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**WHAT MEDIATES THE EFFECTS OF MARKET ORIENTATION ON  
PERFORMANCE?: THE CASE OF HIGH TECHNOLOGY  
COMPANIES IN SOUTH AFRICA**

by

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**16/02/2009**

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Submitted in fulfilment of the requirements  
for the Degree of Doctor of Philosophy in the  
Graduate School of Business  
University of Cape Town

2009

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Supervisor

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Doctoral Degrees Board

## ACKNOWLEDGEMENTS

This dissertation could not have been completed without the support and understanding of the most valuable people in my life: My husband, Wayne, my two beautiful daughters Michaela and Daniella, my parents and my sister, Jeanne, who supported me during these trying years at the University of Cape Town. Without your support I would never have been able to accomplish this task. In particular, Wayne's belief in my capabilities and his relentless motivation and encouragement over the past four and a half years has been a true inspiration. You have been patient and understanding.

I extend my gratitude to the following people who have contributed in many ways to this study. To my supervisor, Professor Steve Burgess, thank you for your input, guidance and support. I appreciate the long hours that you have dedicated to this dissertation. To Annette Greyling and her team at Markinor, specifically Tanya van Niekerk and Jackie Boshoff, your support and contribution have been incredible. I am very grateful for Nedbank's financial support and to several people at Nedbank who have made it possible for me to complete this degree. Thank you to Charel Smith, Jimmy Mnyani, Adrian Burlo, Tony Curtin and Ivan Mzimela for believing in me. To Ernst Gouws and Louw Conradie at OUTsurance, thank you for your incredible patience during the final year of this dissertation and your financial support.

At times it felt like a very long, arduous and trying journey. I thank Pastor Bill, Kenneth Copeland Ministries, Adele Draeger and Hananje van Biljon for your support. Finally, and most importantly, I thank Christ, my Lord and Saviour for blessing me with the endurance and perseverance throughout this dissertation. You have always been my source of wisdom and comfort.

## ABSTRACT

Conventional market orientation philosophy holds that behavioural and philosophical-cultural aspects of marketing are fundamental to an organisation. Prior research on strategic orientation in marketing research has focused on the construct of market orientation, which has been shown to have strong positive relations on business performance. In the present research, the effects of market orientation on performance are assessed concurrently with two other types of strategic orientation: technology orientation and learning orientation. In addition, we assess the mediating properties of entrepreneurship and innovativeness on the relationship of these three types of strategic orientation on business performance.

Two hundred South African high technology firms participated in the present research. Contrary to portrayals of high technology firms as start-ups run by entrepreneurs, many high technology companies in South Africa are firmly established institutions that practise market orientation and strategic planning, for that matter. Because the institutional context of emerging markets differs considerably from that of the high-income countries in which market orientation theory has been proposed and primarily tested, a meta-analysis of prior market orientation studies conducted in 24 emerging markets was conducted, using meta-analysis techniques recommended by Lipsey and Wilson (2001). The results of the meta-analysis results provide insights into market orientation in the emerging market context. Drawing on extant theory and the meta-analysis results, the theorized relations are tested systematically in a structural equation model.

The findings of this study suggest that top management emphasis of market-orientation creates an environment in which technology orientation and learning orientation also thrive. This improves business performance directly and through improved innovation and entrepreneurship.

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## LIST OF ABBREVIATIONS AND ACRONYMS

AVE	average variance extracted
CBT	Cape Biotechnology Trust
CFA	confirmatory factor analysis
CITI	Cape Information Technology Trust
CSIR	Council for Scientific and Industrial Research
DTI	Department of Trade and Industry
EFA	exploratory factor analysis
EM	emerging markets
GDP	gross domestic product
GNI	gross national income per capita
HDI	human development index
HIC	High-income country
LIC	Low-income country
MNC	multi-national corporation
OECD	Organisation for Economic Co-operation and Development
OLS	ordinary least squares
PLS	partial least squares
PPP	purchasing power parity
SAMD	sample-adjusted meta-analytic deviancy
SEM	structural equation modelling
US	United States (of America)
WLS	weighted least squares
WTO	World Trade Organisation

## **CHAPTER 1: INTRODUCTION**

### **PURPOSE AND OVERVIEW OF THE STUDY**

Scholars in the marketing literature have devoted a considerable amount of research in examining the strategic properties of market orientation over the past decade. Their work has mainly contributed to exploring the conceptualisation and measurement of market orientation (Deshpandé et al. 1993; Jaworski and Kohli 1993; Narver et al. 1993; Ruekert 1992), the variables that influence market orientation (Grewal and Tansuhaj 2001; Han et al. 1998; Jaworski and Kohli 1993; Kohli et al. 1993; Narver et al. 1993; Noble et al. 2002; Pelham and Wilson 1996), and the consequences of a company that is dedicated to pursuing a market orientation (Jaworski and Kohli 1993; Slater and Narver 1994b).

Despite considerable progress, scholars still acknowledge several gaps in the existing body of knowledge regarding the implementation of market orientation and explicating the mechanisms that influence the market orientation-performance relationship (Kirca et al. 2005). In the face of the small number of studies that have directly focused on the routes through which market orientation affects performance (Han et al. 1998; Noble et al. 2002), research has primarily lacked a thorough examination of the mediators of the market orientation-performance relationship. From a strategic perspective, market orientation remains fragmentary if practitioners misconstrue the protocol that gives rise to increased customer value and business performance (Han et al. 1998). Meticulous deliberation regarding the strategic orientations that emerging market (EM) high technology companies should consider resulted in an investigation of the actual mechanisms responsible for transforming market-oriented behaviour which leads to increased business performance. On the whole, scholars have recommended that market orientation, technology orientation and innovation orientation are important strategic orientations for EM companies to consider

(Gao et al. 2007; Gatignon and Xuereb 1997; Zhou et al. 2005a). Others have indicated that companies will increase their business performance only if market orientation drives entrepreneurship and learning (Liu et al. 2003). Largely, research in this area is confounded due to the controversial relationship that market orientation shares with technology orientation, learning orientations and entrepreneurship. More importantly so is the adoption of these approaches in EM companies and the effects that these approaches have on business performance and a company's ability to be innovative.

The literature is reviewed rigorously using meta-analysis (referred to as the EM meta-analysis) techniques. Meta-analysis is "a form of survey research in which research reports, rather than people are surveyed" (Lipsey and Wilson 2001). It is one of various ways to summarise, integrate and interpret empirical evidence across a collection of related studies (Cano et al. 2004; Lipsey and Wilson 2001). A meta-analysis enables the researcher to correct for the distorting effects of artefacts that may produce the illusion of conflicting findings (Hunter and Schmidt 2004). In many aspects, meta-analyses overcome the challenges experienced by many primary studies, predominantly for their lack of sufficient power to achieve statistically significant results, and also studies' inability to achieve exact estimation of effect sizes (Lipsey and Wilson 2001).

The EM meta-analysis is benchmarked against the meta-analyses of Cano et al. (2004) and Kirca et al. (2005) since they are the most current, concise and advanced meta-analytical studies in the market orientation literature to date. Of importance is that Cano et al. (2004) considered a disattenuated mean effect size as the best estimator of their market orientation-business performance association. Kirca et al. (2005), on the other hand, transformed reliability-corrected correlations into Fisher's z-coefficients, then averaged the z-coefficients, weighting them by the inverse of their variance, and then reconverted them to correlation coefficients.

Using the approach recommended by Lipsey and Wilson (2001) the meta-analysis results provide insight into the market orientation-performance and technology orientation-business performance relationships. Individual effect sizes are adjusted for bias, artefact, and error, prior to implementing statistical analyses. The results of outlier analysis, homogeneity and reliability of measures are discussed. The regression analyses provide insight into sample and measurement characteristics that moderate the market orientation-performance relationship. Contextual moderators are assessed using a weighted least square regression model (Geyskens et al. 2005). Finally, multivariate analyses were used to reveal the critical influencing factors and consequences of market orientation.

### **CONTRIBUTIONS OF THE RESEARCH**

Firstly, the current research contributes by rigorously summarising the results of multiple independent studies conducted previously in EMs, in the meta-analysis. The results confirm that EMs present boundary conditions for some aspects of market orientation theory. Secondly, it contributes to the market orientation literature concerning top management's emphasis and its predilection towards driving strategies such as technology orientation and learning orientation through market orientation in EM high technology companies. It is important for companies to recognise top management's fervour towards cementing learning and technology through its commitment to market orientation in high technology companies, and top management's relentless efforts in pursuit of innovativeness and business performance. Thirdly, the original contribution that this study makes to the market orientation literature is that it is the first EM study to suggest market orientation, learning orientation and technology orientation as concurrent strategies for firms to drive business performance and innovation. It is incumbent on top management to proactively drive market orientation

simultaneously with these strategic orientations, guiding the company to increased turnover, market share and profits. Finally, this research contributes to the body of knowledge about the mediators of the market orientation-performance (both financial and non-financial) relationship. It contributes to the market orientation literature by confirming the mediating properties of entrepreneurship on the market orientation-business performance relationship. It also contributes to our understanding that market-oriented companies are better innovators in the presence of a learning and technology orientation. The fusion yet methodical order of the relationships between market orientation, learning orientation, technology orientation and entrepreneurship appends to our understanding of how deeply these factors influence a company's predisposition towards innovativeness and business performance; in markets that represents a tough combination of being jostled and nascent at the best of times. The findings of this research underscore the importance of EM high technology companies to consider optimum strategies within the framework of mounting institutional pressures.

### **PLAN OF THE RESEARCH**

This dissertation covers five chapters with relevant supplementary figures, addendums, references and tables. The first chapter (the current chapter) presents a synopsis of the objectives, purpose and intended contributions of this study and includes the proposed conceptual framework. In chapter two, appropriate research from the market and strategic orientation literature streams are introduced to set the conditions and theoretical background for the research hypotheses. In chapter three the design and methodology used to test the hypotheses are introduced. In chapter four the results from the analysis of the hypotheses are reported and in chapter five the limitations of the study and the proposed direction for future research are discussed.

## **CHAPTER 2: LITERATURE REVIEW**

### **INTRODUCTION**

Strategic choice or strategy is one of the most eminent aspects of a company, which Pozzenbon (2004, p.248) describes as “discursive activities framed by a given understanding and account of organisation, managerial activities and the relationship between strategic management research and practice”.

Over the years researchers have provided several strategic choices for companies to consider (for example, Kotler’s contingency thinking and planning, Porter’s generic strategies, Miles and Snow’s prospector, defender, reactor and analyser typology and Strandholm’s efficiency and market-focused strategies). Most recently market, learning and technology orientations have become burning issues for companies to deliberate (Gao et al. 2007; Zhou et al. 2005a). Strategic orientation is particularly important when companies are faced with turbulent markets, more so than when companies operate in moderately stable environments (Grewal and Tansuhaj 2001) and therefore this study seeks to determine why these strategic orientations have become such pertinent strategies for EM companies to contemplate.

The current research is situated in South Africa, an important African EM, which is classified as “middle income” by the World Bank (2006) and “middle human development” by the United Nations (2006). EMs differ substantially from Western high-income countries (HICs), particularly when it concerns institutional context. Institutional context is an important consideration in any research, especially when it differs from the countries in which theories have been developed (Burgess and Steenkamp 2006). Burgess and Steenkamp (2006) recently drew on institutional theory to identify three pillars of the institutional context (viz., socioeconomic, cultural and regulative institutions), which provide a systematic

basis for understanding how EMs differ from HICs. The socio-economic context comprises of a country's dynamics, demographics and diversity. The socio-economic context of EMs is characterised by rapid economic and socio-political transformation (vs. gradual transformation in HICs), a much younger population make-up (vs. a more even spread of population in HICs) and vastly divergent living standards (as opposed to consistent levels of populations in HICs). The second pillar of institutional context, the cultural component, emphasises cultural embeddedness and hierarchy in EMs, where group identification takes precedence over the autonomy and egalitarian cultures as identified in HICs. The third pillar, the regulative system, refers to the rule of law (the preservation of "legal rights in formal laws") and stakeholder influence on corporate governance. Unlike HICs, rule of law is often exploited in EMs in public office for personal benefit and lack of enforcing individual's legal rights. Stakeholder-influence on corporate governance "involves the formal and informal influence that individuals and groups exert on the company with the purpose of shaping its corporate governance structures and processes" (Burgess and Nyajeka 2006). In HICs the influence of government and supply-chain stakeholders are relatively moderate as opposed to EMs where it is relatively high. All in all institutional context holds considerable implications for EM high technology companies and a reflection on previous research indicates that much remains unsaid (Im and Workman Jr. 2004).

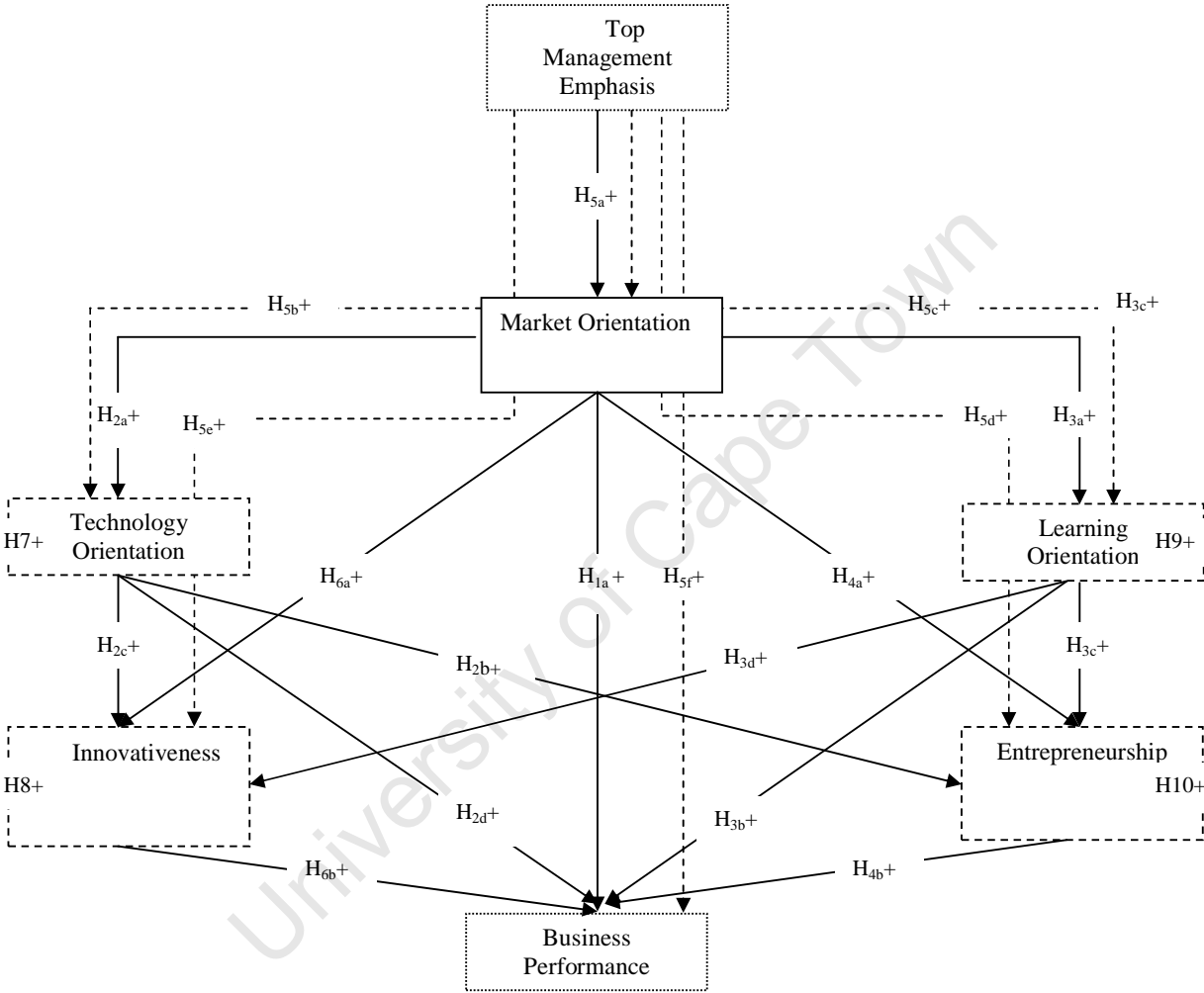
The most comprehensive meta-analysis of findings to date, having tested for competing models, concluded that market orientation has strong direct effects on performance. It also concludes that market orientation is influenced by organisational antecedents, but that mediators play a significant role in determining the strong effects that market orientation shares with performance (Han et al. 1998; Kirca 2004). Although this impressive stream of research has fashioned substantial consensus about the nature of market orientation, its antecedents, mediators and consequences, much work remains to be done

especially in respect of implementing market orientation and understanding how context and other variables may mediate its effects (Kirca et al. 2005).

This chapter is organised in the following manner. Firstly, strategic orientation is introduced followed by a discussion on market orientation. Secondly, two additional strategies are introduced and discussed: technology orientation and learning orientation. Thirdly, the high technology context is discussed with the focal point being on EMs. Fourthly, an in-depth discussion on the meta-analysis employed for this study is introduced. The meta-analysis approach provides a rigorous basis for hypothesis formulation where previous empirical tests of hypothesised relations are assessed for global significance across all relevant studies and analysing the various effects across the body of previous research (Lipsey and Wilson 2001). The focus here remains on carefully defining relevant variables and their hypothesised relations. This not only has the benefit of providing a much better perspective in respect of the significance of relations, but more importantly, will allow an assessment of hypothesised effect sizes in EMs. Finally, the mediators of the market orientation-performance and market orientation-innovativeness relationship are examined. The hypotheses that are the focus of the present research are located in the appropriate places within the literature review and summarised in the final section of the review.

**Figure 2.1 The Conceptual Model**

\_\_\_ Direct Effect  
 --- Mediated/Mediator



## STRATEGIC ORIENTATION

Strategic orientation is a company's politically discursive activities (Pozzebon 2004) that reflect its philosophy, particularly the manner in which it competes according to deeply rooted values and beliefs that guide them to superior performance (Gatignon and Xuereb 1997; Walker Jr. and Ruekert 1987). "These values and beliefs define the resources to be used, transcend individual capabilities, and unify the resources and capabilities into a cohesive whole" (Day 1994a). Such capabilities represent the competitive advantage to the company given that they are difficult to trade, imitate or duplicate (Day 1994a; Hunt and Morgan 1995).

The results in the EM meta-analysis reveal that the market orientation literature lacks a richness of perspective as to how EM companies embrace strategy. Unlike HICs, EMs experience unprecedented changes in their social, legal, and economic systems, which in turn raise serious strategic problems for enterprises (Burgess and Nyajeka 2006). Customers are no longer satisfied with a mass-marketing approach, leaving companies with no option but to adapt their strategies accordingly and to become more market-oriented. A further snapshot of what previous studies have confirmed about strategy and its implications in an EM context, reveals that extant research on the topic of strategy has called for the development and inclusion of technology, innovation and entrepreneurship in their market orientation strategies (Gao et al. 2007; Gatignon and Xuereb 1997; Liu et al. 2003; Zhou et al. 2005a; Zhou et al. 2005b).

For many high technology companies this could offer a solution since their "products, manufacturing processes, markets, distribution channels and competitive boundaries are in a state of continuous flux" (Evans 1991). In high technology companies, the need to be more strategy-oriented is fuelled by the ongoing emergence of industry players, technology

advances and the incessant need for companies to be more market-oriented, adapt to, and create a competitive advantage in changing environmental circumstances (Yasai-Ardekani and Nystrom 1996). Biotechnology companies, in particular, still wrestle with the realisation of an acceptable business definition. Since most biotechnology companies are research-oriented, this behaviour filters through to their strategic definition, which in most instances is less adequate to the business world (Costa et al. 2004). It rings true that companies that pursue strategic orientations such as technology, mega marketing orientation and/or market orientation can obtain extraordinary profits, (Kleindl 1999). A typical example of the role that strategy plays in high technology companies is taken from the late 1990s. This was during high technology's boom years, when high technology companies were creative, innovative and had the ability to make speedy decisions resulting in superior growth and shareholder value. Being creative and innovative enabled high technology companies to grow rapidly over a short period of time. This boosted the company's shareholder value, but the benefits reaped from this type of short-term growth were temporary. The technology bubble burst by the end of 2000, and this forced high technology companies to concentrate on increasing productivity, using the improvement strategically to expand their market share and improve their financial performance (Akella et al. 2003). As such, the environment that high technology companies operate in plays an integral part in the strategic planning process and the selection of individuals responsible for making the decisions that direct its strategic response (Wiersema and Bantel 1992). At best the strategy definition of most high technology companies cannot be known in advance and often managers are faced with an iterative process of trial and error that requires them to develop plans for learning along the way (Costa et al. 2004). But how would they embrace strategy now?

Several concerns about strategy remain unanswered. For one, the inference of market orientation on technology orientation remains unrequited in the literature. Does market and

technology orientation truly create an innovative environment? Does entrepreneurship and learning in high technology companies hinder or aid technology? What are the implications of running market, technology and learning orientations concurrently?

In an endeavour to answer these lingering questions, subsequent sections delve deeper into the relevant strategic orientations apt for EM high technology companies. In an attempt to find the solutions to these persistent questions hypotheses have been formulated. These hypotheses can be found in subsequent sections (and under their appropriate headings).

### **MARKET ORIENTATION: FOUR FUNDAMENTAL APPROACHES**

Market orientation has been influenced by four related approaches that measure the same underlying construct (Cadogan and Diamantopoulos 1995). These four approaches can be neatly summarised as behavioural and philosophical-cultural approaches accounting for the bulk of the research in this domain: Narver and Slater's (1990) and Deshpandé, Farley and Webster's behavioural approach, Kohli and Jaworski's (1990) strategic-behavioural approach and Ruekert's (1992) strategic approach (Cadogan and Diamantopoulos 1995). The four approaches with its strengths and weaknesses have been summarised in table 2.1.

#### **Similarities of the Four Market Orientation Approaches**

Given the emphasis that is placed on customers, the importance of acquiring and utilising information and the significance of interfunctional coordination (Lafferty and Hult 2001; Shapiro 1988), the four approaches share many similarities. Narver and Slater (1990, p. 64) argue that 'the concept of market orientation should be broadened to encompass all sources of relevant knowledge and ideas pertaining to customers and customer value creating

capabilities (Santos-Vijande et al. 2005a). Kohli and Jaworski (1993) share this sentiment by saying that the organisation-wide generation of market intelligence pertains to the current and future needs of customers. Ruekert (1992) state that market orientation is the degree to which the business unit obtains and uses information about customers and then develops strategies to meet these customers' needs. Deshpandé, Farley and Webster (1997) say that market orientation is a set of beliefs that puts the customer first.

In terms of information generation, the opinion is resonated by all four perspectives. Narver and Slater (1990) maintain that a level of understanding is required in the process of creating value for the customer, which necessitates acquiring information on all the constraints that face the customer. Kohli and Jaworski (1990) concur that market intelligence demands the generation of information and Ruekert (1992) clearly enumerates that the level of market orientation is determined by the extent to which a company obtains and uses information from customers. Deshpandé et al. (1997) agree that information about the needs of the customer is important in a customer-oriented company, however, the values that pervade in that company that help define the customer focus are more important (Lafferty and Hult 2001). Narver and Slater's (1990) approach to interfunctional coordination is that it is key to the conceptualisation of market orientation and it is just as important as customer and competitor orientation. Ruekert (1992) assents that companies need to have interfunctional coordination in order to deliver customer value. Deshpandé (1997) suggests that interfunctional coordination forms part of a customer orientation (Lafferty and Hult 2001). Three of the four approaches share the implementation of a customer orientation (responsiveness), which is a crucial aspect of a market orientation. Unfortunately, Deshpandé et al. (1993) do not include the responsiveness factor in their definition and measure of market orientation.

