RLabs) in line with sector blending proposed by Dees et al.

But Mr De Vos represents a totally new breed of entrepreneur on the African continent that integrates social impact and social returns as part and parcel of doing good business.

Is there a future for SE in South Africa, and on the African continent? Mr Abouchabki points towards the fact that on the "demand" side, SA with its wealth of current social economical challenges offers many opportunities for social entrepreneurs to develop and implement a variety of social impact initiatives.

The above is based on the fact that South Africa is a two-tier market where there is a substantial proportion of the population that has not benefited from economic developments, access to services or increased human dignity following wide-scale democracy since 1994. Government is not able to address these shortcomings alone, and the private sector is primarily caught up in competitive pressures to remain profitable and globally competitive. These two factors mean that we are not able to serve the needs of the total population as a country, and need new interventions and role-players to address such shortcomings. This is where social entrepreneurs can and do have a large role to play.

Mr Abouchabki points out that much more could however be done by government and corporate SA to work with local and international donors and NGOs to put in place the required mechanisms to promote and facilitate public, private partnerships and other interventions aimed at assisting social entrepreneurs in getting their respective social impact initiatives off the ground and scaled up.

What makes South Africa a very exciting place to work as a social entrepreneur is the fact that we have highly competitive, highly trained and technology savvy skilled people, operating in a two-tier market. This means that social entrepreneurs have the opportunity to both develop cutting edge solutions and business models, whilst innovating around the needs of the socially marginalised. Europeans and even Americans may have the technology savvy, but don't wake up daily in a world that has extremely rich people on the one side of the road, and extreme poverty on the other.

2.8 Conclusions of the literature review

The above clearly shows that market dynamics and social impact needs point to a convergence between Technology Entrepreneurship (pursuing market opportunities in emerging markets hoping to leverage the perceived scalability and benefits offered through high-tech products and services), and Social Entrepreneurship (responding entrepreneurially to the vast social needs and challenges present in such markets).

Emerging markets offer exciting prospects for Small and Medium sized Enterprises (SMEs) that are able to bring technology based products and services to market. But SMEs face the above-mentioned challenges of absence of formal market channels and prioritisation of social needs amongst their potential customer base, when operating in such markets.

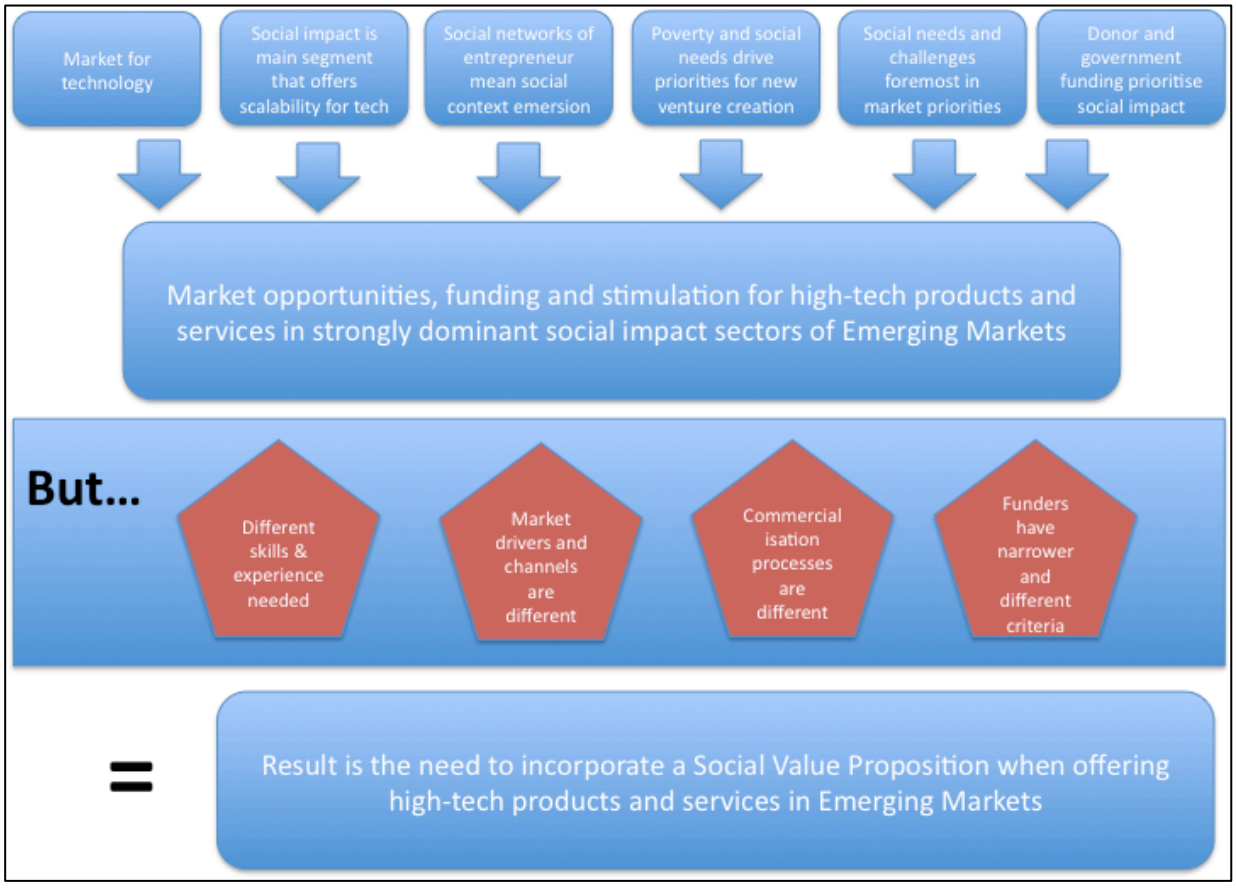


Figure 1: Research logical model

The following propositions follow the above conclusions made in the review of literature as recorded in Chapter Two: Literature Review:

Proposition One:

High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success if able to identify and/or relate with a social impact need or vision.

Proposition Two:

High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success when there are higher levels of Entrepreneurial Orientation.

Proposition Three:

High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success when there are higher levels of social enterprise self-efficacy.

Proposition Four:

High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success when there are both higher levels of social impact considerations (represented by either social impact measures or social enterprise self-efficacy) and higher levels of entrepreneurial orientation.

Proposition Five:

Social impact awareness is not the primary driver of successful high-tech enterprises in emerging markets.

CHAPTER 3: RESEARCH METHODOLOGY

The research aims to answer the above research questions through the formulation, distribution, collection and analysis of a standardised research questionnaire distributed amongst SMEs (and entrepreneurs) offering high-tech products and services in South Africa.

3.1 Research methodology/paradigm

The approach of this study is that of positivist social research as it seeks to assess the strategies, business models and/or specific skills sets of individuals (representing the SME market) offering high-tech products and services.

The methodology centres on a quantitative study, using a research questionnaire, so as to probe a large sample of potential respondents asking close-ended questions, in order to answer the stated research questions. The proposed respondents for this research study are SMEs and entrepreneurs offering high-tech products and services.

3.2 Research Design

The research method used for this study is a non-experimental correlational cross-sectional study. This description is appropriate because there will be no treatment administered to the SMEs. A descriptive study is a quantitative method of research in which one is trying to determine a relationship between two or more quantitative variables within a group of subjects (Waters, 2012), and will be assessing the relationship between the success/failure of SMEs offering high-tech products and services in emerging markets, and the presence (or absence) of social impact considerations, including the ability to identify or align with a social need.

3.3 Population and sample

3.3.1 Population

The population for this study is SMEs. The population drew on the networks of the researcher, which mostly cover Southern African SMEs, as well as a limited number of SMEs offering high-tech products and services in other emerging market countries such as Nigeria, Kenya, Tanzania, Senegal and Vietnam.

The research considered all forms of enterprises that fall within the broader definition of SMEs, including those operated as sole-proprietorships, i.e. where the enterprise is operated by a single individual (sometimes loosely referred to as the 'entrepreneur', whether entrepreneurial or not). This is to cater for the large number of going-concerns in emerging markets where the proprietor considers himself/herself an 'entrepreneur' rather than an SME. For the purposes of the research, SMEs include formal enterprise, and individuals operating formal enterprises.

For the purposes of being categorised as a high-tech enterprise, respondents were asked to indicate that it is either a developer of products and services regarded as high-technology in nature, or a supplier of high-tech products that are generally new to the market and therefore requiring a high level of commercialisation.

In order to rate enterprise success, respondents had to indicate the number of years the business has been in operation, and supply information related to the last few years' growth in employment numbers and turnover.

3.3.2 Sample and sampling method

The research includes existing measurement instruments and research constructs found in literature, including those dealing with measuring social impact, social enterprise self-efficacy as well as the broader concept of entrepreneurial orientation as outlined in the chapter on literature review. Accordingly, the research aims to build on existing constructs and literature by sampling those SMEs within the researcher's networks and or 3rd party networks which

represents a convenience sample that is cheap, easy and quick to obtain (Neumann, 2011). The sample group will not fully represent the entire and/or desired population of SMEs offering high-tech products and services in emerging markets, as this would be impossible to obtain given the limitations of the researcher's networks, available resources, and timeframe relevant to the research objectives.

Non-probability sampling as used in this study implies that it does not involve random selection and that it will prove more difficult to generalise the results to the entire population, and thus possibly render poor external validity (Cooper et al, 2011). However, this may or may not be influenced positively given the number and diversity of responses.

3.4 The research instrument

The research instrument used in this study is a questionnaire. The questionnaire is the most common data collection instrument in business research (Cooper et al 2011). The research instrument was structured into six main sections:

Section one:	Enterprise classification and description
Section two:	Employment, turnover and enterprise age
Section three:	Entrepreneurial Orientation measurement instrument
Section four:	Social Impact Measurement
Section five:	Social Enterprise Self-Efficacy measurement instrument
Section six:	Future outlook on social impact and cross-correlation

3.4.1 Section 1: About the respondent

The questionnaire starts by asking questions specific to the respondent (size and classification of business, services and products offered, location of activities, years in operation, background of respondent (e.g. position in business, etc.), demographics, etc.

The objective of section 1 is to describe the respondent so as to determine fit within the context of size (SME or not), location of activities (Emerging markets or not) and whether or not the respondent offers high-tech products and services.

3.4.2 Section 2: Firm description and attributes

Section two probes the trade history of the respondent with the objective to create a basis for later comparison between "successful" respondents and subsequent presence of proposed attributes (such as presence of a Social Value Proposition, etc.).

The objective of section 2 is to ask questions with which to assess whether or not the respondent can be classified as successful (using existing metrics in literature) and entrepreneurial (using existing metrics and models in literature).

3.4.3 Section 3: Entrepreneurial orientation

Section three contains the measurement instrument for assessing entrepreneurial orientation. This includes nine separate questions pertaining to the innovativeness, risk-appetite and proactiveness of the firm's management.

3.4.4 Section 4: Presence of social impact considerations

Section 4 asks probing questions as to the presence of social impact considerations in business strategy, models and/or skills sets, and utilises a standard Social Impact Measurement construct available in literature.

3.4.5 Section 5: Motivations for presence of social impact considerations

Section 5 is aimed at assessing the social enterprise self-efficacy of the firm and uses the Social enterprise self-efficacy construct taken from existing literature. It now seeks to understand what the motivations are for the presence of social impact considerations.

3.4.6 Section 6: Future considerations in regards to a social impact

The last section aims to understand how social impact considerations will impact the future decisions, strategy, business models and skills of the business. This section will be open to all respondents, whether or not social impact considerations were significant as per responses in previous sections.

3.5 Consistency matrix

Sub-problems	Questionnaire items	Propositions
Are SMEs, offering high-tech products and services in emerging markets, consciously formulating social value propositions so as to be successful?	Section 2 (successful or not) and section 4 (presence of social impact considerations)	High-tech businesses offering products and services to emerging markets need to have some form of Social Value Proposition, defined formally or informally.
Do such SMEs, offering high-tech products and services in emerging markets, consider themselves to be entrepreneurs, technopreneurs and/or social entrepreneurs?	Section 3 (entrepreneurship tendencies and reasoning for the creation of the start-up)	Current standard typology of entrepreneurship, technopreneurship and social entrepreneurship does not adequately apply to the blended approach taken by SMEs offering high-tech products and services in emerging markets.
If having to develop different commercialisation strategies, business models and/or skills necessary for success in emerging markets, was this as a result of the need to demonstrate a social value proposition?	Section 4 (presence and influence of social impact considerations)	***Successful*** high-tech entrepreneurs offering products and services to emerging markets have some form of Social Value Proposition, formally or informally.

Sub-problems	Questionnaire items	Propositions
What is the primary driver for increased interest of high-tech SMEs to enter emerging markets: profits, social impact, need to scale technology?	Section 5 (motivations for presence of social impact considerations)	Social impact and social entrepreneurship in emerging markets are respectively becoming the market opportunity attracting entrepreneurs.

Table 1: Consistency matrix

3.6 Procedure for data collection

Data collection methods influence a test's reliability and validity (Pedhazur & Schmelkin, 1991). Some frequently used methods include surveys (mail or administrated questionnaire survey), experiments, personal or telephone interviews, and secondary data. For this study an online questionnaire was emailed to a list of participants to complete online. Some respondents were contacted for clarification of responses. Although this means that participation may not be fully anonymous (respondents had an option to supply contact details), the contact details and response-specific mentions have been omitted from the research report, thus protecting anonymity and confidentiality of respondents.

The research questionnaires were distributed electronically using Google Forms, during February and March 2014 and a total of 72 completed responses were received. 64 responses were accepted into the final research sample following the removal of a test record, two records that were clearly not qualifying as high-tech enterprises, and lastly removing five records of enterprises that were less than 12 months in business; the latter removed for not enabling historic comparison for the purposes of rating success.

Additional research descriptives were collected including information about reason for starting the business, enterprise location and location of primary market.

