

Antecedents of High-growth and Gazelle Enterprises: An Empirical Study

by

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Abstract

This research explores a problem important to both management strategists and policy-makers: what makes some companies grow rapidly? This topic is important as high-growth companies create a disproportionately high percentage of new jobs. The literature frequently cites sustainable competitive advantage as an explanation for firm performance and growth. Companies can build competitive advantage through the accumulation and development of resources, strategic orientations and unique capabilities. More recently, researchers have looked outside the firm for explanations, concluding that inter-firm co-operative networks and alliances are also important sources of competitive advantage leading to firm growth. While there is an extensive body of literature on firm growth, few studies have specifically addressed the antecedents of *rapid* firm growth. Much of the available literature is descriptive, for example Birch's (1987) study of *gazelle* firms or the OECD (2008) report on *high-growth* firms. There are however few theoretic models or empirical tests to explain the success of these firms. In response this research explains the occurrence of high-growth firms in terms of the resource- and knowledge-based view, dynamic capabilities, core competencies, and strategic orientation theories. Structural equation and growth mixture models were tested using data gathered from a survey administered to a cross-industry sample of Canadian businesses. The study found that high-growth forms were more likely to be innovators, as well as to have a combination of strong entrepreneurial and market orientations and the ability to manage their business networks. These findings highlight the importance to management of not only responding to market demands but leading the market with innovation and extending firm capabilities and reach through networking. In addition, this research indicates that institutional support for innovation, networking and market development would assist in developing high-growth firms in Canada.

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*This dissertation is dedicated to my parents,
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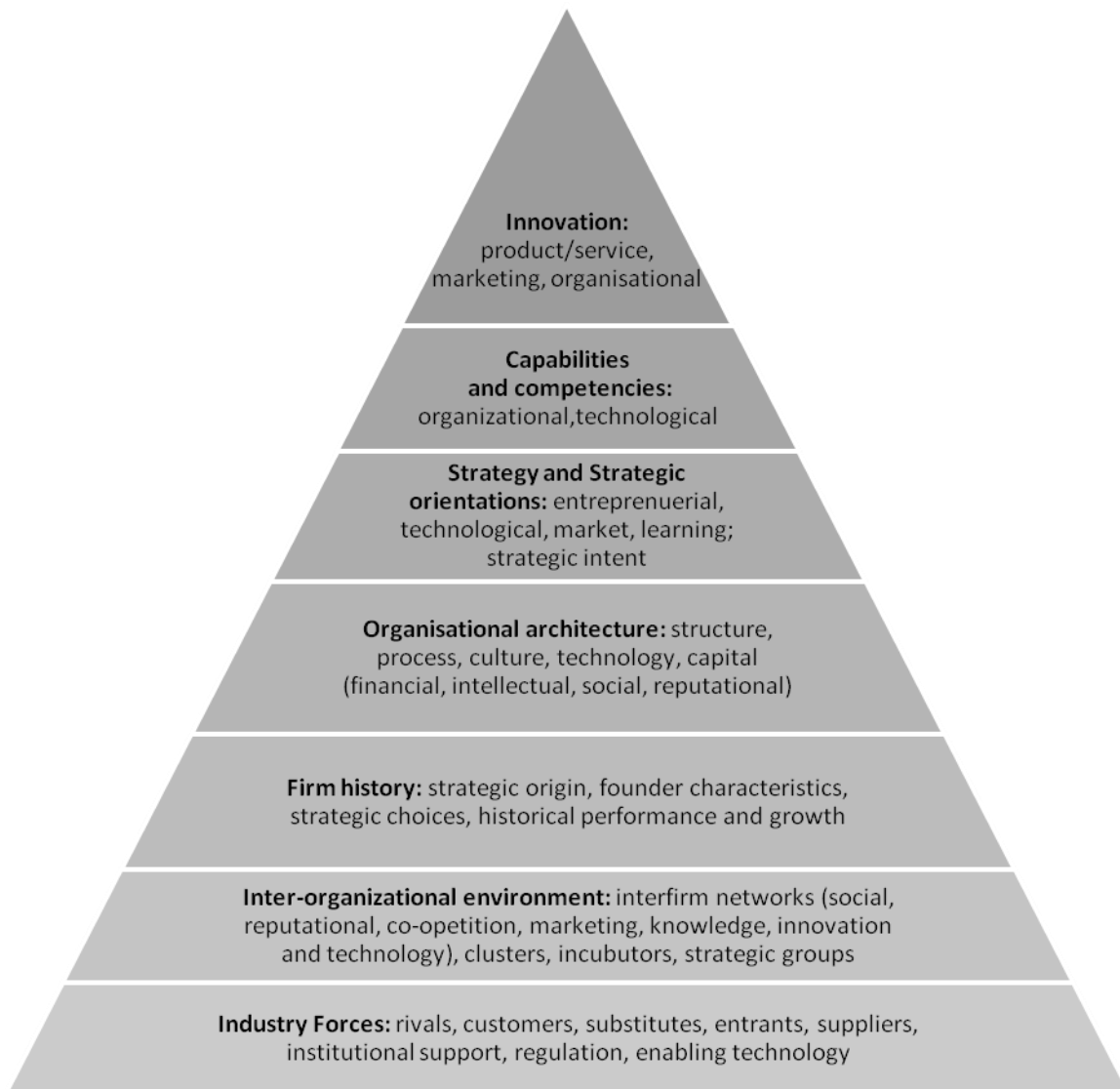
1. Introduction

High-growth firms are rare in the overall population. In a 2006 OECD multi-country study of firm growth over a three-year period, less than five percent of firms met the 20 percent annualised employment growth cut-off (Ahmad and Hoffman, 2008). Rarer still are the Gazelles – defined in the study as high-growth firms that are less than five years old at the start of measurement period. In fact, the firms included in the OECD study must have survived at least four years to be included, therefore an even smaller number of new entries go on to become high-growth or Gazelle firms – perhaps closer to two percent. These firms, although rare, have a disproportionately large impact on the economy. Not only does this group of firms generate wealth, but were the source of approximately 45 percent of new jobs in Canada between 1993 and 2003 (Parsley and Halabisky, 2008). Despite the obvious importance of high-growth firms to the national economy, there has been little research towards an explanation of their origin.

While there is an extensive body of literature on the growth of firms based on economic, entrepreneurship and marketing theory, theories of the firm and strategy, as well as studies of the impact of firm capabilities and orientations, there is a dearth of research specific to high-growth firms (Gundry and Welsch, 2001). Strategy and entrepreneurship research provides support for the influence on business performance of both environmental (*exogenous*) factors that affect the firm, as well as firm-specific (*endogenous*) factors over which it has some degree of control and influence (Porter, 1980; McDougall et al., 1992). Exogenous factors include: (1) market conditions, and (2)

business environment, while endogenous factors can be divided into four groups related to (1) firm history, (2) organisational architecture, (3) strategic orientations, capabilities and strategic intent, and (4) innovation. Figure 1 shows how each of these factors influence the level above.