**Table 2.1 The Four Approaches to Market Orientation**

Behavioural Approaches	
Deshpandé, Farley and Webster (1993)	Kohli and Jaworski (1990)
<u>Scale:</u> MORTN: a scale that evaluates the relationships between corporate culture, customer orientation, innovativeness and business performance.	<u>Scale:</u> MARKOR: a 32-item scale that measures market intelligence generation, market intelligence dissemination and market responsiveness.
<u>Strengths:</u> Customer orientation and innovativeness are key determinants of business performance, having controlled for culture. Demonstrates a unique sampling and analytical method that matches manufacturers and their key customers (Homburg and Pflesser 2000).	<u>Strengths:</u> Matsuno, Mentzer and Rentz (2000) found that the Kohli and Jaworski's (1990) scale is superior to the Narver and Slater (1990) scale for consistency with the market orientation theory and scale operationalisation.
<u>Weaknesses:</u> Does not distinguish the four components of a market orientation, i.e. acquisition, sharing, interpretation and utilisation (Harrison-Walker 2001).	<u>Weaknesses:</u> The MARKOR measure has been criticised for focusing too heavily on information gathering and dissemination. Pelham (1993) argues that this narrow conceptualisation of market orientation does not provide adequate measurement to capture the notion of providing value to customers.
Narver and Slater (1990)	
<u>Scale:</u> a 21-item scale measuring customer orientation, competitor orientation and interfunctional coordination. <u>Strengths:</u> In a study conducted by Oczkowski and Farrell (1998), the results indicated that MTKOR outperforms MARKOR in terms of unidimensionality and predictive validity. It was found that MKTOR is more efficient and superior to the MARKOR scale	<u>Weaknesses:</u> Narver and Slater's (1990) measure of the competitor orientation component does not appear to operationalise the generation of competitor information. Their measure does not include any specific item capturing. The acquisition of competitor information is included in their measure, although sales people are asked whether they share competitor information. Narver and Slater (1990) do not operationalise information regarding exogenous market influences (Harrison-Walker 2001).
Philosophical Approach	
Ruekert (1992)	
<u>Scale:</u> a 23-item scale that measures the use of customer information, the development of a market-oriented strategy and the execution or implementation of a market-oriented strategy. Ruekert (1992) views the customer as the most critical aspect in developing strategies for the firm (Lafferty and Hult 1999). <u>Strengths:</u> Focuses on the strategic aspect of market orientation (Kaynak & Kara 2004). <u>Weaknesses:</u> Ruekert (1992) developed scale items that are specific (e.g., responding to consumer needs in specific situations or using market research for specific objectives). A typical example is: "obtain ideas from customers to improve products". This is an acquisition item that indicates a specific end use, rather than a general end use such as "obtaining ideas from customers." Scale items were designed to be applicable across industries, however, his utilisation item "responding to customer needs when bidding projects" may not be applicable to many firms (Harrison-Walker 2001).	
<u>Similarities of all four approaches:</u> The Kohli and Jaworski (1990) and the Narver and Slater (1990) definition of market orientation focus on the central role of the customer. Their scales entail an internal orientation and recognise the importance of being responsive to customers at an organisational level. In addition to this, Kohli and Jaworski (1990) and Narver and Slater (1990) recognise that interests of other stakeholders and/or other forces influence the needs and expectations of customers (Movando and Farrell, 2000). The intelligence generation and dissemination aspect of the MARKOR scale supports Ruekert's (1992) notion of "collection and use of information". It also supports Narver and Slater's (1990) "collection of customer and competitor information". All three behavioural components suggested by Narver and Slater (1990) overlap with intelligence generation in several aspects (Cadogan and Diamantopoulos 1995). Deshpandé, Farley and Webster designed their model based on organisational culture, with the main focus on customers rather than competitors. Cadogan and Diamantopoulos (1993) explain that Narver and Slater's (1990) interfunctional coordination shares a similar conceptual specification to Kohli and Jaworski's (1990) collective responsibility for the generation of market intelligence. All four approaches share similarities: sharing knowledge within the firm, interfunctional coordination, responsiveness to the market conditions and being customer focused.	

Kohli and Jaworski (1990) and Narver and Slater (1990) specify that market intelligence is important in both competitor and customer orientation and Ruekert (1992) encourage companies to understand the strengths and weaknesses of its competitors (Lafferty and Hult 2001). In their endeavour to assess market orientation theory in particular industries and markets, more than 70 studies over the past fifteen years have adopted Kohli and Jaworski's (1990) strategic-behavioural approach (Bhuiyan 1997; Cadogan and Diamantopoulos 1995; Rose and Shoham 2002; Selnes et al. 1996; Sinkula et al. 1997). Almost 50 have assumed, Narver and Slater's (1990) behavioural approach (Deng and Dart 1994; Fahy et al. 2000; Foxall and Greenley 1995) and some authors have voiced their approval for Ruekert's strategic approach (Atuahene-Gima 1997; Burgess and Nyajeka 2006). Others have implemented Deshpandé et al.'s (1997) philosophical-behavioural approach (Appiah-Adu 1998; Dawes 2000; Santos-Vijande et al. 2005a). Research indicates that MKTOR and MARKOR are the most popular scales used in the market orientation literature (Oczkowski and Farrell 1998). However, for this research, Ruekert's (1992) scale has been used as it measures strategic aspects of market orientation and includes information acquisition, analysis and dissemination (dimension 1), strategic decision-making based on the company's markets (dimension 2) and strategy implementation based on the company's customers (dimension 3).

In summary, the positive effects of marketing orientation on business performance have been confirmed consistently in more than 250 prior market-orientation studies conducted in diverse industry and developmental contexts. Consequently, it is hypothesised that,

H<sub>1a</sub>: Market orientation has a positive effect on business performance in high technology companies in South Africa.

## TECHNOLOGY ORIENTATION

Technology orientation is a company's ability to acquire substantial research and development (in new product development) and to use technical knowledge by building new technical solutions to answer and meet the new needs of users (Cooper 1984; Gatignon and Xuereb 1997). Technology orientation is also the integration of newness/freshness into marketing processes (Voss and Voss 2000) and suggests that consumers prefer products and services of scientific superiority (Gao et al. 2007).

Controversial debates about this phenomenon have caused many to believe that technology orientation is possibly some sort of product orientation. For example, Kotler (2000) describes a technology orientation as a result of a product orientation, meaning that management concentrate on producing high-quality products and improving them over time, not focusing on the customer per se. Still, technology orientation is an important strategy to consider in high technology companies, particularly when one deliberates the implications of risk, learning and leadership that goes hand-in-hand in supplying customers with sophisticated technologies (Gao et al. 2007; Ruekert 1992). Perhaps the most eminent aspect of a technology orientation is its strategic aspect that allows high technology companies to ponder technologies that will fulfil their customer needs. Gao et al. (2007) and Gatignon & Xuereb (1997) state that technology orientation is a strategic orientation (their adapted measure includes the strategic aspects of technology orientation). Consistent with the reasoning of several strategy researchers such as Child (1972), Pozzenbon (2004), and Day (1994a) managers face this great responsibility of making sense of the complex and fluid competitive market. Their means to achieve this is an "establishment of a kind of balance between structure and agency, micro and macro, environmental constraints and strategic choice" Pozzenbon (2004). In line with this kind of philosophy the technology-oriented

company proactively seeks and adopts new technologies in order to emphasise cost superiority that will lead to customer-oriented representation (Day 1994a). In their attempt to adapt to their external environment, high technology companies are often faced with different types of novelties that they engage in their strategies (Dalton et al. 1980; Miles and Snow 1978). These types of novelties or innovations are technical innovations versus administrative innovations, (Appiah-Adu 1998; Noe 1996), new-to-the-company versus new-to-the-market/new-to-the-world innovations (Sandvik and Sandvik 2003) and incremental versus radical innovations (Capon and Glazer 1987). Technical innovations represent a company's products or processes, and administrative innovations refer to a company's structure and administrative processes. New-to-the-company products are defined as products that are already in the market, but are new to the company (Sandvik and Sandvik 2003), whereas new-to-the-market/world products are products that have not been introduced by the company or by the market/world (Atuahene-Gima 1996; Lukas and Ferrell 2000; Sandvik and Sandvik 2003). There are companies that have also adopted a radical-technology approach, have leapt from one generation of technology to the next, and adapted their strategies based on such technologies. Radical technologies provide companies with the possibility to create attractive market opportunities in the area of product design, distribution and pricing (Capon and Glazer 1987). Regardless of which type of novelty a company chooses, it is important that they are specific about which type they elect to include in their strategy.

The nature of high technology companies is such that they devote resources to research and development and champion the acquisition and application of such novelties in its products and services (Costa et al. 2004). They generally exceed in technical proficiency and flexibility and often encourage their employees to propose “crazy ideas” or “something drastically new” that are crucial to the success of break-through innovations. In such companies creativity and invention are the company’s norms and values and introducing breakthroughs becomes a strategic and cultural precedence. Undoubtedly, successful technology hinges on the extent to which high technology companies use these technical proficiencies and “crazy ideas” to implement a market orientation, their capacity to employ structures that accommodate the strategic orientation adopted, and the influence that corporate culture exerts on the company (Costa et al. 2004; Gatignon and Xuereb 1997). Findings suggest that both market and technology orientation promote openness to such “crazy” or drastically new ideas (Appiah-Adu and Ranchhod 1998; Zhou et al. 2005b).

In more recent debates about its relation to market orientation theorist have confirmed some controversial findings. Gao et al. (Gao et al. 2007) for example found that technology orientation should be implemented with a market orientation and that technology orientation relates positively to business performance (contingent on the degree of technological turbulence in the market). Zhou et al. (2005b) established that technology orientation affects company and product performance best through technology-based innovation. Srinivasan et al. (2002) motivate that technology-sensing capability and technology-response capability bring a technology orientation closer to its application companies. Srinivasan et al. (2002) define technology opportunism as: “the organisation’s ability to acquire knowledge about and understand new technology developments, which may be developed either internally or externally”. Still companies that understand the merits of technology as a principal driver of competition and the importance of in-house technology development (Pisano 1990; Schilling

1998) place a tremendous reliance on technology. Companies, particularly high technology companies, who are familiar with how their potential customers embrace technologies, will have a greater awareness of their customers' needs when formulating their marketing strategies (Costa et al. 2004).

The EM meta-analysis highlights several questions about technology orientation that remains unanswered. Firstly, the market orientation-technology orientation relationship, particularly its interrelationship qualities, remains understudied (Gao et al. 2007; Gatignon and Xuereb 1997). This is disconcerting considering the immense reliance companies place on technology. Secondly, the association between technology orientation and entrepreneurship has also not been tested given that entrepreneurship creates a pro-risk, innovative proactive environment conducive to technology and innovation. Thirdly, although Gatignon and Xuereb (1997) confirm a positive link between technology orientation and innovativeness, its association remains understudied.

H<sub>2a</sub>: Market orientation has a positive effect on technology orientation in high technology companies in South Africa.

H<sub>2b</sub>: Technology orientation has a positive effect on entrepreneurship in high technology companies in South Africa

H<sub>2c</sub>: Technology orientation has a positive effect on innovativeness in high technology companies in South Africa

H<sub>2d</sub>: Technology orientation has a positive effect on business performance in high technology companies in South Africa

## LEARNING ORIENTATION

A learning orientation forms the basis for a market-oriented or market-driven strategic orientation (Slater 1995). The literature has conceptualised learning as a three-component organisational culture: commitment to learning, open-mindedness and shared vision (Baker and Sinkula 1999a; Celuch et al. 2002; McGuinness 2005; Paparoidamis 2005; Sinkula et al. 1997). Commitment to learning is a value shared by employees of a company that requires these employees to develop an understanding for the causes and effects of their actions. Open-mindedness prompts employees to use this understanding to challenge outdated and flawed mental models, seek improved ways of doing things, and explore external collaborative opportunities as part of enhancing competencies to achieve competitive advantage (Day 1994a; Senge 1990). Shared vision is the ownership that employees take in the company's goals and values which reflect the company's beliefs. Shared vision gives employees a sense of purpose and direction (Sinkula et al. 1997) that enables them to agree upon, and respond to market information processing and other activities for learning (Celuch et al. 2002; Day 1994b).

The characteristics of a learning orientation is particularly associated with generative, double-loop, proactive learning (Senge 1990). This type of learning influences the behaviour of companies by its impact on deeper norms and mental models. Learning in most companies is adaptive and single-loop, meaning that companies respond and adjust to their environment in a reactive way with the result that their basic business philosophy remains unchanged. As such a learning orientation emulates the level at which a company values the acquisition, development and utilisation of knowledge (Sinkula 1994) to promote a learning culture (Sinkula et al. 1997).

If one considers the aspects of learning and its implications on strategic orientation in high

technology companies one would agree that high technology companies are constantly at the forefront of technological change (Aggarwal and Singh 2004). So it would be beneficial for high technology companies to have open-minded employees that challenge technologies that no longer apply to their business processes, seek improved ways of doing things and explore the company's external environment for opportunities to enhance their skills to achieve competitive advantage (Day 1994a; Senge 1990). Similarly if employees in high technology companies retain a shared vision of the company's goals and values, it will give them a sense of purpose and direction (Sinkula et al. 1997) that enables them to acquire information, disseminate and have a shared interpretation of the results (Sinkula 1994). Scholars therefore suggest that learning leads to diversity in the nature and extent of knowledge in companies, which improves the company's marketing effectiveness, customer value (Day 1994a) and performance (Bennett 1998). In the African context, Burgess (2007) asserts that learning influences market orientation by means of learning systems, experience, knowledge management and supply chain resources. Earlier research conducted in HICs on the relationship between market orientation, learning orientation and business performance reveal that a market-oriented company is only able to enhance its performance and customer value in the presence of a learning orientation (Slater and Narver 1994b). Baker and Sinkula (1999) agree, but caution that market orientation creates an environment that fosters adaptive learning, whereas a learning orientation leads to generative learning (Börjesson and Dahlsten 2004). Therefore, developing a market orientation is a matter of starting a continuous, generative learning process (Santos-Vijande et al. 2005a) using customer information proactively, involving the entire company (Börjesson and Dahlsten 2004) to sustain its performance (Santos-Vijande et al. 2005a).

The fusion of market orientation, learning, innovation and business performance has caused great debate among scholars (Hult et al. 2001; Lee and Tsai 2005; Liu et al. 2003;

Yilmaz 2005). In Taiwan, Lee and Tsai (2005) empirically found that market orientation, learning orientation and innovativeness are significantly related to each other. In China, Liu et al. (2003) found that market orientation is positively and significantly related to learning orientation. Recently in high technology, Mavondo, Chimhanzi and Stewart (2005) established a positive relationship between market, learning and innovation orientation. It is therefore hypothesised that:

H<sub>3a</sub>: Market orientation has a positive effect on learning orientation in high technology companies in South Africa.

H<sub>3b</sub>: Learning orientation has a positive effect on business performance in high technology companies in South Africa.

H<sub>3c</sub>: Learning orientation has a positive effect on entrepreneurship in high technology companies in South Africa.

H<sub>3d</sub>: Learning orientation has a positive effect on innovativeness in high technology companies in South Africa.

### **MULTIPLE STAKEHOLDER APPROACH**

The multiple stakeholder theory is the “simultaneous ordering of attitudes towards each set of stakeholder interests and allocated managerial behaviour to serve these interests (Greenley et al. 2005, p. 1483)”. “Stakeholder theory begins with the assumption that values are necessarily and explicitly a part of doing business. It asks managers to articulate the shared sense of the value they create, and what brings its core stakeholders together (Freeman et al. 2004, p. 364)”. A stakeholder or multiple stakeholders is a party or group (for example, the company’s employees, distributors, suppliers, value-chain organisations, competitors,

customers) who can influence, or is influenced by the company's mission, based on their unique sets of expectations, needs and beliefs (Greenley and Foxall 1998). They are individuals or moral beings who have specific relationships with the company, by means of a membership in some group, or via some role-related interest (Freeman 1994; Goodpaster 1991).

Empirical evidence shows that the marketing concept and the stakeholder concept can be viewed as representative of a single underlying philosophical business orientation (Lusch and Laczniak 1987). Furthermore, empirical research in the marketing literature provides us with robust evidence that market orientation is the basis for developing stakeholder theory (for example, the focus on consumers and competitors) (Greenley and Foxall 1998, p. 54). However, a stakeholder orientation demands a wider understanding; one that goes beyond the consideration of consumers and competitors. Companies that are stakeholder-oriented understand their external and internal stakeholders (Bruce 1995) and optimise the interests of all those valued in the system (Greenley and Foxall 1996; Greenley and Foxall 1997). A stakeholder approach to market orientation (Greenley et al. 2004) stresses the importance of donor, supply-chain members and beneficiary interaction, and could be a valuable way to engage in developing appropriate innovations, both product and process, by means of optimising internal and external resources (Luk et al. 2005).

The earlier works of Greenley and Foxall (1997) compared multiple stakeholder orientation (for example, customers, employees, stockholders, governmental agencies, suppliers and the public at large) to a single stakeholder orientation (for example, customers and/or competitors) and found that multiple stakeholder-oriented companies are likely to outperform those with a single stakeholder orientation. Maintaining a fine balance between addressing and satisfying the company's own needs and values and those of the range of stakeholders requires a finely crafted balance (Miller and Lewis 1991). In fact, the absence of

a balanced focus on stakeholders curbs managerial interventions aimed at fostering partnerships that satisfy mutual goals and creating superior value for target customers (Baker and Sinkula 1999b; Cravens 1998b; Voss and Voss 2000).

For companies to develop a competitive advantage that is rare and difficult to imitate companies should extend a planned orientation to a wider range of stakeholders, including stakeholders that affect the company's corporate responsibility (Hunt and Morgan 1995). In essence, such an approach marries stakeholder theory with the marketing concept in an attempt to develop a richer description of company orientation. Companies that have a corporate culture that combines a market orientation, who are aware of the needs of stakeholders and are satisfying those needs, appear to have a better business performance than companies who do not (Cravens 1998b). Moreover, involving stakeholders such as the company's employees, shareholders and financial analysts allows a company to create new products according to its sense and respond capabilities (Srinivasan, 2002).

Over the years the marketing literature has identified four pertinent stakeholder groups that have a significant influence on the company: customers, competitors, employees and shareholders (Greenley and Foxall 1996; Greenley and Foxall 1998; Greenley and Foxall 1997). The first two stakeholders, customers and competitors, are components of market orientation and have been the subject of rigorous debate in the marketing literature. However, Luk et al. (2005) empirically prove that when companies support all four fundamental stakeholders concurrently, companies will improve their financial, market and corporate social performance. The reasons for including a wider stakeholder orientation into the marketing domain are two-fold. Firstly, in the interest of addressing the diverse needs of various stakeholders, consumers and competitors cannot be considered in isolation (Kotter and Heskett 1992). As such the orientation of one group must be developed with the concern of the other groups. Secondly, an effective orientation to the consumer stakeholder group can

only be attained if it is dependent on orientation in other groups (for example, market orientation will be more effective if all employees are educated to recognise marketing as an element of their job).

Studies on stakeholder orientation and its relation to market orientation in EMs are inadequate. Although Luk et al. (2005) established that customer and employee orientations have synergistic effects in the context of stakeholder orientation, to date, a conventional model for this strategic management philosophy does not exist. More importantly, research methods on this subject are varied and evidence in support of the theory is contradictory (Cravens 1998a; Voss and Voss 2000). The adoption of a stakeholder orientation enables companies to develop a better understanding of entrepreneurship; one in which risk is better understood (Luk et al. 2005) and resources and competencies are optimised. It is not to say that a stakeholder orientation takes precedence over a market orientation, but rather that a market orientation is the foundation of a stakeholder orientation. For this reason this study addresses a customer and competitor orientation according to the market orientation philosophy. Bearing in mind that many high technology companies do not have shareholders due to the size of these companies, market orientation is viewed in light of how enthusiastic the management team is to look after the company's interests. If the management team is dedicated it will try hard to increase profits (Luk et al. 2005). Further probing into the context of high technology companies provides a better understanding of the structures of these companies and how they embrace their stakeholders and the concept of market orientation.

## **THE HIGH TECHNOLOGY CONTEXT**

High technology is synonymous with the terms “cutting edge” and “most advanced technology currently available”. It is the expertise of a company to perform a service or manufacture a product that is new or modern. High technology products and services are developed and/or sold by companies who possess avant garde skills, knowledge or equipment (OECD - Organisation for Economic Co-operation and Development, 2007), and is generally introduced in markets that are dynamic in nature (Gao et al. 2007). Indeed, the most pioneering companies are technologically sophisticated, innovative, aggressive, and market-oriented (Calantone et al. 1994).

Often the odds of implementing and accepting high technology products and services are very low, partly due to the degree of uncertainty in the market (Aggarwal and Singh 2004), and it is for this reason that high technology companies should optimise their marketing strategies, which often is not a well-developed competency in these companies (Smith 2005). In this study, high technology companies are studied in light of embracing strategy, their focus on their entrepreneurial capabilities and also their learning potential and the consequences of these dynamics on their company’s innovativeness and business performance.

In line with the OECD, high technology industries can be grouped according to technology intensity and product approach (finished products). The OECD acknowledge that high technology embraces a vast spectrum of industries in both the manufacturing and services sectors that include pharmaceuticals, aircraft, spacecraft, medical, precision and optimal instruments, radio, television, accounting, telecommunications and computing machinery. The telecommunications industry, along with its explosive growth of advanced technology and the related phenomenon of the globalisation of the world economy, has

brought about an information age that affects aspects of the socioeconomic, cultural and regulative activity of countries and more acutely so in EMs. For example, the cellular phone industry (telecommunications) in South Africa has grown from zero in 1992 to R23 billion in 2006, contributing significantly to South Africa's economic growth, and bringing about a depletion of cultural boundaries and various regulating implications. The cellular industry grew to about R54 billion in 2007. People in previously under-serviced areas, who never owned phones before, are making over 35 million calls (65 million minutes) per month from Vodacom's 2 135 community phone shops alone (Statistics South Africa, 2006). In the telecommunications industry in China too, high technology has brought about a sweeping cultural change where now, people are craving the best technology available (Li et al. 2000).

Faced with ongoing challenges such as these and also extremely short product life cycles, high technology companies remain competitive by using alternative marketing approaches such as web-based marketing in their quest to deliver new products ad infinitum. This pressing need for companies to deliver new products before they have any market value, requires new learning by users (Hills 2004) and forces the research and development and marketing departments to work closely together (Aggarwal and Singh 2004) hence the need for learning and interfunctional coordination. As such, marketing in high technology companies can be intricate, forcing top management to be more competent in implementing counterintuitive strategies and employing adequate resources to expedite entry into the market (Costa et al. 2004).

High technology companies frequently encounter limitations concerning their management structure and financial resources. Often high technology companies are formed by technical entrepreneurs with a strong technological orientation and very little formal management training (Costa et al. 2004; Smith 2005). Frequently their finances are tied up in long-term research and lengthy commercialisation processes. Consequently, they do not

possess or have access to the necessary skills, especially in the area of marketing, strategic management, and management procedures, which inevitably tend to be less formally expressed (Costa et al. 2004). Lack of strategic management in high technology companies may cause failure to maintain a customer focus (Ruekert 1992) especially in markets typical of a constant state of uncertainty (Dobni and Luffman 2000a; Gao et al. 2007). Such hyper-competitive markets (Hills 2004) make the development and conservation of a market orientation even more acute (Dobni and Luffman 2000b). Above and beyond top management's emphasis on market orientation, high technology companies' organisational structures (formalised and centralised) can either limit or improve a buyer's decision-making process at the consideration or switching stage of his/her purchase. In effect, intense information requirements force high technology companies to a non-hierarchical response (Heide 1995). Moreover, the climate that high technology companies operate in, plays a strategic role in their knowledge creation capability, which is conducive to risk taking, teamwork and collective action, and is a necessity for successful innovation in high technology companies (Smith 2005).

Meta-analytical results show that very little conceptual and empirical research has been conducted in high technology companies in the context of EMs (Hills 2004). A few market-oriented studies have been conducted in a range of high technology industries such as chemical, pharmaceutical, biotechnology and automobile, most of which have been performed in HICs (Aggarwal and Singh 2004; Dobni and Luffman 2000b; Ruekert 1992; Wren et al. 2000). None has explored market, technology, and learning orientation in light of its mediating properties in high technology companies, nor entrepreneurship and innovativeness for that matter. Some studies have focused on homogenous industries in information technology and biotechnology (Aggarwal & Singh 2004; Ruekert 1992), which produce notable differences concerning industry-specific characteristics (service vs.

manufacturing companies) and can contribute to potential moderating effects (for example, business performance is higher for service than manufacturing companies (Cano et al. 2004)).

Several institutions have been established to regulate high technology in South Africa specifically. Organisations such as the Technology and Human Resources for Industry Programme, Council for Scientific and Industrial Research (CSIR), National Science and Technology Forum and the Institute of Computer Technology play an important role in influencing the regulative aspects by promoting research and technology development and support the enhancement of the quantity and quality of appropriately skilled people in South African communities. The Cape Biotechnology Trust (CBT), a forum that was established in 2002 and funded by the Department of Science and Technology, facilitates communication between researchers, industry and government. Similarly CITI (Cape Information Technology Initiative) is an industry body that acts as a regional trade association, networking body and a promotion agency for the information technology industry in Cape Town specifically. The Department of Trade and Industry (DTI) is a government organisation that acts as a channel for the transformation and development of the South African economy. It provides leadership to the South African economy and responds to challenges and opportunities of the economic citizens with the aim of supporting the government's economic goals of growth, employment and equity. Organisations such as the CBT, CITI and CSIR provide valuable insight in understanding how high technology companies operate and network in South Africa.