3.7 Data analysis and interpretation

Before examining quantitative data to test the various propositions, the raw data is cleaned and captured into a format that is easier to analyse using statistics software. Data coding can be a simple task if the data is recorded as numbers on well-organised recording sheets. The coding procedure is about creating a set of rules, stating that the researcher will assign certain numbers to variable attributes (Neuman, 2006).

3.7.1 Creating a data set containing the research sample

The raw data obtained from the survey questionnaire via Google Forms was exported into an Excel spreadsheet and questions were grouped and coded according to the consistency matrix, which correlates with the different propositions.

3.7.2 Data coding

Each data record in the sample was allocated a unique identifier (1 to 71) and was used to ensure that record integrity could be enforced throughout, especially in instances where records were removed, sorted or changed.

The primary variables (EO, SIM, SESE and SIF) and corresponding items were labelled according to the variable name and item number (e.g. EO1 to EO9, etc.). Categorical variables, such as whether or not a respondent considered itself to be high-tech (Yes, or No) were coded where 0 represented ‘No’, 1 represented ‘Yes’ and ‘2’ was used in questions where a third option existed, such as ‘Neither’ or ‘Unsure’.

Similar coding was used to represent firm age (coded into 0 to 4), enterprise growth (-1, 0, 1 with -1 indicating that the enterprise did not grow in the preceding year) and firm profitability (0, 1). Calculated items were included to represent items that were formed from two or more other items in the data set, such as EOavg to represent the average of the nine EO variable items, as well as the formation of

the variable Success (later used as the dependent variable) which was calculated based on the logic outlined in later sections of this report.

Collectively this resulted in the creation of a final Excel file that contained only the coded records to be used in further statistical analysis is reported on in the remainder of this document.

3.7.3 Data analysis tools and software used

The researcher did not have success in using IBM's SPSS statistical software tool, due to difficulties in accessing the student version and failing to get the software to function properly on an Apple operating system.

For this reason, Microsoft Excel™ was used as the primary software to record, review, manipulate and report on the final sample. Regression analysis was performed using the trial version of StatsPlus™, a free statistical analysis toolkit downloaded from the Internet. Factor analysis was conducted using another demo version of a statistical analysis toolkit, named XLStat™. Both software packages integrated seamlessly into Microsoft Excel and produced results that were automatically populated into the main Excel spreadsheet used for the statistical analysis.

3.8 Measurement instruments

Measurement instruments in existing literature were built into the survey questionnaires so as to enable comparison of results with those found in literature. Three instruments cover the main research themes required to answer the main propositions outlined earlier, being respectively Social Impact Measures (SIM) (to assess the overall social impact of each respondent), Social Enterprise Self-Efficacy (SESE) (to assess an individual respondent's awareness of, personal views on and reflection on social vision, needs and context in the market environment in which the business operates), and lastly Entrepreneurial Orientation (EO) (to characterise the entrepreneurial strength of the business using familiar scales).

Social Impact Measures were adopted from the Centre for the Advancement of Social Entrepreneurship (Dees et al., 2002). The purpose of the SIM construct is to assess the respondent across a number of social impact dimensions including reach and impact of a social impact initiative, innovativeness, the potential for expanding the initiative and lastly the sustainability of the initiative.

The SIM measures were included for sake of depth and rigour as reported in literature. SIM itself is on the face of it intended for the review of social entrepreneurial activities where the specific intent is focused around a tangible social impact initiative. This is apparent from reviewing the underlying questions comprising the four main dimensions of SIM and begs the question as to whether or not non-social entrepreneurial firms will be able to recognise social impact in their own entrepreneurial activities, as such respondents most probably may not pursue social impact initiatives in their main stream business activities, as this is not the purpose of their ventures; and worse, possibly only perceive social impact initiatives as something related to ad hoc outreach type activities such as corporate social investment (Baron & Markman, 2003). However, all respondents had to complete the component in the questionnaire dealing with SIM and the research will determine if this measure succeeded or not.

The primary objective of the research as encapsulated in the first proposition, is to determine if respondents could identify and/or relate to a tangible social need within the context of pursuing their day-to-day business activities. The researcher's assumption as informed by literature, is that high-tech entrepreneurs in emerging market conditions will only be able to sell their products or services, if they are able to translate the value proposition of such products or services in the language of tangible social needs. Similarly, as shown in the literature review in chapter two, are many of the procurement and/or sales channels for new products and services based on public procurement mechanisms that assess social impact (e.g. addressing a citizen need such as access to clean water, sustainable energy, or affordable telecommunications), rather than the technical merits of the proposed product or service.

For this reason, the research instrument includes a number of variables from the guide to SE at the National Centre for Social Entrepreneurs (2001), where the objective is to use the variables to probe the awareness of a social need, social

vision, or indicate whether or not a respondent was aware of general social issues within the context of implementing day-to-day business activities. The purpose therefore of using selected variables (only ten most relevant of the fourteen variables were selected from those used in similar application of the SESE construct (Urban, 2015) was to assess social enterprise self-efficacy, as well as use the underlying questions relevant to identifying whether or not respondents were able to identify with social impact awareness.

The last construct included in the research process was included to validate the primary dependent variable (Success). To determine this, the research instrument included a section assessing entrepreneurial orientation as a construct. EO has been studied in various instances and sufficient literature points towards EO best characterised by three primary dimensions namely Innovation, Risk-taking, and Proactiveness, in total measuring the entrepreneurial intensity of the enterprise (Sharma and Dave 2011). The measurement instrument adopted for EO in this research study was taken from existing literature and is comprised of nine dimensions (EO1 to EO9). Some researchers such as Sharma and Dave (2011), Miller (1983) and Covin and Slevin (1989) have defended the use of all nine variables as a single construct whilst others have focused on the three individual dimensions.

Proactiveness in the EO construct is defined as the ability to anticipate the market (Lumpkin and Dess 1996), including risks, opportunities and trends, and then provide the necessary strategic direction and vision necessary to deliver against such anticipations (Venkataraman 1989). Building on the propositions outlined before and applying literature in regards to the social impact conditions in emerging markets, the expectation would be that firms with a higher level of success would similarly demonstrate higher levels of Entrepreneurial Orientation (EO). For the purposes of the research outlined in this report and supported by above literature, EO will be used in this research by averaging all nine dimensions to form a single construct to represent the entrepreneurial orientation of each respondent, termed EOavg.

3.9 Scales and variables

3.9.1 Standardising on a Likert scale for main variables

Items falling within the scope of the research propositions were emphasised in the above measurement instruments, especially measures related to social impact, innovation (both in the measures for social impact as well as entrepreneurial orientation) and especially measures related to social vision and the identification of a social need. Likert scales were used for all measurement items, ranging from 1 to 7 (1 being strong disagreement and 7 being full agreement with the measurement question).

Applying the Likert scales through an easily accessible and online research instrument allowed respondents to quickly work through the relatively large number of questions, whilst ensuring automatic and faultless capturing of responses (no unanswered questions were allowed by the online tool), leaving complete and full responses from each research participant.

3.9.2 Calculation of the dependent variable Success

A separate variable named Success was introduced for the purposes of testing the stated propositions listed earlier; an attempt at quantifying a non-subjective measure of success, as opposed to leaving it to respondents to indicate whether or not they believed themselves to be successful or not.

The reasons for creating a tailor made variable for this purpose was firstly because success as a construct is a very subjective and contestable measure, evident in the large number of ratings and rankings used to compare business enterprises, many of which function on publically available information such as annual financial statements or share prices. Such ratings and rankings typically include both hard measures (e.g. financial turnover, employment figures, firm age) and soft measures (e.g. workplace satisfaction, customer satisfaction) and are difficult to apply to SMEs in emerging markets as disclosing financial performance information is not a statutory requirement (Chong, 2008).

The second reason for creating a special variable for success was to introduce a credible yet practical measure supported by literature and applicable to easily quantifiable metrics, such as growth in turnover, changes in profitability and the age of the venture. The researcher settled on three hard measures adopted from an economic impact assessment methodology developed for, and used in the assessment of business incubators in Canada (Smith, 2013).

The variable Success was subsequently defined as a combined score, ranging between 1 (not successful) and 7 (very successful), by awarding higher scores for increases in employment numbers, growth in turnover and additional points for such growth in consecutive years. The measure considered the last two years of data submitted by respondents. Respondents that have been in business longer scored additional points over and above those for employment and turnover, based on the sustainability of the enterprise.

3.9.3 Dependent and independent variables

The primary variable to be studied is that of Success (dependent variable), and this is analysed based on its relationship with variables used for descriptive statistics as well as those from the three main measurement instruments (thus independent variables):

Variable	Purpose/construct	Type	Items
Success	Calculated variable to represent firm success based on firm age, growth in employment, and turnover	Dependent variable	Success
EO	Entrepreneurial Orientation	Independent variable	EO1 to 9, EOavg
SIM	Social Impact Measurement	Independent variable	SIM1 to 14, SIMavg
SESE	Social enterprise self-Efficacy	Independent variable	SE1 to 10
SIF	Social Impact Future intentions	Independent variable	SIF1 to 4

Table 2: Description of primary variables

3.10 Limitations of the study

Relying on a convenience sample based on the direct and 3rd party networks of the researcher means that the study may be weak in terms of external reliability. This weakness of external reliability is possibly manageable through the number and diversity of responses.

The study is intended to focus on high-tech firms. High technology is a dynamic concept that can be interpreted subjectively as evidenced by the responses in the final sample. Some firms consider themselves to be high-tech but not offer any high-tech products or services, or having high-tech operations, but rather aspiring to be future high-tech firms (e.g. consultancies, research firms, computer support, etc.). Other firms again clearly demonstrate high-tech activities, but do not consider themselves to be high-tech, but rather see themselves as domain specific firms (e.g. a financial services firm despite the business activity centred on the development of high-tech mobile banking). This collectively means that there will be a margin of subjectivity towards the final sample in so far as classification related to high-tech businesses.

The purpose of the study is to assess the behaviour of emerging market firms. South Africa is grouped by some as an emerging market with other emerging markets such as China and Brazil. The term emerging market is confusing as it encompasses countries that are vary different in size (Chinese population upwards of a billion people, compared to 60 million South Africans), market focus and development stage. However, given the nature of the researcher's network being predominantly based in South Africa, the label 'emerging market' will be applied to all data from South African or similar emerging market countries.

The choice of respondents in the final sample was very much informed by the personal networks of the researcher, which in itself covers both high-tech and non-high-tech firms. This opens the final sample to an element of high self-selection bias, both from the researcher's determination of which firms are regarded as high-tech or not, but also from the point of view of the respondents, that also self-select based on own application of the definition for high-tech firms.

Final respondents varied considerably in size and age of the firm, and the final sample therefore represents a broad spectrum of firms, even more so when adding the dimension of firm type (entrepreneurial, technopreneurial, social entrepreneurial, etc.).

A last limitation worth mentioning is the fact that most of the firms in the final sample, being predominantly high-tech in nature, are unfamiliar with the world of social impact literature and therefore social impact constructs. This is significant given the use of social impact measurement and social enterprise self-efficacy measurement constructs that utilise a number of concepts and terminologies commonly used in the social enterprise world, but that may not be familiar at all to high-tech firms. So for example can non-social enterprise firms see social impact purely as activities involved in corporate social responsibility, transformation (e.g. BBBEE) and enterprise development (e.g. EDI) pursuits, rather the social impact of day-to-day business activities.

The above limitations were addressed in part through an introductory letter outlining the purpose of the research, the different definitions and through awareness of such potentially confusing aspects outlined above.

3.11 Validity and reliability of research

3.11.1 External validity

External validity refers to the extent to which the results from a particular research are generalisable. Various other forms of validity are described, such as descriptive validity (the factual accuracy of what the researcher reports), interpretative validity (the accuracy of the meaning of participants that is conveyed by the researcher), and theoretical validity i.e. the degree to which the theoretical explanation fits the data, (Saunders et al.2009). The results will be validated against literature in later sections, especially in areas where high-conformity is expected (i.e. motivations for starting high-tech ventures) to ensure that responses match expectations. Results will be additionally correlated using the outputs from the three discussions with entrepreneurs outlined in the literature review.

3.11.2 Internal validity: Success and EO

Internal validity is the degree to which the research can conclude that observed relationships are causal, and not attributable to flaws in the design (Saunders et al., 2009). This is particularly important when research is aimed at making statements about cause and effect. This is relevant to the proposed research as this research is examining cause. The researcher could have had additional discussions with respondents post data collection to validate understanding, although it may be difficult to show causality. This however was not deemed necessary.

The main constructs (EO, SIM and SESE) utilised in the measurement instrument builds on literature pointing towards the accepted use of averaging the underlying items in each variable and using that result as a grouped indicator of construct outcome.

This could otherwise be achieved by attempting to reduce the underlying items (e.g. EO1 to 9, or SE1 to 10) to a number of statistically acceptable and meaningful representative factors or dimensions. The process of doing so is referred to as exploratory factor analysis (EFA) and is used when there is no concrete indication from theory of any specific cluster or dimensionality in the data, or if there is a specific expectation from the researcher as to the presence of underlying clusters or dimensions in the research instrument (Floyd & Widaman, 1995). A similar technique builds on known dimensions, i.e. when clusters in the underlying items are known to exist, and is referred to as confirmatory factor analysis (CFA).

The following section outlines the results from using factor analysis to test the validity of data in the final sample, by testing whether or not the expected dimensionality in the EO variable is in fact present (Child, 2006). Since the underlying factors are known from literature, the researcher is using factor analysis not for the purposes of extracting factors, but as a means to assess internal validity by seeing if the same clusters are present in the data, as those found in literature.