Figure 1 Building Sustainable Competitive Advantage



Endogenous factors: controlled or influenced by the firm or founders.

Exogenous factors: influence, or had influence, on the firm.

Recent studies support the effect of environmental factors on the development of the firm and its orientations and behaviours (e.g., McDougall et al., 1992; Manu 1992, 1996; Littunen, 2000; Covin et al., 2000, 2001; Ensley et al., 2006). Structure-conduct-performance theory (e.g., Bain, 1954; Porter, 1980, 1985) provide the theoretical foundation for this research. Aspects of a firm's history, particularly its strategic origin, founders' prior experience and resources, strategic choices and historical growth patterns, determine many of its current characteristics and its potential for growth (e.g., Wagner, 1992; Gundry and Welsch, 2001; Cooper et al., 1994). This path-dependent development of capabilities is supported by the evolutionary economics and resource-based view literature (e.g., Nelson and Winter, 1973, 1982; Nelson, 1991). The *organisational architecture* of the firm comprises processes, culture, technology and capital (Booz Allen Hamilton, 1982). According to the behavioural, resource- and knowledge-based views (e.g., Cyert and March, 1963; Nelson, 1991; Kogut and Zander, 1992) organisational architecture must influence the development of a firms' strategic orientations and capabilities as well as its output in the market. A firm's strategic orientations and capabilities guide its interaction with the environment and its tendency to be *entrepreneurial* (Lumpkin and Dess, 1996). The firm receives and reacts to information from the market (Narver et al., 2004), customers and competitors (Kohli and Jaworski, 1990) and alliance partners (Ritter, 1999) to determine the focus of innovation, either product/service, marketing or organisational. All of these environmental and firm-specific factors combine to determine the company's unique value proposition in the

market, its source of sustainable competitive advantage, which influences the firm's performance and growth (Manu, 1996; Thomson, 2006).

Further research is required to determine what particular factors, combined in what proportions, are associated with *rapid* growth. Empirical studies normally measure growth on a continuum from negative, low to high (e.g., Wagner, 1992; Mata, 1994; Covin et al., 2000, 2001; Lumpkin and Dess, 2001; Sarkar et al., 2001; Audretsch, 2002; Walter, 2006). High-growth firms are, however, outliers in these general models of firm growth (Coad and Rao, 2008). In addition, theoretical models commonly examine only one or two key constructs to establish their relationship with level of performance or growth. I argue that this type of model, along with the treatment of growth as a continuous variable, cannot form the basis for a study of high-growth firms.

Rapid growth, being a rare occurrence, is the result of an uncommon combination of multiple endogenous and exogenous factors. Just as a professional basketball player must be sufficiently tall, yet highly coordinated, agile and fast, high-growth companies possess not just one of the prerequisites for growth, but likely a number of complementary characteristics, resources and strategies. One must consider, simultaneously, a number of firm-specific and environmental factors in order to explain the rapid growth of firms. This approach was taken by Cozzarin and Percival (2006) who found evidence of complementarity in pair-wise comparisons of organisational strategies that provides firms with a strategic competitive advantage. Using constrained regression to test supermodularity in pairs of variables, the study confirmed that innovation is tied to performance and is complementary to many strategies. It is therefore necessary to

develop an integrative theoretical a model to specifically explain the occurrence of high-growth firms.

It is also important to consider the growth objectives of the entrepreneur, as noted by Orser and Hogarth-Scott (2002) who found that a business owners' intentions to pursue growth was positively related to actual growth. The motivation behind the desire to grow, or in fact not to grow, varies according to the individual owner and relates to their goals for the business. Growth in employment was found by Freel and Robson (2004) to be associated with new product development. While this type of growth adds value to the economy it may not be a primary goal of the business owner. The authors however noted that growth in sales and profitability tends follow this initial employment increase. It is therefore practical to consider the concept of growth in an aggregate sense, rather than focusing on a single metric such as sales, employment, profit, assets, or equity. Owners' growth objectives may be related to a desire to increase productivity or efficiency through economies of scale, as described by Henderson and Cokburn (1996), or perhaps to build technological knowledge which is considered by Hitt et al. (2000) to be "the foundation for economic growth" (p. 242). I argue therefore that a highly innovative value proposition (in the form of the company's market offering) supported by sound organisational architecture and capabilities, along with the owners' desire to grow and a direction set through appropriate strategic orientations, provides the necessary conditions for rapid firm growth.

Speaking to the importance of firm growth, Hart and Oulton (1996) considered it to be "central to any explanation of the growth of an economy" (p. 1244). Growing companies tend to be more profitable, produce greater numbers of new products, and

have spawned entirely new industries, particularly in high-technology (Fischer et al., 1999; Barringer et al., 2005; Lentz and Mortensen, 2008). It is for these reasons that the growth of firms has long been considered an important topic in the economics, entrepreneurship and strategic management literatures. Although Barringer et al. (2005) argued that examining high-growth firms allows researchers to gain a better understanding of firm growth in general, these firms have received somewhat less attention in the literature.

It may be that high-growth firms are considered anomalies in light of existing theories of firm growth (Etemad and Keen, 2007). Another possible explanation for the lack of research in the area of high-growth firms is the notion that firm growth is a purely stochastic process. Gibrat's (1931) law of proportionate effect states that the proportionate change in the size of a firm is independent of its initial size. Stochastic events result in a log normal distribution of firms by size with the rate of growth of firms regressing to the mean over time (Ijiri and Simon, 1967). If growth rates are simply a function of random processes, and given that high-growth cannot be sustained indefinitely, one may question the efficacy of studying the causes of, or processes related to, the rapid growth of firms.

There is however an exception to the rule of proportional growth in the case of smaller, younger firms which exhibit faster employment growth than their larger, older counterparts. Hart (2000) argues that small firms do not conform to Gibrat's law in that they create a disproportionately high number of new jobs for their size. The growth of small firms tends to be negatively related to their size as their average costs continue to decrease (Hart and Oulton, 1996). This occurs until the firm reaches minimum efficient

scale, at which point average costs are minimized. These firms may in fact be in danger of stagnation or even failure if they do not reach their optimal level of efficiency (Audretsch, 2002). It is therefore an important research goal to consider the factors involved in determining how firms can achieve minimum efficient scale as quickly as possible.