In the next section, the typical characteristics of an EM are explained. EMs are important in the context of this study and recently Burgess and Steenkamp (2006) authenticate "that it is paramount for the future of marketing science and practise that we conduct more research in so-called emerging markets".

## EMERGING MARKETS

EMs constitute the major growth opportunity in the evolving world economic order and more than 80% of the world's consumers live in EMs and/or transitional economies or low-income countries (LICs) (Arnold & Quelch 1998; Steenkamp & Burgess 2002). The concepts EM, transitional economies and LICs are classified by The World Trade Organisation (WTO), the United Nations and the World Bank as similar types of economies. The WTO uses a method of self election whereby 149 member countries classify themselves as “developed” or “developing”. The United Nations measures countries on the human development index (HDI) where three basic dimensions of human development are measured: life expectancy at birth, adult literacy rate and educational attainment, and gross domestic product (GDP) per capita at purchasing power parity (PPP). Countries that have a low HDI count would typically be considered as EMs, while countries with a high HDI count are considered to be developed. The World Bank (2006) classifies countries based on gross national income per capita (GNI), and adjusts for currency fluctuations. Their method of categorising countries shows considerable coincidence with that of the United Nations, “but is more user-friendly and relevant to marketing since it concentrates on the available monetary resources in a country (Burgess & Steenkamp 2006). Burgess and Steenkamp (2006, p. 4) define an EM as one “in which the PPP-adjusted GDP per capita, converted to US dollar and smoothed for three-year currency fluctuations, is equal to or less than the highest ranked country classified as middle income by the World Bank ...”. Unlike the World Bank who classifies countries based on GNP, Burgess and Steenkamp (2006) use GDP per capita because GDP is a better measure of domestic growth and economic performance as it excludes remittances from other countries.

EMs are a special class of markets, distinguished by low- and middle-income and human

development classification (Burgess and Steenkamp 2006). The EM context is characterised by distinctive socio-economic, cultural and regulative systems. According to Burgess and Steenkamp (2006) a country's socioeconomic system includes dynamics, demographics and diversity. Dynamics refer to the rapid social and economic change. Demographics refer to aspects such as the relative youth (for example 25%-45% of EM populations are aged 15 or below) and low formal education of EM populations, which gives marketers an indication of the products and services they should concentrate on. Diversity relates to vast population differences within EMs such as the elite vs. the mass market, each cluster being indicative of distinct living standards. Generally, the bulk of individuals in EMs are much younger, ranging from very wealthy to very poor (compared to HICs), adapt modern consumer lifestyles (Burgess and Steenkamp 1999), and create opportunities for companies to introduce their products and services to.

Geographically, EMs include transitional economies such as the former Soviet Union, the Eastern Bloc, Asia, Middle East and developing countries of Africa (Burgess & Steenkamp 2006). Socio-economically they all share characteristics such as high rates of inflation, high levels of indirect taxation and inadequate physical distribution infrastructures. Yet, culturally there are vast differences among EMs (Schwartz 2004) 2004 - Israeli psychologist).

Culturally, South Africa embraces embeddedness (respect tradition, self discipline and social order) whereas China adopts a more hierarchical and mastery type of culture (ambition, wealth and authority) and Slovenia embraces harmony and egalitarianism (responsible, loyal and world at peace). And within South Africa there are many cultural differences which Burgess (2003) refers to as the SA Tribes where consumer behaviour differ significantly across cultures regarding choice of brand, social and political attitudes and perceptions that have serious implications for marketers. Regulatively speaking embedded cultures tend to resist direct conflict (viz., the personification of economic welfare in strict legal form) and

law enforcement, while hierarchical cultures (for example, China and Uganda) endorse control to the powers that be who are often “charged with controlling uncertainty” (Burgess and Nyajeka 2006; Licht et al. 2005).

According to the EM meta-analysis, and of the empirical and non-empirical market-oriented studies that have been conducted, most have been conducted in countries with a high prevalence of hierarchy in their culture (for example, China, India and Zimbabwe). Many studies have inferred the significance of market orientation in EMs, its importance to address customer needs and wants (Golden et al. 1995) and the level of attention companies denote to market research for new product development. Greater emphasis on market research reflects a company’s appreciation of the transformation that takes place in the economic systems and the consequences of a free, competitive business environment (Appiah-Adu 1998). As the market and competitive structures of EMs continue to grow, so the customers’ needs and expectations will develop, guiding companies to implement their strategies that form the basis of a competitive advantage in these markets (Zhou et al. 2005b). Companies in Ghana, for instance, a country that ranks high on embeddedness (Schwartz 2004), are becoming increasingly market-oriented and innovative, specifically in sectors where demand is weak, competition is mounting, and operating costs are escalating (Appiah-Adu 1998). EMs such as these often provide opportunities for innovation, particularly for companies that trade with information about customers, competition, information technology (Achrol 1991; Appiah-Adu 1998) and organisational activities (Agarwal et al. 2003). Recently in Burgess and Steenkamp’s (2006, p. 20) *Marketing Renaissance* the authors distinguished influencing factors that hold certain implications for companies and could also hold implications for the market orientation-business performance relationships. These influencing factors are discussed in greater detail in the sections that follow.

## **Institutional Context: Socioeconomic System**

The socioeconomic system of a country details the social and economic dynamics, the relative youth of the population, and the diversity (levels of within-country diversity) inside a country (Burgess & Steenkamp 2006).

Several aspects of the socioeconomic system hold direct implications for EM high technology companies and are examined in more detail in this study. Consider for a moment the extreme population variation in EMs, characterised by vastly divergent living standards (the elite vs. the mass market). Generally the elite in EM markets are those who are on par with individuals in HICs in terms of education and wealth and by and large are individuals who are media savvy and knowledgeable about the latest Western trends (Burgess & Steenkamp 2006). The mass market, comprising 90-95% of EM populations, have limited access to education and basic necessities such as running water and are fundamentally poor by HIC standards. Yet both these markets create opportunities in EMs for the development, production and/or distribution of products and services offered by high technology companies. An example is Bulk SMS, a South African high technology company that utilises the cellular phone industry to satisfy a need to both poor and wealthy individuals. Companies such as Capitec Bank use Bulk SMS's services (by means of text messages sent via cellular phone) to notify low-income individuals when their salary has been deposited into their bank account so that these individuals don't have to request a balance inquiry several times a day and in effect pay excessive bank charges. Companies also use Bulk SMS's services to inform high net worth individuals of their product offerings or products on sale.

In this research the political transformation and economic systems of EMs are also deemed as important paradigms for high technology companies to consider when formulating their strategies. To date, very little attention has been devoted to the implications of social,

socio-political and market reforms for EM companies and thus this study addresses these shortcomings in the literature. The melting pot of social reform, political transformation, and economic buoyancy sets the pulsating scene that is so conducive to high technology. For one, the adverse legacies of former regimes are being addressed as EMs move from either centrally-controlled to market-based economies or an era of apartheid (segregation) to political freedom. The demographics such as relative youth hold many opportunities for the high technology industry. For example, 25%-45% of EM populations are below the age of 15 and most individuals at this age have been exposed to cellular phones. Here cellular phone companies have a captive market where they can explore technologies such as “chat rooms” and games. The diversity aspect of EMs deal with the great differences in EM populations and Burgess and Steenkamp (2006) refer to it as the “elite” and “mass market”. The elite are those individuals who have a formal education, are particularly wealthy and populate the urban areas. They are generally the top 10% of the population who receive up to 40% of national income and have product choices and economic resources similar to HICs. The mass market, on the other hand, comprising of up to 90-95% of the population are fundamentally poor by HIC standards with spending power of USD1000-4000 PPP per capita annually and as many as two thirds are short of sustained access to an improved water source or sanitation.

### **Institutional Context: Regulative System**

The regulative system embraces the structures, processes and legal rules that are prevalent in a society and reflects its socioeconomic and cultural systems (Burgess & Steenkamp, 2006). These include factors such as corporate governance and investor rights: rule of law and stakeholder influence (Licht et al. 2005). Rule of law is the preservation “of legal rights

in formal laws and codes that regulate individual and group behaviour and provide formal institutions for their enforcement” (Burgess & Steenkamp 2006). Stakeholder influence on corporate governance relate to the impact (formal and informal) that individuals and groups have on the company with the aim of moulding its corporate governance structures and processes. In EMs, several contributing factors such as uneven infrastructure development, the low formal education of the bulk of the population, and scarce resources force governments and business to work together. Government rely on the private sector (including civil society and value-chain stakeholders) to support social and economic development objectives and the private sector often needs the co-operation of government, to attend to the requirements of the mass-market segment and often do not have the financial means and power to construct roads, schools and hospitals that are so desperately needed (Burgess 2006).

The prominence of social connectedness in EM companies also encourages stakeholder interaction. Luk et al. (2005) for instance tested stakeholder orientation in China and found that customer orientation, competitor orientation and employee orientation have strong relations with financial and market performance. Peng and Lou (2000) found that the impact on a company’s performance when managers establish personal relationships with government representatives, is greater than had the company advertised, changed its pricing, payment terms or delivery. There is also support that country characteristics play a moderating role concerning a sound philosophy such as transaction cost economies. Transaction cost economies refers to the cost incurred in making an economic exchange, for example costs incurred in searching for the best supplier/partner/customer, the cost of establishing a supposedly "tamper-proof" contract, and the costs of monitoring and enforcing the implementation of the contract (Kumar and Subramanian 1998). And Geyskens’s (2005) meta-analysis provides evidence that the institutional environment of companies influence

transaction cost matters in governance decisions. Additionally, Burgess and Steenkamp (2006, p. 20) say “the ability of transaction cost theory to explain departure from market governance is lower in countries characterised by a strong rule of law, societal cynicism, and high cultural mastery”.

In the next section, entrepreneurship is discussed. It provides arguments and several implications for companies to consider when deliberating strategy for their companies.

## **ENTREPRENEURSHIP**

Entrepreneurship is a multidimensional concept distinguished by proactiveness, risk taking, and innovativeness (Luo et al. 2005; Miller 1983). It captures a company’s “attitude toward strategic planning processes that reflects the extent to which a company practices business venturing as a result of the level of exposure to Western business philosophy (Liu et al. 2002, p. 373).”

Entrepreneurship has its origins in the early making of strategy when Mintzberg (1973) posited three types of strategy making: entrepreneurial, planning and adaptive. The earliest operationalisation of entrepreneurship appears to be from Miller (1983). Miller (1983, p. 771) defines entrepreneurial companies as “one that engages in product marketing innovation, undertakes somewhat risky ventures and is first to come up with proactive innovations, beating competitors to the punch”. Empirically, Deshpandé et al. (1993) found that organisational cultures that are more market-and entrepreneurial-oriented perform much better than organisational cultures that are hierarchical. Firms that are entrepreneurial are innovators, risk-takers and generally proactive concerning information gathering and analysis, particularly in the development and execution of innovative strategies (Covin and Slevin 1991). The passionate nature of a pro-innovative culture promotes information

utilisation and sharing (Deshpandé et al. 2004; Jaworski and Kohli 1993) and if such a culture maintains its focus on innovativeness, the relationship between entrepreneurship and market orientation could be enhanced (Matsuno et al. 2002). In effect, the ultimate goal of companies that are entrepreneurial is to engage in risk-taking, innovative endeavours which are initially caused by new technology (technology driven) or by customers' needs (customer driven). In due course, the company's business success lies in its meeting market needs (Matsuno et al. 2002).

In an effortless technology-oriented obsession, high technology companies may be tempted to elude the process of market learning. However, the nature of entrepreneurs is to distinguish themselves from those engrossed in the technology and science and to effectively manage the risk through insight, beating its competitors. In a sense, proactiveness identifies new market opportunities, for example introducing new products in new markets (Miller and Friesen 1982; Venkatraman 1989) which lead to increased levels of intelligence generation and responsiveness (Kohli and Jaworski 1990).

Entrepreneurship and its relation to market orientation is arguably one of the most controversial topics in the market orientation literature. For one, does entrepreneurship direct companies to be more market-oriented or are market-oriented companies more entrepreneurial? We see from the market orientation literature that Matsuno et al. (2002) motivate entrepreneurial proclivity (risk-taking, proactiveness, and innovativeness) as an antecedent to market orientation. Their findings in 364 US manufacturing companies suggest that the greater the entrepreneurial proclivity, the greater the level of market orientation. Liu et al. (2002) on the other hand tested market orientation as an antecedent to entrepreneurship in state-owned enterprises in China and found that although companies may be both market and entrepreneurial orientated simultaneously, the higher the level of market orientation, the more the emphasis on entrepreneurship. When we delve deeper, we find that the tolerance for

risk is greater in developed markets such as North America and Northern Europe, as opposed to Asia and particularly Africa, which have been described as areas where managers tend to avoid risk uncertainty (Shoham and Rose 2001). So it is with high technology companies that are frequently faced with situations that require them to take risks, but mostly so when there is an ever-pressing need to be more innovative in order to have a first-mover advantage situation (Costa et al. 2004). This is eminent in EM environments characterised by rapid economic and sociological change (Deshpandé and Farley 2004).

For high technology companies, an entrepreneurial proclivity is not enough given that these companies need to study market needs and match them with an appropriate technology. Although Luo et al. (2005) suggest that institutional, strategic, and organisational specific factors are determinants for corporate entrepreneurship, very little is said about its possible mediating role in EMs. It is therefore hypothesised that,

H<sub>4a</sub>: Market orientation has a positive effect on entrepreneurship in high technology companies in South Africa.

H<sub>4b</sub>: Entrepreneurship has a positive effect on business performance in high technology companies in South Africa.

### **TOP MANAGEMENT EMPHASIS**

Top management refers to the board of directors, chief executives and top-echelon executives of a company (Aggarwal & Singh 2004). Top management emphasis of market orientation suggests that companies have a better chance for the successful implementation of the marketing concept (Jaworski and Kohli 1993). Burgess & Steenkamp (2006) include top management in their definition of leadership and stress that top management's emphasis is

important in marketing strategy, particularly in EMs where socioeconomic factors (for example, low formal education) and cultural characteristics play a significant role. Top management's attitude towards risk, a multidimensional construct that comprises perceptions of outcome uncertainty, outcome likelihood, and potential outcome range (Sitkin and Pablo 1992), requires them to embrace market-oriented behaviours such as innovation (Jaworski & Kohli 1993).

The concept of top management as a general construct has been researched widely in the market orientation literature (Aggarwal and Singh 2004; Chelariu et al. 2002; Jaworski and Kohli 1993; Kuada and Buatsi 2005) and scholars have confirmed the positive effect that top management's emphasis has on market orientation (Jaworski & Kohli 1993). Drawing on this stream of research and particularly on the study that Srinivisan et al. (2002) performed in computer, manufacturing and telecommunications businesses, top management's emphasis remains an important distinction in market-oriented companies. The work done by Srinivasan et al. (2002) has contributed to our understanding of top management's role in support of new technologies, particularly middle and junior management dedicating resources to sensing and responding to such technologies.

Top management's emphasis of market orientation in high technology companies is indispensable, particularly when strategies such as market and technology orientations are considered (Costa et al. 2004; Smith 2005). Often high technology companies lack a top management structure since it is common for the majority of high technology companies to start as small or medium enterprises and to remain small and specialised (Costa et al. 2004). Although a diversity of managerial backgrounds gives a richness of perspectives when addressing decision-making, the management of these types of companies are innovative, technical entrepreneurs and lack formal management training in the strategic management and marketing areas (Costa et al. 2004). The typical role that top management in EM

companies find themselves in is to fend for their company's survival (Jaworski & Kohli 1993). The ever-present mounting need to adapt to market trends compels them to be sensitive to competitor activities and to gear them up for customer's current and future needs.

EMs companies are often faced with the demand for new products and services (Appiah-Adu 1998) predominantly in the type of economic environment that high technology companies operate in (Dobni et al. 2001). New products and services have a high propensity for failure and thus top management should demonstrate a willingness to take risks, accept occasional failures (Kohli & Jaworski 1990) and most importantly formulate strategies accordingly. It has also been confirmed that top management will be proactive toward market opportunities, innovation and have a tolerance for risk in the presence of entrepreneurship (Matsuno et al. 2002). It is with this argument that the following is hypothesised.

H<sub>5a</sub>: Top management emphasis of market orientation has a positive effect on market orientation in high technology companies in South Africa.

H<sub>5b</sub>: Top management emphasis of market orientation has an indirect and positive effect on technology orientation in high technology companies in South Africa.

H<sub>5c</sub>: Top management emphasis of market orientation has an indirect and positive effect on learning orientation in high technology companies in South Africa.

H<sub>5d</sub>: Top management emphasis of market orientation has an indirect and positive effect on entrepreneurship in high technology companies in South Africa.

H<sub>5e</sub>: Top management emphasis of market orientation has an indirect and positive effect on innovativeness in high technology companies in South Africa.

H<sub>5f</sub>: Top management emphasis of market orientation has an indirect and positive effect on business performance in high technology companies in South Africa.

## INNOVATIVENESS

Innovativeness is the design and execution of new ideas, products and processes in the company (Hult et al. 2001). Innovativeness is enhanced by a company's market orientation because market orientation drives a continuous proactive disposition toward meeting customer needs (Appiah-Adu & Singh 1998; Kirca et al. 2005). Moreover, innovativeness depends on the type of strategic orientation that a company pursues.

A high level of innovativeness has been related to high levels of customer (Slater and Narver 1994a) and learning orientation (Drucker 2002; Hurley and Hult 1998; Slater 1995), specifically in highly uncertain markets, because companies that are committed to innovation are externally focused and drive a customer-oriented approach (Appiah-Adu 1998; Deshpandé et al. 1993, Gatignon & Xuereb 1997). The relationship between customer orientation and innovativeness has also been proven to be mediating with performance. Han et al. (1998) empirically provide evidence that each component of market orientation (customer orientation, competitor orientation and interfunctional coordination) facilitate a company's innovativeness, which in turn influences its business performance when the level of technological turbulence is high. A sound explanation for the significant and strong positive relationship between a company's innovativeness and performance is ascribed to innovations that serve to accommodate the market and the technological turbulence a company faces in its consumer environment (Appiah-Adu 1998; Kirca et al. 2005). Most notably, based on their findings in 408 Chinese telecommunications equipment companies, Li et al. (2000) provide practical evidence that innovation has played a significant role in shaping the characteristics of high technology industries, particularly with regard to product innovation. It is therefore hypothesised that:

H<sub>6a</sub>: Market orientation has a positive effect on innovativeness in high technology companies in South Africa.

H<sub>6b</sub>: Innovativeness has a positive effect on business performance in high technology companies in South Africa.

## **META-ANALYSIS**

In the process of establishing a theoretical rationale for the associated relationships of market orientation and its related antecedents, mediators, moderators and consequences, a meta-analysis was conducted for this study. Meta-analysis is a technique that provides a quantitative summary (mean values and range effects) for the relationships under study and has been included in several marketing (Cano et al. 2004; Kirca 2004) and strategic orientation studies (Geyskens et al. 2005). It enables the researcher to correct for the distorting effects of artefacts that may produce the illusion of conflicting findings (Hunter and Schmidt 2004), overcomes the challenges experienced by many primary studies predominantly for its lack of sufficient power to achieve statistically significant results, and achieves exact estimation of effect sizes (Lipsey & Wilson 2001).

Geyskens et al. (2005) identify three types of meta-analytic approaches. The first, vote counting, tabulates both significantly positive and negative findings as well as non-significant findings. This method has drawn many criticisms since it does not compare the strength of the relationships under investigation, it exacerbates significant effects when the number of primary studies increases, and omits effect size information. The second type of meta-analytic approach is based on the premise that it combines significance levels across studies. Although this method tests the presence of an effect, it does not test its magnitude, nor does it explain variability in effect sizes across studies, which results in an ambiguous interpretation

of results since significance levels reflect both magnitude of an effect and sample size. The third type of meta-analytic approach, the statistical integration of independent study results, emphasises effect sizes and allows the researcher to correct for the power of statistical artefacts (i.e. sampling error and measurement error). The statistical integration type of meta-analysis is used for this study.

The meta-analyses by Cano et al. (2004) and Kirca et al. (2005) stand as the most comprehensive meta-analyses conducted in the market orientation literature to date. Using the random effects model, Cano et al. (2004) explored the market orientation-performance relationship in great detail across five continents, assigning codes to 187 samples, adjusting the effect size for each study using weighted inverse variance. Kirca et al. (2005) selected articles based on studies that reported the r-family (univariate r, (Hunter and Schmidt 1990) of effects and articles that measured market orientation at organisational level, providing corrected-for-artefacts for each effect size. The main advantage of a meta-analysis compared to traditional research methods (a narrative on historical accounts of research findings), is that a meta-analysis provides comprehensive and statistical analyses of relationships under study, whereas traditional research provides obscured effects of such relationships (Kirca et al. 2005; Lipsey & Wilson 2001). The methodology for the meta-analysis portion in this research embraces aspects of the database development and eligibility study, independent samples, attenuation and choice of model (Lipsey & Wilson 2001). This is followed by a discussion on how effects size metric and artefacts were corrected for and how and why outlier analysis, interdependence and homogeneity tests were conducted. The R program and Microsoft Access were used to conduct analyses for the EM meta-analysis.

## Database Development and Eligibility Study

A literature search was conducted by means of computer-based and manual searches of published and unpublished empirical studies. The literature search generated 41 documents comprised of 37 refereed publications, two working papers, one book article and one dissertation. Through the coding and recording process, sixteen studies were eliminated since they did not meet the eligibility requirements. The remaining 25 produced 308 effect sizes. To ensure representativeness of the database, computer-based articles were requested through online databases (EMERALD, Science Direct and EBSCO) and various universities (for example, University of Cape Town and University of Witwatersrand). The databases were searched using the following key words: 'emerging market', 'market orientation', 'strategic orientation', 'technology orientation', 'customer orientation', 'performance', MARKOR, MKTOR, 'learning', high technology', and 'innovation'. In order to account for multi variations of the key words, wildcard symbols (for example \* and ?) were used. Manual searches were conducted by examining references from market orientation and strategic orientation articles. The UMI database was used to locate published dissertations and working papers.

Four types of market-orientation scales were considered for this study: MKTOR, MARKOR, Desphandé, Farley and Webster's (1997) nine-item scale and Ruekert's (1992) three-component scale. Both published and unpublished studies available in English, conducted between 1/1/1995 and 31/12/2007 were eligible for inclusion in this study. A coding form was prepared that specified the data to be extracted for each study, for example, sample size, effect size, scales to measure market orientation, innovation, performance, and potential contextual and external moderators (Lipsey & Wilson 2001). The objective of creating a coding protocol is to develop a database for statistical analysis (Lipsey & Wilson

2001). Effect sizes were corrected for regression metric, measurement error, artefacts and sample bias. Twenty-five EM/LIC studies were selected for inclusion in this meta-analysis (see table 2.2).

### **Independent Samples and Attenuation**

To ensure mutual exclusivity, the samples for each study across journal articles, dissertations, and working papers were compared. Of all the studies that were included in the meta-analysis, none indicated that samples were duplicated.

Effect sizes were disattenuated for (adjustment for measurement error) based on the claim that statistical artefacts are independent of effect sizes of moderating variables (Hunter & Schmidt 1990). Hunter and Schmidt's adjustment for measurement error was used. In instances where reliability is not considered, the true relationship between variables tends to be underestimated (Caruso 2000) hence the disattenuation of mean effect size is the best estimation method (Lipsey & Wilson 2001).

### **Model**

Lipsey and Wilson (2001) distinguish three types of effects models: the fixed, random and mixed-effects models. The fixed-effects model is applied in this study since the crucial issue in determining statistical procedure is the nature of the inference desired, i.e. conditional inference (Hedges and Vevea 1998). Conditional inference occurs when inferences are made about the effect size parameters in the set of studies (that are observed). This particular model treats the effect-size parameters as fixed and assumes that the excess between studies variability can be explained by the independent variables in a meta-analysis, i.e. the study and

effect size descriptors (Hedges and Vevea 1998; Lipsey and Wilson 2001; Rosenthal and Rubin 1982). Fixed-effects models are usually used in conjunction with the homogeneity of effect parameters. Although a random-effects model “is appropriate when there is evidence of heterogeneity among population effects” (Hedges & Vevea 1998) random-effects models require accurate estimates of the random-effects variance component (Lipsey & Wilson 2001). Accurate estimates are unavailable for use in the present study and as such the random-effects model is not considered for this research. A mixed-effects model is also not considered for this study because it assumes that the effects of between-study variables, such as treatment type, are systematic but that there is a remaining unmeasured (or possibly immeasurable) random effect in the effect size distribution in addition to sampling error. This is to say that variability, in the effect size distribution, is attributed to systematic (modelled) between-study differences, subject-level sampling error, and an additional component” (Lipsey & Wilson 2001, p. 119).