	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9
Count	64	64	64	64	64	64	64	64	64
Average	5.52	4.48	4.38	5.00	5.31	3.91	4.97	4.81	4.89
Std Dev	1.71	1.67	1.77	1.54	1.54	1.65	1.56	1.71	1.68
Variance	2.92	2.79	3.13	2.38	2.38	2.72	2.44	2.92	2.83
Log Variance	0.47	0.45	0.50	0.38	0.38	0.43	0.39	0.46	0.45
Skewness	-1.27	-0.44	-0.2	-0.72	-1	0.07	-0.74	-0.67	-1.08
Kurtosis	0.62	-0.54	-0.97	0.01	0.26	-1.05	0.08	-0.33	0.55

Table 3: Descriptive statistics for EO items

In order to use FA, certain conditions need to be met, including firstly whether or not there are sufficient records in the test sample. Different limits have been suggested in literature with the minimum suggested sample containing at least 100 records. Comrey and Lee (1992) recommends a lower limit of at least 300 records. Both instances exceed the relative low number of records in the final sample, containing only 64 records and therefore not meeting the first condition for factor analysis.

A further condition is that there needs to be univariate and multivariate normality within the data (Child, 2006) and an absence of univariate and multivariate outliers. There are no multivariate outliers in the data, but items EO1 and EO9 have Skewness scores falling outside of the acceptable range (+/-1) indicating a departure from normal distribution (Cramer, 1997).

In addition to this, using EOavg as a single factor is considered potentially risky, with the recommendation that there should be at least more than two factors to represent the construct, a condition satisfied with the three factors (EOi, EOr and EOp). When reducing the overall construct to two or three factors, there should be very high correlation between the underlying variables (EO1 to EO9), with the suggestion of correlation more than 0.7 (Child, 2006).

Success	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9
1	0.07	0.35	0.28	0.37	0.19	0.16	0.10	0.13	0.13

Table 4: EO inter-item correlation

Correlation matrix (Pearson (n)):

Variables	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9
EO1	**1**	0.261	0.303	0.337	0.516	0.057	0.523	0.643	0.434
EO2	0.261	**1**	0.732	0.215	0.162	0.011	0.231	0.188	0.273
EO3	0.303	0.732	**1**	0.221	0.183	0.203	0.228	0.145	0.201
EO4	0.337	0.215	0.221	**1**	0.734	0.218	0.382	0.247	0.300
EO5	0.516	0.162	0.183	0.734	**1**	0.180	0.366	0.300	0.264
EO6	0.057	0.011	0.203	0.218	0.180	**1**	0.350	0.067	0.202
EO7	0.523	0.231	0.228	0.382	0.366	0.350	**1**	0.497	0.747
EO8	0.643	0.188	0.145	0.247	0.300	0.067	0.497	**1**	0.606
EO9	0.434	0.273	0.201	0.300	0.264	0.202	0.747	0.606	**1**

Kaiser-Meyer-Olkin measure of sampling adequacy:

EO1	0.681
EO2	0.579
EO3	0.561
EO4	0.675
EO5	0.647
EO6	0.504
EO7	0.725
EO8	0.723
EO9	0.699
KMO	0.661

Table 5: Kaiser-Meyer-Olkin measure for EO

Only two of the nine variables for EO (EO2 and EO4) have higher coefficients than 0.3 as outlined in table 4 above, and therefore fail the third requirement for factor analysis.

The researcher chose to continue with the factor analysis, despite the above reservations.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy above gives the measure for each individual item as well as the total KMO measure for all nine items. It ranges between 0 and 1 with a low value indicating that it is not possible to extract factors. Kaiser (1974) suggested that factors should not be extracted for KMO values below 0.5; ideally one should seek to extract factors for values upwards of 0.7.

As indicated in the above table, only EO7 and EO8 had KMO values above 0.7, with the remainder of items ranging between 0.5 and 0.7. Kaiser recommends that

one refrain from extracting factors for items with values in last-mentioned range (0.5 to 0.7) as the quality of the sample is therefore considered mediocre.

Cronbach's alpha: 0.809

Factor analysis:

Reproduced correlation matrix:

	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9
EO1	0.716	0.328	0.261	0.451	0.529	-0.059	0.554	0.680	0.579
EO2	0.328	0.873	0.855	0.190	0.154	0.020	0.216	0.196	0.240
EO3	0.261	0.855	0.879	0.246	0.183	0.195	0.247	0.118	0.231
EO4	0.451	0.190	0.246	0.829	0.845	0.286	0.369	0.234	0.228
EO5	0.529	0.154	0.183	0.845	0.888	0.171	0.371	0.313	0.248
EO6	-0.059	0.020	0.195	0.286	0.171	0.878	0.459	-0.035	0.303
EO7	0.554	0.216	0.247	0.369	0.371	0.459	0.794	0.632	0.763
EO8	0.680	0.196	0.118	0.234	0.313	-0.035	0.632	0.767	0.698
EO9	0.579	0.240	0.231	0.228	0.248	0.303	0.763	0.698	0.784

Residual correlation matrix:

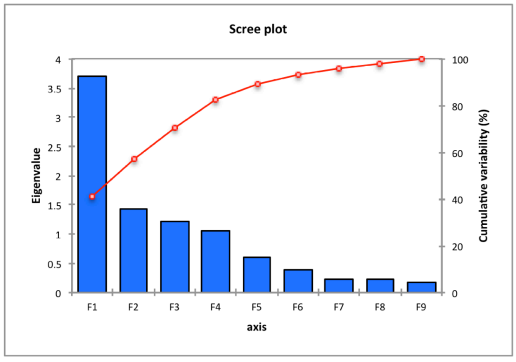
	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9
EO1	0.284	-0.067	0.042	-0.114	-0.013	0.116	-0.031	-0.037	-0.145
EO2	-0.067	0.127	-0.122	0.026	0.008	-0.009	0.015	-0.008	0.033
EO3	0.042	-0.122	0.121	-0.025	0.001	0.008	-0.019	0.026	-0.030
EO4	-0.114	0.026	-0.025	0.171	-0.111	-0.068	0.012	0.013	0.072
EO5	-0.013	0.008	0.001	-0.111	0.112	0.009	-0.005	-0.014	0.016
EO6	0.116	-0.009	0.008	-0.068	0.009	0.122	-0.109	0.102	-0.101
EO7	-0.031	0.015	-0.019	0.012	-0.005	-0.109	0.206	-0.135	-0.016
EO8	-0.037	-0.008	0.026	0.013	-0.014	0.102	-0.135	0.233	-0.092
EO9	-0.145	0.033	-0.030	0.072	0.016	-0.101	-0.016	-0.092	0.216

Table 6: Reproduced and residual correlation matrix for EO items

The above matrix shows the results of calculating the difference between the values in the item correlations matrix and the reproduced correlation matrix, with last-mentioned automatically calculated by the statistical software as the factor loadings matrix, with its transpose.

Eigenvalues:

	F1	F2	F3	F4	F5	F6	F7	F8	F9
Eigenvalue	3.696	1.441	1.214	1.058	0.595	0.381	0.234	0.216	0.166
Variability (%	41.064	16.014	13.484	11.753	6.609	4.238	2.600	2.398	1.840
Cumulative %	41.064	57.078	70.562	82.315	88.924	93.163	95.763	98.160	100.000



Eigenvectors:

	F1	F2	F3	F4	F5	F6	F7	F8	F9
EO1	0.394	0.095	0.132	-0.319	-0.544	-0.411	-0.058	-0.151	0.474
EO2	0.257	-0.651	0.094	-0.083	0.195	0.109	0.491	-0.446	0.072
EO3	0.261	-0.656	-0.015	0.078	-0.178	-0.045	-0.456	0.471	-0.177
EO4	0.334	0.079	-0.567	-0.134	0.324	0.281	-0.469	-0.285	0.242
EO5	0.345	0.146	-0.530	-0.269	-0.044	-0.107	0.501	0.381	-0.310
EO6	0.171	0.044	-0.268	0.802	-0.407	0.173	0.174	-0.092	0.139
EO7	0.411	0.180	0.171	0.287	0.262	-0.510	-0.157	-0.306	-0.490
EO8	0.362	0.221	0.383	-0.180	-0.278	0.656	-0.052	-0.075	-0.354
EO9	0.388	0.162	0.352	0.192	0.465	0.081	0.136	0.471	0.446

Factor pattern:

	F1	F2	F3	F4	ial communa	ial communa	ecific variance
EO1	**0.758**	0.114	0.145	-0.328	1.000	0.716	0.284
EO2	0.494	**-0.782**	0.103	-0.085	1.000	0.873	0.127
EO3	0.502	**-0.788**	-0.017	0.081	1.000	0.879	0.121
EO4	**0.641**	0.095	-0.624	-0.138	1.000	0.829	0.171
EO5	**0.664**	0.175	-0.584	-0.276	1.000	0.888	0.112
EO6	0.328	0.052	-0.295	**0.825**	1.000	0.878	0.122
EO7	**0.791**	0.216	0.188	0.295	1.000	0.794	0.206
EO8	**0.696**	0.265	0.422	-0.185	1.000	0.767	0.233
EO9	**0.746**	0.194	0.388	0.197	1.000	0.784	0.216

Values in bold correspond for each variable to the factor for which the squared cosine is the largest

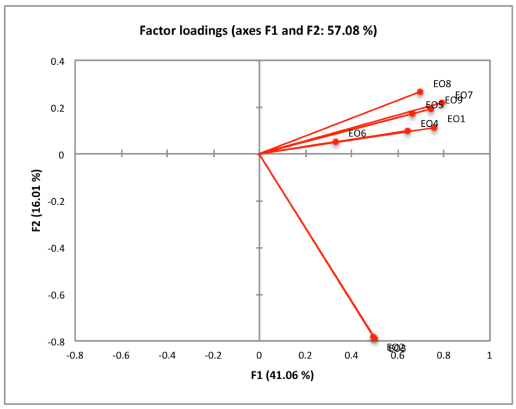


Table 7: Factor loadings for EO extracted factors

Factor loadings above 0.7 were seen to be statistically significant (Tabachnick and Fidell (2007)) and emerged for factor 1 (EO1, EO4, EO5, EO7, EO8 and EO9),

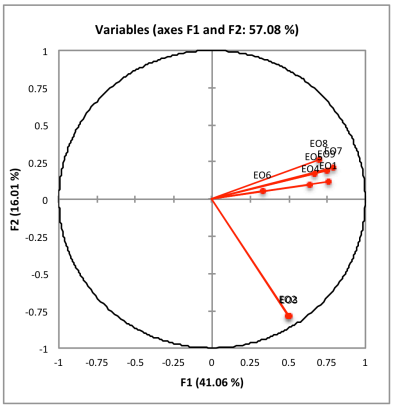
factor 2 (EO2 and EO3) and factor 4 (EO6). The first factor is a grouping of a large number of variables which may or may not correspond with the groupings in literature which in this instance is expected to contain a grouping for either EOrisk (thus EO4, EO5) or EOproactiveness (thus EO7, EO8 and EO9). Factor two could be a correct grouping for EOinnovativeness (thus EO1, EO2 and EO3).

Applying factor analysis to the underlying nine items of the EO variable (thus EO1 to EO9) results in four main factors (F1 to F4). Factors 2, 3 and 4 have several negative (reverse) pattern coefficients with the original EO items. Factor one is a grouping of a large number of items that would otherwise have been re-grouped further.

Such negative loadings or reverse-coded loadings may indicate confusion or misreading of instructions by the respondents. This however is highly doubted as the questions are standard from literature and follow a similar logic throughout. Rather is the explanation that such results indicate an element of complex factor structures emerging from the factor analysis.

Correlations between variables and factors:

	F1	F2	F3	F4
EO1	0.758	0.114	0.145	-0.328
EO2	0.494	-0.782	0.103	-0.085
EO3	0.502	-0.788	-0.017	0.081
EO4	0.641	0.095	-0.624	-0.138
EO5	0.664	0.175	-0.584	-0.276
EO6	0.328	0.052	-0.295	0.825
EO7	0.791	0.216	0.188	0.295
EO8	0.696	0.265	0.422	-0.185
EO9	0.746	0.194	0.388	0.197



Factor pattern coefficients:

	F1	F2	F3	F4
EO1	0.394	0.095	0.132	-0.319
EO2	0.257	-0.651	0.094	-0.083
EO3	0.261	-0.656	-0.015	0.078
EO4	0.334	0.079	-0.567	-0.134
EO5	0.345	0.146	-0.530	-0.269
EO6	0.171	0.044	-0.268	0.802
EO7	0.411	0.180	0.171	0.287
EO8	0.362	0.221	0.383	-0.180
EO9	0.388	0.162	0.352	0.192

Table 8: Factor pattern coefficients for extracted factors

By further interrogating the results, the dimensionality in the EO construct is apparent and to some extent in line with groupings prescribed in literature. The dimensionality arising from the initial results serves as an additional validation of the data in the final sample. Note however that the number of records in the final sample are deemed below the optimal number as suggested in literature, with the dimensionality in the data expected to increase significantly if there was a larger number of records in the final sample.

3.11.3 Reliability

Reliability is the extent to which a data collection method will yield consistent findings, or results in other researchers making similar observations or reaching

similar conclusions (Saunders et al., 2009). Leedy and Omrod (2010) suggest that using the research instrument in a consistent manner from participant to participant can enhance reliability, and criteria should be set for researcher inputs and judgements so that they are not variable. The same set of questions was asked to each respondent and consistency was enforced through the online interview instrument.

Respondent validation, where respondents are given the opportunity to review the researcher's account of the interaction, has been described by Bryman and Bell (2007) as important in validating the research findings. Each respondent had the opportunity to review the final completed research output as recorded by Google Forms, prior to submission.

3.11.3.1 Descriptive statistics for all items in the primary variables

All records in the initial sample (n=71) were checked for validity and reliability, before applying various correlation and multiple analysis tests to determine statistically significant relationships between target variables (Cohen and Holliday, 1988). The number of records in the final sample (n-64) were achieved through cleaning data and checking for validity by assessing the results of seeking correlation between variables. Some records in the initial sample lacked sufficient data with which to populate the Success variable, specifically those records for enterprises not having two or more years' business activity; a critical input to the rating algorithm used to calculate Success.

The final sample included only records that were classified as high-technology, with the vast majority representing firms that operate in, or originate from an emerging market.