Regardless of the how or when their growth occurs, the entrepreneurship literature cites high-growth firms as an important source of net new jobs and knowledge through research and development, innovation and technology spill-over (e.g. Schreyer, 2000; OECD, 2007). Etemad and Keen (2007) declared that these firms foster change and “act as catalysts for other firms to emulate” (p. 29) as well as create employment, wealth and overall social benefits which suggests their importance for study. Schreyer maintains that there is a positive correlation between employment growth at the macroeconomic level and a country’s proportion of expanding firms. In a study of high-growth companies, Fischer et al. (1999) conclude that these firms benefit society through the creation of high-value jobs and innovative products or services. The study explains that these firms are also more likely to do research and development and to invest in internationalisation. In summarizing the results of interviews with a number of owners, policy-makers and service providers, the authors note a shared sense among these stakeholders that that high-growth firms are “good for the economy and could provide leadership by example” (p. 11).

Rapid growth of an organisation does not however come without a cost. It results in numerous challenges to management which, if not addressed, could result in the failure of the firm (Hambrick and Crozier, 1985; OECD, 2007). These include inadequate skills

and systems, overconfident management, interpersonal conflict and cash flow problems. This provides further justification for the research into the organisational processes involved in rapid growth with the goal of assisting managers through these turbulent times.

1.1. Profiling High-Growth Firms

Industry Canada has focused its attention for the past several years on the growth of SMEs as an important factor in economic growth through job creation (Parsley and Halibisky, 2008). Their goal in studying strong and ‘hyper’ growth firms (with employment growth exceeding 50 or 150 percent over four years, respectively) has been to determine what has made these firms successful as well as what can be done to further encourage SME growth. Their study found that the majority of net new jobs were created by small businesses (SMEs). Hyper growth businesses comprised only 4 percent of Canadian business, yet were responsible for 45 percent of net job growth between 1993 and 2003, as shown in Figure 2. There is a significant risk associated with rapid growth however, as their research showed that SMEs in the slow (less than 50 percent employment growth) or strong growth classes had a better chance of surviving than the hyper growth firms. Hyper growth was found not to be sustainable for long periods, however high rates of growth were found to occur at various times in the life cycle of firm, therefore the phenomenon is not only associated with start ups. Parsley and Halibisky (2008) considered this pattern to reflect the model of creative destruction as proposed by Schumpeter, whereby “firms leapfrog each other through innovation and development of new markets” (p. 9).

Figure 2 Share of Firms and Net Job Creation by Growth Category, 1993–2003

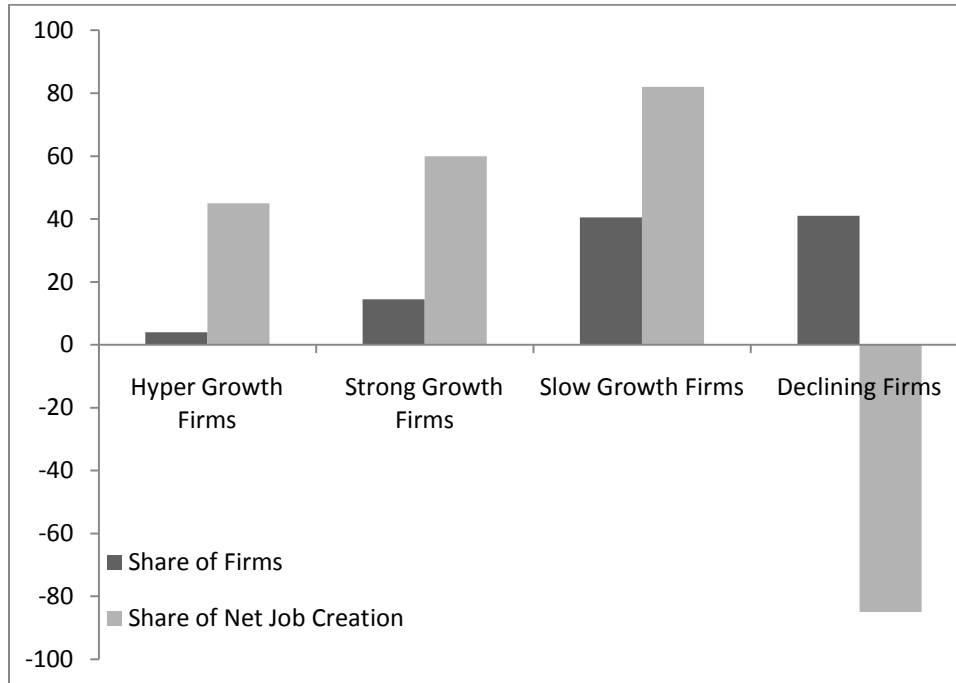


Figure adapted from Parsley and Halibisky (2008).

The annual Profit 100 publication (Profit, 1999-2008) lists the top 100 Canadian firms by five-year revenue growth. In order to explore the growth phenomenon, I collated data on the firms reported annually for the last ten years in which this list has been published. This resulted in a dataset of 790 firms that was used to develop a profile of high-growth. This involved the breakdown of the sample by various demographic variables as well as the development of a growth mixture model to represent the latent growth classes within the sample.

By analyzing the data obtained from these lists over a number of years, I established a profile of the typical high-growth firm included in the top 100 list as shown in Table 1. This table reflects the characteristics of the companies after they have undergone at least five years of rapid growth, therefore most would have been considered small-to-medium enterprises at the beginning of the growth cycle. Most have some

international sales, though it is not known whether this was the case prior to rapid growth. Clendenning & Associates (2000) provide a classification of a number of industries as being *knowledge-based*. Tier I includes of a number of science and technology-related industries considered to be knowledge producers. Tier II comprises high knowledge, innovative, knowledge-user firms. I have categorized all other industries not covered under this system as *unrated* in Table 1. The table shows that high-growth firms occur across categories, including these traditional resource-based industries, and not only in the high-technology sector.

Table 1 Demographics of Profit 100 Firms by Knowledge-based Industry Category

Variable Name	Mean (SD)	Mean (SD) by Knowledge-Based Industry Category		
	(n=790)	Tier I (n=182)	Tier II (n=334)	unrated (n=274)
Firm Age	17(8)	16(4)	17(6)	17(12)
Employees	361(1991)	167(400)	306(1289)	558(3042)
Sales (M\$)	74(358)	32(112)	90(452)	82(334)
Exports as % of Sales	32(37)	64(31)	39(40)	13(24)

Although high-growth firms are rare, they are found in most industries. Intuitively one might expect to find most of these firms within the high-growth industries; however they are actually distributed throughout the economy. Table 2 shows the breakdown by industry for Profit 100 firms listed between 1999 and 2008. A number of these firms appear in the top 100 list for multiple years, therefore the total number of firms is 790 rather than 1,000 for the ten-year period.