### **Correction for Effect Size Metric**

The effect size metric is an indication of the effect that one variable has on another (Geyskens et al. 2005). In this meta-analysis a common effects size for all the studies were introduced. The literature suggests that either  $r$  (Geyskens et al. 2005) or its Fisher- $z$  transformed value could be used (Hunter & Schmidt 1990). In this meta-analysis  $r$  was used, simply because it is easy to understand (Rosenthal 1994), it produces a smaller upward bias than  $z$  (Hunter & Schmidt 1990) and, to date, statistical artefacts have been developed for  $r$  and not  $z$  (Law 1995). In instances where  $r$  was not reported and only beta and  $t$ -values were available, the correlation effects were computed. See table 2.2.

## **Correction for Artefacts at the Individual Level**

“Artefacts are imperfections that systematically attenuate observed correlations and inflate their variability” (Geyskens et al. 2005). These artefacts can easily be corrected for by means of correction for measurement error, range restriction and dichotomisation (Hunter and Schmidt 1994). Measurement error, either systematic or at random, occurs when there is unpredictability in either variable upon which the correlation is based. “Range restriction occurs if a variable upon which the correlation is based has a smaller range in the study sample than in the population” (Geyskens et al. 2005). And dichotomisation refers to the divergence of two possible values (for example successful and unsuccessful) from a 50-50 split and is often grouped into subjects above and below a certain cut-point (Geyskens et al. 2005; Lipsey and Wilson 2001; McCallum et al. 2002).

**Table 2.2 Effect Size Metric**

<p><b>From <math>\beta</math> to <math>r</math> :</b></p> <p><math>r_i = \beta_i + .05?</math>, where <math>\beta_i</math> is a standardised regression coefficient, and <math>? = 1</math> when <math>\beta_i</math> is non-negative and 0 when <math>\beta_i</math> is negative</p>		
<p>From <math>t</math> to <math>r</math>:</p> <p><math>r_i = \frac{t_i}{\sqrt{t_i^2 + N_i - 2}}</math> where <math>t_i</math> is a t-test for independent groups and <math>N_i</math> is the sum of the sample sizes of the contrasted groups for effect size <math>i</math></p>		
<b>From <math>t</math> to <math>r</math></b>	<b>From <math>\beta</math> to <math>r</math></b>	<b><math>r</math></b>
Akimova (2000)	Burgess and Nyajeka.(2005)	Atuahene-Gima (2005)
Appiah-Adu (1998)	Chelariu, Quattarra & Dadzie (2002)	Deshpandé and Farley (1999b)
Hooley, Fahy, Greenley, Beracs, Fonfara & Snój (2003)	Deshpandé and Farley (2002)	Goa, Zhou & Yim 2007
Tse, Sin, Yau, Lee & Chow (2003)	Deshpandé, Farley and Bowman (2004)	Kaynak & Kara (2004)
	Grewal & Tansuhaj (2001)	Liu, Luo & Shi (2003)
	Kuada & Buatsi (2005)	Luk, Yau, Tse, Sin & Chow (2005)
	Qu and Ennew (2003)	Mavondo (1999)
	Sin, Tse, Yau, Lee, Chow & Lau (2000)	Powpaka (1998)
	Singh (2003)	Soehadi, Hart & Tagg (2001)
	Subramanian and Gopalakrishna (2001)	Zhou, Yim & Tse (2005)
	Zhou, Gao, Yang & Zhou (2005)	

In this study the individual effect sizes were corrected for by way of these artefact corrections in order to derive a more precise inference of the population relationship between variables of interest (Geyskens et al. 2005). Although Geyskens et al. (2005) explain that range restriction and dichotomisation information is available for most studies, very few

studies correct for range restriction purely because meta-analyses focused on a variety of areas some of which has little concern for range restriction (Cortina 2003). All studies in this meta-analysis were subject to correcting for measurement error, small sample size bias and range restriction. None of the studies were corrected for dichotomisation.

The meta-analysis results are reported after each correlation has been corrected for attenuating effects of artefacts individually. In instances where artefact information was not available, the mean value of all the other artefacts in the meta-analysis was calculated and this value was inserted where information was not available. A reliability of 0.83 for overall performance was calculated and used for the Kaynak & Kara (2004), Mavondo (1999), Nakata (2002), Subramanian & Gopalakrishna (2001) studies. See table 2.2.

### **Outlier Analysis**

In the process of selecting eligible studies for inclusion in the meta-analysis, outlier analysis was conducted. Outliers are referred to as “effects size values that are notably discrepant from the preponderance of those found in the research of interests, and hence, unrepresentative of the results of that research ...” (Lipsey & Wilson 2001). Geyskens et al. (2005) propose Huffcutt & Arthur’s (1995) sample-adjusted meta-analytic deviancy (SAMD) statistic to test for effect size outliers.

Several outliers were detected (Deshpandé and Farley 1999a; Grewal and Tansuhaj 2001; Nakata 2002; Powpaka 1998; Powpaka 2005; Zebal 2003), and although the deletion of these outliers would have resulted in a higher correlation between the two constructs, all these studies except Zebal’s (2003) and Nakata’s (2002) were retained since the results show that there are no biasing effects on the empirical findings and conclusions reached. For example, in Thailand Grewal and Tansuhaj (2001) studied the role of market orientation and strategic

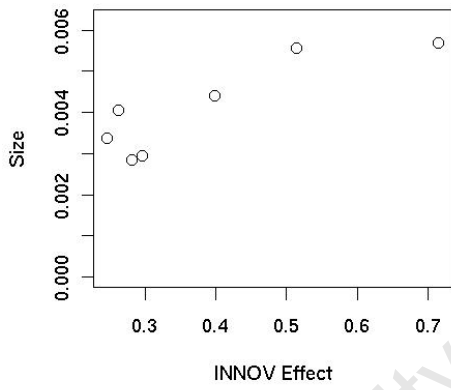
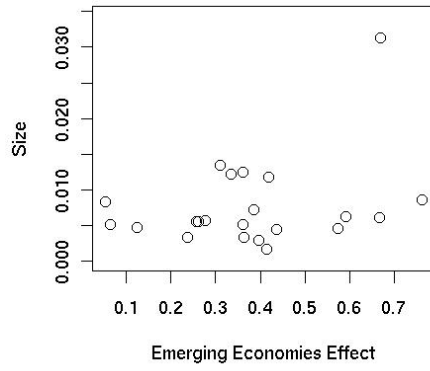
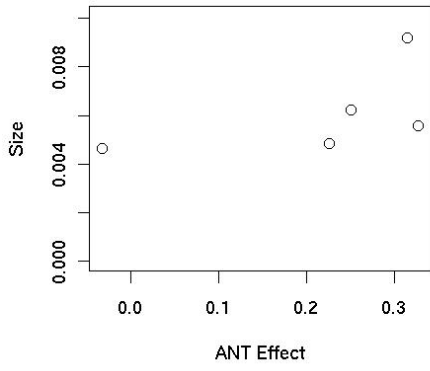
flexibility under extreme volatile conditions. Similarly Powpaka (2005) researched performance-based rewards and internal marketing in Thailand among female employees in the service sector, and found that, unlike Western countries, performance-based rewards and internal marketing is needed in countries like Thailand to improve non-financial performance of companies such as job satisfaction. Table 2.3 provides a summary of the various outliers that were detected in the meta-analysis.

### **Interdependence**

“Interdependence occurs when more than one effect size relevant to a given relationship comes from the same sample. This happens when either the independent or the dependent variable is measured by several instruments or methods” (Geyskens et al. 2005). A few studies were identified for interdependent effect sizes and results reveal that no interdependence was present. See table 2.4.

**Table 2.3 Elimination of Outliers**

<p> <math display="block">SAMD_i = \frac{\bar{r}_{without\ study\ i}}{\sqrt{\text{var}_i + \text{var}_r}}</math>             where <math>\bar{r}_i</math> is the <math>i</math>th correlation effect size after artefact correction, <math>\bar{r}_{without\ study\ i}</math> is the mean sample-weighted effect size computed across all of the other studies, <math>\text{var}_i = \frac{(1 - \bar{r}_{without\ study\ i}^2)^2}{N_i - 1}</math>, en <math>\text{var}_r = \frac{(1 - \bar{r}_{without\ study\ i}^2)^2}{\sum_{i=1}^q (N_i) - q}</math> </p>	
Emphasis- Market Orientation	<pre>ES_emphasis &lt;-c(ES_emphasis &lt;-c(0.4276, 0.4772) sum(N_emphasis*ES_emphasis)/sum(N_emphasis) sample_emphasis &lt;-c(109, 91) funnelplot.default(ES_ANT, sample_emphasis, size= 1/sample_rewards, xlab="rewards Effect", ylab="Size")</pre>
Rewards- Market Orientation	<pre>ES_rewards &lt;-c(ES_rewards &lt;-c(0.6187, 0.4888, 0.4575) sum(N_rewards*ES_rewards)/sum(N_rewards) sample_rewards &lt;-c(161, 87, 207) funnelplot.default(ES_ANT, sample_rewards, size= 1/sample_rewards, xlab="rewards Effect", ylab="Size")</pre>
Conflict- Market Orientation	<pre>ES_conflict &lt;-c(ES_conflict &lt;-c(0.0988, -0.1322, 0.1389) sum(N_conflict *ES_conflict)/sum(N_conflict) sample_conflict &lt;-c(161, 90, 207) funnelplot.default(ES_ANT, sample_conflict, size= 1/sample_conflict, xlab=" conflict Effect", ylab="Size")</pre>
Formalisation- Market Orientation	<pre>ES_formal &lt;-c(ES_formal &lt;-c(-0.02996, 0.3041, 0.119) sum(N_formal *ES_formal)/sum(N_formal) sample_formal &lt;-c(161, 90, 207) funnelplot.default(ES_ANT, sample_formal, size= 1/sample_formal, xlab=" formal Effect", ylab="Size")</pre>
Centralisation- Market Orientation	<pre>ES_central &lt;-c(ES_central &lt;-c(0.00566, 0.0534, 0.1933) sum(N_central *ES_central)/sum(N_central) sample_central &lt;-c(161, 89, 207) funnelplot.default(ES_ANT, sample_central, size= 1/sample_central, xlab=" central Effect", ylab="Size")</pre>
Market Orientation - Performance	<pre>ES_EMCS &lt;-c(0.3600, 0.3106, 0.5584, 0.7633, 0.2374, 0.2968, 0.2588, 0.1880, 0.0519, 0.1689, 0.3624, 0.3613, 0.2652, 0.0648, 0.6290, 0.2611, 0.3694, 0.5923, 0.6890, 0.4179, 0.2610, 0.2176) N_EMCS &lt;-c(80, 74, 161, 116, 297, 129, 408, 120, 346, 179, 304, 193, 176, 194, 225, 210, 138, 159, 162, 573, 180, 350) funnelplot.default (ES_EMCS, sample_EMCS, size= 1/sample_EMCS, xlab="Emerging Economies Effect", ylab="Size")</pre>



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**Table 2.4 Correction for Interdependent Effect Sizes**

$r_i''(x, Y) = \frac{\sum_{j=1}^n r_i''(x, y_j)}{\sqrt{n + n(n-1)r_{amongy_j}}}$ <p>where <math>r_i''(x, Y)</math> is the correlation between a single variable <math>x</math> and a composite <math>Y</math> (that is the sum of multiple <math>y_j</math> measures), <math>r_i''(x, y_j)</math> is the correlation between <math>x</math> and a single <math>y_j</math> (after artefact correction), <math>r_{amongy_j}</math> is the average correlation among <math>y_j</math> measures (after artefact correction), <math>n</math> is the number of <math>y_j</math> measures, and <math>i</math> ranges from 1 to <math>m</math> with <math>m</math> the number of effect sizes remaining after elimination of outliers (<math>m=q</math>).</p>
<p>Luk et al. (2005)</p> <pre>&gt; EMCs_InterdependentES &lt;- c(0.2621, 0.2702, 0.2263, 0.0823, 0.4263, 0.3815, 0.3045, 0.1683) &gt; EMCs_n &lt;- c(8) &gt; sum(EMCs_InterdependentES)/sqrt(EMCs_n + ((EMCs_n*(EMCs_n-1))* 0.7668)) = 0.297242</pre> <p>Powpaka (1998)</p> <pre>&gt; EMCs_InterdependentES &lt;- c(0.360846, 0.20819, 0.414726, -0.0788753, 0.458381, 0.157750) &gt; EMCs_n &lt;- c(9) &gt; sum(EMCs_InterdependentES)/sqrt(EMCs_n + ((EMCs_n*(EMCs_n-1))* 0.426851)) = 0.2412999</pre>

### Homogeneity

Lipsey et al. (2001, p.115) refer to homogeneity as the condition in which the “dispersion of the effect sizes around their mean is no greater than that expected from sampling error alone”. In a homogenous distribution, usually assumed in a fixed-effects model, the population mean and individual effect sizes diverge solely by sampling error. For this meta-analysis, several tests for homogeneity were conducted, namely the chi-square test, 75% rule, residual standard deviation and 95% credibility interval. The chi-square test is a statistical significance test analysing whether the observed variation in effect size values is greater than that expected by chance (than the variation that would be expected from sampling error

alone) (Geyskens et al. 2005). There is a possibility of moderators being present if the test proves to be significant. The 75% rule states that looking for moderators “is warranted if less than 75% of the observed variance in correlations is attributable to sampling error and artefacts” (Geyskens et al. 2005, p. 5). Calculating the credibility interval around the mean effect sizes is another way to test for moderators. The larger the span of the credibility interval (for example, exceeds .11 or includes zero), the greater the likelihood that moderators exist (Hunter and Schmidt 1990; Steel and Kammeyer-Mueller 2002). Finally, the size of the residual standard deviation, “which is the standard deviation in the observed correlations after removing sampling error and study-to-study artefact variations” (Geyskens, 2005, p. 5), is also a test to see if moderators are present. Although the results indicate that the chi-square test is not significant (demonstrating the absence of moderators), the 75% rule and credibility intervals indicate that moderators could be present (see table 2.5). Caution must be taken when interpreting these results because these tests also have some weaknesses. The chi-square test generally has less power to identify deviation in study population parameters unless of course the number of effect sizes are considerable (Lipsey & Wilson 2001) - and we know the effect sizes for this study are small. The other test also has some limitations. At times the 75% rule indicates heterogeneity when really no moderators are present (Geyskens et al. 2005). Similarly the credibility intervals may include zero particularly when the effect size is very close to zero and with residual standard deviations there is no common ground as to what comprises a large residual standard deviation (Geyskens et al. 2005).

Regardless of conflicting results, moderator analysis was conducted to determine whether there are moderators that influence the market orientation-performance and technology orientation-performance relationships.

## **Moderator Analysis**

Moderator analysis denotes the search for study-level characteristics that influence effect sizes and is often conducted in the context of a fixed-effect model. In the process of conducting moderator analysis, two types of analyses could be used: subgroup and regression analysis (ANOVA) (Geyskens et al. 2005). In subgroup analysis, the moderator variable forms the basis on which the effect sizes are grouped. On each subgroup, a meta-analysis is conducted. In this study regression as opposed to subgroup analysis is used to test for potential moderators (Geyskens et al. 2005; Lipsey & Wilson 2001). Multiple regression is a preferred method for this study since this method allows for the separation of effects of various moderators.

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**Table 2.5 Homogeneity Analyses**

Chi-square test Without artefact distribution	Residual Standard Deviation Without artefact distribution	<b>75% Rule</b>	95% credibility interval
$\chi^2(k-1) = \frac{\sum_{i=1}^k N_i (r_i - \bar{r})^2}{(1 - \bar{r}^2)^2}$	$SD_{res} = \frac{\sum_{i=1}^k N_i (r_i - \bar{r})^2}{\sum_{i=1}^k N_i} \cdot \frac{(1 - \bar{r}^2)}{N - 1}$	$\frac{(1 - \bar{r}^2)^2 (N - 1)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i}$ <p> <math>\geq .75</math>                      Heterogeneity if  <math>\frac{(1 - \bar{r}^2)^2 (N - 1)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i}</math>  <math>\leq .75</math> </p>	$\left[ \bar{r} \pm 1.96 SD_{res} \right]$
Technology orientation = 4.53119 Check: chi-square distribution at 95% confidence, 1 <i>df</i> = 3.84 at <i>p</i> =0.05	= -0.0003	= 15%	0.3646 0.3469
MO/Perf = 164.388 Check: chi-square distribution at 95% confidence, 21 <i>df</i> = 32.671 <i>p</i> =0.05	0.0208	52.15%	0.3697 0.2882

In this instance the weighted least squares (WLS) as opposed to the ordinary least squares (OLS) method is used because the effect sizes from primary studies are based on different sample sizes and error variances are heterogeneous (Hedges and Olkin 1985). With multiple regression, the independent variables are moderator variables and the individual effect sizes constitute the dependent variable (Geyskens et al. 2005). A moderator is present when a regression coefficient for a particular moderator variable is significant (Steel & Kammeyer-Mueller 2002). Results in the meta-analysis reveal that technological turbulence, competitive intensity, market turbulence and demand uncertainty do not moderate the market orientation-

performance and technology orientation-performance relationships.

The next section includes the results found in the meta-analysis concerning the relationship between market orientation and its related antecedents and consequences as well as the relationship between technology orientation and various related consequences. A great deal of attention is also denoted to industry and contextual moderators that have possible influences on these relationships.

**Table 2.6 Moderator Analysis**

MOModerators	ES_MOPerf <-c(0.3600, 0.3106, 0.5584, 0.7633, 0.2374, 0.2968, 0.2588, 0.1880, 0.0519, 0.1689, 0.3624, 0.3613, 0.2652, 0.0648, 0.6290, 0.2611, 0.3694, 0.5923, 0.6890, 0.4179, 0.2610, 0.2176) ES_Rulelaw ES_Eco lm1<-(MOPerf~MOjobsatis+MOorgcom+MOcust) summary(lm1)
MOConsequences	ES_MOjobsatis <-c(.4113, 0.4044) ES_MOorgcom <-c(0.0954, 0.5053) ES_MOcust <-c(0.4846, 0.3736, 0.3049, 0.4182, 0.6551)
TechModerators	ES_TechSales <-c(0.3611, 0.2128) ES_TechProdPerf <-c(0.4650, 0.30070) Lm2<-(TechPerf TechnSales~TechnProdPerf) summary(lm2)

### Meta-analysis Results

Tables 2.7a, 2.7b and 2.7c summarise the corrected-for-artefacts correlations for the relationship between market and technology orientation, its antecedents, and consequences. Several constructs could not be included in the meta-analysis, simply because they did not contain multiple study effects that could be related to the other constructs in the model (Brown and Peterson 1993). As a result of this limitation, 14 effect sizes for market orientation antecedents, 36 effect sizes for market orientation consequences and 4 effect sizes

for technology orientation consequences were collected.

The following section provides a critical analysis of the reasons why the same antecedents have a positive relationship with market orientation in EMs vs. a negative relationship with market orientation in HICs. The results in the meta-analysis also provide insight into the relationships that have received very little or no attention in the market orientation literature.

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**Table 2.7a Effect Sizes for Antecedents-Market Orientation in EMs and LICs**

Author	Publication Year	Sample size	Country	Economic Context EM=emerging LIC=low income D=Dual	Industry Type	MO Scale	Association
Burgess & Nyajeka	2005	161	Zimbabwe	LIC	single (retail)	MARKOR, Ruekert	Centralisation (+), formalisation (-), reward system (+), interdepartmental conflict (+, ns), top management risk attitudes (+)
Zhou, Gao, Yang & Zhou	2005	180	China	EM	single (manufacturing)	MARKOR	Group culture(+), managerial attitude toward change (+), moderated
Chelariu, Quattarra, Dadzie	2002	109	Ivory Coast	LIC	cross-sectional (unknown)	MARKOR, MKTOR	Top management emphasis (+), risk averse (ns) centralisation (ns), reward (+), formalisation (ns), interdepartmental conflict (-), interdepartmental connectedness (+)
Kuada & Buatsi	2005	207	Ghana	LIC	cross-sectional (manufacturing)	MARKOR	Top management emphasis (+), risk averse (+, ns), centralisation (+), reward (+), formalisation (+, ns), interdepartmental conflict (+, ns), interdepartmental connectedness (+)

**Table 2.7b Effect Sizes for Market Orientation-Consequences in EMs and LICs**

Author	Publication Year	Sample size	Country	Economic Context EM=emerging LIC=low income D=Dual	Industry Type	MO Scale	Association
Deshpande, Farley	1999a	340	India, Japan	Dual	Cross-sectional	MARKOR, MKTOR, DFW	Innovativeness (0.2968) Significant, positive, direct
Deshpande, Farley	2002	297	China	EM	Cross-sectional	MARKOR, MKTOR, DFW	Innovativeness (0.2460) Significant, positive, direct
Goa, Zhou & Yim	2007	408	China	EM	Single	MKTOR	Product performance (0.3938)
Kaynak and Kara	2004	179	China	EM	Single	MARKOR	Employee turnover (0.1915), Customer quality (0.4390), customer reputation (0.4891), customer retention (0.4846)
Powpaka	2005	194	Thailand	EM	Single	MKTOR	Job satisfaction (0.4113) organisational commitment (0.0954)
Qu & Ennew	2003	225	China	EM	Single	MARKOR	Customer retention (0.3736), customer satisfaction (0.5355)
Zhou, Gao, Yang & Zhou	2005	180	China	EM	Single	MARKOR	Significant, positive, direct, mediated, moderated
Sin, Tse, Yau, Lee, Chow & Lau	2000	210	China	EM	Single	MKTOR	Customer retention (0.3736)
Zhou, Yim & Tse	2005	350	China	EM	Single	MARKOR, MKTOR	Product Performance (0.27021)
Singh	2003	138	China	EM	Single	MKTOR	Customer retention (0.4182)
Subramanian & Gopalakrishna	2001	162	India	EM	Single	MKTOR	Product Performance (0.7340), Customer Performance (0.6551)

**Table 2.7c Effect Sizes for Market Orientation-Performance in EMs and LICs**

Author	Publication Year	Sample size	Country	Economic Context E=emerging LIC=low income D=Dual	Industry Type	MO Scale	Perf Scale S=subjective O=objective X=mixed	Mean ES corrected for artefacts	Association
Akimova	2000	221	Ukraine	EM	cross-sectional	OTHER	S	0.3600	Significant, positive, direct
Appiah-Adu	1998	74	Ghana	LIC	cross-sectional	MKTOR, OTHER	S	0.3106	Significant, positive, mediated
Burgess & Nyajeka	2005	161	Zimbabwe	LIC	single	MARKOR, Ruekert	S	0.5584	Significant, positive, direct
Deshpande, Farley	2002	297	China	EM	cross-sectional	MARKOR, MKTOR, DFW	S	0.2374	Significant, positive, direct
Deshpande & Farley	1999a	340	India, Japan	D	cross-sectional	MARKOR, MKTOR, DFW	S	0.7633	Significant, positive, direct
Deshpande, Farley & Bowman	2004	129	China, England, France, Germany, Hong Kong, India, Japan, Thailand, UK, USA, Vietnam	D	cross-sectional	MARKOR, MKTOR, DFW	S	0.2968	Significant, positive, direct, mediated, moderated
Grewal & Tansuhaj	2001	120	Thailand	EM	cross-sectional	MARKOR	O	0.1880	Partially significant, positive, moderated
Hooley, Fahy, Greenley, Beracs, Fonfara & Snoj	2003	1619	Hungary, Poland, Slovenia	D	cross-sectional	MKTOR	X	0.0519	Significant, positive, direct

Author	Pub Year	Sample size	Country	Economic Context E=emerging LIC=low income D=Dual	Industry Type	MO Scale	Perf Scale S=subjective O=objective X=mixed	Mean ES corrected for artefacts	Association
Kaynak & Kara	2004	179	China	EM	cross-sectional	MARKOR	X	0.1689	Partially significant, positive, direct
Luk, Yau, Tse, Sin & Chow	2005	193	China	EM	single	OTHER	S	0.3613	Partially significant, positive, direct, moderated
Mavondo	1999	176	Zimbabwe	LIC	single	OTHER	O	0.2652	Significant, positive, direct, moderated
Powpaka	1998	194	Thailand	EM	single	MKTOR	S	0.0648	Significant, positive, direct, moderated
Qu & Ennew	2003	215	China	EM	single	MARKOR	S	0.6292	Significant, positive, direct, moderated (ns)
Sin, Tse, Yau, Lee, Chow & Lau	2000	210	China	EM	cross-sectional	MKTOR, OTHER	S	0.2611	Significant, positive, direct
Tse, Sin, Yau, Lee & Chow	2003	573	China	EM	cross-sectional	MKTOR	S	0.4170	Significant, positive, direct
Singh	2003	138	India	LIC	cross-sectional	MKTOR	S	0.3694	Significant, positive, direct, moderated
Soehadi, Hart & Tagg	2001	159	Indonesia	LIC	single	MARKOR	S	0.5923	Significant, positive, direct
Subramanian & Gopalakrishna	2001	162	India	LIC	cross-sectional	MKTOR	S	0.6890	Significant, positive, direct
Zhou, Gao, Yang & Zhou	2005	180	China	EM	cross-sectional	MARKOR	S	0.2610	Significant, positive, direct, mediated, moderated

In the next section results of the EM meta-analysis are reported. The comparison between Kirca et al.'s (2005) meta-analysis and the EM meta-analysis is detailed in table 2.8.