The basic approach for testing the above propositions was to assess whether or not there exists a statistically significant relationship between Success (Dependent Variable (DV) for all regressions) in the final sample, and several independent variables sourced from the respective measurement instruments.

Through this heuristic approach, regression was used to eliminate variables with insignificant regression coefficients, with the hypothesis considered significant at the p-level of below 0.05.

The following table gives descriptive statistics for the primary variables used in the analysis.

SIM refers to variables in the Social Impact Measurement instrument (variables SIM1 to SIM14). EO refers to variables in the Entrepreneurial Orientation instrument (EO1 to EO9, as well as EOi (EO1 to EO3 for the innovation component of EO), EOr (EO4 to EO6 for the risk component of EO), EOp (EO7 to EO9 for the proactiveness component of EO). SESE refers to variables in the Social enterprise self-efficacy instrument (variables SE1 to SE10). All variables in the table are represented in the final sample size (n = 64) and have a range between 1 and 7.

Variable	Count	Mean	Median	SD	Var	Skewness (Fisher)	Kurtosis (Fisher)	Type	Regression with DV?
Success	64	4.77	5.00	1.77	3.09	-0.13	-1.19	DV	NA
EO1	64	5.52	6.00	1.71	2.87	-1.27	0.62	IV	
EO2	64	4.48	5.00	1.67	2.75	-0.44	-0.54	IV	Yes
EO3	64	4.38	5.00	1.77	3.08	-0.20	-0.97	IV	Yes
EO4	64	5.00	5.00	1.54	2.34	-0.72	0.01	IV	Yes
EO5	64	5.31	6.00	1.54	2.34	-1.00	0.26	IV	
EO6	64	3.91	4.00	1.65	2.68	0.07	-1.05	IV	
EO7	64	4.97	5.00	1.56	2.41	-0.74	0.08	IV	
EO8	64	4.81	5.00	1.71	2.87	-0.67	-0.33	IV	
EO9	64	4.89	5.00	1.68	2.78	-1.08	0.55	IV	
SIM1	64	4.23	4.00	1.74	2.99	-0.13	-0.99	IV	
SIM2	64	4.59	5.00	1.75	3.02	-0.50	-0.71	IV	
SIM3	64	3.98	4.00	1.95	3.73	-0.22	-1.15	IV	
SIM4	64	4.17	4.00	1.97	3.83	-0.18	-1.23	IV	
SIM5	64	4.25	4.00	2.03	4.06	-0.19	-1.08	IV	
SIM6	64	4.67	5.00	1.86	3.41	-0.66	-0.66	IV	
SIM7	64	4.31	4.00	1.67	2.75	-0.37	-0.66	IV	
SIM8	64	4.89	5.00	1.89	3.50	-0.75	-0.43	IV	
SIM9	64	4.59	5.00	1.97	3.80	-0.46	-1.02	IV	
SIM10	64	4.98	5.50	1.88	3.48	-0.54	-0.98	IV	
SIM11	64	4.42	4.00	1.88	3.49	-0.30	-0.96	IV	
SIM12	64	4.11	4.00	1.85	3.38	-0.07	-0.95	IV	Yes
SIM13	64	4.11	4.50	2.09	4.28	-0.25	-1.39	IV	Yes
SIM14	64	3.47	3.50	1.61	2.56	0.08	-0.57	IV	
SE1	64	5.38	6.00	1.30	1.67	-0.83	0.19	IV	
SE2	64	5.36	6.00	1.38	1.89	-0.94	0.39	IV	
SE3	64	5.44	6.00	1.33	1.75	-1.23	1.67	IV	
SE4	64	5.23	6.00	1.47	2.12	-0.80	-0.17	IV	
SE5	64	5.06	5.00	1.51	2.25	-0.88	0.42	IV	
SE6	64	5.25	5.00	1.39	1.91	-0.65	-0.21	IV	Yes
SE7	64	5.27	6.00	1.48	2.16	-0.96	0.14	IV	

Variable	Count	Mean	Median	SD	Var	Skewness (Fisher)	Kurtosis (Fisher)	Type	Regression with DV?
SE8	64	5.92	6.00	1.15	1.29	-1.09	0.64	IV	
SE9	64	5.55	6.00	1.37	1.84	-1.08	1.17	IV	Yes
SE10	64	6.36	7.00	1.06	1.11	-1.68	2.10	IV	
SIF1	64	4.23	4.00	1.69	2.80	-0.44	-0.68	IV	
SIF2	64	3.56	3.50	1.76	3.06	0.14	-0.97	IV	
SIF3	64	4.72	5.00	1.36	1.83	-0.40	-0.13	IV	
SIF4	64	4.78	5.00	1.72	2.92	-0.69	-0.49	IV	
EOavg	64	4.81	4.94	1.04	1.06	-0.86	0.53	IV	Yes
EOi	64	4.79	5.00	1.35	1.80	-0.54	-0.47	IV	Yes
EOr	64	4.74	4.67	1.20	1.42	-0.41	-0.04	IV	Yes
EOp	64	4.89	5.00	1.42	2.00	-0.96	0.68	IV	
SIMavg	64	4.34	4.57	1.23	1.49	-0.70	0.11	IV	
SIMa	64	4.25	4.50	1.62	2.57	-0.38	-0.76	IV	
SIMb	64	4.41	4.33	1.60	2.51	-0.53	-0.46	IV	
SIMc	64	4.82	5.33	1.74	2.97	-0.62	-0.82	IV	Yes
SIMd	64	4.03	4.00	1.24	1.51	-0.26	0.46	IV	Yes
SEavg	64	5.48	5.80	1.12	1.25	-0.97	0.44	IV	Yes

Table 9: Descriptive statistics for each item comprising the main variables

3.11.3.2 Checking for normality using Skewness and Kurtosis

(See also section 4.3.1 and 4.3.2 for histograms involving the main variables).

The above data comprised of the underlying items making up the main variables (EO, SIM and SESE) were checked for normality, as a precursor to conducting factor analysis.

All variables had acceptable Kurtosis scores ranging between +/- 3 as indicated in the above table (Pearson, 1905). Items EO1, EO9, SE3, SE8, SE9 and SE10 had Skewness scores outside of the acceptable range of +/- 1.

Applying the Kurtosis and Skewness measures collectively indicates that the data for all items, bar those failing the Skewness test outlined above, have distributions that don't significantly depart from normal distributions.

	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9	EOavg	EOi	EOr	EOp
EO1	**1.00**												
EO2	0.26	**1.00**											
EO3	0.30	0.73	**1.00**										
EO4	0.34	0.22	0.22	**1.00**									
EO5	0.52	0.16	0.18	0.73	**1.00**								
EO6	0.06	0.01	0.20	0.22	0.18	**1.00**							
EO7	0.52	0.23	0.23	0.38	0.37	0.35	**1.00**						
EO8	0.64	0.19	0.14	0.25	0.30	0.07	0.50	**1.00**					
EO9	0.43	0.27	0.20	0.30	0.26	0.20	0.75	0.61	**1.00**				
EOavg	0.72	0.55	0.58	0.63	0.64	0.40	0.76	0.66	0.71	**1.00**			
EOi	0.66	0.84	0.86	0.33	0.36	0.12	0.41	0.41	0.38	0.78	**1.00**		
EOr	0.39	0.17	0.27	0.84	0.82	0.63	0.48	0.26	0.33	0.73	0.35	**1.00**	
EOp	0.62	0.27	0.22	0.36	0.36	0.23	0.86	0.82	0.91	0.82	0.47	0.41	**1.00**

Table 10: EO variable inter-item correlation matrix

	SIM1	SIM2	SIM3	SIM4	SIM5	SIM6	SIM7	SIM8	SIM9	SIM10	SIM11	SIM12	SIM13	SIM14	SIMavg	SIMa	SIMb	SIMc	SIMd
SIM1	**1.00**																		
SIM2	0.78	**1.00**																	
SIM3	0.62	0.56	**1.00**																
SIM4	0.66	0.62	0.83	**1.00**															
SIM5	0.50	0.50	0.61	0.64	**1.00**														
SIM6	0.43	0.40	0.51	0.54	0.70	**1.00**													
SIM7	0.25	0.26	0.33	0.34	0.51	0.61	**1.00**												
SIM8	0.51	0.48	0.49	0.59	0.64	0.61	0.49	**1.00**											
SIM9	0.45	0.46	0.45	0.54	0.74	0.57	0.46	0.74	**1.00**										
SIM10	0.40	0.40	0.32	0.41	0.61	0.63	0.50	0.71	0.76	**1.00**									
SIM11	-0.03	0.12	-0.08	0.06	-0.02	-0.08	0.14	0.19	0.18	0.22	**1.00**								
SIM12	0.29	0.25	0.11	0.16	0.21	0.27	0.31	0.37	0.41	0.36	0.40	**1.00**							
SIM13	0.19	0.13	0.38	0.32	0.45	0.66	0.46	0.56	0.57	0.56	-0.05	0.37	**1.00**						
SIM14	0.21	0.03	0.10	0.04	0.10	0.14	0.20	0.20	0.24	0.23	0.30	0.25	0.29	**1.00**					
SIMavg	0.68	0.65	0.68	0.04	0.79	0.77	0.63	0.83	0.83	0.78	0.25	0.52	0.65	0.35	**1.00**				
SIMa	0.87	0.84	0.87	0.74	0.65	0.54	0.34	0.60	0.55	0.44	0.02	0.23	0.30	0.11	0.79	**1.00**			
SIMb	0.47	0.46	0.57	0.90	0.88	0.90	0.80	0.68	0.70	0.68	0.01	0.30	0.61	0.17	0.86	0.61	**1.00**		
SIMc	0.50	0.49	0.47	0.57	0.73	0.66	0.53	0.90	0.92	0.91	0.21	0.42	0.62	0.25	0.90	0.58	0.48	**1.00**	
SIMd	0.25	0.20	0.20	0.23	0.30	0.40	0.43	0.51	0.54	0.53	0.61	0.77	0.64	0.66	0.68	0.25	0.43	0.42	**1.00**

Table 11: SIM variable inter-item correlation matrix

	SE1	SE2	SE3	SE4	SE5	SE6	SE7	SE8	SE9	SE10
SE1	**1.00**									
SE2	0.80	**1.00**								
SE3	0.79	0.82	**1.00**							
SE4	0.77	0.87	0.87	**1.00**						
SE5	0.78	0.76	0.78	0.85	**1.00**					
SE6	0.60	0.67	0.63	0.69	0.69	**1.00**				
SE7	0.57	0.62	0.62	0.72	0.75	0.77	**1.00**			
SE8	0.70	0.62	0.65	0.66	0.64	0.76	0.69	**1.00**		
SE9	0.57	0.58	0.59	0.61	0.61	0.64	0.60	0.65	**1.00**	
SE10	0.49	0.44	0.46	0.39	0.35	0.49	0.40	0.55	0.55	**1.00**

Table 12: SE variable inter-item correlation matrix

	SIF1	SIF2	SIF3	SIF4
SIF1	**1.00**			
SIF2	0.67	**1.00**		
SIF3	0.66	0.46	**1.00**	
SIF4	0.52	0.53	0.53	**1.00**

Table 13: SIF variable inter-item correlation matrix

3.11.3.3 Cronbach Alpha scores for main variables

The Cronbach Alpha coefficient is calculated for the purpose of assessing the inter-item correlation between different items comprising a grouped variable (Cronbach, 1951), such as for example the underlying items making up EO (thus EO1 to EO9). The correlation coefficient ranges between +1 to -1 and follows a predictable direction of correlation (e.g. positive correlation coefficient means that if one variable increases in value, the other variable will similarly increase). A zero Cronbach Alpha coefficient indicates that there is no correlation between the two variables.

The following table gives a suggested interpretation for the different values of Cronbach Alpha values (Hinkle, Wiersma & Jurs, 2003):

Absolute value of coefficient	Strength of correlation
0.90 – 1.00	Very high
0.70 – 0.90	High
0.50 – 0.70	Moderate
0.30 – 0.50	Low
0.00 – 0.30	Little, if any

Table 14: Cronbach Alpha range descriptives

The calculated Cronbach Alpha values for the four main variables are all considered high, when using the suggested range interpretations offered above. The coefficient value for Social Enterprise Self-Efficacy (SE) is very high (alpha = 0.95), indicating that the correlation between the ten items comprising SE is such that the items may be considered redundant.

Variable	EO	SIM	SE	SIF
Number of items (k)	9	14	10	4
Sum of Variances	24.13	48.31	17.98	10.61
Variance in Totals	85.51	292.19	123.06	28.30
Cronbach Alpha	**0.81**	**0.90**	**0.95**	**0.83**

Table 15: Cronbach Alpha values for main variables

3.11.3.4 Pearson's correlation coefficient matrix

A second measure of data reliability is the correlation between different variables that are not necessarily grouped together. This may include single variables that represent a grouped list or cluster (e.g. EOavg) or individual items comprising the four main variables (i.e. EO, SIM, SE and SIF). The Pearson's correlation coefficient for each such variable is displayed in the correlation coefficient matrix below. The table includes the result of the null-hypothesis (at $p<0.05$ level) indicating whether each cross-wise pairing of two variables are correlated or not. Some of the results may contradict the results from later regressions but that may be due mainly to the relative low number of records in the final sample (n=64).