For example, the top ranked firms between 2006 and 2008 were a marine technologies firm, a short-term cash loan and furniture rental business, and a corporate child care company respectively. Kids & Company Ltd., the Profit 100 growth leader for 2008, provides daycare services for the employees of Canada’s largest companies including the top banks, accounting and law firms and a number of multi-national

corporations. They started in 2002 in Toronto and have recently opened two more locations in London and Calgary. The company's five-year revenue growth was an astounding 12,639%, with sales in 2007 of \$13.7 million. Revenue growth does not necessarily equate with profitability as the company posted a substantial loss which speaks to one of the risks associated with high-growth. Employment rose at a similar rate to revenue with the number of employees reaching 370 in 2007, up 362 since 2002 (Spence, 2008). Table 3 summarises data for the entire 2008 Profit 100 list of companies.

Table 2 Distribution of Profit 100 Firms by Industry (1999-2008)

NAICS	Count (n=790)
11 Agriculture, Forestry, Fishing and Hunting	1
21 Mining and Oil and Gas Extraction	20
22 Utilities	10
23 Construction	17
31-33 Manufacturing	174
41 Wholesale Trade	21
44-45 Retail Trade	60
48-49 Transportation and Warehousing	21
51 Information and Cultural Industries	182
52 Finance and Insurance	35
53 Real Estate and Rental and Leasing	9
54 Professional, Scientific and Technical Services	129
55 Management of Companies and Enterprises	1
56 Administrative and Support, Waste Management and Remediation Services	57
61 Educational Services	12
62 Health Care and Social Assistance	5
71 Arts, Entertainment and Recreation	6
72 Accommodation and Food Services	8
81 Other Services (except Public Administration)	22

As high-growth is of particular interest in this study, a latent class analysis was performed to demonstrate the heterogeneity of growth rates found even among firms in this elite category. In order to examine surviving firms in more current economic conditions, a subset of the sample was derived from the companies in the Profit 100 listing between 2004 and 2007. Growth figures are also listed for the current year and five years prior, thereby providing a sufficient number of data points between 1999 and

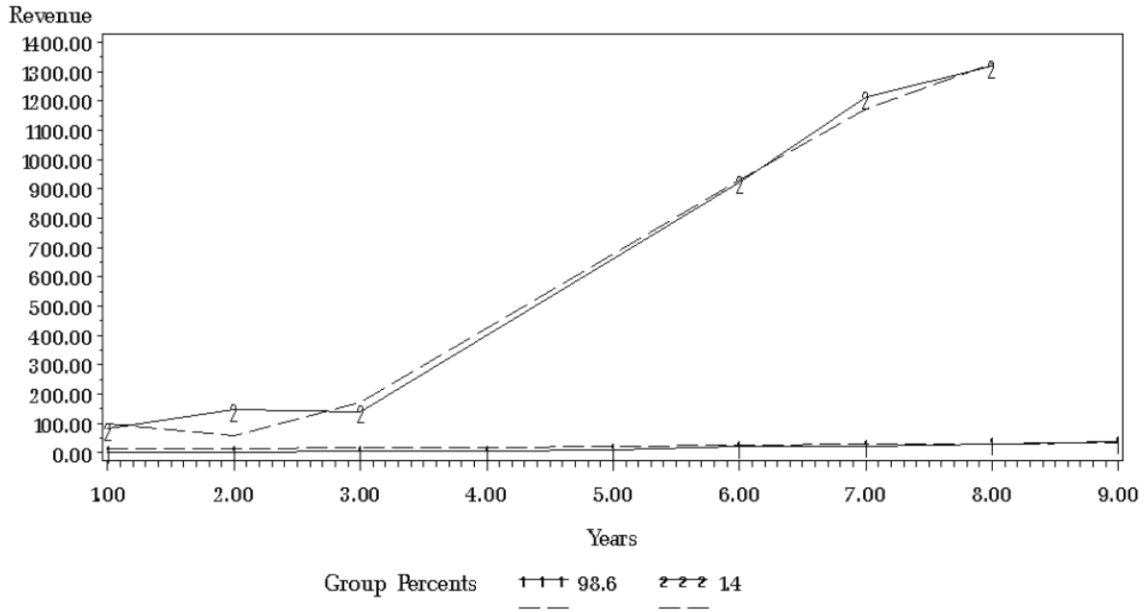
2007 inclusive to allow the mapping of higher-order growth curves. A growth mixture model with two classes of sales growth was developed using the ‘proc traj’ extension in SAS. As shown in Figure 3, the result was significant for a linear trajectory of lower-growth firms (curve marked as ‘1’, near the x-axis) and a cubic trajectory (curve marked as ‘2’) for high-growth firms which comprised only 1.4% of this sample. The diagram indicates each group’s trajectory with two curves, with the solid line corresponding to the sample means and the dashed line representing the estimated means.

Table 3 Profit 100 List Summary (2008)

Variable Name	Mean	SD	Min	Max
Firm Age	12	7	7	55
2002 Employees	89	480	1	4,535
2007 Employees	689	4,063	3	40,000
Employment Growth %	889	1,526	-19	11,400
2002 Sales (M\$)	7.6	33	0.1	307
2007 Sales (M\$)	120	620	1.0	6,009
Sales Growth %	1,800	1,792	627	12,639
Exports as % of Sales	37	38	0	100

It is evident from this analysis that there are two distinct populations within this selection of high-growth Canadian companies corresponding to growth and high-growth firms. The goal of this research is to provide further insight into what may make the high-growth firms different from others. Latent growth curve analysis is explained further in Section 5.2 in the context of the survey data gathered for this research.

Figure 3 Growth Mixture Model, Profit 100 Firm Sales



1.2. Scope of Research

This study seeks to enhance our understanding of high-growth firms by developing and testing a theoretical framework and model based on a number of the firm-specific and intra-firm factors while controlling for industry and market conditions. Organisational architecture is considered in terms of the evolutionary economics and the behavioural, resource and knowledge-based views of the firm. Strategic orientations, capabilities and strategic intent are viewed through the lens of strategy and entrepreneurship theory. Product or service, marketing and organisational innovation are examined in relation to firm growth. Although this research will focus on current firm-specific factors, it will consider these in the context of environmental factors in light of their importance to policy formation. Firm history, for example its origin as a spinoff, spinout or merger, as

well as environmental factors such as market turbulence and dynamism, and the objectives of the entrepreneur, will be controlled for in the model.