Market orientation and top management factors: The amount of emphasis that managers place on market orientation has a positive and significant effect in the context LICs such as the Ivory Coast and Ghana ( $r = 0.45$ ,  $p < .05$ ). These results are consistent with results obtained in HICs (Bhuiyan 1998; Pulendran et al. 2000; Selnes et al. 1996; Tay and Morgan 2002; Wren et al. 2000) and Kirca et al. (2005) also concur this association by obtaining a positive and significant reliability-corrected mean correlation for this relationship in their meta-analysis conducted across 147 studies ( $r=0.44$ ,  $p<.05$ ). There was insufficient data available on the risk attitude-market orientation association (for both meta-analyses) and therefore this association was omitted.

Market orientation and interdepartmental dynamics: Kirca et al.'s (2005) meta-analysis reported a negative and significant result on the interdepartmental conflict-market orientation association ( $r=-.28$ ,  $p>0.05$ ). Contradictory to this finding, the meta-analysis conducted on EM/LICs reports an overall positive result ( $r = 0.0715$ ,  $p<.05$ ) suggesting that conflict could be task-related which can be constructive in relevant solutions (Kuada 2005).

**Table 2.8 Meta Analyses Comparison: Kirca et al. (2005) and EM meta-analysis**

Construct	Kirca et al. (2005) results			EMC and LICs results			
	Number of effects	Total sample size	Corrected mean r	Number of effects	Total sample size	Corrected mean r	
<b>Antecedents of market orientation</b>							
Top Management Emphasis	13	4074	.44*	2	200	.45	
Interdepartmental dynamics	20	3282	.56*	-	-	-	
Interdepartmental connectedness							
Interdepartmental conflict	4	530	-.28*	3	458	.07	
Organisational systems							
Centralisation	9	2062	-.27*	3	457	.099	
Formalisation	9	2185	-.12*	3	458	.103	
Market-based reward systems	5	1297	.42*	3	455	.52	
<b>Consequences of market orientation</b>							
Organisational Performance	69	12 732	.46*	22	5317	.328	
Overall performance							
Customer Consequences	16	2485	.35*	5	914	.436	
Customer Loyalty	11	1684	.45*	-	-	-	
Customer Satisfaction							
Employee Consequences							
Organisational Commitment	12	2203	.71*	2	374	.29	
Job Satisfaction	5	937	.61*	2	374	.41	
Customer Orientation	7	1214	.25*	-	-	-	
Innovation Consequences							
Innovativeness	30	6013	.45*	2	413	0.26	
New Product Performance	30	5922	.36*	3	920	0.41	
<b>Consequences of technology orientation</b>							
Sales Growth		-	-	-	2	$\frac{75}{8}$	.29
Product Performance		-	-	-	2	$\frac{75}{8}$	.39

\* p<0.05

There was insufficient data available on the interdepartmental connectedness-market orientation association for the EM meta-analysis and therefore this association was omitted.

Market orientation and organisational structure and systems: Similar to results reported in HICs (Burgess and Harris 1999; Kohli and Jaworski 1990; Zaltman et al. 1973), Kirca et al.'s (2005) meta-analysis report a negative, significant relationship between formalisation and market orientation ( $r=-.12$ ;  $p>.05$ ), which means that market-orientation is not conducive to a formalised structure. Although Burgess and Nyajeka (2006) reported a negative relationship, overall results indicate that in LICs formalisation is positively related to market orientation ( $r=0.103$ ,  $p>.05$ ). A plausible explanation for this could be that initially when companies switch from non-market-oriented strategies to market-oriented strategies formalisation helps employees to acquire market-oriented proficiencies and routines. It also helps diminish the possible damage caused by interdepartmental conflict on information dissemination and the implementation of customer-oriented measures (Kuada & Buatsi 2005). Results reported for the centralisation-market orientation association is negative according to Kirca et al.'s study (2005) ( $r=-.27$ ,  $p>.05$ ), but the EM meta-analysis reported an overall positive result ( $r= 0.099$ ,  $p<.05$ ). Although management styles across African countries differ greatly, Kuada (2005) suggests that this positive association could be attributed to the authoritarian characteristics of African managers and their subordinates' respect and loyalty towards them (Blunt and Jones 1995; Kuada 1994).

Market Orientation and market-based reward system: A market-based rewards system affects all elements of market orientation ( $r=0.5205$ ;  $p>.05$ , EMs/LICs) and Kirca et al.'s (2005) results report to be similar ( $r=.42$ ;  $p>.05$ ). This strong, positive relationship explains why companies that reward employees based on their customer satisfaction and customer relationship building are more market orientated.

Market orientation and learning: In the process of establishing a mean value for the

positive and significant relationship between learning and market orientation in EM/LIC, results revealed that most learning orientation studies have been conducted in developed countries (Baker and Sinkula 1999a; Celuch et al. 2002; Santos-Vijande et al. 2005b; Slater and Narver 1995). In developed markets, the individual components of market orientation, for example, customer orientation, competitor orientation and knowledge dissemination are positively and significantly related to learning orientation (Dibella 1996). This means that market orientation underpins the cultural foundation of organisational learning and that learning-oriented companies, very much like market-oriented companies, not only generate, disseminate and utilise market information to improve their customer service, but also continually explore market dynamics to improve the company's performance. Unfortunately, no results were reported on learning for either Kirca et al. (2005) or the meta-analysis for EMs/LICs.

Several strategic orientation antecedents and consequences have also been explored in EMs, for example, Zhou et al. (2005a) found a positive association between culture and managerial attitude to change and strategic orientation (innovation and market orientation). Only recently technology orientation was tested by Gao et al. (2007) and Zhou et al. (2005a) in China, but to date no antecedents have been tested in this context. The closest we are to published results on the antecedents of technology is Srinivasan et al.'s (2002) future focus on the company, top management's advocacy of new technologies and organisational culture as antecedents that influence technology opportunism. Top managements emphasis remains an important antecedent, particularly when one considers strategy. If top management emphasise the importance of market orientation in high technology then their focus will also be on technology orientation.

## MARKET ORIENTATION CONSEQUENCES

Market orientation and business performance: The most frequently studied relationship concerning the consequences of market orientation is the business performance-market orientation association. As expected, market orientation has a positive relationship with business performance (LICs/EMs,  $r = .32$ ) which is in line with Cano et al.'s. (2004),  $r = .35$  and Kirca et al.'s. (2005),  $r = .46$ ) results. Kirca et al.'s (2005) results differ substantially and this could be ascribed to the method that they used in their meta-analysis (z-transformed).

Market orientation and customer consequences: The EM meta-analysis reveal that the most studied customer consequence is customer retention ( $r = .45$ , (Kirca et al. 2005);  $r = .436$ , LICs/EMs) which means that customers make repeat purchases from companies who implement market orientation. The results for both meta-analyses proved to be similar.

Market orientation and employee consequences: Both job satisfaction ( $r = .61$ , (Kirca et al. 2005);  $r = .41$ , LICs/EMs) and organisational commitment ( $r = .71$ , (Kirca et al. 2005);  $r = 0.29$ , LICs/EMs) have a positive relationship with market orientation and Powpaka (2005) suggests that if companies were to improve job satisfaction among front-line service employees, remuneration programmes such as performance-based reward systems (among others) may be needed. Zhou (2005) also says that because market orientation and innovation are fairly new concepts for companies to implement, leadership plays a significant role in job satisfaction and organisational commitment. Indeed meta-analyses concur that both reward systems and leadership have a very strong relationship with market orientation, which in turn leads to companies having satisfied, committed employees who have confidence in the company's future performance.

Market orientation and innovation: Both meta-analyses reveal that market orientation develops a company's innovativeness because it guides companies toward an uninterrupted

disposition toward satisfying customer needs and stresses greater information use (Atuahene-Gima 1995; Han et al. 1998) ( $r=.45$ , (Kirca et al. 2005);  $r=.26$ , LICs/EMs). If we compare the two meta-analyses, it would appear that the relationship between market orientation and innovativeness is much weaker in LICs/EMs. Yet Deshpandé and Farley (1999) concur in their comparison between Japanese and Indian companies that this relationship is not dependent on macro-economic differences. Still this relationship warrants further probing to understand its dynamics in high technology companies.

Market Orientation and Product Performance: The relationship between new product performance and market orientation is strong ( $r=.36$ , (Kirca et al. 2005);  $r=0.41$ , LICs/EMs) which concludes that market orientation improves the customer-perceived value of the company's products and services by stimulating superior customer value (Brady & Cronin 2001). Some authors maintain that this relationship is contingent on environmental forces such as high levels of demand uncertainty and technological turbulence (Gao et al. 2007; Zhou et al. 2005a).

## **TECHNOLOGY ORIENTATION CONSEQUENCES**

Results on the consequences of technology orientation state that sales growth ( $r = .29$ ) and product performance ( $r = .39$ ) have good relationships with technology orientation (Gao et al. 2007; Zhou et al. 2005a), but studies have not yet explored the relationship between technology orientation and its effect on innovativeness. The implications of testing this relationship is important for its contribution to the market orientation literature since it will bring to fruition a new dimension of the way high technology companies will assess, implement and monitor strategy in the context of EMs.

## **MEDIATORS**

Given the ambiguous findings in the literature concerning the mediators of market orientation, scholars have argued that there are actual mechanisms responsible for changing market orientation behaviour into business performance. Mediating presumes that one or more intervening variable (mediator variable) “transmit” some of the casual effects of prior variables onto subsequent variables (Kline 2004). Based on the findings of Han et al. (1998) and Kirca et al.’s (2004) who found that technical and administrative innovation and innovativeness mediate the relationship between market orientation and business performance, the current research hypothesise that market-oriented companies perform better in the presence of innovativeness.

## **Market orientation-Performance Mediators**

The overall business performance-market orientation relationship has been explored by many in the literature and several scholars concur that this association is direct and positive (Cano et al. 2004; Day 1994a; Deng and Dart 1994; Gray et al. 1998; Greenberg 1982; Greenley and Foxall 1996; Hamel and Prahalad 1994; Harrison-Walker 2001; Kirca 2004; Narver and Slater 1990; Ruekert 1992). Other scholars say that the existence of such a relationship is subject to the circumstances in which it takes place (Anwar and Sohail 2003; Atuahene-Gima 1995; Bhuian 1997; Langerak 2003) for example, a medical doctor that assesses the specific needs of a patient but does not necessarily meet the needs of the patient (Anwar & Sohail 2003).

In agreement with this theory and what others have motivated for and confirmed regarding innovativeness' mediating properties (Han et al. 1998; Kirca et al. 2005), the current research hypothesise that market-oriented companies perform better in the presence of innovativeness. That is, companies who listen to their customers and use customer research information (based on the types of new products and process technology customers want), will have improved sales turnover, increased market share and better profits. In light of what has previously been said about entrepreneurship and its strong positive relationship with market orientation (Liu et al. 2003) and business performance (Matsuno et al. 2002) , it stands to be argued that market-oriented companies will perform better when they identify new customer needs, pursue new market opportunities and are prepared to have a proclivity towards risk-taking.

H<sub>7</sub>: Innovativeness mediates the relationship between market orientation and business performance in high technology companies in South Africa.

H<sub>8</sub>: Entrepreneurship mediates the relationship between market orientation and business performance in high technology companies in South Africa.

### **Market orientation-Innovativeness Mediators**

Having argued that there is a strong positive link between market orientation and innovativeness, our attention is drawn to how this relationship improves in the presence of a learning and technology orientation.

The relationship between market orientation and learning has been confirmed (Hult & Ketchen Jr. 2001; Lee & Tsai 2005; Yilmaz 2005) and also the relationship between learning and innovativeness (Drucker 2002; Hurley, Hult et al. 2005). This study hypothesises that when companies are open-minded and committed to learning, when there is communality of purpose and employees see themselves as partners in the business, companies are able to meet customer needs better in terms of the new products and services they wish to offer (Baker and Sinkula 1999b; Hult and Ketchen Jr. 2001). Similarly, high technology companies are able to introduce state-of-the-art technology products and technological innovations based on research results (Zhou et al. 2005a) and, as a result, are able to be better innovators.

H<sub>9</sub>: Learning orientation mediates the relationship between market orientation and innovativeness in high technology companies in South Africa.

H<sub>10</sub>: Technology orientation mediates the relationship between market orientation and innovativeness in high technology companies in South Africa.

## DISCUSSION AND IMPLICATIONS

The meta-analysis reported in this study presents a quantitative summary of market orientation and its relationship with associated antecedents and consequences. It is important to note that all studies and constructs that have been conducted in EMs in the market orientation literature could not be integrated simply because they lacked the fundamental requirements to compute effect sizes. It is also important to note that only specific moderators could be coded from existing studies. Table 2.8 summarised the comparison between mean values for the relationship between market orientation and its antecedents and consequences in Kirca et al.'s (2005) meta-analysis and the EM meta-analysis conducted in this study. In total, 45 effect sizes were collected in the EM meta-analysis.

Results of the meta-analysis indicate that several factors influence strategy, and that the most prominent antecedent relevant to this study is top management emphasis on market orientation. Given the strong emphasis that top management places on market orientation, management's predisposition towards risk and its unifying focus in identifying new market opportunities, market orientation is seen as a mechanism to generate increased levels of business performance (Jaworski & Kohli 1993; Kuada & Buatsi 2005; Burgess & Nyajeka 2006). Companies that are market-oriented create the environment for employees to be open-minded and "think outside the box" (Baker & Sinkula 1999). In EM companies strategy should be supported by the amount of emphasis that top managers place on market orientation through frequently reminding employees of the importance of being perceptive and responsive to market developments (Jaworski and Kohli 1993; Zhou et al. 2005a). Top management's emphasis is also important in new technologies because new technologies may require termination of existing assets for which management's authorisation will be required (Srinivisan 2002). We know that corporate entrepreneurship and its association with market

orientation have been tested in Chinese state-owned enterprises and attest to be positive (Liu et al. 2003). It is to be expected that entrepreneurship being measured as a leadership aspect will have a positive relationship with market and technology orientation in high technology companies. For this research it is hypothesised that the leadership in high technology companies are willing to take more risks than their competitors, are better innovators and plan their strategies better than their competitors and typically make the vision of their business a reality. They are also able to identify customer needs and new market opportunities better than their competitors. Surprisingly results in the meta-analysis reveal that learning orientation is under-studied in the context of EM companies and even more so in the high technology context. To the author's knowledge, the association between learning, market and technology orientation as concurrent strategies has not been tested in an EM context. This is a significant contribution to the market orientation literature as companies that practise a learning orientation believe that employee learning is an investment, encourage employees to be open-minded (to think outside the box) and believe that the survival and competitiveness of the company depend on the company's ability to learn (Sinkula 1994). Moreover, learning leads to innovativeness and improved business performance (Hult et al. 2004a). More than 250 studies in the market orientation literature confirm that market orientation in EM companies leads to better profits and increased business performance. It is to be expected that the same would hold true for the technology orientation-business performance relationship (Hult, Ketchen Jr. et al. 2004). In terms of innovation consequences two of the 22 studies in the EM meta-analysis confirm that market orientation leads to innovativeness.

A review of prior research into the substantive moderators of the market-orientation performance relationship shows that the current studies provide inadequate support that the market orientation-performance relationship is contingent on environmental factors such as

market and technological turbulence and competitive intensity (Kirca et al. 2005). In this regard, this research expands upon the findings of prior endeavours to summarise antecedents that influence the market orientation-performance relationship, but particularly providing valuable insight into the distinctiveness of EMs.

### **IMPLICATIONS FOR MANAGERS**

The results of this meta-analysis provide insight to managers in EM companies who wish to pursue certain strategic orientations for their companies. In high technology companies this is particularly important in their assessment concerning the market orientation-financial performance technology orientation-financial performance relationships. When managers consider strategy, they are concerned about what type of strategy to implement, its impact on performance and the dynamics that impede and enhance strategic orientation. This meta-analysis provides insight into each of these issues. Focus areas for managers to consider are the importance of top management's emphasis on market and technology orientation, specifically top management's support of employees and that the company's survival depends on its ability to adapt to market trends. A burning issue, particularly in high tech is that employees must be sensitive to the activities of competitors, but more importantly, with a mushrooming EM market such as South Africa, top management plays a commendable role in gearing employees up to serving customers and meeting customers' future needs. Part and parcel of leadership in high technology companies is management's willingness to take on risk. Wrapped in the concept of entrepreneurship is the predisposition of management to drive innovation in their companies, to plan their strategies effectively and to identify customer needs and wants accurately and also better than their competitors. Without the concept of entrepreneurship in high technology companies it would be difficult for managers

to identify new market opportunities better than their competitors or to make the vision of the business a reality. The application of top management emphasis and corporate entrepreneurship enable high technology companies to direct their attention to implementing suitable strategies and to reap the rewards of business performance and innovation. As a result market orientation is a strategic organisational practice that refers to the company's conventional application of knowledge for accomplishing a variety of organisational functions in their endeavour to satisfy customer needs, have good financial performance and enough room for innovation. The continuous appeal for companies to invest in learning leaves one breathless at times. Consider for a moment management's unremitting zest to continuously encourage their employees to think outside the box, to invest in employee learning, and to drive constant innovation as part of the company's corporate culture. Such is the case of learning. It requires managers to encourage employees to be dedicated to the goals of the company and to persuade them that the company's survival and competitiveness depend on their aptitude to learn.

In this chapter the EM meta-analysis were discussed in light of the findings from the market orientation literature conducted in LICs and EMs. Various strategic orientations for EM high technology companies were considered and debated from both a theoretical and practical point of view. The market orientation-performance and market orientation-innovativeness links were assessed and several mediators were proposed. In this respect this study points out important shortcomings of the extant literature. In the next chapter the research methodology used to test the hypothesis relations in this dissertation is addressed.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **INTRODUCTION**

In this chapter the research methodology is addressed. Firstly, the details of the population and sampling frame are presented. This includes a discussion on the unit of analysis.

Secondly the sampling and research methods are detailed and thirdly a discussion of the questionnaire development and pilot study is reviewed. Fourthly the author discusses the data collection method followed by a discussion on measurement. Finally the cross-cultural aspects of methodology and its applicability for this research are addressed in the context of the diverse cultures within South Africa.

### **SAMPLING DESIGN**

The sampling frame was defined from the Matrix database that consists of 70 000 companies in South Africa that applied for finance in the past three years. The final list consisted of companies from various segments that included all four provinces in South Africa. This list serves as the sampling frame for the present study.

To date, the estimated number of high technology companies in South Africa is unknown (CBI, CITI, CSIR, DaVinci Institute, DTI, Markinor). Two hundred and thirty-five companies were telephoned from the matrix database. The sample was considered to be representative to accurately reflect the characteristics of high technology companies in South Africa.

When the final list of high technology companies was reviewed the considerable diversity of high technology companies in South Africa was readily apparent. High technology companies in South Africa differ considerably in organisational size considering the number of individuals employed. They also differ in terms of their organisational structure, which

includes divisions of international and local multinational corporations, large independent local South African companies, medium-sized companies and a number of small independently-owned businesses. They differ noticeably in terms of industry classification, including pharmaceutical, pathology, biotechnology, healthcare, manufacturers of organic products, information technology, and telecommunications companies. It is important to note that, even though high technology companies differ considerably in these respects, they have shared characteristics, for example, leadership capabilities and learning (Shan 1990; Smith 2005).

The sample represents a hodgepodge of one-man operators, small independent sector outlets, medium and large independent companies and multi-national corporations (MNCs). An important deliberation in the process of identifying the sample for this study was the origin of high technology companies (OECD). A number of high technology companies in South Africa have their origin outside of South Africa, and the implications that this has for this research is that often MNCs deal with conflicting pressures in different markets and simultaneously need to adhere to various internal company policies (Kostava and Roth 2002). MNCs are “a network of exchange relationships among different organisational units, including the headquarters and subsidiaries that are collectively embedded in an external network of customers, suppliers, regulators, and competitors” (Ghoshal and Bartlett 1990, p. 604). In order for MNCs “to gain legitimacy in its multiple environments, subsidiaries tend to become isomorphic with other units within the MNC, including the headquarters and other subsidiaries as well as the host country’s institutional environment (Kirca 2004, p. 32).” More importantly, MNCs face socio-economic and regulative pressures in the host country and are subjected to a metamorphic process that forces them to assume the “procedures, practices and behaviours that are institutionalised in the host country environment” (Kirca 2004, p. 32). The same would ring true for smaller foreign high technology companies who have a

division(s) in various countries including South Africa. Consequently, the sample for this research included South African high technology companies, foreign high technology companies who have divisions in South Africa and MNCs who have subsidiaries in South Africa.

A concern for any research study is the suitability of the candidates who attempt to answer the questionnaire. Researchers often rely on key informants for comprehensive or in-depth information, which cannot be obtained from representative survey respondents (Kumar et al. 1993). The following section addresses the unit of analysis, particularly the issue of key informants, and the value that they add to organisational research.

### **UNIT OF ANALYSIS**

The key informants selected for this study included top, senior and middle managers, who were responsible and accountable for marketing in high technology companies. Key informants, unlike respondents who describe their personal feelings regarding the topic of interest, are those who are well informed about the topic being researched and are competent to provide information regarding the variables of interest (Kumar et al. 1993). These individuals were selected based on the premise that they are key decision makers in their company, they possess good knowledge and an adequate awareness of their company's environment, and have access to strategic and financial information (Kumar et al. 1993; (Kumar et al. 1993; Phillips and 1981). Although Kumar (1993) applied the "selection problem" in his study (identifying two or more informants competent to report on a particular issue), it was decided that in this study two screening questions will be inserted asking the particular individual who the most suitable person is to speak to about marketing in their company and to rate themselves on how knowledgeable they are about their company's

marketing function? This would give the researcher an indication about the informant's ability to answer the questionnaire accurately.

In the next section the sampling method will be discussed which is key to this study in obtaining generalisability of results to the population of high technology companies.

Reference is made to sampling methods that previous EM market orientation studies have used and the reason why the preferred method was used is discussed.

### **THE SAMPLING AND RESEARCH METHOD**

Simple random sampling was employed across the four provinces of South Africa with the aim of ensuring representation and generalisability of results to the population of high technology companies in EMs. A reflection on previous market orientation studies conducted in EMs indicated that some of the studies used sampling methods such as multi-stage sampling procedures (i.e. stratified random) (Gao et al. 2007; Zhou et al. 2005b) and random sampling methods (La Porta et al. 1998; Qu and Ennew 2003; Tse 1998; Tse et al. 2003). Stratified random sampling was used extensively in LICs such as the Ukraine (Akimova 2000), Thailand (Zhou et al. 2005), Hungary, Poland and Slovenia (Hooley et al. 2003), Zimbabwe (Burgess & Nyajeka 2005) and Ivory Coast (Chelariu et al. 2002). Although stratified random sampling is able to increase the statistical efficiency of a sample (Bryman and Bell 2007, p.187) the main disadvantage of this approach, and particularly for this study, is that the "information necessary to properly stratify the sample is usually not available in advance" (McDaniel & Gates 2007, p. 390). The advantage of using simple random sampling as opposed to other non-probability sampling techniques, is that error can be computed, the survey results can be projected to the total population and information obtained is from a representative cross-section of the population (Cooper and Schindler 2003; McDaniel and

Gates 2007).

The survey research method was applied in this study as it would enable the interviewer to interact with the respondents to obtain facts and opinions (McDaniel & Gates 2007) on how strategic orientation is applied in high technology companies. The researcher compiled a questionnaire to assess the relationship between the strategic orientation and various other organisational characteristics considered as mediators for the present study. Cogitating the methods used in previous EM market orientation studies, results suggest that very few studies made use of e-mail (Kaynak & Kara 2004), while others used hand-delivered questionnaires (Sin et al. 2000), and most of them mailed pen-and-paper questionnaires (Grewal & Tansuhaj 2001; Hooley et al. 2003; Luk et al. 2005; Sin et al. 2003; Tse et al. 2003). Others conducted face-to-face interviews (Deshpandé & Farley 2002; Deshpandé & Farley 2004; Gao et al. 2007; Zhou et al. 2005a). We know that “lack of reliable and fast transportation in parts of EMs, unreliable mail delivery, and low penetration of the Internet” hamper primary data collection (Burgess & Steenkamp 2006, p. 23). Based on this premise and the argument that time-harassed “entrepreneurs” in EM high technology companies have very little time to complete surveys, the survey research method used for this study was a 15- 20 minute-long telephonic interview. Although more expensive than mail questionnaires, the cost associated with telephonic interviews was much lower than face-to-face interviews, the completion time was faster and interviewer bias was reduced. Table 3.1 details the final sample included.