Pearson's Correlation Coefficients Matrix

Missing values removal	Pairwise deletion	Success	EO2	EO3	EO4	SIM12	SIM13	SE6	SE9	EOavg	EOi	EOr	SIMc	SIMd
Success	**R**	**1.**												
	R Standard Error													
	t													
	p-value													
	H0 (5%)													
EO2	**R**	**0.34473**	**1.**											
	R Standard Error	0.01421												
	t	2.89163												
	p-value	0.00528												
	H0 (5%)	*rejected*												
EO3	**R**	**0.29215**	**0.73243**	**1.**										
	R Standard Error	0.01475	0.00748											
	t	2.40536	8.47056											
	p-value	0.01915	6.06095E-12											
	H0 (5%)	*rejected*	*rejected*											
EO4	**R**	**0.36023**	**0.21542**	**0.22106**	**1.**									
	R Standard Error	0.01404	0.01538	0.01534										
	t	3.04059	1.737	1.78476										
	p-value	0.00346	0.08735	0.07919										
	H0 (5%)	*rejected*	*accepted*	*accepted*										
SIM12	**R**	**0.28377**	**0.01338**	**0.01635**	**0.18323**	**1.**								
	R Standard Error	0.01483	0.01613	0.01612	0.01559									
	t	2.33022	0.10533	0.12878	1.46763									
	p-value	0.02306	0.91645	0.89795	0.14726									
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*									
SIM13	**R**	**0.28206**	**0.02553**	**0.02743**	**0.23173**	**0.37055**	**1.**							
	R Standard Error	0.01485	0.01612	0.01612	0.01526	0.01391								
	t	2.31496	0.20112	0.21605	1.87574	3.14135								
	p-value	0.02394	0.84126	0.82966	0.0654	0.00258								
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*	*rejected*								
SE6	**R**	**0.27542**	**0.19962**	**0.14836**	**0.15524**	**0.27244**	**0.35126**	**1.**						
	R Standard Error	0.01491	0.01549	0.01577	0.01574	0.01493	0.01414							
	t	2.25588	1.60411	1.18125	1.23733	2.22953	2.95409							
	p-value	0.02762	0.11377	0.24201	0.22063	0.02941	0.00443							
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*	*rejected*	*rejected*							
SE9	**R**	**0.31596**	**0.1392**	**0.15012**	**0.16546**	**0.15141**	**0.29576**	**0.64422**	**1.**					
	R Standard Error	0.01452	0.01582	0.01577	0.01569	0.01576	0.01472	0.00944						
	t	2.62216	1.10681	1.19562	1.32105	1.20614	2.43788	6.63229						
	p-value	0.01098	0.27265	0.2364	0.19134	0.23235	0.01765	9.27124E-9						
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*	*accepted*	*rejected*	*rejected*						
EOavg	**R**	**0.31646**	**0.55307**	**0.58039**	**0.63133**	**0.08562**	**0.29316**	**0.19184**	**0.09675**	**1.**				
	R Standard Error	0.01451	0.0112	0.0107	0.0097	0.01601	0.01474	0.01554	0.01598					
	t	2.6268	5.22715	5.61195	6.41011	0.67667	2.41447	1.53912	0.76542					
	p-value	0.01085	2.14397E-6	4.98471E-7	2.23111E-8	0.50113	0.01872	0.12886	0.44692					
	H0 (5%)	*rejected*	*rejected*	*rejected*	*rejected*	*accepted*	*rejected*	*accepted*	*accepted*					
EOi	**R**	**0.30382**	**0.84043**	**0.86424**	**0.32677**	**0.05143**	**0.14308**	**0.14886**	**0.0968**	**0.78449**	**1.**			
	R Standard Error	0.01464	0.00474	0.00408	0.01441	0.01609	0.0158	0.01577	0.01598	0.0062				
	t	2.51102	12.21145	13.52693	2.7224	0.40546	1.13833	1.18536	0.76583	9.96072				
	p-value	0.01466	0.	0.	0.0084	0.68654	0.25936	0.2404	0.44669	0.				
	H0 (5%)	*rejected*	*rejected*	*rejected*	*rejected*	*accepted*	*accepted*	*accepted*	*accepted*	*rejected*				
EOr	**R**	**0.32893**	**0.16653**	**0.26577**	**0.84169**	**0.15558**	**0.35338**	**0.18824**	**0.19745**	**0.72806**	**0.34881**	**1.**		
	R Standard Error	0.01438	0.01568	0.01499	0.0047	0.01574	0.01411	0.01556	0.0155	0.00758	0.01417			
	t	2.74263	1.3298	2.17076	12.27387	1.24012	2.97447	1.50918	1.58597	8.36259	2.93057			
	p-value	0.00796	0.18846	0.03379	0.	0.21961	0.00418	0.13633	0.11783	9.31527E-12	0.00473			
	H0 (5%)	*rejected*	*accepted*	*rejected*	*rejected*	*accepted*	*rejected*	*accepted*	*accepted*	*rejected*	*rejected*			
SIMc	**R**	**0.25646**	**-0.04836**	**0.10467**	**0.05331**	**0.4189**	**0.61877**	**0.45212**	**0.41342**	**0.25892**	**0.12735**	**0.21248**	**1.**	
	R Standard Error	0.01507	0.01609	0.01595	0.01608	0.0133	0.00995	0.01283	0.01337	0.01505	0.01587	0.0154		
	t	2.08925	-0.38127	0.82873	0.42038	3.63247	6.20204	3.99118	3.5751	2.11069	1.01102	1.71215		
	p-value	0.0408	0.7043	0.41044	0.67566	0.00057	5.05552E-8	0.00018	0.00069	0.03884	0.31594	0.09187		
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*	*rejected*	*rejected*	*rejected*	*rejected*	*rejected*	*accepted*	*accepted*		
SIMd	**R**	**0.30376**	**0.06451**	**0.08595**	**0.18712**	**0.7658**	**0.63542**	**0.32103**	**0.19977**	**0.24788**	**0.1575**	**0.28071**	**0.57929**	**1.**
	R Standard Error	0.01464	0.01606	0.01601	0.01556	0.00667	0.00962	0.01447	0.01549	0.01514	0.01573	0.01486	0.01072	
	t	2.51048	0.50904	0.67928	1.49988	9.37661	6.47955	2.66903	1.60538	2.01473	1.25585	2.30289	5.59586	
	p-value	0.01468	0.61253	0.49949	0.13872	0.	1.6964E-8	0.0097	0.11349	0.04828	0.21388	0.02465	5.30126E-7	
	H0 (5%)	*rejected*	*accepted*	*accepted*	*accepted*	*rejected*	*rejected*	*rejected*	*accepted*	*rejected*	*accepted*	*rejected*	*rejected*	

Table 16: Pearson's correlation coefficients matrix

CHAPTER 4: DATA ANALYSIS AND RESULTS

4.1 Introduction

The following chapter outlines the demographic overview of respondents in the final sample and then elaborates on the above results in context of the stated research propositions.

4.2 Overview of respondents in the final sample

93.0% of respondents had head office listed as based in an emerging market (primarily South Africa), with 64.2% having the majority of sales to emerging markets. The majority of respondents were enterprises with four or more years in business, in line with the expectation that high-tech enterprises typically need more time to penetrate markets with new technology compared to non-high tech enterprises, based on the time involved for commercialisation, including completion of research and development and associated market readiness activities (Zemlickien, 2011).

53.5% of respondents founded the business in the pursuit of entrepreneurial rewards (higher rate of income, addressing a specific market opportunity or pursuing an income outside of corporate employment), whilst 18.3% started the business venture in the pursuit of a social impact objective.

All respondents in the final sample are categorised as high-tech enterprises as all had activities that either involved developing high-tech products or services, or were the first to introduce new high-tech products or services to the market. However, only 78.9% of respondents regarded themselves as high-tech business enterprises. This demonstrates the variance in how respondents view themselves, with a greater presence of new labels such as social entrepreneurs (7.0%), high-tech entrepreneurs or technopreneurs (33.8%) or some not considering themselves to be entrepreneurial ventures at all (35.2%) (Martin & Osberg, 2007). 23.9% considered their businesses as normal entrepreneurial enterprises, despite

the majority regarding the businesses as high-tech, and all responses indicating some form of high-tech activity.

4.3 Regression analysis involving Success (DV)

Linear regression analysis was the primary research method used to determine statistically meaningful relationships between the different variables introduced in previous sections (Cramer, 1997), with said variables representing the key constructs taken from literature, namely Entrepreneurial Orientation (EO), Social Impact Measurement (SIM) and Social Enterprise Self-Efficacy (SESE).

Linear regression is a statistical method that attempts to model a linear relationship involving two or more variables, by attempting to fit a linear curve on the data from said variables. The analysis involves two sets of data, being firstly the predictor variable(s) (referred to as independent variables) and a response variable (referred to as the dependent variable) (Neter, Wasserman and Kutner, 1996).

Success - introduced as a tailor-made variable by the researcher in earlier chapters - is used as the dependent variable for all linear regression analysis in this research study.

The following table outlines statistically significant relationships found between different variables, obtained by running regressions between the dependent variable (Success) and all independent variables.

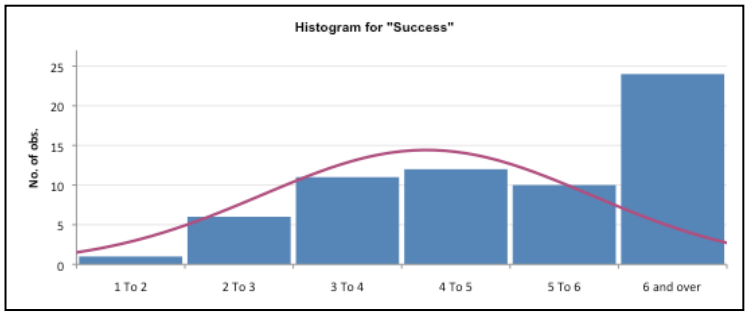
Independent Variable in regression with Dependent Variable (Success)	t-stat	p-value
EO2 (Entrepreneurial Orientation – innovativeness variable 2)	2.892	0.005
EO3 (Entrepreneurial Orientation – innovativeness variable 3)	2.405	0.019
EO4 (Entrepreneurial Orientation – risk appetite variable 1)	3.041	0.003
SIM12 (… initiative generates own funding or outside funding is fairly reliable)	2.330	0.023
SIM13 (… initiative has entered into several partnerships with businesses)	2.315	0.024
SE6 (… be an agent of social change)	2.256	0.028
SE9 (… promote a balance of economic, social & environmental concerns)	2.622	0.011
EOavg (Non-weighted average of all nine EO items: EO1 to EO9)	2.627	0.011
EOi (Non-weighted average of EO innovativeness items: EO1 to EO3)	2.511	0.015

Independent Variable in regression with Dependent Variable (Success)	t-stat	p-value
EOr (Non-weighted average of EO risk-taking items: EO4 to EO6)	2.743	0.008
SIMc (Non-weighted average of SIM expandability/replicability items: SIM8 to SIM10)	2.089	0.041
SIMd (Non-weighted average of SIM sustainability items: SIM11 to SIM14)	2.510	0.015
SEavg (Non-weighted average of SE Self-Efficacy items: SE1 to SE10)	2.035	0.046

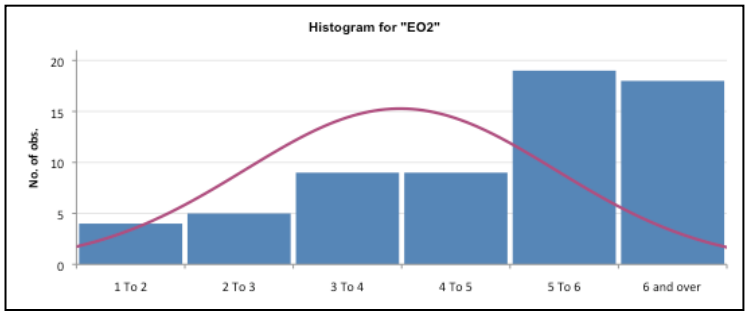
Table 17: Successful regressions with Success (DV)

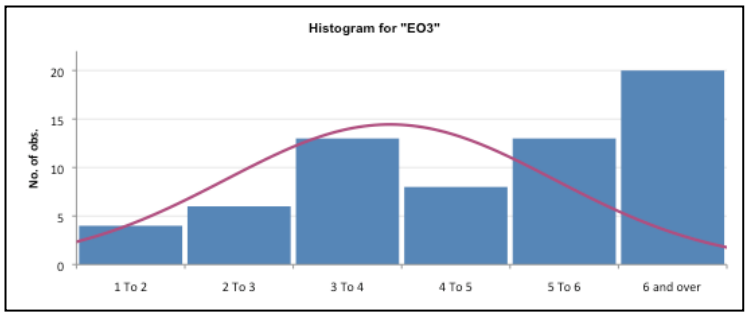
The following section displays histograms for the primary items involved in the main variables for which the researcher found successful linear regressions between said items (independent variables) and the dependent variable Success. Each histogram includes a fitted approximate normal distribution curve. Note that SE9 had a Skewness value outside of the acceptable range (-1.08).