The population of interest for the empirical model consists of high-growth firms as defined by the OECD. This includes firms of 10 or more employees at the beginning of the measurement period that have at least 20 percent annualised growth in employment or turnover during the three-year measurement period (Ahmad and Hoffman, 2008). To fall within the OECD criteria, firms must have been established at least one year prior to the start of the measurement period. In addition, firms of 250 employees or fewer were selected to be consistent with other studies of small-to-medium enterprises (Schreyer, 2000). The most commonly used and agreed-upon measures of firm growth are sales and employment (Freel and Robson, 2004). This, in addition to desire to remain compatible with the OECD definition of high-growth firms, made these a logical choice to represent the latent construct of firm growth.

The intent of the research is to explain the antecedents of high-growth in existing firms; however it does not speak to the conditions required for the birth of potential high-growth firms.

1.3. Research Questions

This study proposes to enhance understanding of high-growth firms through the development and testing of a theoretic model. To this end, it will address the following questions:

1. Is a market-driven (customer or competitor) and/or opportunity-driven (entrepreneurial) orientation associated with rapid growth?

2. Does innovation mediate the influence of these orientations on the occurrence of high-growth firms?
3. Does network competence moderate the effectiveness of either, of both, of these strategic orientations? And finally,
4. Is rapid growth most likely in the presence of both orientations, along with the ability to innovate and network effectively?

1.4. Potential Contributions

The results of the study will contribute incrementally to the entrepreneurship, marketing and strategic management literature. The research builds on early market orientation and entrepreneurial orientation literature (e.g. Lumpkin and Dess, 1996, 2001; Kohli and Jaworski, 1990; Narver and Slater, 1990; Day, 1994), the study makes a contribution by connecting the two streams within the context of networking competence (e.g. Ritter *et al.*, 1999) and innovation research.

Gristein (2008) pointed to discrepancies surrounding the combination of various strategic orientations and firm performance. Both Hult et al. (2004) and Frishammer and Horte (2007) analysed the impact market and entrepreneurial orientations on innovation and growth, while Ruoken and Saarenketo (2009) reported the combined effect of entrepreneurial orientation, learning orientation, and market orientation on rapid internationalisation. This study will build upon the research on combined strategic orientations. It will also contribute to the theoretical models through the additional of network competence as a modifier and innovation as a mediator of high-growth. The focus of most empirical studies in this area has been growth or performance as an outcome, as opposed to rapid growth.

Determining the factors that are associated with rapid growth can have implications for management as well as policy. Strategic management involves making changes to critical aspects of the business that affect its growth and profitability in the future (Asnoff, 1985). If a firm's goal is to grow it must be able to focus its limited resources using a strategy appropriate for growth. From a practical standpoint, smaller companies can overcome resource limitations and build on their strengths by establishing networks. The appropriate application of market and entrepreneurial orientations will depend on the industry environment as well as the firm's overarching strategy. I argue that network competence will tend to reinforce the effect of whatever strategic orientations on which the company decides to focus. The results of study will provide further empirical evidence of both the economic impact of high-growth and gazelle firms, but also the areas in which small firms can be assisted in developing their internal capabilities to meet their growth goals.

1.4.1. Potential Theoretical Contribution

This research proposes to address a perceived gap in the entrepreneurship, marketing and strategic management literature by increasing our understanding of the importance of the synergistic effects of strategic orientations, networking and innovation in achieving high-growth. While a number of studies have addressed the relationships between entrepreneurial orientation (EO) or market orientation (MO) and growth, few have considered the interactions between them, along with the effects of inter-firm relationships resulting in high-growth. This research applies resource-based and dynamic capabilities theories (e.g. Barney, 1991; Nelson, 1991; Conner and Prahalad, 1996; Teece

et al., 1997; Eisenhardt and Martin; 2000) to develop an explanation for sustainable competitive advantage leading to rapid growth.

The need for a holistic approach is reflected in the literature by Schreyer (2000), stating that there is “no simple or mono-causal explanation for fast growth or the absence thereof” (p. 29) which acknowledges a great deal of heterogeneity between firms. Delmar et al. (2003) claimed that prescriptive advice on the causes of high-growth is often oversimplified based on “unidimensional views of the phenomenon” (p. 212). Schreyer suggested that research on rapid growth could be directed towards helping firms understand their markets better, while Delmar et al. proposed that managers be offered a number of growth strategies from which to choose to best fit with their resources, goals and market environment. This dissertation proposes a model for high-growth that includes not only constructs related to a firm’s understanding of its market, but the ability of the firm to react to market conditions through the expression of one or more of the dimensions of EO. The model will attempt to address the need for firm growth research that accounts for the heterogeneity between firms and industries. By controlling for various firm characteristics, origin, resource availability, and market conditions it can be applied to developing flexible strategies for managers based on their particular circumstances. These areas do not appear to be adequately developed in the strategic orientations literature, particularly in the context of high-growth firms.

As part of a working group on small-to-medium enterprises (SMEs) and entrepreneurship, an OECD (2007) study was launched to examine the extent to which innovation is related to high-growth. A review of the related literature uncovered little empirical evidence to prove this relationship, though it had been noted in an earlier

OECD study. One of the problems identified was the lack of a standard measure of growth that could be used to compare results between countries. Delmar et al. (2003) suggested that the lack of standards limits the comparability and usefulness of prior studies. Through the use of the OECD (2008) standard measures for identifying high-growth and gazelle firms the results of this study, combined with those of European research partners, will contribute to the entrepreneurship literature by providing empirical evidence relating innovation to high-growth.

The inclusion of network competence (NC) in the model allows the study to examine the impact of relationships with parties in business networks, including alliance partners, customers, suppliers, competitors and service providers, on internal firm processes. Florin et al. (2003) explained the relationship between a firm's social capital and high-growth through increased access to resources within its network. This research supports Florin's study in stressing the importance of networks for growth, though it takes a different approach in explaining the firm's strategic orientations and ability to innovate as the actual drivers of growth. In this dissertation, the processes and routines associated with an entrepreneurial or market orientation are enhanced through the firm's membership in business networks. Social capital is considered as a moderator rather the main effect in the model of high-growth. Studies such as these explore the possibility of alternative modes of governance and contracting, with resource sharing and innovation occurring across organisational boundaries.

1.4.2. Potential Practical Contribution

When the high-growth firm is considered from the perspectives of the various types of stakeholders involved it becomes apparent that there are multiple ways in which the research can be applied. In order to engage in research on firm performance and to effectively apply these results in a practical setting, scholars must have “a heightened sensitivity to these diverse social constructions of the phenomenon of rapid growth” (Fischer et al. 1999, p. 16). Some of the potential beneficiaries of an enhanced understanding of the antecedents of rapid growth include firm owners, managers, and policy-makers, as described by Davidson et al. (2006):

- *Owners.* This group of stakeholders is concerned with the entire business and the growth of particular activities within it as well as supporting governance structures as required. They are more likely to be motivated by sales rather than employment growth.
- *Managers.* Although the growth of the firm as a whole is not their primary concern, they are interested in the growth of particular activities within their unit. This could involve both increases in employment and sales.
- *Policy-makers.* Davidson states that the role of government should be to promote creation and growth of new activities for added value and job creation rather than increasing overall governance structures through general employment growth. Etamad and Keen (2007) suggested that special policy directed at high-growth firms is warranted.