**Table 3.1 Types of High Technology Industries**

<b>Industry</b>	<b>Frequency</b>	<b>Percent</b>
Biotechnology	6	3
Chemicals	4	2
Computers, not Information Technology	4	2
Construction	7	4
Distribution	2	1
Electronics	15	8
Engineering	9	5
Engineering and Industrial	2	1
Environmental	2	1
Farming \ Agricultural	2	1
Financial \ Financial Services	3	2
Food	4	2
Information Technology	16	8
Internet	5	3
Logistics	3	2
Manufacturing	28	14
Marketing \ Marketing services	2	1
Medical	2	1
Mining	3	2
Motor industry \ Automotive	7	4
Packaging	2	1
Petro chemical	2	1
Pharmaceutical	8	4
Retail	5	3
Shipping	2	1
Telecommunication	7	4
Transport	4	2
Wireless	3	2
Other	41	21
<b>Total</b>	<b>200</b>	<b>100</b>

In the next section the development of the questionnaire is discussed. During the construction of the questionnaire the length of questionnaire, incidence rate, structure of the questionnaire, wording and time available to complete the questionnaire were taken into consideration (Bradburn et al. 2004).

## QUESTIONNAIRE DEVELOPMENT

Extensive research was conducted on the market orientation literature and several data archives were searched for existing questions and scales on antecedents and consequences of market and technology orientation.

Having considered telephonic interviews as the survey method, the next step involved the question response format which consisted of scaled-response questions only. Existing scales were used which were predominantly developed in HICs and as such most of the wording had to be changed to suit respondents in an EM context. Consequently existing questions were revised and new questions were prepared. The final draft of the questionnaire was then put into sequence and formatted accordingly.

In organisational research, one has to take cognisance of the fact that there is a fine balance between the time respondents are willing/able to spend answering the questionnaire and “the number of items needed per scale in order to reach adequate levels of reliability and to yield stringent tests of hypothesis” Bagozzi (1994a, p.41), suggests that a minimum of 4 to 8 items per construct would be adequate and on average 4 to 12 items per construct were included in the questionnaire.

Simple interview instructions were prepared for testing the questionnaire (Leedy and Ormrod 1989). As clarity and courtesy form the groundwork for a good interview (Cooper and Schindler 2003), instructions were inserted where necessary to terminate an unqualified participant (participants who do not answer the filter questions correctly). It was also necessary to gauge when to conclude the interview at the time the participant decides to discontinue and then to skip directions (when movement is dependent on the answer to specific questions). These instructions were inserted just before the question. Instructions on how the answer should be verified or how the interviewer should query were placed just after

the question (Bradburn et al. 2004). After the first draft was prepared it was scrutinised in terms of the objectives of the research: measuring strategic orientation (learning, market and technology orientation) and the mediating role of strategic orientation and organisational characteristics in high technology companies.

This brings us to the pilot test of the questionnaire and the way in which data was collected for this study. Considering that most of the studies (in the meta-analysis conducted in Chapter 2) chose either mail or interview questionnaires, it is important to understand why these two techniques, among others, were not considered for this study.

### **PILOT TEST**

The pilot test involved two stages. At the first stage a UCT marketing professor, who has substantial knowledge on the topic of market orientation critically reviewed the questionnaire, reassessed the methodology employed, re-evaluated the scales and checked the length of questionnaire and correct wording for the questionnaire. The objective of this pilot-test interview was to solicit peer feedback of the draft questionnaire (Bradburn et al. 2004) and to check the appropriateness of the language in South Africa, the time it took to answer the questionnaire, and response alternatives. Several changes were made to the questionnaire as scales were adjusted to suit the South African market and the sequence of items were re-arranged to avoid order bias. Other small changes were made to the questionnaire instructions and overall layout. At the second stage the questionnaire was administered telephonically to five different marketing people at OUTsurance, a South African-based insurance company with divisions abroad. On average it took 20-30 minutes to complete the telephonic questionnaire, and feedback required that minor changes be made to the vocabulary used to describe various concepts especially where questions were difficult to answer. The

questionnaire was still too long. The head of marketing Business OUTsurance terminated the interview within 15 minutes due to time constraints. The measure of technology orientation was too cumbersome and a decision was made that the technology orientation scale of Gao et al. (2007) be used instead. The job satisfaction variable was deleted as it was an individual level construct. No additional changes needed to be made and the final survey instrument was simple, well presented, and expected to produce data that truly reflects the constructs being measured.

## **DATA COLLECTION**

To date, the total population of high technology companies in South Africa is unknown. Subsequently, one-man operators, small independent sector outlets, and companies who have either relocated, closed business or were unknown at the listed address, were excluded from this sample.

A senior market-research consultant from a blue-chip research company in South Africa was approached to schedule and commence the field work. At interview stage, companies and candidates were screened as the telephonic interviews commenced. To determine whether these companies qualified as a high technology company, screening questions were introduced such as “would you consider your firm to be technologically innovative”, “would you consider the products and services delivered by your company to be state-of-the-art technology” and “would you say that your company uses sophisticated technologies in new product development”. If the answer was “no”, the interview was terminated. It was also important that the company being interviewed had a marketing department. Consequently another screening question was introduced: “does your company have a marketing department, group or individual that is responsible for the marketing function?” If the answer

was “no”, the interview was terminated. No other limitations were placed on the sample selection in order to include an extensive cross-section of high technology companies for the generalisability of each hypothesis to be tested.

Candidates were informed that all responses would be treated confidentially. Managers were given every opportunity to answer and thus options such as “don’t know” or “does not apply to me” were included in order to reduce response bias. Response bias occurs “when the respondent knowingly provides incorrect information or when the respondent attempts to respond truthfully to a clear question of a factual nature, yet the response is not the true value (Frankel and Frankel 1977, p.42). A space was inserted to make provision for any comments after completing answers to each relevant scale.

The purpose of the methodologies applied in this research is to fulfil the objectives of testing leadership, strategic orientation, the mediating role of strategic orientation and organisational characteristics in EM high technology companies. To determine this, specific measures (that have mostly been tested in HICs) have been adapted and employed and are discussed under measurement scales later on. Next we look at the importance of validity, reliability and the practicality of such measurements scales for this study.

## **MEASUREMENT**

The scales that have been used in the questionnaire to measure the variables in the dissertation were tested for validity, reliability and practicality. These scales are detailed in addendum 2.

In the following section the measurement scales are detailed, in particular the types of response scaling and also how scales were adapted to suit the current study.

## MEASUREMENT SCALES

In this study, and unless indicated otherwise, all items were measured on a five-point Likert scale (1=“strongly disagree”, 2 = “disagree”, 3 = “neither agree nor disagree”, 4 = “agree”, 5=“strongly agree”).

Over the years several rigorous instruments have been developed to determine the level of market orientation in companies (Deshpandé et al. 1993; Kohli & Jaworski 1990; Narver & Slater 1990; Ruekert 1992). Many of these traditional market orientation scales are too cumbersome and complex to apply in EMs due to the high degree of respondent sophistication that they command. Burgess and Steenkamp (2006, p. 27) caution that “shorter, simpler scales are also needed in organisational research, as otherwise the response rate among time-harassed managers will drop to unacceptable low levels.” Most of the scales used in this study are existing scales that have been shown to have acceptable reliability and validity in prior research (Atuahene-Gima 2005; Burgess and Nyajeka 2006; Sinkula 1994), and most have been adapted to portray shorter and simpler versions of the original scales. These adapted scale items were applied in the questionnaire to measure the variables in this study. See addendum 3.

Market orientation: Market orientation was measured using Ruekert’s (1992) three-dimensional, 23-item scale. Three items in this scale were considered for deletion and in the end scale items 19 (“respond to customer needs when bidding projects”) and 9 (“values customer input in planning new products”) were deleted and items 20 and 21 were combined, (“respond to customer needs in writing contracts” and “respond to customer needs in creating terms of sale”). The reason for this was that the questionnaire already took a long time to complete and that items on customer needs were covered sufficiently. Ruekert’s scale has proven to be reliable and valid, particularly in the high technology context (Ruekert 1992)

and more specifically in the EM context where Burgess and Nyajeka applied it in their Zimbabwean study (Burgess & Nyajeka 2006). It has also shown to be a comprehensive measure for a customer-oriented strategy (Lafferty and Hult 2001). In effect, a number of authors have argued in recent years that scales may seem behavioural and that attitudinal elements do a better job of measuring market orientation (Deshpandé et al. 1993; Narver & Slater 1990).

**Technology orientation:** Technology orientation was measured using Gao et al.'s (2007) scale. Gao et al.'s (2007) measure was adapted from Gatignon and Xuereb's (1997) technology orientation scale and their adapted scale appears to be a better measure of technology orientation as it measures the implementation of sophisticated technologies in new product development and its ability to measure how readily accepted technological innovation is in high technology companies based on research results. In the context of EMs, this application has been tested in China in the retail market, but not yet in the high technology context.

**Learning orientation:** Sinkula, Baker and Noordewier's (1997) scale was used to measure learning orientation. Eleven items were used to obtain a better understanding of how companies include learning as key to improvement, competitive advantage, employees' commitment to goals and whether learning is considered as an investment or an expense. Apart from Liu et al.'s (2003) study, the reliability of this scale has not been tested in many EMs (Liu, Luo et al. 2003).

In general, the validity, reliability and applicability of the scales of Jaworski and Kohli (1993) and to a lesser extent those of Covin and Slevin (1989), Hult (1998), and Sinkula, Baker and Noordewier (1997) have already been tested in LICs such as the Ivory Coast (Chelariu et al. 2002), Ghana (Kuada & Buatsi 2005), Zimbabwe (Burgess & Nyajeka 2005) and EMs such as China (Liu et al. 2002; Luo et al. 2005; Zhou et al. 2005).

Top Management emphasis: Jaworski and Kohli's (1993) scale was used to measure top management emphasis. This scale is appropriate for measuring top management's involvement on market trends in EMs. Its relevance is most pertinent in measuring top management's emphasis on competitive activities, specifically in high technology companies and the markets that they operate in, and more importantly top management's involvement in customers' future needs and delivering consistent customer service. This instrument has shown to be reliable in LICs (tested in 109 randomly-chosen companies in the Ivory Coast ( $\alpha=.78$ )) and in Ghana (tested in 207 manufacturing companies ( $\alpha=.78$ )).

Entrepreneurship: Entrepreneurship was measured using Covin and Slevin's (1989) entrepreneurial orientation scale which brings together aspects of active management styles such as the dynamic methods in innovation, risk-taking and proactiveness, and also attitude toward strategic planning practices that suggests the degree to which companies implement business venturing as a consequence of its close contact with Western business philosophy. In 2003, Liu, Luo et al. conducted both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to test the reliability ( $\alpha = .88$ ) of this scale in 304 state-owned enterprises in China and the results supported the unidimensionality of this scale.

Innovativeness: For innovativeness, nine criteria from Capon, Farley, Lehmann, and Hulbert's scale (1992) was used. Items included being the first to market and cutting-edge technology, avoiding late entry and stable markets, frequently introduced incremental new products into new markets, emphasis on new product development, refining existing products, and the use of innovative production processes. The adapted scale for innovativeness has been tested in high technology companies in China for its appropriateness, validity and reliability (Li et al. 2000) and also in India from 116 randomly selected companies on the Bombay stock exchange (Deshpande 1999).

Business performance: Business performance has been measured extensively in the market

orientation literature. Similarly, in the current research three measures of performance were introduced: sales, market share and profitability.

An important aspect of methodology, particularly in EM countries is to ensure that, amongst others, all the necessary steps have been taken to address the cross-cultural aspects of methodology. This will be addressed in the following sections.

## **CROSS-CULTURAL ASPECTS OF METHODOLOGY**

“Cross-cultural research in business and management tends to presuppose that culture is a major explanatory variable that exerts profound influence on organisational behaviour (Bryman and Bell 2003, p. 67)”. Cross-cultural research refers to data collection/analysis of more than one nation. Its relevance to this study lies in the context of the diverse cultures within South Africa. Referred to by Burgess (2003) as the “SA Tribes”, the 16 “tribes” represent a richness of diverse social identity by which they are essentially grouped to form the 16 different consumer groups in South Africa.

The issue of cross-cultural research methods has been raised by several scholars, particularly in the area of social psychology (Brislin 1970), business (Bearden et al. 2006; Sekaran 1983), consumer studies (Burgess 2002) and more specifically in the field of market orientation (Kaynak & Kara 2004). Cross-cultural methodological procedures have come under scrutiny, particularly in EMs where researchers need to ensure that extensive reliability and validity tests must be done, accepted back-translation methods should be used, the issue of non-response bias must be addressed and new measures or shortened versions of traditional measures are designed to account for individual differences in cross-cultural research.

Similarly, in South Africa's challenging cross-cultural research environment portrayed by the "SA Tribes", several cross-cultural methodology aspects were considered with the aim of projecting generalisability of results to other EM countries. In cross-cultural research, the issue of validity and reliability tests of the data collected is paramount. The topic of data analysis techniques will be discussed in greater detail in Chapter 4. In terms of accepted back-translation procedures in South Africa (where eleven languages are considered official languages) this posed to be a challenge. After much deliberation and gaining an understanding from South African research companies (AC Nielsen, Markinor, Research International) as to how this challenge could be alleviated, it was decided that questionnaires be scripted in English only.

In order to minimise response bias, respondents were assured that their responses would be held in confidence and that the information obtained from this study would be used for the purposes of advancing knowledge in the academic and corporate sectors. As discussed several of the scales were adapted for this study to portray shorter and simpler versions. The objective of adapting these scales was to include items with the highest loading factors and to obtain a satisfactory response rate among time-pressured managers. The issue of measurement invariance was also considered and addressed which meant that the relations of latent variables with their indicators had to be identical across groups.

## **CONCLUSION**

In conclusion, Chapter 3 addressed the process of this research, which is the sampling design, sampling and research method, and data collection methods. In addition, the questionnaire development was also addressed as well as the measures to assess the hypothesised relations discussed in Chapter 2.

Compared to previous market orientation studies, the methods and scales used in this study have been chosen to respond to the unique setting of companies in EMs, specifically the way in which key informants were chosen to answer the questionnaire. In particular, the sampling method for this study was chosen to ensure generalisability of results to other EMs. Furthermore, the manner in which data was collected for this research ensured that every measure was put in place for time-harassed “entrepreneurs” to complete the questionnaire. Underpinning the methodological and design issues of this research is the aspect of cross-cultural methodology. This was discussed in the last section of this chapter. Chapter 4 presents the results inclusive of the data analysis results for the psychometric properties of the scales and tests the hypothesised relations.

## **CHAPTER 4: RESULTS**

### **INTRODUCTION**

In Chapter 3 the research process and the reasons for testing the hypotheses in Chapter 2 were discussed. In this Chapter, the data analysis techniques are addressed. Firstly an assessment of the reliability and validity of measures are introduced. Secondly, the statistical analyses used to test the hypotheses are described. Finally, the results of the statistical analyses are reported.

### **DESCRIPTION OF THE SAMPLE**

A total of 235 companies from the Matrix database were contacted telephonically. Overall, 200 completed questionnaires were received, accounting for a final response rate of 85%. The majority of the respondents (72%) were senior and top management. Results indicate that high technology companies in South Africa date back as far as 1900, with the majority (133) of high technology companies in South Africa having initiated their companies between 1950 and 1999. Only 28 of the 200 companies were younger than 7 years, which suggests that the majority of high technology companies in South Africa are long-established entities. The size of these companies varied on average between 11-50 employees, which gives us an indication that most of these firms are relatively small. Interestingly, 36 (18%) high technology companies employed more than 1 000 employees, with the majority of these companies being MNCs. Concerning the typical high technology industry groupings, the results indicate that 14% (majority) of high technology companies are manufacturing companies, with the rest being electronics, information technology, engineering, construction, telecommunication etc. Refer table 3.1. In general, of the 200 high technology companies interviewed for this

research, 110 (55%) were South African-owned companies and 90 (45%) were non-South African-owned companies. See table 4.1.

**Table 4.1 Description of Respondents (N=200)**

	Descriptors	Frequency	Percent (%)
Management Level	Junior	17	8
	Middle	38	19
	Senior	69	35
	Top Management	74	37
	Non-Managerial	2	1
Years of Employment	Less than 1 year	17	8
	1-2 years	36	18
	3 to 6 years	57	29
	7 to 10 years	37	19
	11 to 20 years	36	18
	More than 20 years	17	8
Number of Employees	10 or Less	13	6
	11 to 50	45	23
	51 to 100	34	17
	101 to 200	30	15
	201 to 500	32	16
	501 to 1000	10	5
	1001 to 2000	14	7
	2001 or more	22	11
Age of Company	1900-1949	27	14
	1950-1975	37	18
	1976-1989	46	23
	1990-1999	50	25
	2000-2007	28	14
	Don't Know	12	6
Type	SAO	110	55
	MNC	90	45
	Service	54	27
	Manufacturing	32	16
	Both	113	57
	Don't know	1	-

Note: SAO=South African Owned  
MNC= Multi National Company

Moreover, fifty percent of companies were South African-owned with no other divisions and 32 (16.5%) were South African-owned with divisions abroad and also throughout provinces in South Africa. Of the 90 non-South African-owned companies, 57 (28.5%) were MNCs with divisions in other provinces in South Africa. These results indicate that the majority of high technology companies in South Africa are MNCs.

### **ASSESSING SCALE RELIABILITY AND VALIDITY**

In order to assess scale reliability and validity, SEM with maximum likelihood estimation in LISREL 8.8 was used. The advantages of using SEM for assessing scale reliability and validity are the appropriateness of assessing models completely as opposed to coefficients separately. It also has the ability to use confirmatory factor analysis in order to minimise measurement error by including multiple indicators per latent variable (Hair Jr. et al. 1998). The reliability and validity were assessed by means of psychometric analyses using Cronbach's Alpha and confirmatory factor analyses (CFA) (Steenkamp and van Trijp 1991). Nunnally and Bernstein's (1994) recommended reliability was used as a measure of acceptable reliability (see table 4.2).

The composite reliability for each set of focal constructs (i.e., entrepreneurship, organisational learning, market and technology orientation and innovativeness) exceeded the usual .60 benchmark (Bagozzi et al. 1988) and the results showed that the co-efficient alpha internal reliabilities of the subscales were in the range of .64-88. All measures of the major constructs exhibit good internal consistency (see table 4.2).

**Table 4.2 Univariate Statistics for Summated Scales (N=200)**

Variable	Coefficient Alpha	Mean	SD	AVE
Market Orientation	.87	4.058	.412	.30
Technology Orientation	.74	4.131	.571	.42
Top Management Emphasis	.65	4.049	.547	.32
Entrepreneurship	.81	4.025	.547	.41
Learning	.85	4.092	.403	.35
Innovativeness	.82	3.898	.671	.54

Note: SD=standard Deviation AVE=Average Variance Extracted

The next step in data analysis involved the assessment of convergent and discriminant validity of key measures, where key measures were analysed by means of a series of confirmatory factor analyses (Anderson and Gerbing 1988; Gerbing and Anderson 1988). Ruekert's (1992) second-order, three-factor market-orientation scale indicated moderate fit, suggesting that some of the items possessed either low factor loadings or high cross-loadings. The model was collapsed into a first-order, one-factor model. Four items were deleted ("beating the competition is more important than financial performance at our company", "prices of our products or services are determined by how much a product is worth to a customer", "when we segment our market or choose target segments, we consult marketing research information" and "our financial arrangements with clients, such as payment terms or credit policies, take customer needs into account"). The fit improved considerably. The standardised loadings of all the items of strategic orientation were statistically significant and 15 of the 22 variables exceeded .50, with no exceptionally large residuals and no modification indices standing out, suggesting convergent validity. Scale 2 did not fit the hypothesised model well. The organisational learning scale proved to be problematic so the second-order, three-factor scale was collapsed into a first order, one-factor scale. Five items had low loadings and unacceptable standardised residuals. These items were deleted ("we are not afraid to question the shared assumptions we have about the way we do business", "an emphasis on constant innovation is not a part of our corporate culture", employee learning

really isn't a top priority in our company”, “managers in this business unit do not want their ‘view of the world’ to be questioned” and “top managers often tell employees to be sensitive to the activities of our competitors”). This improved fit considerably. The standardised loadings of all the items were statistically significant and 17 of the 22 variables exceeded .50, suggesting convergent validity. A 95% confidence interval was constructed around the correlation coefficients (for latent variables) in order to assess discriminant validity. Support for discriminant validity was evident as none of the confidence intervals included 1.0. In additional support of discriminant validity, Fornell and Larcker (1981) suggest that the amount of variance that is obtained by a construct in relation to the amount of variance due to measurement error could be calculated by a measure called AVE (average variance extracted). This was done in order to estimate whether the shared variance between all possible pairs of constructs were lower than the average variance extracted. The results confirm that (for each construct), the AVE extracted was much higher than its highest shared variance with other constructs. This indicated further support for the discriminant validity (see table 4.3).

**Table 4.3 Scale Reliabilities and Validities (N=200)**

	X <sup>2</sup> statistic			Fit indices		RMSEA	ECVI		
	χ <sup>2</sup>	d.f	Prob	CFI	TLI	RMSEA	90% conf. interval	Point est.	90% conf interval
Model 1	347	206	<0.0001	0.95	0.94	0.064	0.054 ; 0.074	2.35	2.10 ; 2.65
Model 1a (Excluding items 11, 12, 14, 18)	271	149	0	0.95	0.95	0.065	0.053 ; 0.077	1.80	1.58; 2.05
Model 2	492	251	0	0.93	0.92	0.072	0.063 ; 0.081	3.06	2.76 ; 3.41
Model 2a (Excluding items 6, 12, 13, 19)	299	169	0	0.96	0.95	0.062	0.050 ; 0.073	1.95	1.68; 2.17

X<sup>2</sup> = chi square statistic CFI= Comparative Fit Index TLI= Tucker-Lewis Index RMSEA = Root Mean Square Error of Approximation ECVI = Expected Cross validation Index

### MODEL SPECIFICATION AND FIT

Having obtained the reliability and validity of the underlying measurement model, four structural models were initially tested in LISREL 8.8. The first model was an overall model excluding business performance. The other three models were separate covariance models that included sales turnover (N=167), market share (N=174) and profitability (N=162) respectively. Not all respondents answered the performance question, hence the requirement to run three separate models. The sample (200) was relatively small compared to the large number of items, so it required that each latent variable be measured by a single indicator variable. For this data parcelling was used, a technique that “involves summing or averaging items’ scores from two or more items and using these parcel scores in place of the item scores in a SEM analysis (Bandalos 2002, p.78)”. The error variances were fixed to a level suitable to its coefficient alpha reliability  $(1-\alpha)(\text{var})$  (Bollen 1989). The results indicated exceptional fit, however, the data did not satisfy the requirements of maximum likelihood estimation in LISREL 8.8 (Bagozzi 1994b) and improper and non-convergent solutions made it difficult to

interpret the estimates. Bagozzi and Yi (1994, p. 14) suggest that “structural equation analysis of MANOVA designs can be accomplished via Wold’s (1985) partial least squares (PLS) approach, which avoids many of the assumptions and chances that improper solutions will occur in LISREL analyses”. In particular PLS allowed for the observed measures to be set free in the models (they were fixed to 1 in LISREL) so three separate models were tested in PLS.

### Tests of research hypothesis

As detailed earlier, the PLS analysis (estimated with the LVPLS 1.6 program) was applied to compute the critical ratios for the PLS estimates by means of jack-knifing of parameter estimates and standard errors of parameters (Efron and Gong 1983). The results are reported in tables 4.4 to 4.9.