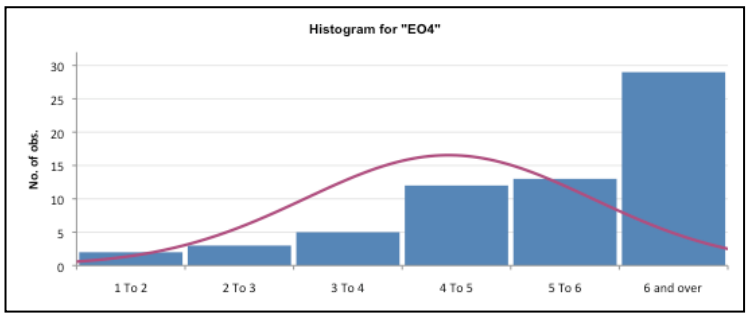
4.3.1 Histogram for Success (DV)

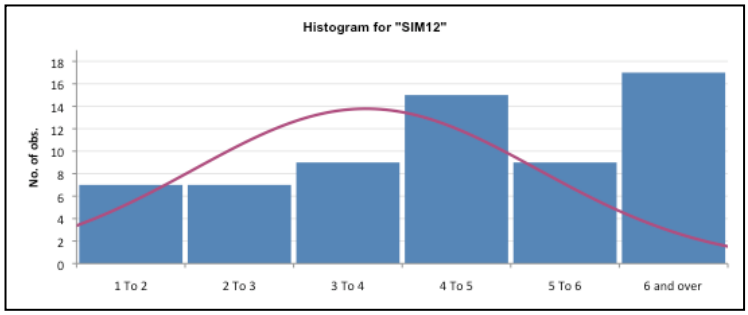


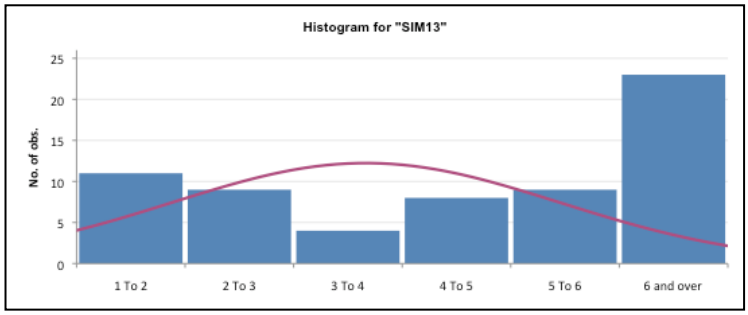
4.3.2 Histograms for selected independent variables (IVs)

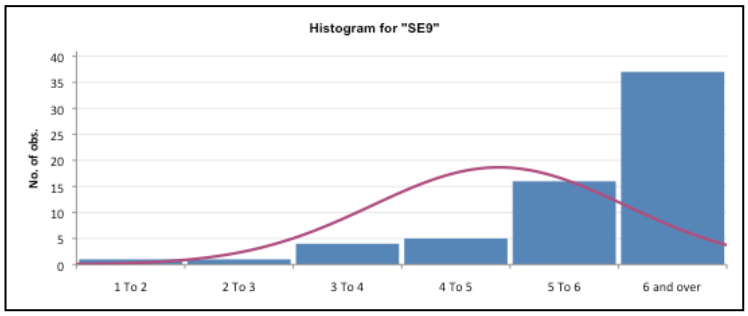


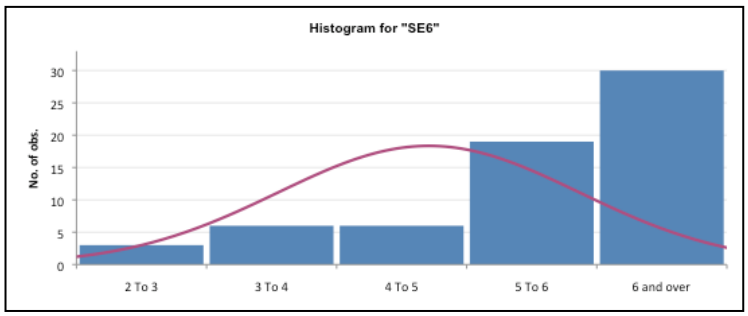


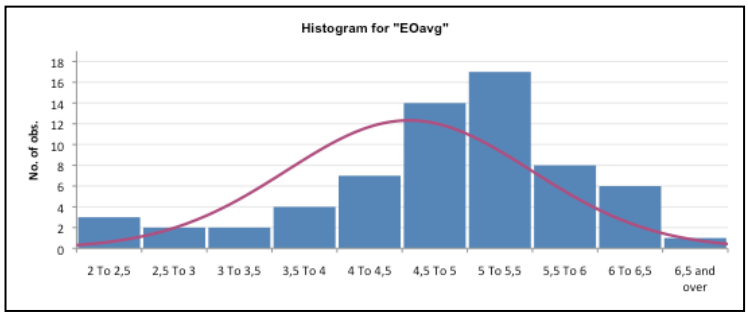


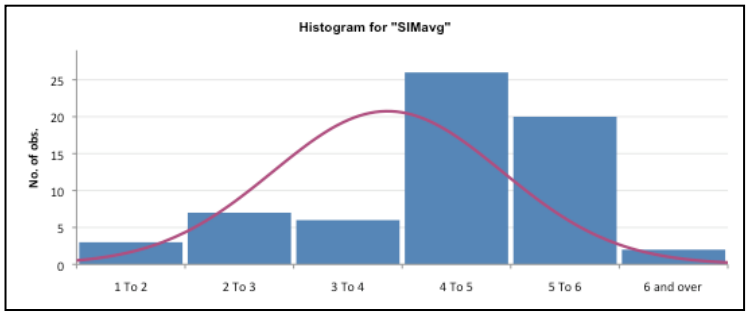

Histogram for "SIM12"
No. of obs.
0
2
4
6
8
10
12
14
16
18
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over

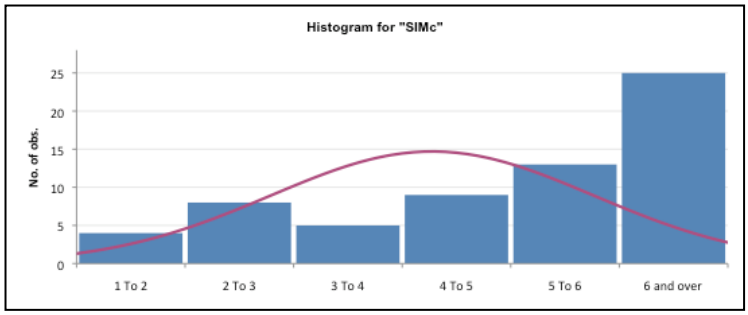

Histogram for "SIM13"
No. of obs.
0
5
10
15
20
25
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over

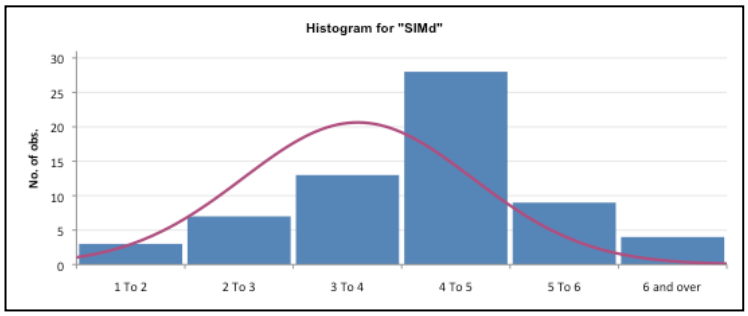

Histogram for "SE9"
No. of obs.
0
5
10
15
20
25
30
35
40
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over

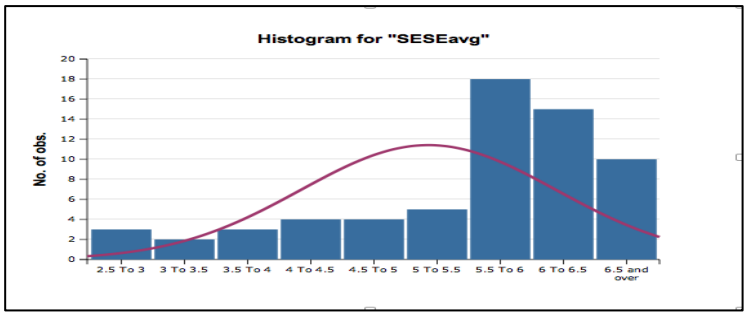

Histogram for "SE6"
No. of obs.
0
5
10
15
20
25
30
2 To 3
3 To 4
4 To 5
5 To 6
6 and over


Histogram for "EOavg"
No. of obs.
0
2
4
6
8
10
12
14
16
18
2 To 2,5
2,5 To 3
3 To 3,5
3,5 To 4
4 To 4,5
4,5 To 5
5 To 5,5
5,5 To 6
6 To 6,5
6,5 and over


Histogram for "SIMavg"
No. of obs.
25
20
15
10
5
0
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over


Histogram for "SIMc"
No. of obs.
25
20
15
10
5
0
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over


Histogram for "SIMd"
No. of obs.
30
25
20
15
10
5
0
1 To 2
2 To 3
3 To 4
4 To 5
5 To 6
6 and over


Histogram for "SESEavg"
No. of obs.
20
18
16
14
12
10
8
6
4
2
0
2.5 To 3
3 To 3.5
3.5 To 4
4 To 4.5
4.5 To 5
5 To 5.5
5.5 To 6
6 To 6.5
6.5 and over

4.4 Results pertaining to propositions

The outputs from the above linear regression analysis were used in conjunction with earlier statistical methods outlined in the previous sections of this report, to validate the five main research propositions introduced in the beginning of this document.

4.4.1 Proposition one: Social Impact awareness a predictor for success

The first seven items in the SESE construct assess the respondent's ability to identify a social need, articulate a social vision, or indicate whether or not the respondent is a champion for a social cause. Scoring higher scores against any of these items would indicate that the respondent had an above average awareness of social impact. In order to test the first proposition, regression analysis was used to determine whether or not there exists a statistically significant relationship between Success (DV) and any one of these first seven items in the SESE measurement instrument, using said items as independent variables (IV), in the regression analysis.

The following table lists the result for only item SE6 where the null-hypothesis was rejected, i.e. that there isn't a statistically significant relationship between the response variable (DV) and the predictor variable (IV). No such relationships were found for the remainder of the SE1 to SE7 items.

Response (DV)	Predictor (IV)	Coefficient	t-stat	p-level	R^2	Null hypothesis
Success	SE6	0.35041	2.256	0.028	0.0768	Rejected

Table 18: Regression analysis results for proposition one

Proposition one is confirmed by the above result despite only one of the seven items demonstrating a successful regression with the DV Success.

4.4.2 Proposition two: EO is a predictor for Success (DV)

Building on the results from the factor analysis involving EO, the researcher also took a heuristic approach to testing for relationships as well as dimensionality. This was achieved by running individual regressions between the DV Success and each EO variable (EO1 to 9) as predictor variables, as well as using the known dimensions from literature (EOi, EOr and EOp) as predictor variables. Only three of the nine variables had statistically significant correlations with Success, and none of the three underlying variables of EOp (EO7, EO8 and EO9) served as meaningful predictors for Success.

Despite this, regressions for EOavg, EOi and EOr resulted in statistically significant correlations, but not EOp.

The following table lists the results from the regression analysis between response variable Success, and predictor variables EOavg, EOi, EOr and EOp.

Response (DV)	Predictor (IV)	Coefficient	t-stat	p-level	R^2	Null hypothesis
Success	EO2	0.3651	2.892	0.0053	0.1188	Rejected
Success	EO3	0.2925	2.405	0.0191	0.0853	Rejected
Success	EO4	0.4133	3.041	0.0034	0.1297	Rejected
Success	EOavg	0.5104	2.627	0.0109	0.1002	Rejected
Success	EOi	0.3794	2.511	0.0147	0.0923	Rejected
Success	EOr	0.4846	2.741	0.0079	0.1082	Rejected

Table 19: Regression analysis results for proposition two

EOavg, the variable representing Entrepreneurial Orientation as a construct, was shown to be a statistically significant predictor for Success.

The overall proposition that Success can be predicted through the EO construct (represented by EOavg) is supported by the evidence of dimensionality pointed out in the section outlining factor analysis involving the EO construct as well as the groupings emerging from the regression analysis.

Note though that averaging EO1 to EO9 to achieve a combined EOavg as a single construct for entrepreneurial orientation may be covering up the underlying variance in the respective EO variables (Coltman, 2008). However, given the reliability of data in the final sample and consistency between variables, the factors are accepted and the proposition remains acceptable in so far that the data in the final sample supports EO as a valid construct that mirrors the dimensionality found in literature.

Using regression analysis to establish the link between the observed EOavg as a predictor variable, and Success as a response variable, Success (DV) is further supported as a valid representation of firm success, by interpreting the statistically significant relationship between firms with high EO and those achieving greater levels of Success.

4.4.3 Proposition three: SESE a predictor for Success (DV)

Social Enterprise Self-Efficacy (SESE) as a construct is a combination of items SE1 to SE10 as outlined in the section introducing the various measurement instruments used in the research.

Factor analysis involving the SESE was conducted to validate the construct based on the data collected through the SESE section of the research instrument. Running 50 iterations using XLStat based on SE1 to SE10, and the final sample (n=64 records) resulted in a KMO measure of 0.9. Only one factor (factor 1) had an Eigenvalue above 1. This corresponds to the high Cronbach Alpha score for SESE outlined in the section on data reliability (Cronbach Alpha for SESE of 0.95), which indicates that the inter-item variance between SE1 to SE10 is such that the items can be considered redundant.

SEavg was calculated as the average of all 10 underlying SESE items (SE1 to SE10) and represents the Social Enterprise Self-Efficacy construct as a single value. Continuing with the regression analysis, a linear regression analysis was attempted using SEavg as the predictor variable, and Success (DV) as the response variable.

Response (DV)	Predictor (IV)	Coefficient	t-stat	p-level	R^2	Null hypothesis
Success	SEavg	0.39639	2.035	0.046	0.0626	Rejected

Table 20: Regression analysis results for proposition three

Proposition three is confirmed by the result displayed in the above table, which concludes that SEavg is a statistically significant predictor variable for the response variable Success. However, note the reservations in regards to the high Cronbach Alpha value for SESE, as well as the results of the factor analysis involving SESE.

4.4.4 Proposition four: EO an improvement to the regression formula

Since EOavg was shown to be a statistically significant predictor for Success, the researcher wanted to determine if adding EOavg to the regression formula for SE6 (found to be a predictor for Success in previous sections) would improve the outcome. EOavg was subsequently added to the regression formula along with SE6 to determine if the two predictor variables offer a statistically significant correlation with the response variable Success and if so, if the result is in fact an improvement on only using SE6.

The null hypothesis was accepted, indicating that SE6 and EOavg cannot be used simultaneously as predictors for Success. Subsequent to this, EOavg was added to the regression with SIM12 (… initiative generates own funding or outside funding is fairly reliable), with SIM12 having a statistically significant relationship with Success. It resulted in a rejection of the null hypothesis, and an improvement on the regression using only SIM12 with the R squared values improving from 0.0805 to 0.1665.

There isn't a clear guideline in literature on a specific range of values for R squared as have for example been outlined for Cronbach Alpha scores in earlier sections of this report. However, a squared multiple correlation of 0.3 or greater is considered by some as indicative of a moderately strong relationship (Sudman and Blair, 1998), indicating that the output from adding EOavg to SIM12 is not considered a very strong correlation.