Of these three groups, the entrepreneurs (owners, or potential owners) are the most likely to benefit from this research as they are the driving force that takes a

company from inception through its initial growth phase and beyond (Shane, 2003). Managers, though motivated to grow the company, would also be affected by the problems associated with rapid growth and would also benefit from an understanding of the organisational challenges described by Hambrick and Crozier (1985).

By definition, owners are entrepreneurial and would profit from a greater insight into the effects of an EO on growth of their business. Entrepreneurs are also instrumental in determining the firm's MO based on the market conditions they face as well as the firm's overarching strategy. These decisions involve changes to critical aspects of the business that affect its growth and profitability in the future (Asnoff, 1985). Entrepreneurial networks are also critical for gaining legitimacy, finding opportunities, and securing resources (Elfring and Hulsink, 2003). It is important for entrepreneurs and entrepreneurial managers to be aware of these factors associated with rapid growth in order to develop a strategy appropriate for their business.

1.5. Study Outline

This dissertation is organised as follows. Chapter Two contains the literature review consisting of three sections. The first section outlines the theoretical foundations of sustainable competitive advantage and firm growth based on industrial organisation economics and resource-based-theory. The second section explains various strategic orientations in relation to the theoretical framework and growth. The third section reviews the current theoretical and empirical literature on high-growth firms.

In Chapter Three, the limitations of the current literature on firm growth are discussed while leading to a model specifically focussed on high-growth firms. A model

and hypotheses are proposed that take into account the complex set of conditions required for rapid growth, along with the rationale for developing it and an explanation of its practical benefits.

Chapter Four describes the two methods employed in this research. The first establishes a descriptive model of high-growth firms through the creation of growth mixture models, a type of structural equation model. These models show the distribution of firms within distinct groups based on growth trajectory. The second method involves a survey administered to a cross-industry sample of Canadian businesses, measuring aspects of firm structure, strategic orientations and intent, innovation performance, competitive environment, internationalisation and growth of employment and sales over a three-year period.

Chapter Five presents the results and analysis of these two approaches which leads to discussion, conclusions and implications in Chapter Six.

2. Literature Review

The purpose of this study is to determine the factors and mechanisms contributing to rapid growth in companies. I will review, compare and contrast historical perspectives on the development of sustainable competitive advantage and growth from an industrial organisation economic perspective leading to resource-based theory. I will then critically examine the more recent literature on the theoretical explanations of high-growth firms.

In order to determine the factors and mechanisms contributing to rapid growth in companies it is logical to consider the explanations for firm growth in general. Though factors external to the firm (the market, other firms) will be included or controlled for in the empirical model, these will be set aside for a moment. When considering only the factors internal to the firm, one would expect to find a normal distribution of firm characteristics that relate to growth across the entire population of growing firms. Given that high-growth firms belong to the larger category that I refer to as *growth firms*, and given that the firm characteristics associated with growth are roughly homogenous within the set of growth firms, it is logical to assume by inclusion that the characteristics that cause growth in growth firms would be found in the high-growth firms.

This relationship does not imply though that the high-growth class of firms does not have additional characteristics not found in the growth class. These are in fact the very factors and mechanisms that are of interest to this study. I argue that it is the heterogeneity of characteristics amongst firms that results in variations in rate of growth. Given the interconnectedness of resources and processes within the firm, it may not be

possible however to consider only those factors associated with high-growth without considering those associated with growth in general. Nor is it possible to examine the mechanisms contributing to growth or high-growth in a firm without considering the interactions between the firm and the market or with other firms in its network.

2.1. Sustainable Competitive Advantage as an Explanation of Growth

While examining theories of firm growth it is useful to consider, simultaneously, the theoretical explanations for the existence of the firm. These theories are complementary; according to Mahoney (2001), “the set of market frictions that explain sustainable firm-level rents would be sufficient market frictions to explain the existence of the firm” (p. 655). The industrial organisation economics literature develops a framework for understanding both the existence and growth of the firm. The resource-based theory of the firm is built upon, and extends, this framework. Table 4 shows the relevant research.

The industrial organisation and strategic management literatures contain somewhat conflicting explanations for the birth and growth of firms (Connor, 1991). Industrial organisation theories of the firm provide the basis for a resource-based view by explaining the role of resources as key factors in firm entry, competitive advantage and growth. Resource-based theory developed in the strategic management literature adds to this explanation by including *isolating mechanisms* at the firm level of analysis, which are analogous to entry barriers at the industry level (Mahoney and Pandian, 1992). These mechanisms, involving unique resources (Dierickx et al., 1989) and causal ambiguity (Lippman and Rumelt, 1982), are important to production and distribution and are frequently adjusted and renewed to maintain competitive advantage (Wernerfelt, 1984).