**Table 4.4 Direct Effect Estimates for Structural Model: Effects on Sales Turnover**

Path Coefficients	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Sales Turnover	0.01	0.02	0.33
MO -> Technology Orientation	0.56	0.03	21.70
MO -> Entrepreneurship	0.24	0.04	6.73
MO -> Innovativeness	0.22	0.03	6.85
MO -> Learning orientation	0.58	0.02	26.48
Technology Orientation -> Entrepreneurship	0.21	0.04	5.90
Technology Orientation -> Innovativeness	0.39	0.03	11.32
Entrepreneurship ->Sales Turnover	0.23	0.04	6.24
Innovativeness -> Sales Turnover	0.09	0.04	2.35
Learning orientation -> Entrepreneurship	0.14	0.04	3.59
Learning orientation -> Innovativeness	-0.03	0.03	0.94
Mgmt emphasis of MO -> MO	0.49	0.03	16.82

**Table 4.5 Total Effect Estimates for Structural Model: Effects on Sales Turnover**

Total Effects	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Sales Turnover	0.15	0.04	4.23
MO -> Technology Orientation	0.56	0.03	21.70
MO -> Entrepreneurship	0.44	0.02	17.90
MO -> Innovativeness	0.42	0.03	14.92
MO -> Learning Orientation	0.58	0.02	26.48
Technology Orientation -> Entrepreneurship	0.21	0.04	5.90
Technology Orientation -> Innovativeness	0.39	0.03	11.32
Technology Orientation -> Sales Turnover	0.09	0.02	4.95
Entrepreneurship -> Sales Turnover	0.23	0.04	6.24
Innovativeness -> Sales Turnover	0.09	0.04	2.32
Learning Orientation -> Entrepreneurship	0.14	0.04	3.58
Learning Orientation -> Innovativeness	-0.03	0.04	0.69
Learning Orientation -> Sales Turnover	0.03	0.01	2.53
Mgmt Emphasis Of MO -> Entrepreneurship	0.22	0.02	11.74
Mgmt Emphasis Of MO -> Innovativeness	0.21	0.02	9.90
Mgmt Emphasis Of MO -> Learning Orientation	0.29	0.02	12.44
Mgmt Emphasis Of MO -> MO	0.49	0.03	16.82
Mgmt Emphasis Of MO-> Sales Turnover	0.07	0.02	3.93
Mgmt Emphasis Of MO -> Technology Orientation	0.28	0.02	11.65

**Table 4.6 Direct Effect Estimates for Structural Model: Effects on Market Share**

Path Coefficients	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Market Share	0.00	0.03	0.05
MO -> Technology Orientation	0.56	0.02	22.47
Technology Orientation -> Entrepreneurship	0.19	0.04	5.37
Technology Orientation -> Innovativeness	0.38	0.04	10.46
Entrepreneurship -> Market Share	0.27	0.05	5.94
Innovativeness -> Market Share	0.09	0.04	2.11
Learning Orientation -> Entrepreneurship	0.15	0.04	4.00
Learning Orientation -> Innovativeness	-0.01	0.02	0.28
Mgmt Emphasis of MO -> MO	0.48	0.03	15.18
MO -> Entrepreneurship	0.26	0.03	7.57
MO -> Innovativeness	0.21	0.03	6.70
MO -> Learning Orientation	0.57	0.02	26.58

**Table 4.7 Total Effect Estimates for Structural Model: Effects on Market Share**

Total Effects	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Market Share	0.16	0.04	4.57
MO -> Technology Orientation	0.56	0.02	22.47
MO -> Entrepreneurship	0.46	0.02	18.85
MO -> Innovativeness	0.42	0.03	15.35
MO -> Learning Orientation	0.57	0.02	26.58
Technology Orientation -> Entrepreneurship	0.19	0.04	5.37
Technology Orientation -> Innovativeness	0.38	0.04	10.46
Technology Orientation -> Market Share	0.09	0.02	4.07
Entrepreneurship -> Market Share	0.27	0.05	5.94
Innovativeness -> Market Share	0.09	0.04	2.03
Learning Orientation -> Entrepreneurship	0.15	0.04	4.00
Learning Orientation -> Innovativeness	-0.01	0.04	0.17
Learning Orientation -> Market Share	0.04	0.01	2.74
Mgmt Emphasis Of MO -> Entrepreneurship	0.22	0.02	11.45
Mgmt Emphasis Of MO -> Innovativeness	0.20	0.02	9.65
Mgmt Emphasis Of MO -> Learning Orientation	0.27	0.02	11.53
Mgmt Emphasis Of MO -> Market Share	0.08	0.02	3.98
Mgmt Emphasis Of MO -> MO	0.48	0.03	15.18
Mgmt Emphasis Of MO -> Technology Orientation	0.27	0.02	11.40

**Table 4.8 Direct Effect Estimates for Structural Model: Effects on Profitability**

Path Coefficients	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Profitability	0.03	0.02	0.84
MO -> Technology Orientation	0.57	0.02	22.71
MO -> Entrepreneurship	0.28	0.04	7.84
MO -> Innovativeness	0.21	0.03	6.08
MO -> Learning Orientation	0.57	0.02	26.08
Technology Orientation -> Entrepreneurship	0.16	0.04	4.22
Technology Orientation -> Innovativeness	0.35	0.03	10.18
Entrepreneurship -> Profitability	0.12	0.04	2.65
Innovativeness -> Profitability	0.20	0.04	5.09
Learning Orientation -> Entrepreneurship	0.15	0.04	3.96
Learning Orientation -> Innovativeness	0.04	0.03	1.06
Mgmt Emphasis Of MO -> MO	0.49	0.03	15.70

**Table 4.9 Total Effect Estimates for Structural Model: Effects on Profitability**

Total Effects	Mean	Standard Deviation (STDEV)	T Statistics
MO -> Profitability	0.16	0.03	4.96
MO -> Technology Orientation	0.57	0.02	22.71
MO -> Entrepreneurship	0.45	0.03	17.29
MO -> Innovativeness	0.43	0.03	14.71
MO -> Learning Orientation	0.57	0.02	26.08
Technology Orientation -> Entrepreneurship	0.15	0.04	4.22
Technology Orientation -> Innovativeness	0.35	0.03	10.18
Technology Orientation -> Profitability	0.09	0.02	5.91
Entrepreneurship -> Profitability	0.11	0.04	2.64
Innovativeness -> Profitability	0.21	0.04	5.09
Learning Orientation -> Entrepreneurship	0.15	0.04	3.96
Learning Orientation -> Innovativeness	0.03	0.04	0.77
Learning Orientation -> Profitability	0.02	0.01	1.86
Mgmt Emphasis Of MO -> Entrepreneurship	0.22	0.02	11.27
Mgmt Emphasis Of MO -> Innovativeness	0.21	0.02	9.69
Mgmt Emphasis Of MO -> Learning Orientation	0.28	0.02	11.75
Mgmt Emphasis Of MO -> Mo	0.48	0.03	15.70
Mgmt Emphasis Of MO -> Profitability	0.08	0.02	4.30
Mgmt Emphasis Of MO -> Technology Orientation	0.27	0.02	11.31

H<sub>1a</sub>: Market orientation has a positive effect on business performance in high technology companies in South Africa.

As noted earlier the relationship between market orientation and business performance were tested in three separate covariance structure models. The reason for this was that the respondents did not answer all the questions on performance. Contradictory to the hypothesis, market orientation has a non-significant direct relationship with the three measures of performance: market share, sales turnover and profitability. However, analysing the total effects of these relationships we see a drastic improvement in this relationship. The relationship with all three performance measures becomes significant suggesting the presence

of moderators.

H<sub>2a</sub>: Market orientation has a positive effect on technology orientation in high technology companies in South Africa.

The effects of market orientation on technology orientation have been reported by Gatignon and Xuerb (1997) in the US and also by Gao et al. (2007) in China. Consistent with these results market orientation has a significant and positive direct effect on technology orientation. The results are also consistent with Atuahene-Gima and Ko's (2001) argument that the maximum positive effect on business performance is achieved when a company's market orientation and entrepreneurship is aligned.

H<sub>2b</sub>: Technology orientation has a positive effect on entrepreneurship in high technology companies in South Africa.

In line with what Covin and Slevin (1990) report, technological sophistication influences entrepreneurship and in many ways technological innovation succeeds in environments that are beneficial to integrated frameworks of risk-taking and innovation. Results report a positive effect on entrepreneurship offering support for the hypothesis.

H<sub>2c</sub>: Technology orientation has a positive effect on innovativeness in high technology companies in South Africa.

Consistent with the findings of Gatignon and Xuereb's (1997) US study technology orientation has a strong, positive and significant effect on innovativeness. In Gatignon and

Xuereb's (1997) research the authors found that the more technology-orientated companies are the more innovative they become. In typical highly uncertain markets such as EMs (Aggarwal and Singh 2004) technology orientation improves the performance of innovation (Gatignon & Xuereb 1997). Findings suggest a significant and positive relationship between technology orientation and innovativeness.

H<sub>2d</sub>: Technology orientation has a positive effect on business performance in high technology companies in South Africa.

The total effects estimates reported on the relationship between technology orientation and business performance is positive and significant (.11). These results are consistent with Gao et al.'s (2007) Chinese study. Gao et al. (2007) found that technology orientation has a positive effect on business performance at high levels of technological turbulence.

H<sub>3a</sub>: Market orientation has a positive effect on learning orientation in high technology companies in South Africa.

As detailed in Chapter Two, the theoretical expectation regarding the direct and total effects of market orientation on learning orientation is significant, positive and very strong. Previous research on the relationship between market orientation and learning in state-owned enterprises in China suggests similar results (Liu et al. 2003). In line with what has been hypothesised, this study reports a positive and significant result between market orientation and learning orientation.

H<sub>3b</sub>: Learning orientation has a positive effect on business performance in high technology companies in South Africa.

H<sub>3b</sub> suggests that learning has a positive and direct effect on market orientation. Consistent with the findings of authors like Yilmaz et al. (2005) and Hult and Ketchen (2004b) the results indicate that learning has a positive effect on business performance.

H<sub>3c</sub>: Learning orientation has a positive effect on entrepreneurship in high technology companies in South Africa.

As hypothesised, learning orientation has a positive and significant effect on entrepreneurship. This is also consistent with Liu et al.'s (2002) study in China on their sample of state-owned enterprises where the results confirm that companies should encourage a learning orientation in order to enhance their customer orientation and corporate entrepreneurship.

H<sub>3c</sub>: Learning orientation has a positive effect on innovativeness in high technology companies in South Africa.

Contrary to the hypothesised effect, the results produce a non-significant effect. Some researchers have argued that its adoption is generally intended to contribute to a company's effectiveness and business performance (Hult et al. 2004b, p.432). This direct weak relationship could be attributed the fact that learning orientation alone is not enough for high technology companies to be innovative, but that market orientation is obligatory for firms to

recognise and develop new markets and to guarantee organisational survival.

H<sub>4a</sub>: Market orientation has a positive effect on entrepreneurship in high technology companies in South Africa.

H<sub>4b</sub>: Entrepreneurship has a positive effect on business performance in high technology companies in South Africa.

Hypothesis 4a suggests that market-oriented firms will have a tendency to engage in strategic planning, possess some level of innovation and have a propensity to take risks. In other words market-oriented firms also focus on being entrepreneurial. The link between market orientation and entrepreneurship has been tested in for-profit (Liu, Luo et al. 2003) (.68) and not-for-profit organisations (231 US hospitals = .60) (Bhuiyan et al. 2005). The total estimated effect between market orientation and entrepreneurship is positive and significant suggesting that market-oriented companies create an environment that is conducive to entrepreneurship.

Hypothesis 4b suggests that entrepreneurship has a strong, positive and significant effect on business performance. This finding is consistent with literature and results concerning entrepreneurial posture's positive relationship with business performance in technologically sophisticated environments (Covin and Slevin 1991). Entrepreneurship should not be thought of a merely absent or present in companies, but rather as a behavioural phenomenon that can be managed (Covin and Slevin 1991).

H<sub>5a</sub>: Top management emphasis on market orientation has a positive effect on market

orientation in high technology companies in South Africa.

H<sub>5b</sub>: Top management emphasis on market orientation has an indirect and positive effect on technology orientation in high technology companies in South Africa.

H<sub>5c</sub>: Top management emphasis on market orientation has an indirect and positive effect on learning orientation in high technology companies in South Africa.

H<sub>5d</sub>: Top management emphasis on market orientation has an indirect and positive effect on entrepreneurship in high technology companies in South Africa.

H<sub>5e</sub>: Top management emphasis on market orientation has an indirect and positive effect on innovativeness in high technology companies in South Africa.

H<sub>5f</sub>: Top management emphasis on market orientation has an indirect and positive effect on business performance in high technology companies in South Africa.

H<sub>2a</sub> predicts a positive relationship between top management's emphasis on market orientation and market orientation in EM high technology companies. The results indicate that top management emphasis has a positive and significant effect on market orientation. Reflecting on the results of Kirca et al.'s (2004) meta-analysis ( $r=0.44$ ) and the EM meta-analysis conducted for this study ( $r=0.45$ ), the results in EM high technology companies are very similar. Looking at the total effects H<sub>1b</sub>-H<sub>1f</sub> estimates, top management emphasis on market orientation causes firms to be more learning-orientated and technology-orientated. It also causes them to achieve higher levels of entrepreneurship and innovativeness and in effect achieve higher levels of business performance.

H<sub>6a</sub>: Market orientation has a positive effect on innovativeness in high technology companies in South Africa.

Consistent with Hypothesis 5 the total direct effect reported on the market orientation-innovativeness relationship is positive and significant. This supports what has been argued and found by many scholars in the market-orientation literature (Deshpandé and Farley 1999b; Kirca et al. 2005; Lee and Tsai 2005; Vázquez et al. 2001): that market orientation has a positive effect on innovativeness. The result reported on the total effect of this relationship is much higher than the direct effect, suggesting that possible mediators could be present.

H<sub>6b</sub>: Innovativeness has a positive effect on business performance in high technology companies in South Africa.

As hypothesised and consistent with previous research conducted on the link between innovativeness and business performance (Deshpandé & Farley 1999) the results in the current research suggest a positive and significant link. Organisational innovativeness has importance for cumulative economic growth and together with strategy, innovative companies stand to increase their competitive lead in order to survive and develop further.

H<sub>7</sub>: Innovativeness mediates the relationship between market orientation and business performance in high technology companies in South Africa.

As hypothesised innovativeness is a strong mediator on the market orientation-business performance relationship. The results indicated that the relationship between market orientation and business performance improves through innovativeness. Essentially this means

that when high technology companies take a “first-mover” stance (in other words they want to be the first in the market with innovative products and new process technology), these companies start to see increased levels of market share, sales and profits.

H<sub>8</sub>: Entrepreneurship mediates the relationship between market orientation and business performance in high technology companies in South Africa.

The results indicate that high technology companies will also produce higher levels of market share, sales and profitability when entrepreneurship is present in the company. That is, when high technology companies assume more risk, increase their level of innovation, but most importantly identify customer needs and new market opportunities, the relationship between market orientation and business performance becomes stronger.

H<sub>9</sub>: Learning orientation mediates the relationship between market orientation and innovativeness in high technology companies in South Africa.

H<sub>10</sub>: Technology orientation mediates the relationship between market orientation and innovativeness in high technology companies in South Africa.

Some scholars have argued that “learning occurs primarily at cultural level and that is likely to be mediated by other factors that impact directly on performance (Hult, Ketchen Jr. et al. 2004). H<sub>9</sub> and H<sub>10</sub> suggest that the relationship between market orientation and innovativeness increases drastically when it is mediated by learning and technology orientation. The concept of a learning orientation suggests that employees are open-minded individuals that are committed to the company’s goals and share in the company’s vision

(Sinkula 1994). When employees take this approach companies are able to be more market-oriented (Yilmaz 2005) and are more susceptible to innovation. In general, companies that are technologically-oriented are able to identify their customer's needs and wants more accurately and are aware of their competitive stance in the market at any given time (Cooper and Schindler 2003; Cooper 2000; Miller 1983). As hypothesised, market orientation has a total positive and significant effect on business performance when it is mediated by technology orientation. Market orientation and innovativeness also has an increased positive total effect in the presence of learning.

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## **CHAPTER 5: CONCLUSION**

### **DISCUSSION AND CONCLUSIONS**

This dissertation investigated the contingency effects of strategic orientation on business performance and innovativeness in EM high technology companies. It considered the implications if companies pursued strategies such as market, learning and technology orientations in an EM context. By coalescing the main doctrines of the market and strategic orientation literature, a conceptual framework was developed and tested using data from senior and top managers from high technology companies in South Africa. The research sample of high technology companies in South Africa includes multi-national companies and South African-owned companies.

The results of the data analysis supported a number of hypotheses regarding the dynamics of factors that enable high technology companies in EMs to perform successfully. In this chapter the findings of the current research is discussed and highlights concerning its theoretical and practical implications for managers are presented. The chapter concludes with a discussion of the limitations of this study and the direction for future research.

### **DISCUSSION OF FINDINGS**

The findings of this research support the contingency effects of strategic orientation on business performance. It also provides insight into the dynamics that cause high technology companies to perform better.

Market orientation and business performance: Contradictory to what most theorists have hypothesised and tested in the market orientation literature (Cano 2004; Kirca, Jayachandran et al. 2005) (EM meta-analysis), the results of this study report non-significant direct effect of

market orientation on business performance in EM high technology companies. Consistent with Jaworski and Kohli's (1993, p. 63) results, the authors found that "market orientation does not appear to be related to performance using the more objective measure of market share (Jaworski & Kohli 1993, p. 63)". Multivariate analyses reveal that the overall relationship between market orientation and business performance improves greatly in the presence of entrepreneurship and innovativeness, suggesting the mediating properties of entrepreneurship and innovativeness. Results suggest that this relationship performs at its best when companies have a propensity to take risks, engage in strategic planning activities, apply innovation and identify new market opportunities (Liu, Luo et al. 2003). This line of reasoning suggests that managers in high technology companies should take cognisance of the fact that market orientation is not a single strategy that they should rely on. One of marketing's axioms is that a product must satisfy a need and that customers must be more customer-oriented. As a corollary to this axiom, earlier works on the subject of market orientation suggest that companies should implement market orientation strategies to increase their sales, market share, and profits (Atuahene-Gima 1995; Appiah-Adu 1997). Anecdotal to this suggestion, some have proposed that it might be beneficial to overlook the customer at new product research and development stage (Moore 1995). As the market orientation literature evolved over the years, scholars identified more strategic orientations for managers to consider in their relentless pursuit of business performance. In EMs, Gao et al. (2007) propose competitor, technology and customer orientations and Zhou et al. (2005) suggest innovation and market orientation. Others like Mavondo et al. (2005) propose market and learning orientation and Liu et al. (2003) adds that apart from market and learning orientation, firms must practise entrepreneurship. Generally conceptual and empirical studies supports a positive link between market orientation and business performance (Voss & Voss 2000), but it is important to appreciate when the alternative hypothesis should be accepted.

The current research provides unequivocal evidence that the relationship between market orientation and business performance is non-significant, but is significant when technology orientation and entrepreneurship are present.

Market orientation and top management emphasis: Consistent with extant literature (Chelariu, Outtarra et al. 2002; Jaworski & Kohli 1993; Kirca, Jayachandran et al. 2005; Kuada & Buatsi 2005), top management emphasis drives market orientation in EM high technology companies. In high technology companies, top management are committed to sharing their vision with everyone in the company. They know that in order for their companies to sustain cutting-edge technology, they need to drive a predisposition towards information acquisition, analysis and dissemination. They also know that their companies need to engage in strategic decision-making, market investment and most importantly the implementation of relevant strategies and market-oriented customer interaction policies (Burgess & Nyajeka 2006). Evidently, such decision-making requires a certain level of risk-taking on the part of senior management (Jaworski & Kohli 1993; Burgess & Nyajeka 2006). It seems plausible then to argue that the knock-on effect of top management's emphasis on market orientation has repercussions for entrepreneurship, learning and technology orientation. In the engine room of high technology companies, top management prioritise competitive activity with laser-beam aptness. Multivariate analyses in this research suggest that top management focus their attention through market orientation on learning, technology and entrepreneurship to maintain a certain level of avant garde skills, knowledge, processes and business performance. While top management's attitude towards risk was not tested in the current research, top management's emphasis on market orientation and its association with risk becomes palpable in the presence of entrepreneurship. It allows for higher levels of risk-taking, continuous adaption to market trends and heightens their sense for new market opportunities and customer needs (and wants). An emphasis of top management on market

orientation takes us further to its contribution to learning in EM high technology companies. The total effects estimate for the top management emphasis-learning orientation relationship suggests that senior management plays a significant role in recognising learning as key to the company's competitive advantage. Senior management acknowledges employee learning as an investment to the company and as a key commodity to the company's survival. What emanates from this is that top management emphasis on market orientation stimulates employees' shared vision and open-mindedness. It suggests that top management share their vision with employees encouraging employees to be sensitive to competitive activity and gearing the company up to meet customers' needs. Consequently employees seek total agreement on the vision of the company (at all levels, functions and divisions) and share in the communality of purpose. An emphasis of top management on market orientation contributes to the way in which high technology firms introduce their state-of-the-art technology products and services to their customers. It contributes to the manner in which research results are collected to better introduce technological innovations in the market. It aids high technology companies to accept sophisticated technologies easily in their programmes and project management. Top management emphasis on market orientation is also particularly important for first-mover advantage (i.e. first in the market with innovative products, new process technology and develop new markets).

Market orientation and learning: As discussed in Chapter 4, the association between market orientation and learning is very strong, positive and significant. Consistent with what theorists have tested in EMs (Sinkula 1994; Deshpandé & Farley 1998; Liu, Luo et al. 2003), market-oriented companies are cognitive enterprises that engage in practices whereby individual knowledge is conveyed by individuals to the company for the use of others in the company. As expected, and consistent with the hypothesis, market orientation creates a conducive environment for employee learning in high technology firms. It fashions a

sentiment of agreement on the purpose of the firm's vision and goals on all levels throughout the company. It creates an atmosphere of communality and purpose for employees to view themselves as collaborators in planning the directions of the company. Scholars (Baker and Sinkula 1999a; Day 1994b) have argued that learning orientation implemented in the short run influences market information processing behaviours and is a sustainable strategy in the long run as it increases business performance and the company's competitive advantage (Baker and Sinkula 1999a; Day 1994b).

Market orientation and technology orientation: Based on the analysis and the individual rankings and scores obtained from senior and top management in high technology companies, the findings indicate that market orientation does not suffice as the only strategic orientation that EM high technology companies should pursue (Zhou, Yim et al. 2005). Although it is widely known that in most high technology companies innovation and knowledge creation form the primary energy for sustainable growth, this research raised the importance of setting pro-active strategies in a company environment that is conducive to learning, risk-taking, proactiveness and innovativeness. Results presented in Chapter 4 suggest that market orientation, technology orientation and learning orientation are strong strategic orientations, particularly in the presence of entrepreneurship and innovativeness. In many aspects, "the growth and evolution of high technology firms have fascinated theorists and practitioners alike, given the highly entrepreneurial, innovative and dynamic environment that pervade these firms and their industries (Nambisan 2002, p.141)". Researchers have even gone as far as to say that the most pioneering companies are technologically sophisticated, innovative, aggressive, and market-oriented (Calantone et al. 1994). Over the years studies in the market orientation literature have emphasised the importance for firms to be market and technology-oriented (Gatignon & Xuereb 1997; Zhou, Yim et al. 2005; Gao, Zhou et al. 2007). Although this seems like a plausible argument, the findings of the current research suggest that an

emphasis on market orientation causes firms to be more technology-oriented. Whether this theory would hold in consumer product categories remains unanswered. The results of this study suggest that market and technology orientation are separate yet interrelated constructs. In the high technology context, this means that new products have state-of-the-art technology if senior management places emphasis on customer information to improve quality, uses customer information to develop technology and relies on market research information to manage their product portfolios. Credence is placed in sophisticated technologies when high technology companies listens to the opinions of their customers and values their input in new-product planning. Technological innovations are also more readily accepted by customers when high technology firms base their strategic planning on market research.

Market orientation and entrepreneurship: The results on the direct positive link between market orientation and entrepreneurship support what several scholars in the literature have confirmed (Becherer and Maurer 1997; Luo et al. 2005; Miles and Arnold 1991; Zhou et al. 2005a). The current research motivates that market orientation is an antecedent of entrepreneurship, which is consistent with Liu et al.'s (2003) findings in their study conducted in China. Concerning the magnitude of this relationship, one realises that high technology companies are distinguished by a high degree of innovativeness and risk-taking. Similarly, market orientation and entrepreneurship enables companies to identify customer needs (and wants), new market opportunities and make the vision of their company a reality. Yet, only when senior management in high technology companies utilises customer information to develop their technologies and products, does their level of innovation improve. Since market orientation is an enabler of entrepreneurship and entrepreneurship is a mediator between market orientation and business performance, high technology companies have the proclivity to take on risk and increase their innovation levels.

Entrepreneurship, referred to by some as the parent of innovation (Meyers 1986), has

drawn many controversial debates in the literature. For some the fundamental idea underlying entrepreneurship is when companies introduce new products in new or existing markets or even existing products in new markets. Others deem entrepreneurship as an important element in the strategic planning process (Burgelman 1985). Still others postulate that market orientation with an entrepreneurial drive provides the cultural foundation for organisational learning which enables a firm to achieve higher levels of business performance and better customer levels (Slater 1995). The model in the current research suggests that entrepreneurship is in fact a multi-dimensional concept (Covin & Slevin 1991). It also implies that several factors influence entrepreneurship (market orientation, technology orientation and learning orientation) and that entrepreneurship enhances performance, confirming its mediating properties between market orientation and business performance.