As shown already, SIM12 and SIM13 are sufficient predictors for Success, meaning that Entrepreneurial Orientation (through EOavg) is not a pre-requisite for predicting Success, but rather an improvement on SIM. This proves proposition five in so far that high-tech firms in emerging markets that demonstrate greater levels of social impact awareness and entrepreneurial orientation, will demonstrate greater levels of success, keeping in mind that adding EOavg renders a marginal improvement.

4.4.5 Proposition five: Social impact awareness not the primary driver

Question nine on the SESE measurement instrument (represented by variable SE9) asked respondents to rate the importance of balancing economic, social impact and environmental concerns (the so-called triple bottom line), as opposed to pursuing one or only two of the three areas.

Response (DV)	Predictor (IV)	Coefficient	t-stat	p-level	R^2	Null hypothesis
Success	SE9	0.4089	2.622	0.0109	0.011	Rejected

Table 21: Regression analysis results for proposition five

SE9 through regression showed a statistically significant relationship with Success as indicated in the above table, showing that respondents strongly agreed with the need to balance economic, social impact and environmental concerns.

In addition, respondents were asked to select the two most significant reasons for prioritising social impact from a range of options:

What is the primary reason for prioritising social impact awareness in your business strategy?		
1	Dictated by the market (e.g. pursue increased sales, address specific market opportunity)	31%
2	For regulatory compliance reasons	27%
3	Dictated by investors, shareholders or partners	24%

What is the primary reason for prioritising social impact awareness in your business strategy?		
4	To increase social impact (e.g. impacting beneficiaries, making the world a better place)	18%

Table 22: Poll results for proposition five

The above results correspond with the previous finding in so far as balancing social impact with economic and environmental considerations, in that respondents collectively rated increasing social impact the lowest amongst the four options.

Both dimensions therefore substantiate proposition five being that social impact awareness is not the primary reason for increased social impact awareness amongst successful high-tech enterprises in emerging firms.

4.5 Summary of results

	Proposition	Result
1.	High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success if able to identify and/or relate with a social impact need or vision.	Proven through regression analysis between dependent variable Success and SE self-efficacy variable SE6 (… be an agent of change) that indicates that SE6 is a statistically significant predictor of Success.
2.	High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success when there are higher levels of entrepreneurial orientation.	Proven through regression analysis between a predictor variable EOavg (the variable that represents Entrepreneurial Orientation as a combined construct (combining EO1 to EO9)) and dependent variable Success.
3.	High-tech enterprises in an emerging market like South Africa will demonstrate greater levels of success when there are higher levels of social enterprise self-efficacy	Proven through regression analysis between a predictor variable SEavg (the variable that represents Social Enterprise Self-Efficacy as a combined construct (combining SE1 to SE10)) and dependent variable Success.
4	High-tech enterprises in an emerging	Proven through regression analysis by including EOavg as predictor variable to

	Proposition	Result
	market like South Africa will demonstrate greater levels of success when there are both higher levels of social impact awareness and entrepreneurial orientation.	another predictor variable SIM12 (an item on the SIM measurement construct), and using Success as the dependent variable.
5.	Social impact awareness is not the primary driver of successful high-tech enterprises in emerging markets.	Proven through a combination of regression analysis between a predictor variable SE9 (important to balance economic, social and environmental concerns) and dependent variable Success, and a poll where respondents were asked to list the top reasons for prioritising social impact considerations.

Table 23: Summary of proposition testing outcomes

CHAPTER 5: IMPLICATIONS AND RECOMMENDATIONS

5.1 Overview

The research study considered a sample of high-tech firms, classified by size as being SMEs, and the majority having operations in, or originating from an emerging market – in most instances South Africa. The research focused on assessing the relationship between the social impact, as well as the social enterprise self-efficacy, and the success of each firm.

Success as a construct is a self-created variable and was developed by the researcher through the application of a logical algorithm, where firm age (proxy for sustainability), growth in turnover and changes in employment numbers were used to populate a dependent variable termed Success. This variable was used as the baseline for testing the stated research propositions and, despite having literature support in so far as the underpinning logic, is an artificial construct with limitations in scope and breadth. For example, Success does not take into account the full spectrum of soft and hard measures that may be used to interrogate the success (or failure) of a firm.

The research does however show that the Success variable does have a direct linear and statistically significant relationship with Entrepreneurial Orientation (EO), which serves as additional validation of the underlying logic behind its calculation.

The concluding view from performing various correlation and regression statistical tests on the data, is that there exists a direct linear relationship, deemed statistically significant, between the social enterprise self-efficacy of high-tech SMEs in South Africa, and the variable Success. Furthermore, there is a statistically significant relationship between Success (dependent variable) and the firm's ability to identify with a social impact consideration, represented by one of the SESE items, SE6.

A key discussion in literature on social entrepreneurship as outlined in the chapter on literature review, is the concept of sector-bending, and the finding that there is

a considerable overlap between the practices, drivers and focus of social and commercial entrepreneurs (Dees and Anderson, 2003). This discussion goes further on the critical finding that there needs to be a dominant social impact focus for entrepreneurs in order to be classified as social entrepreneurs (Glennie, 2012; Kuponen, 1993). In this light, the researcher found a statistically meaningful relationship between another SESE item SE9 and, strengthened with results from a poll included in the research instrument where respondents were asked as to the primary reason for prioritising social impact, shows that respondents value balancing economic, social and environmental considerations in the pursuit of success. This demonstrates that social impact considerations were not the overriding driver for high-tech SMEs that achieved greater scores on the Success variable, which supports the above findings from literature.

Collectively and individually, these findings point to a statistically defendable argument that high-tech SMEs in an emerging market such as South Africa consider social impact dimensions and that those with greater scores on the Social Enterprise Self-Efficacy scale, have greater levels of Success, despite social impact not being the dominant driver.

5.2 Implications and recommendations

High-tech firms are more often than not founded and managed by incumbents with a suitable technical background, academic qualification and/or experience (Lee & Wong, 2004). In an emerging country like South Africa, many market opportunities for high-tech products and services involve the public sector (e.g. medical devices supplied to state hospitals under the management of the Department of Health, or e-learning software supplied to rural schools under the management of the Department of Basic Education) and/or involve a direct social need such as financial inclusion (e.g. mobile banking software targeting the so-called ‘unbanked’).

Supplying goods to instruments of the state, such as is the case in South Africa, requires firms to satisfy a number of secondary objectives under scrutiny of public sector procurement processes such as indicating the potential for job creation, encouraging local procurement, impacting on social upliftment, and supporting

racial and economic transformation. Further, the rollout of products and services to satisfy basic public needs in an emerging market like South Africa requires additional processes to deal with issues of literacy, challenges pertaining to digital inclusiveness, as well as managing practical realities such as pricing of products and services.

Such realities impact directly on the ability of firms to successfully sell products and services in an emerging market and require skills, experience, business practices and support processes over-and-above those normally associated with the commercialisation of high-tech products and services.

The research outputs correlate the above conclusions from both literature as well as limited interviews with high-tech social enterprises alluded to in the above dissertation: high-tech SMEs in an emerging market such as South Africa, will demonstrate higher levels of success where there are higher levels of social enterprise self-efficacy, or higher levels of social impact considerations. In other words, to be successful in commercialising high-tech products and services, such firms need to be mindful of the social needs and social context in which such products and services are commercialised. This mindfulness extends beyond simple window-dressing, and requires high levels of social enterprise self-efficacy, meaning that the enterprise should both talk-the-talk, and walk-the-walk.

5.3 Limitations of the research

The final sample used in this research (n=64) is considered small in so far as offering sufficient data with which to ensure the robustness of the factor and correlational analysis outputs (Comrey and Lee, 1992). This limitation has specific bearing on the use of different constructs involving EO, SESE and SIM, as the underlying dimensionality of the corresponding items for each variable is a critical indicator of the statistical relevance and significance of using said constructs, and subsequently may limit the ability to draw meaningful insights from literature.

Apart from strengthening the statistical significance of the findings, additional records will go a long way to enable further comparison amongst clusters in the data, such as contrasting the above findings for different sizes of enterprises in the

SME spectrum, as well as importantly investigating whether or not the findings are specific to a certain industry (e.g. medical devices versus mobile e-commerce (or m-commerce)). So for example is the expectation that some industries such as those involving public health will involve higher levels of public sector scrutiny, in contrast to for example m-commerce offerings that offered directly to the market without any form of public sector scrutiny, currently still targeting high-end sectors of the economy with predominantly smart-phone focused applications.

The overwhelming number of enterprises represented in the final sample were from firms in South Africa. This limits the ability to meaningfully extrapolate findings to cover other emerging countries, especially given the broad spectrum of size, industry and market differences between emerging market countries (Cooper et al, 2011).

5.4 Suggestions for further research

The research utilised a number of constructs from the domain of social entrepreneurship and social impact research, and applied these in an environment that does not necessarily conform to, or mirror the social impact literature. For this reason, additional research may better test the robustness of utilising the SIM and SESE measures – both developed for use in assessing social entrepreneurship and social impact – to confirm whether or not additional dimensions are needed to better adapt such measures to the world of normal commercial enterprises.

A key output from the research literature review pointed towards the value, when assessing the success and/or sustainability of an SME firm, to not limit measures only to those involving financial and profitability aspects of the business, but also additional dimensions such as social impact. The above research clearly outlines the need to appreciate the social impact dimensions of a high-tech SME in an emerging market.

Additional research may shed further light on the value of expanding due diligence investigations used by Venture Capital firms when considering investment in commercial enterprises, by incorporating the above constructs for the assessment of social impact dimensions, prior to investment, as alluded to in Urban's

conclusion from application of the SESE and SIM constructs (Urban, 2015). In doing so, social impact and social enterprise self-efficacy assessed prior to investment, may contribute to improved appraisal of the future potential for such investment firms to actually and realistically achieve projected returns, as current projections may not indicate whether or not the social impact dimensions, and subsequent costs, efforts, time and risks involved in identifying and navigating such dimensions, are properly catered for in first-instance investment proposals.

It would be very useful to compare the results and findings of this research to those involving other emerging markets (e.g. Brazil, Chile, India, Tanzania) to determine if in fact the findings from this research can be expanded on to apply suitably to other emerging markets and not just South Africa. This could be achieved by repeating the research process in other emerging markets, using the same constructs, methodology and research instrument.

A primary objective of the research as outlined in the introduction, is to inform policy, especially in regards to ensuring that high-tech entrepreneurs operating in emerging markets are suitably trained and supported so as to appreciate the need to expand commercialisation processes to include those needed to assess and demonstrate appropriate social impact. This offers fertile ground for further research, by probing the way in which high-tech SMEs in emerging markets actually changed commercialisation processes and business practices, so as to be more socially conscious and socially relevant, and thereby ultimately achieve greater levels of success.

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APPENDIX A: LETTER TO RESPONDENTS

SJ Lamprecht
Masters student
Wits Business School

Tuesday 31 July 2012

To whom it may concern

Social considerations of SMEs offering high-tech products and services in Emerging markets

Emerging markets are the last frontier for high-tech products and services, in regards to accessing untapped markets, and addressing social needs and income disparity through scalable technology. SMEs are ideally positioned to benefit from this market opportunity given flexibility, high-risk appetite and the need to find new markets.

Stephan Lamprecht is a Masters in Management student with the Wits Business School and is conducting research into the social considerations of SMEs offering high-tech products and services in Emerging markets. The purpose of the research is to investigate the strategies of SMEs offering high-tech products and services in Emerging markets.

Information collected will be treated confidentially and will not be supplied to any 3rd party.

Please complete the survey ***by no later than Friday 21 September 2012*** by using the Google Docs link emailed to you.

The researcher will compile a summary report from the survey and notify respondents via email of the web address where the report can be downloaded.

I thank you in advance for your participation and believe that your contribution will ensure a very positive advance towards establishing best-practices for high-tech

commercialisation in Emerging markets, and improving the success rate of SMEs offering high-tech products and services in such markets.

Regards,

Stephan J Lamprecht

APPENDIX B: OUTLINE OF RESEARCH INSTRUMENT

Section 1: Demographics and background of respondent

Example of Section 1 questions:

- Size (to determine SME status)
- Sector (comparison between sectors)
- Primary products and services offered (high-tech or not)
- Presence of R&D activities (high-tech or not)
- Reason for founding of business (entrepreneurial, technopreneurial, or SE)
- Respondent details (person completing the survey).

Section 2: Success and Entrepreneurial tendencies

Example of Section 2 questions:

- Years in operation (towards assessing success)
- Reason for founding business (e.g. responding to social funding opportunity, market opportunity and/or need to enter new markets for scaling of products and services)
- Opportunity driven or self-sustainability (multiple choice)
- Presence of risk, resource constraints and/or opportunity metrics in business activities (e.g. rate riskiness of business on scale from low to high, as well as impact of resource constraints (low to high), and clarity/impact of opportunity; collectively using Likert type scales to rate the presence and significance of each mentioned metric).

Section 3: Presence of social impact considerations

Example of Section 3 questions:

- If the business was founded to pursue a specific social impact, is this still the dominant driver today? (Yes or No)
- If 'No' to the previous question, then ask two questions around firstly what the dominant driver is today (from available options such as profits, technology, other), and secondly what the reasons were for the change (multiple choice options including need to scale, etc.)
- To what extent do you consider social impact important to achieving business mission/vision? (Likert scale)
- What is role of social impact in your business strategy? (multiple-choice options where more than one can be selected (e.g. list top three) from options such as: no impact, primary driver of strategy (thus dominant SVP), significant in raising funding, etc.
- Rate influence of social considerations in defining the market, developing market channels, attracting funding, setting strategy, getting customers, retaining customers, obtaining regulatory approval, etc. (Likert scale)
- Have you ever discussed social impact at board meetings and if so, how often?
- Has your business defined a social impact strategy?
- Do you have a Social Value Proposition and if so, is it formally defined, or informally embedded in operations?