Table 4 Theoretical Foundation for Sustainable Competitive Advantage and Growth

Context	Theory	Key Publications	Assumptions	Sustainable Competitive Advantage	
				Contributing Factors	Proposed Mechanism
<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <p>Market</p> <p>↓</p> </div> <div style="text-align: center; margin-right: 10px;"> <p>↑</p> </div> <div style="text-align: center; margin-right: 10px;"> <p>Firm</p> </div> <div style="text-align: center; margin-right: 10px;"> <p>↓</p> </div> <div style="text-align: center; margin-right: 10px;"> <p>↑</p> </div> <div style="text-align: center;"> <p>Network</p> </div> </div>	IO Econ.	Schumpeter, 1950; Bain, 1954; Porter 1979, 1980, 1985; Connor, 1991; Stigler, 1961, 1964; Coase, 1937, Williamson, 1981	Purpose of firm to maximize profits, economic rents determined at market equilibrium, bounds on firm size and scope	Industry forces; Innovation	Product/service, marketing and organisational innovation lead to enhanced efficiency, quality and a cost- or differentiation-based <i>competitive advantage</i> in the market.
	Commitment and first mover advantage	Lieberman and Montgomery, 1998	Entry order effects exist; magnitude varies greatly across products and markets; dissipates over time; weaker effect than marketing mix effects	Industry forces; Innovation	Determines timing of entry of new products/services to preempt key <i>resources</i> ; set <i>cost structures</i> through perception as pioneer, switching costs and network externalities; and develop organisational <i>capabilities</i> ahead of competitors.
	Behavioural theory / Organisational learning	Cyert and March, 1963; Levitt and March, 1988	Bounded rationality, conflicting interests, satisficing, sequential decision-taking, inefficiency	Industry forces; Firm history	Routines encoded based on interpretations of the past. The firm learns and adapts to industry forces and its environment over time to develop its <i>organisational architecture</i> and <i>strategic orientations</i> . Leads to better decisions, more efficient use of resources and more available <i>resources</i> . This with an enabling culture and structure drives <i>innovation</i> .
	Evolutionary theory	Schumpeter, 1950; Nelson and Winter, 1973, 1982, 2002; Nelson, 1991	Variety, behavioural continuity, profit-induced growth, limited path-dependence		
	Capabilities and competence-based theory	Leonard-Barton, 1992; Prahalad and Hamel, 1990; Eisenhardt and Martin, 2000; Teece et al., 1997; Grant, 1996; Pisano, 1994; Henderson and Cockburn, 1994	Core competencies may lead to core rigidities	Organisational architecture; Strategic orientations	Strategic orientations enable the firm to dynamically recombine and reconfigure resources within the organisation to develop new <i>capabilities</i> and drive <i>innovation</i>
	Resource-based view	Penrose, 1959; Lippman and Rumelt, 1982; Peteraf, 1993; Amit and Schoemaker, 1993; Wernerfelt, 1984; Barney, 1991; Nelson, 1991; Conner and Prahalad, 1996	Information asymmetry, barriers to imitation, causal ambiguity, firms as bundles of resources heterogeneously distributed (differences persist over time)	Firm history; Organisational architecture	Valuable, rare, inimitable, non-substitutable (VRIN) resources are developed over time within the organisational architecture are combined and configured to develop <i>capabilities</i>
	Knowledge-based theory	Madhok, 1996; Kogut and Zander, 1992; Grant, 2002	Knowledge, particularly tacit, considered as a VRIN resource	Inter organisational environment; Capabilities	Strategic alliances, network relationships and clusters increase efficiency through reduced transaction costs and provide access to a larger pool of <i>resources</i> and stimulates knowledge exchange, creation, <i>innovation</i>
	IO Econ. (transaction cost theory)	Coase, 1937; Williamson, 1981	Uncertainty; trust; transaction costs reduced by internalising		

From the perspective of the consumers of the firm's output, Connor (1991) stated that this strategic advantage is derived from products (or services) that are distinctive, with either superior utility or equivalent utility at a lower price. Connor went on to explain that the challenge to strategy is in maintaining the balance between low cost and above-normal returns.

I consider the industrial organisation and resource-based theory to be complementary in that they provide insight not only into the impact of firm resources and capabilities on a firm's growth, but also the effect of the market and the firm's network.

2.1.1. IO Economics Foundations

Industrial organisation (IO) economics provides mainly market-based explanations for the existence of the firm. Connor (1991) considers five IO economics theories of the firm: (1) the neo-classical perfect competition model, (2) Bain-type IO, (3) the Schumpeterian and (4) Chicago schools of thought, and (5) transaction cost economics. These theories have provided the framework for the development of resource-based theory.

Perfect Competition

Under the neo-classical perfect competition model, the firm is considered as an *input-combiner* where its output (size) is bounded by the limits of technological and managerial factors due to diseconomies of scale (Ahuja and Lambert, 2001). Inputs are a combination of labour and capital controlled by management according to the production function of the firm (Slater, 1997). This model depends on a number of assumptions including: all companies having perfect information and equal access to technology;

management competence in determining the right balance of inputs; resources that are divisible and mobile and flow to where they can contribute the most value; and marginal revenue is equal to the margin cost of the resources used in production (Connor, 1991).

This is of course an idealised model that acknowledges the contribution of resources to the size of the firm (its growth) but assumes a homogenous distribution of valuable resources in obvious combinations. The perfect competition model assumes zero above normal profits for all firms, so while it explains the existence of the firm it provides no incentive for growth, nor any explanation for rapid growth of any one firm within its industry (Lippman and Rumelt, 1982). Supranormal profits are in fact considered a type of market failure as they indicate a state of disequilibrium due economies of scale, scope or learning, imperfect information or transaction costs (Yao, 1988). Particular firms are in a position to take advantage of the market failure.

Rumelt (1984) argued that the perfect competition model is not actually a theory of the firm; rather that it deals only with price setting in which aspects of the firm are assumed away. Neoclassical theory does however explain the function of the firm as an input-combiner that, after removal of many of the assumptions, provides the basis for the resource-based view (Connor, 1991).

Bain-type IO

Under the Bain-type model of competition, firm size is not limited by diseconomies of scale; competition is imperfect as larger firms are able to obtain higher profits through collusion and monopoly power, assuming the absence of government intervention (Connor, 1991). Connor described a model in which the company is able to increase

demand through advertising while raising barriers to competition through product differentiation and capital outlay.

In the Bain-type IO model, growth is strategic to the firm in that it enhances its ability to monopolistically control the market Bain (1954). Firm resources are not strategic; they are interchangeable and simply considered as the means of producing the target output. Profits are not related to the marginal value of resources to production, but to the level to which prices can be increased above costs. The structure-conduct-performance hypothesis expressed by Bain (1954) explores the competitive dynamics that influence the allocation of market share and profits within an industry or competitive group. Porter (1980, 1985) proposed a framework of five forces (rivalry, buyer power, supplier power, threat of new entrants, and threat of substitutes) that the company needs to balance to remain competitive. Success or failure is considered to be a function of position within the structure (Henderson and Cockburn, 1994; Porter, 1979) rather than of firm-specific characteristics, resources or capabilities.

In resource-based theory, strategy involves conscious decisions around firm resources rather than position in the industry structure. The firm is taken as the unit of analysis rather than industry in resource-based theory. The Bain-type IO model does introduce the possibility of sustainable competitive advantage, though it relies on collusion to explain this circumstance (Connor, 1991).

Schumpeterian Competition

Schumpeter's view of the firm encompasses the concepts of continuous change in products and processes that reflect the true nature of firm development. Evolutionary forces prevail in the firm's ability to adapt to its environment (market demand, changes in

technology) through innovation as explored further by Nelson and Winter (1982). This model lays the foundation for a dynamic capabilities perspective in which resources are re-combined in unique ways as required in times of market turbulence. Firms compete through the process of *creative destruction* in which competencies are constantly renewed, as a means of achieving a “decisive cost and quality advantage” given new market opportunities (Schumpeter, 1950, p. 84).