Market orientation and innovativeness: Consistent with what scholars have confirmed in the market orientation literature regarding the effect that market orientation has on innovativeness, this study reports that firms who are market-oriented have a first-mover advantage in terms of their innovative products, services, processes and technology. Some researchers report that learning and innovativeness are separate constructs, yet they are interrelated (Hurley & Hult 1998). Others argue for innovativeness' mediating effect on business performance (Deshpandé & Farley 2004; Zhou, Yim et al. 2005). In line with this reasoning this study reports that innovativeness mediates the link between learning orientation and business performance.

## SIGNIFICANCE AND CONTRIBUTIONS OF THIS STUDY

The current research provides several theoretically significant and important contributions to the extant strategic and market orientation literature. Firstly, this is the first study to propose a meta-analysis that solely focuses on EM studies. Accommodating up to 80% of the world's consumers, EMs and LICs are important markets to consider for research. EMs and LICs have unique socio-economic and political systems compared to HICs. Moreover, amongst each other, EMs differ from one another culturally (i.e. China's hierarchical and mastery type of culture vs. South Africa's embeddedness). Despite the many research studies conducted in China, other important EMs and LICs remain untapped considering its prolific grounds for market orientation research. South Africa, for example, rich in cultural heritage and constantly at the forefront of rapid socio-political and economic change (Burgess & Harris 1999) offer a unique location for future research to be conducted. Secondly, the impact and "knock-on" effect of top management emphasis on market orientation should not be underestimated. The findings of this research suggest that an emphasis by top management on market orientation will cause companies with a learning orientation to be more innovative and increase their business performance. The same applies when top management drives technology orientation or learning through market orientation. Thirdly, this research contributes to the market orientation literature being the first to examine market orientation, technology orientation, learning orientation and entrepreneurship as concurrent strategies for EM companies to consider. It appends to existing conceptual and empirical evidence that it is not enough for companies to consider market orientation as the only strategic orientation for their companies to deliberate. It overrides some of the current suggested rulings that market orientation is a panacea for enhancing innovativeness and business performance. Fourthly, this study contributes largely to having identified mechanisms as process variables that

mediate the market orientation-business performance relationship. Despite the argument that innovativeness is perhaps the most argued mediator of the market orientation-business performance relationship (Han, Kim et al. 1998; Hurley & Hult 1998; Kirca, Jayachandran et al. 2005) the current research confirms that entrepreneurship and innovativeness are strong mediators of the market orientation business performance relationship. Consistent with Liu et al.'s (2003) findings, companies should identify individuals with an entrepreneurial spirit and coach them in the principles of market orientation.

In summary, market orientation creates the environmental platform for learning orientation and technology orientation to thrive. The beneficial effects of learning (.58) and technology orientation (.56) on sales turnover are primarily due to the presence of market orientation. Similarly the positive and significant effects of learning and technology orientation respectively on market share (.56, .57) and profit (.57, .57) are explained by the existence of market orientation. It is therefore advantageous for top managers in high technology firms to emphasise market orientation and the magnitude of rewards that market orientation brings if they wish to report superior levels of business. Together with an environment of entrepreneurship and innovativeness high technology companies will reap superior business performance if market, learning and technology orientation are practised concurrently.

### **LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH**

The findings of this study should be assessed in light of evident key limitations. The first limitation pertains to the choice of sample frame. The current research assessed strategic orientation and important mediators in high technology industries. High technology companies are a unique sample set on its own, inclusive of its many inimitable characteristics. Studying mediators in a single industry limited the generalisability of findings

to other industries. The second limitation concerns the number of variables for this study. At the onset of the study antecedents such as interpersonal and intergroup relations were identified and included in this study. Several strategic orientation consequences were also considered (employee and customer consequences). Due to the time constraints of telephonic interviews, these variables were omitted. Future research could include various organisational antecedents and consequences. Thirdly, the market orientation literature has afforded very little attention on the mediators of the market orientation-business performance relationship, which provides fertile avenues for future research. From a managerial perspective, the explication of the course and direction through which market orientation influences business performance is crucial. The inference of mediating variables such as technology orientation, learning orientation, entrepreneurship and innovativeness for management may be useful as they track the impact it has on the market orientation-performance for Balance Scorecard purposes. Finally, the current research did not assess culture. The extant literature requires a better understanding of how culture impacts the market orientation-business performance relationship from a mediating perspective. Organisational culture paradigms provide prolific grounds for future research topics.

## Addendum 1

### FORMULAS USED FOR THE EM META-ANALYSIS

(Lipsey & Wilson 2001)

#### Formulae for corrections for measurement error, range restriction and dichotomisation

$r_i^1 = a_i b_i c_i r_i$  where  $r_i$  is the  $i$ th observed correlation effect size  $a_i$  is the correction for measurement error,  $b_i$  is the correction for range restriction,  $c_i$  is the correction for dichotomisation of a continuous variable, and  $I$  ranges from 1 to  $q$  with  $q$  the total number of effect sizes being meta-analysed.

#### Measurement error

$a_i = \frac{1}{\sqrt{a_{xi}} \sqrt{a_{yi}}}$  where  $a_{xi}$  and  $a_{yi}$  are the reliabilities for the two variables in correlation effect size  $I$

#### Range restriction

$b_i = \frac{u_i}{\sqrt{(u_i^2 - 1)r_i^2 + 1}}$  where  $u_i$  is the ratio of the unrestricted (population) standard

deviation to the study standard deviation. For dichotomous variables with unequal splits,  $u_i$

$= .50 / \sqrt{p_i(1-p_i)}$  where  $p_i$  is the proportion of cases in the lower portion of the dichotomy. If both variables in the correlation are affected by range restriction, this correction should be applied twice.

#### Dichotomisation

$c_i = \frac{\sqrt{p_i(1-p_i)}}{F_z}$  where  $p_i$  is the proportion of cases in the lower portion of the

dichotomy, and  $F_z$  is the ordinate of the normal distribution corresponding to the cumulative probability equal to  $p_i$ . If both variables in the correlation are dichotomised continuous variables, this correction should be applied twice.

The 75% rule

Without artefact distribution correction

$$\text{Homogeneity if } \frac{(1-r^{-2})^2 / (N-1)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i} \geq .75$$

$$\text{Heterogeneity if } \frac{(1-r^{-2})^2 / (N-1)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i} \leq .75$$

With artefact distribution corrections

Homogeneity

$$\frac{\frac{(1-r^{-2})^2}{N-1} + r_a^{-2} a^{-2} b^{-2} \left( \frac{\text{var}(a)}{a^{-2}} + \frac{\text{var}(b)}{b^{-2}} \right)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i} \geq .75$$

Heterogeneity

$$\frac{\frac{(1-r^{-2})^2}{N-1} + r_a^{-2} a^{-2} b^{-2} \left( \frac{\text{var}(a)}{a^{-2}} + \frac{\text{var}(b)}{b^{-2}} \right)}{\sum_{i=1}^k N_i (r_i - \bar{r})^2 / \sum_{i=1}^k N_i} \leq .75$$

The 95% credibility intervals

$$\text{Without artefact distribution correction: } \left[ r \pm 1.96 SD_{res} \right]$$

With artefact distribution corrections:

$$\left[ \begin{array}{c} r \pm 1.96 \frac{SD_{res}^a}{\bar{a}\bar{b}} \end{array} \right]$$

Without artefact distribution correction:

The test to conduct moderator analysis denotes the following formulae:

$$r_i = b_0 + b_1 X_{i1} + \dots + b_j X_{ij} \text{ where } X_1 \text{ to } X_j \text{ represent the } j \text{ moderator variables}$$

(dichotomous or continuous) and  $b_0$  to  $b_j$  are unstandardised regression coefficients obtained

through weighted least squares estimation. The standard error for  $b_j$  is  $\frac{S_{bj}}{\sqrt{MS_{error}}}$  where

$MS_{error}$  is the mean square residual

## Addendum 2

### SCALES

#### Top Management Emphasis

EMPH1 Top managers repeatedly tell employees that this business unit's survival depends on its adapting to market trends.

EMPH2 Top managers often tell employees to be sensitive to the activities of our competitors.

EMPH3 Top managers keep telling people around here that they must gear up to meet customers' future needs.

EMPH4 According to top managers here, serving customers is the most important thing our business unit does.

Five point scale: Anchors strongly agree/Strongly disagree

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Jaworski, Bernard J. and Ajay K. Kohli (1993), "Market Orientation: Antecedents and Consequences," *Journal of Marketing*, 57 (3), 53-70.

#### Entrepreneurship

Compared to major competitors our firm has a higher:

ENTRE1 Propensity to take risk

ENTRE2 Level of innovation

ENTRE3 Tendency to engage in strategic planning activities

ENTRE4 Ability to identify customer needs and wants

ENTRE5 Ability to make the vision of the business a reality

ENTRE6 Ability to identify new market opportunities

Five point scale: Anchors strongly agree/Strongly disagree

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Luo, Xueming, Lianxi Zhou, and Sandra S. Liu (2005), "Entrepreneurial Firms in the Context of China's Transition Economy: An Integrative Framework and Empirical Examination," *Journal of Business Research*, 58 (3), 277-84.

Adapted from Covin and Slevin (1991), Dess *et al.* (1997), Miller and Friesen (1983), Morris

and Paul (1987), Smart and Conant (1994) and Zahra (1991).

### **Learning Orientation**

Commitment to learning

CO1. Managers basically agree that our organisation's ability to learn is the key to our competitive advantage.

CO2. The basic values of this organisation include learning as key to improvement.

\*CO3. The sense around here is that employee learning is an investment, not an expense.

CO4. Learning in my organisation is seen as a key commodity necessary to guarantee organisational survival.

Shared Vision

\*VS1. There is a commonality of purpose in my firm.

VS2. There is total agreement on our organisational vision across all levels, functions and divisions.

VS3. All employees are committed to the goals of this firm.

VS4. Employees view themselves as partners in charting the directions of the firm.

Open-Mindedness

OM1. We are not afraid to reflect critically on the shared assumptions we have made about our customers.

OM2. Personnel in this firm realise that the very way they perceive the marketplace must be continually questioned.

OM3. We rarely collectively question our own biases about the way we interpret customer information.

Five point scale: Anchors strongly agree/Strongly disagree

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Sinkula, James M., William E. Baker, and Thomas Noordewier (1997), "A Framework for Market-Based Organisational Learning: Linking Values, Knowledge, and Behavior," Journal of the Academy of Marketing Science, 25 (4), 305-18.

### **Strategic Orientation**

Please indicate the extent to which each of the following statements describes your firm's activities.

## **Market Orientation**

Use of information subscale

MO\_IN1 Listen to opinions of customers

MO\_IN2 Uses customer information to improve quality

MO\_IN3 Objectives based on customer needs

MO\_IN4 Use customer information to develop technology

MO\_IN5 Use market research data in managing products

MO\_IN6 Use market research to segment markets

\*MO\_IN7 Obtain ideas from customers to improve products

MO\_IN8 Sales force has information on customers and competitors

MO9 Values customer input in planning new products

Development of a market orientation strategy

MO\_DEV1 Strategy relies on market research

MO\_DEV2 Develop specific plans for market segments

\*MO\_DEV3 Products have resources to improve market position

MO\_DEV4 Values market position versus financial performance

MO\_DEV5 Prices determined by customer value

MO\_DEV6 Focus on markets which have competitive strength

MO\_DEV7 Invests in building market position

MO\_DEV8 Planning organised by markets rather than products

Implementation of a market-oriented strategy

MO\_IMP1 Keep promises we make to customers

\*MO\_IMP2 Respond to customer needs when bidding projects

\*MO\_IMP3 Respond to customer needs in writing contracts \*MO21 Respond to customer needs in creating terms of sale

\*MO\_IMP4 Respond to customer needs in credit policies

MO\_IMP5 Respond to customer needs in delivery on time

Five point scale: Anchors strongly agree/Strongly disagree

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Ruekert, Robert W. (1992), "Developing a Market Orientation: An Organisational Strategy Perspective," *International Journal of Research in Marketing*, 9 (3), 225-45.

### **Technology Orientation**

Tech01 Our new products are always at the state-of-the-art of the technology

Tech02 Technological innovation, based on research results, is easily accepted in our organisation

Tech03 Technological innovation is easily accepted in our programme/ project management

Tech04 We use sophisticated technologies in our new product development

Five point scale: Anchors strongly agree/Strongly disagree

\*\*\*Denotes items inserted

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Gatignon, Hubert and Jean Marc Xuereb (1997), "Strategic Orientation of the Firm and New Product Performance," *Journal of Marketing Research*, 34 (1), 77-90.

### **Innovativeness**

Compared to others in our industry, our firm tends to be

INNOV1 First to market with innovative new products and services

INNOV2 First to develop a new process technology

INNOV3 First to recognise and develop new markets

INNOV4 At the leading edge of technological innovation

Five point scale: Anchors strongly agree/Strongly disagree

\*\*\*Denotes items inserted

\*\*Denotes items deleted after the pre-test procedure

\* Denotes items deleted during the measure refinement process

**Scale:** Srinivasan, Raji, Gary L. Lilien, and Arvind Rangaswamy (2002), "Technological Opportunism and Radical Technology Adoption: An Application to e-Business," *Journal of Marketing*, 66 (3), 47-68. who adapted from Deshpandé, Rohit, John U. Farley, and Frederick E. Webster Jr. (1993), "Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: A Quadrad Analysis," *Journal of Marketing*, 57 (1), 23-27.

### **Business Performance**

PERF1 Compared to your competitors, how did your division perform last year based on sales turnover?

PERF2 Compared to your competitors, how did your division perform last year based market

share?

PERF3 Compared to your competitors, how did your division perform last year based on profitability?

University of Cape Town

**Addendum 3**  
**QUESTIONNAIRE**  
**PROJECT HIGH TECH**

Good day, my name is ... (Say your name clearly) calling from Ipsos-Markinor, an independent market research company. Ipsos-Markinor has been commissioned to conduct a survey as part of on-going strategy research at the University of Cape Town, Graduate School of Business.

We know that you are busy and appreciate your contribution. Project High Tech explores factors affecting the business performance of high technology companies. We will not ask you to provide any proprietary or sensitive performance information and neither you nor your company will be identified in our data file. Your responses will be held in strict confidence. The results will help South African high technology companies understand how to achieve better performance. In appreciation of your participation, you will receive a report of the results when the analysis is completed later this year. The survey will take approximately 15 minutes.

May I have 15 minutes of your time to ask you some questions?

- 1        Yes, continue.
- 2        No, new appointment.  
          *END OF INTERVIEW, NON-RESPONSE "A"*
- 3        No answer, etc.  
          *END OF INTERVIEW, NON-RESPONSE "I"*
- 4        Refused, etc.  
          *END OF INTERVIEW, NON-RESPONSE "E"*

Screening questions

Before we begin, I would like to ask you a few questions.

S1. Would you consider your firm to be technologically innovative?

Yes (continue)

No (**close**)

S2. Would you consider the products and services delivered by your company to be state-of-the-art technology?

Yes (continue)

No (**close**)

S3. Would you say that your company uses sophisticated technologies in new product development?

Yes (continue)

No (**close**)

**Interviewer:** If yes to S1-S3, continue – this company can now be regarded as High Tech. The next step is to determine the correct person in the company.

S4. Does your company have a marketing department, group or individual that is responsible for the marketing function?

Yes (continue)

No (**close**)

S5. Who is the best person to speak to about marketing in your company?

I am (continue with S.6)

If it is a different person, then thank the person and ask for the contact details of the person they nominated. Terminate the interview and contact the relevant marketing person.

Name:

Title/Position:

S6. How knowledgeable are you about your company's marketing function?

Extremely knowledgeable (**continue**)

Very knowledgeable (**continue**)

Somewhat knowledgeable (continue)

Not too knowledgeable (ask if there is another person you could interview that is more knowledgeable about marketing or terminate the interview)

Not at all knowledgeable (ask if there is another person you could interview that is more knowledgeable about marketing or terminate the interview)

Name:

Title/Position:

## MAIN QUESTIONNAIRE

### Section 1: Company and personal information

Which one of the following industries does your company operate in? **Read out. One mention only.**

Biotechnology

Electronics

Pharmaceutical

Computers (not Information Technology)

Telecommunication

Wireless

Information Technology

Internet

Other (specify)

Which of the following management levels applies to you? **Read out. One mention only.**

Junior management

Middle management

Senior management

Top management

None of these (**Do not read out**)

How long have you worked for this company?

Less than 3 months (**Close**)

3-6 months

7-11 months

1-2 years

3-6 years

7-10 years

11-20 years

More than 20 years

How long have you been in your current position?

Less than 3 months

3-6 months

7-11 months

1-2 years

3-6 years

7-10 years

11-20 years

More than 20 years

In what year did your company start conducting business?

Capture exact year (YYYY)

If Don't know, ask for an estimate (YYYY)

Does your company sell products, services or both? **One mention only.**

Products

Services

Both

Don't know (Do not read out)

How many people does your company currently employ i.e. all permanent employees in all branches and divisions? Would you say...? **Read out. One mention only.**

Less than 10

11-50

51-100

101-200

201-500

501-1000

1001-2000

More than 2000

Which of the following statements best applies to your company? Is your company... (**read out**) **One mention only.**

A multi-national company with *no* divisions in other provinces in South Africa (**skip to Q.10**)

A multi-national company with divisions in other provinces in South Africa (**ask Q.9**)

South African-owned with divisions abroad and in other provinces in South Africa (**ask Q.9**)

South African-owned with *no* other divisions (**skip to Q.10**)

South African-owned with divisions in other provinces in South Africa (**ask Q.9**)

**Ask if option 2, 3, 5 chosen in Q8:** In which South African provinces does your company conduct its business? I.e. in which provinces do you have offices? **Read out. Multi mentions possible.**

Eastern Cape

Free State

Gauteng

KwaZulu Natal

Limpopo

Mpumalanga

Northern Cape

North West Province

Western Cape

## Section 2: Survey Questionnaire

Read out:

The following section focuses on how market orientation is applied and practised throughout your company. I will read the statement to you. For each one please indicate whether you “strongly agree”, “agree”, “neither agree nor disagree”, “disagree” or “strongly disagree”.

This will apply to all the statements that follow unless indicated otherwise.

Randomise statements. ASK ALL. Read out. One mention only per statement.	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
Our company has the resources we will require to improve our market position MO_DEV3	5	4	3	2	1	6
We use customer information to improve quality MO_IN2	5	4	3	2	1	6
Our company's objectives are based on customer needs MO_IN3	5	4	3	2	1	6
We use customer information to develop our strategy MO_IN4	5	4	3	2	1	6
We develop specific plans for market segments MO_DEV2	5	4	3	2	1	6
When we segment our market or choose target segments, we consult marketing research information MO_IN6	5	4	3	2	1	6
We obtain ideas from customers to improve products or services MO_IN7	5	4	3	2	1	6
We listen to what our customers have to say MO_IN1	5	4	3	2	1	6
Once we have reviewed market research we plan our strategies MO_DEV1	5	4	3	2	1	6
Beating the competition is more important than financial performance at our company. MO_DEV4	5	4	3	2	1	6
We use market research data in managing products/services	5	4	3	2	1	6

MO_IN5						
Our financial arrangements with clients, such as payment terms or credit policies, take customer needs into account MO_IMP4	5	4	3	2	1	6
Prices of our products or services are determined by how much a product is worth to a customer MO_DEV5	5	4	3	2	1	6
We make sure we respond to customer needs when we write contracts and create terms of sale MO_IMP3 (20+21)	5	4	3	2	1	6
We invest in improving our market position MO_DEV7	5	4	3	2	1	6
We keep promises that we make to customers MO_IMP1	5	4	3	2	1	6
Our people who deal with customers have information on customers and competitors MO_IN8	5	4	3	2	1	6
We organise our marketing plans according to customers and their needs rather than products MO_DEV8	5	4	3	2	1	6
We focus marketing activities on markets or segments where we can compete effectively MO_DEV6	5	4	3	2	1	6
We respond to customer needs by delivering on time MO_IMP5	5	4	3	2	1	6

### Section 3: Technology

The next section refers to the role that technology plays in your firm

Randomise statements Read out. One mention only per statement.	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
Our new products are always at the state-of-the-art of the technology TECH01	5	4	3	2	1	6
Technological innovation, based on research results, is easily accepted in our organisation TECH02	5	4	3	2	1	6
Technological innovation is easily accepted in our programme/ project management TECH03	5	4	3	2	1	6
We use sophisticated technologies in our new product development TECH04	5	4	3	2	1	6

### Section 4: Entrepreneurship

We now have a few questions about entrepreneurship in your company.

Randomise statements Read out. One mention only per statement.	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
We are willing to take more risks than our competitors. ENTRE01	5	4	3	2	1	6
We are better innovators than our competitors ENTRE02	5	4	3	2	1	6
We plan our strategies better than our competitors	5	4	3	2	1	6
Compared to our competitors, we are able to identify our customer's needs and wants more accurately ENTRE03	5	4	3	2	1	6
We are able to make the vision of the business a reality ENTRE04	5	4	3	2	1	6
Our company has the ability to identify new market opportunities better than our competitors EMTRE05	5	4	3	2	1	6

## Section 5: Learning

The following section focuses on the extent to which learning is applied and practiced throughout your company.

Randomise statements Read out. One mention only per statement.	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
Our company believes that employee learning is an investment, not an expense CO3	5	4	3	2	1	6
Employees view themselves as partners in charting the direction of the business unit. VS4	5	4	3	2	1	6
Employees are encouraged to be open-minded and to "think outside the box". OM3	5	4	3	2	1	6
Employee learning really isn't a top priority in our company. CO4	5	4	3	2	1	6
Managers in this business unit do not want their "view of the world" to be questioned. OM2	5	4	3	2	1	6
An emphasis on constant innovation is not a part of our corporate culture. OM4	5	4	3	2	1	6
All employees are committed to the goals of this business unit. VS3	5	4	3	2	1	6
We are not afraid to question the shared assumptions we have about the way we do business. OM1	5	4	3	2	1	6
Our basic values emphasise the role of learning as a key to improvement in this company. CO2	5	4	3	2	1	6
Employees understand who we are and where we are going as a business unit. VS2	5	4	3	2	1	6
Management believes that our survival and competitiveness depend on the company's ability to learn. CO1	5	4	3	2	1	6

Top leadership believes in sharing its vision for the business unit with everyone in the company. VS1	5	4	3	2	1	6
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## Section 6: Innovativeness

This section focuses on your company's innovativeness.

Randomise statements Read out. One mention only per statement.	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
Our company tends to be first to the market with innovative new products and services INNOV1	5	4	3	2	1	6
We are first to develop processes that are technologically more advanced than our competitors INNOV2	5	4	3	2	1	6
We are first to recognise and develop new markets INNOV3	5	4	3	2	1	6
Our company is at the leading edge of technological innovation INNOV4	5	4	3	2	1	6

Section 7: Top management emphasis

The next section concerns top management emphasis.

Randomise statements	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree	Don't know (DNRO)
Top managers repeatedly tell employees that this business unit's survival depends on its adapting to market trends EMPH1	5	4	3	2	1	6
Top managers often tell employees to be sensitive to the activities of our competitors EMPH2	5	4	3	2	1	6
Top managers keep telling people around here that they must gear up to meet customers' future needs EMPH3	5	4	3	2	1	6
According to top managers here, serving customers is the most important thing our business unit does. EMPH4	5	4	3	2	1	6

Section 8: Business performance

I have three final questions. This next section pertains to business performance in your company.

**59.** Over the last three years, would you say your company's sales grew annually by... **Read out. One mention only.**

0-24%

25-49%

50-99%

100-199%

More than 200%

Don't know (Do not read out)

Compared to your competitors, how did your division perform last year on... (read out each option). Would you say...? <b>Read out scale. One mention only per statement.</b>	Much better than your competitors	Better than your competitors	About the same	Worse than your competitors	Much worse than your competitors	Don't know (DNRO)
a. Sales turnover	5	4	3	2	1	6
b. Market share	5	4	3	2	1	6
c. Profitability	5	4	3	2	1	6

It will help us to understand your answers if we have two broad measures of company size.

How many people does your company employ in this business unit i.e. this business unit or division that you are part of?

One only

2-3

4-6

7-10

11-15

16 or more

Don't know (Do not read out)

Into which of these broad classes of annual sales turnover would your firm be classified?

Less than R10 million

R10-R24 million

R25-49 million

R50-R99 million

R100 million or more

Don't know / Refused (**Do not read out**)

Thank you for participating in Project High Tech. Should you wish to receive the executive report containing the research results, could you please supply me with your postal address.

Interviewer: Please capture full postal address details.

Thank respondent and close.

University of Cape Town

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