Section 4: Motivations for presence of social impact considerations

Example of Section 4 questions:

- What is the dominant reasons for answering positive to section 3 questions pertaining to social impact (limited options available to force respondent to prioritise options):
    - The business opportunity at heart of business is a social impact opportunity (Likert scale)
    - The founder(s) is a social entrepreneur
    - The business has an existing Social Value Proposition
    - The market dictates a focus on social impact
    - Partners/shareholders insists on social impact prioritisation (why?)
    - Funder requires social impact focus
    - Regulations require it (e.g. CSI, BBBEE).

Section 5: Future considerations in regards to an SVP

Example of Section 5 questions:

- What is the probability of your business pursuing social impact business opportunities in the next 12 months, two years and/or five years? (Likert scale)
- What is the probability of your business strategy changing in the next year/2 years to respond to social impact opportunities or social impact demands? (Likert scale)
- How do you rate the future role of social impact in business opportunities in general (in general, not limited to your firm only)? (Likert scale)

APPENDIX C: ADDITIONAL REGRESSION RESULTS

Linear Regression Results: Success (DV) with EOavg (IV)

Regression Statistics

R	0.31646
R-square	0.10015
Adjusted R-square	0.08563
S	1.693
N	64

Success = 2,16466 + 0,54104 * EOavg

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	19.77726	19.77726	6.90006	0.01085
Residual	62.	177.70712	2.86624		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	2.16466	1.01253	0.14065	4.18868	2.13788	0.03648	*rejected*
EOavg	0.54104	0.20597	0.12931	0.95278	2.6268	0.01085	*rejected*
T (5%)	1.99897						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

Table 24: Regression results for Success (DV) with EOavg (IV)

Linear Regression Results: Success (DV) with SE6 (IV)

Regression Statistics

R	0.27542
R-square	0.07585
Adjusted R-square	0.06095
S	1.7157
N	64

Success = 2,92597 + 0,35041 * SE6

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	14.98002	14.98002	5.08898	0.02762
Residual	62.	182.50435	2.94362		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	2.92597	0.84322	1.2404	4.61155	3.46999	0.00095	*rejected*
SE6	0.35041	0.15533	0.03991	0.66091	2.25588	0.02762	*rejected*
T (5%)	1.99897						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

Table 25: Regression results for Success (DV) with SE6 (IV)

Linear Regression Results: Success (DV) with SE9 (IV)

Regression Statistics

R	0.31596
R-square	0.09983
Adjusted R-square	0.08531
S	1.6933
N	64

Success = 2,49702 + 0,40899 * SE9

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	19.71452	19.71452	6.87575	0.01098
Residual	62.	177.76985	2.86726		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	2.49702	0.89068	0.71657	4.27746	2.80349	0.00674	*rejected*
SE9	0.40899	0.15597	0.0972	0.72078	2.62216	0.01098	*rejected*
T (5%)	1.99897						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

Table 26: Regression results for Success (DV) with SE9 (IV)

Linear Regression results for Success (DV) with SIM12 (IV)

Regression Statistics

R	0.28377
R-square	0.08053
Adjusted R-square	0.0657
S	1.71135
N	64

Success = 3,6512 + 0,27119 * SIM12

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	15.90276	15.90276	5.42991	0.02306
Residual	62.	181.58162	2.92874		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	3.6512	0.52391	2.60392	4.69849	6.96913	2.43161E-9	*rejected*
SIM12	0.27119	0.11638	0.03855	0.50383	2.33022	0.02306	*rejected*
T (5%)	1.99897						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

Table 27: Regression results for Success (DV) with SIM12 (IV)

Linear Regression results for Success (DV) with SIM13 (IV)

Regression Statistics

R	0.28206
R-square	0.07956
Adjusted R-square	0.06471
S	1.71225
N	64

Success = 3,78201 + 0,23936 * SIM13

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	15.71171	15.71171	5.35904	0.02394
Residual	62.	181.77266	2.93182		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	3.78201	0.47576	2.83098	4.73304	7.94941	4.84352E-11	*rejected*
SIM13	0.23936	0.1034	0.03267	0.44605	2.31496	0.02394	*rejected*
T (5%)	1.99897						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

Table 28: Regression results for Success (DV) with SIM13 (IV)

Linear Regression Results: Success (DV) with SIM12 and EOavg (IVs)

Regression Statistics	
R	0.40806
R-square	0.16652
Adjusted R-square	0.13919
S	1.64267
N	64

Success = 1,33117 + 0,24711 * SIM12 + 0,50319 * EOavg

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	2.	32.88417	16.44208	6.09335	0.00387
Residual	61.	164.60021	2.69836		
Total	63.	197.48438			

	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (5%)*
Intercept	1.33117	1.0527	-0.77384	3.43618	1.26453	0.21085	*accepted*
SIM12	0.24711	0.11212	0.02291	0.47131	2.20394	0.03131	*rejected*
EOavg	0.50319	0.20058	0.1021	0.90429	2.50863	0.01479	*rejected*
T (5%)	1.99962						

LCL - Lower value of a reliable interval (LCL)
UCL - Upper value of a reliable interval (UCL)

APPENDIX E: SESE FACTOR ANALYSIS RESULTS

XLSTAT 2016.01.26783 - Factor analysis - Start time: 3/31/2016 at 7:45:53 AM
Observations/variables table: Workbook = Hoof Datastel 10 Maart 2016.xlsx / Sheet = StatsPlusData / Range = StatsPlusData!$AA$1:$AJ$65 / 64 rows and 10 columns
Filtering / N first rows: Number of observations: 50
Correlation: Pearson (n)
Extraction method: Principal components
Number of factors: Automatic

Summary statistics:

Variable	Observations	with missing	without missin	Minimum	Maximum	Mean	Std. deviation
SE1	64	0	64	2.000	7.000	5.375	1.303
SE2	64	0	64	2.000	7.000	5.359	1.384
SE3	64	0	64	1.000	7.000	5.438	1.332
SE4	64	0	64	2.000	7.000	5.234	1.466
SE5	64	0	64	1.000	7.000	5.063	1.511
SE6	64	0	64	2.000	7.000	5.250	1.392
SE7	64	0	64	2.000	7.000	5.266	1.483
SE8	64	0	64	3.000	7.000	5.922	1.145
SE9	64	0	64	1.000	7.000	5.547	1.368
SE10	64	0	64	3.000	7.000	6.359	1.060

Correlation matrix (Pearson (n)):

Variables	SE1	SE2	SE3	SE4	SE5	SE6	SE7	SE8	SE9	SE10
SE1	**1**	0.804	0.791	0.767	0.778	0.604	0.572	0.701	0.569	0.487
SE2	0.804	**1**	0.817	0.873	0.756	0.669	0.618	0.619	0.582	0.441
SE3	0.791	0.817	**1**	0.873	0.775	0.634	0.623	0.647	0.590	0.460
SE4	0.767	0.873	0.873	**1**	0.853	0.694	0.716	0.663	0.608	0.394
SE5	0.778	0.756	0.775	0.853	**1**	0.695	0.751	0.636	0.605	0.353
SE6	0.604	0.669	0.634	0.694	0.695	**1**	0.767	0.760	0.644	0.487
SE7	0.572	0.618	0.623	0.716	0.751	0.767	**1**	0.686	0.600	0.403
SE8	0.701	0.619	0.647	0.663	0.636	0.760	0.686	**1**	0.646	0.547
SE9	0.569	0.582	0.590	0.608	0.605	0.644	0.600	0.646	**1**	0.552
SE10	0.487	0.441	0.460	0.394	0.353	0.487	0.403	0.547	0.552	**1**

Kaiser-Meyer-Olkin measure of sampling adequacy:

SE1	0.860
SE2	0.888
SE3	0.938
SE4	0.873
SE5	0.884
SE6	0.912
SE7	0.924
SE8	0.891
SE9	0.956
SE10	0.905
KMO	0.900

Cronbach's alpha: 0.948

Factor analysis:

Reproduced correlation matrix:

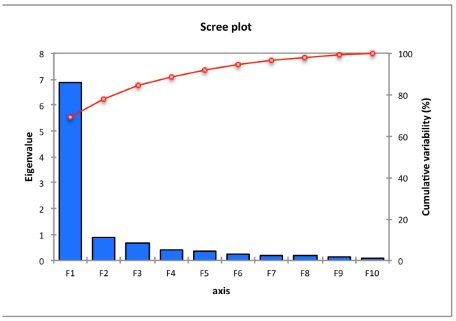
	SE1	SE2	SE3	SE4	SE5	SE6	SE7	SE8	SE9	SE10
SE1	0.740	0.754	0.757	0.783	0.758	0.723	0.703	0.715	0.658	0.511
SE2	0.754	0.768	0.771	0.798	0.772	0.736	0.715	0.728	0.670	0.520
SE3	0.757	0.771	0.774	0.801	0.775	0.739	0.718	0.731	0.672	0.522
SE4	0.783	0.798	0.801	0.829	0.802	0.765	0.744	0.757	0.696	0.541
SE5	0.758	0.772	0.775	0.802	0.776	0.740	0.720	0.733	0.674	0.523
SE6	0.723	0.736	0.739	0.765	0.740	0.706	0.686	0.699	0.642	0.499
SE7	0.703	0.715	0.718	0.744	0.720	0.686	0.667	0.679	0.624	0.485
SE8	0.715	0.728	0.731	0.757	0.733	0.699	0.679	0.691	0.636	0.494
SE9	0.658	0.670	0.672	0.696	0.674	0.642	0.624	0.636	0.584	0.454
SE10	0.511	0.520	0.522	0.541	0.523	0.499	0.485	0.494	0.454	0.352

Residual correlation matrix:

	SE1	SE2	SE3	SE4	SE5	SE6	SE7	SE8	SE9	SE10
SE1	0.260	0.050	0.034	-0.016	0.020	-0.119	-0.131	-0.015	-0.089	-0.024
SE2	0.050	0.232	0.047	0.075	-0.016	-0.067	-0.098	-0.110	-0.088	-0.079
SE3	0.034	0.047	0.226	0.072	0.000	-0.105	-0.095	-0.084	-0.083	-0.062
SE4	-0.016	0.075	0.072	0.171	0.051	-0.071	-0.028	-0.094	-0.088	-0.146
SE5	0.020	-0.016	0.000	0.051	0.224	-0.046	0.031	-0.097	-0.068	-0.170
SE6	-0.119	-0.067	-0.105	-0.071	-0.046	0.294	0.081	0.061	0.002	-0.012
SE7	-0.131	-0.098	-0.095	-0.028	0.031	0.081	0.333	0.007	-0.024	-0.082
SE8	-0.015	-0.110	-0.084	-0.094	-0.097	0.061	0.007	0.309	0.010	0.053
SE9	-0.089	-0.088	-0.083	-0.088	-0.068	0.002	-0.024	0.010	0.416	0.098
SE10	-0.024	-0.079	-0.062	-0.146	-0.170	-0.012	-0.082	0.053	0.098	0.648

Eigenvalues:

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Eigenvalue	6.888	0.897	0.648	0.391	0.331	0.264	0.210	0.170	0.131	0.069
Variability (%	68.881	8.975	6.481	3.913	3.312	2.642	2.103	1.697	1.309	0.688
Cumulative %	68.881	77.856	84.336	88.250	91.561	94.203	96.307	98.003	99.312	100.000



Eigenvectors:

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
SE1	0.328	0.151	0.356	-0.191	0.375	0.357	-0.390	0.095	-0.408	-0.334
SE2	0.334	0.247	0.255	0.018	-0.101	-0.457	-0.277	0.523	0.122	0.422
SE3	0.335	0.227	0.273	0.034	-0.083	-0.118	0.587	-0.360	-0.452	0.249
SE4	0.347	0.297	0.055	0.080	-0.172	-0.153	0.248	0.026	0.440	-0.688
SE5	0.336	0.279	-0.118	0.101	-0.111	0.485	-0.265	-0.416	0.406	0.361
SE6	0.320	-0.171	-0.414	-0.211	-0.038	-0.516	-0.381	-0.432	-0.192	-0.122
SE7	0.311	-0.028	-0.549	-0.090	-0.398	0.331	0.152	0.456	-0.306	-0.008
SE8	0.317	-0.262	-0.162	-0.400	0.609	0.012	0.355	0.117	0.322	0.171
SE9	0.291	-0.352	-0.075	0.839	0.270	-0.013	-0.014	0.058	-0.069	-0.025
SE10	0.226	-0.690	0.460	-0.169	-0.443	0.122	-0.031	-0.053	0.132	-0.012

Factor pattern:

	F1	ial communa	ial communal	ecific variance
SE1	**0.860**	1.000	0.740	0.260
SE2	**0.876**	1.000	0.768	0.232
SE3	**0.880**	1.000	0.774	0.226
SE4	**0.911**	1.000	0.829	0.171
SE5	**0.881**	1.000	0.776	0.224
SE6	**0.840**	1.000	0.706	0.294
SE7	**0.817**	1.000	0.667	0.333
SE8	**0.831**	1.000	0.691	0.309
SE9	**0.764**	1.000	0.584	0.416
SE10	**0.594**	1.000	0.352	0.648

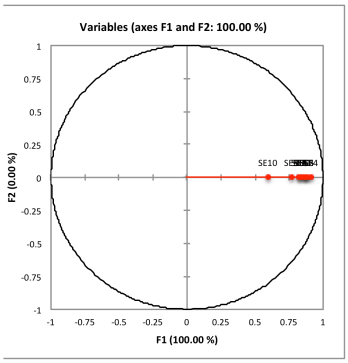
Values in bold correspond for each variable to the factor for which the squared cosine is the largest

Cronbach's alpha:

	Cronbach's alpha
F1	0.948

Correlations between variables and factors:

	F1
SE1	0.860
SE2	0.876
SE3	0.880
SE4	0.911
SE5	0.881
SE6	0.840
SE7	0.817
SE8	0.831
SE9	0.764
SE10	0.594



Factor pattern coefficients:

	F1
SE1	0.328
SE2	0.334
SE3	0.335
SE4	0.347
SE5	0.336
SE6	0.320
SE7	0.311
SE8	0.317
SE9	0.291
SE10	0.226