The Schumpeterian model of competition does however counter the Bainian by valuing the role of large, even monopolistic, firms. These larger companies are able take the risks involved in radical innovation due to the power afforded by their current market position. Additional market power gained after innovation and new product development provides incentive for further growth (Connor, 1991). Resource-based theory recognizes the importance of innovation in developing sustainable competitive advantage (Prahalad and Hamel, 1990) but assumes that this can be achieved without the monopolistic conditions implied in the Schumpeter’s revolutionary innovation model (e.g. Wernerfelt, 1984).

Chicago School

In response to anti-collusion policy implemented in the wake of Bain-type IO, the Chicago view maintained that firms enhance social welfare by improving the efficiency of production, and in fact are most efficient when they “act together as a monopolist” (Stigler, 1964, p. 44). According to Stigler though, it would be impractical or impossible to have all firms in an industry cooperate, as opportunistic tendencies would lead some firms to undercut pricing agreements. The theory states that the cost of full monitoring, which represents the cost of obtaining perfect information related to prices within the

industry, would be prohibitive. Based on this reasoning, Stigler concluded that collusion on its own is not sufficient to explain high returns and growth (Stigler, 1961).

Stigler argued that the firm's performance is explained by its efficiency and effectiveness, whether in terms of production or in use of capital for advertising to increase market awareness of products and prices. Barriers to entry developed through investment in innovation are not considered to be determinants of long-term profit as these can be eroded by imitation. Rather than innovating, a firm that becomes more efficient at producing current goods will grow. This will be achieved, in contradiction with the perfect competition model, through economies of scale (Connor, 1991).

Innovation is however an important element of resource-based theory as renewal of products and services to continue to accrue long-lived rents. However, the efficiency referred to in the Chicago model could be achieved through *organisational innovation* and improvement of internal processes and capabilities which would tend to support resource-based theory.

Transaction Cost Theory

Firms were considered by Coase (1937) to be an alternative to markets as a means of organizing production. Contracts that would have incurred transaction costs if negotiated in the market could be executed in a 'costless' manner within the firm. Coase considered the boundary of the firm to be flexible. It was decisional, according to whether a particular transaction would be brought inside the firm, or if it would be conducted outside the firm boundary in the market. Williamson (1981) built on this theory by emphasizing the importance of transaction cost avoidance in situations of asset specificity and imperfect information where there are a small number of optional contractors

available. In this scenario, enveloping the transaction within the firm eliminates opportunistic behaviour by the contractors. As a result, the goal of all parties (ideally) becomes the profitability of the firm.

Transaction cost theory not only explains firm entry (at least on a per transaction basis) but also the formation of firms around the same isolating mechanisms described in resource-based theory as the key drivers of sustainable competitive advantage. According to Mahoney (2001), these factors are sufficient to explain both the growth of the firm and its creation. While this model provides an adequate explanation for the existence of the firm as a means of avoiding opportunism (Connor, 1991), sustainable competitive advantage is explained through the combination of unique and costly-to-copy resources, developed and combined in a causally ambiguous manner (Lippman and Rumelt 1982; Wernerfelt, 1984; Dierickx et al., 1989; Mahoney and Pandian, 1992). These mechanisms are responsible not only for the firm's existence but also for its continuing ability to charge supra-normal rents (Mahoney, 2001).

2.1.2. Resource-Based Theory

Resource-based theory has developed as an alternative to market-based explanations for the existence of the firm. Taking a resource perspective leads to some different insights that would not be apparent from the traditional product perspective (Wernerfelt, 1984) as does looking at the difference between firms (Nelson, 1991). The latter though raises some interesting research challenges in that we are trying to observe idiosyncrasies between firms, but at the same time are attempting to generalize across firms (Gibbert, 2006).

The unit of analysis becomes the firm rather than the market, industry or competitive group. Perhaps most central to this study though is the role of resource-based theory in explaining sustainable competitive advantage and the growth of firms. The drivers of superior returns are considered to be the firm's idiosyncratic resources that provide superior efficiency, while the sustainability of this advantage is maintained through the inimitability of these resources. I will describe four components of resource-based theory in the context of firm growth, including: (1) the resource-based view, (2) commitment and first-mover advantage, (3) knowledge-based theory and, (4) capabilities and competence theory.

Resource-Based View

The resource-based view (RBV) assumes a scarcity of resources and characterizes firms as a bundle of unique resources that, due to their heterogeneous distribution across firms, result in a competitive advantage in the marketplace (Rumelt, 1984). Building on the work of Penrose (1958), RBV theory characterizes particular firm resources as being valuable, rare, inimitable and non-substitutable (VRIN) which may include tangible or intangible assets such as brand names, proprietary processes or patents, efficient procedures, knowledge of technology, skilled personnel, machinery, *et cetera* (Wernerfelt, 1984). These so-called VRIN resources (e.g. Barney, 1991) are not easily duplicated by competitors and their strategic use results in enhanced performance and sustainable competitive advantage for the firm (Nelson, 1991; Peteraf, 1993; Amit and Schoemaker, 1993).

Empirical support for the strategic function of resources can be found in a meta-analysis of 125 studies of the effect of strategic resources on performance (Crook et al.,

2008) which reported an average effect size of between .22 and .29, depending on the appropriability of the resources in question. Competitive advantage, according to Lippman and Rumelt (2003), is tightly coupled to the resources themselves rather than to the firm. It is considered that these resources cannot simply be acquired on the market, but have to be developed, and that the process behind their development may be causally ambiguous and path dependent, which is the reason they are rare and valuable.

Lippman and Rumelt (1982) introduced the concepts of *uncertain imitability* which prevents entry in a model in which entry was free and firms were price-takers with variation in profitability and above-normal industry rate of return. This is explained by the inability of entrants (imitators) to identify, with certainty, the causes of performance differences. In this model, total industry revenue is divided among a number of firms. A new firm can enter as long as their costs are lower than those of the least efficient firm, which would then be displaced. This continues until potential entrants would not pay to enter (Wernerfelt, 1984); average profitability increases as less efficient firms are replaced by new entrants (Rumelt, 1984). Although in contradiction to classical equilibrium models, the authors in fact claim that above normal profits would ward off potential entrants in the belief that levels of efficiency of the incumbents would be difficult to imitate. This would appear to explain not only a *selection* mechanism in determining firm survival, but unique resources as a source of sustainable competitive advantage. New entries, according to Rumelt (1984), are driven by market growth.

Wernerfelt explained that while strategy originated with the analysis of strengths and weaknesses (which in fact alludes to resources) there were no supporting economic models. In his 1984 study, Rumelt applied the firm entry model developed earlier to

explore the strategic choices that managers make in response to changes in the environment and the resulting differences in profitability among firms. The focus of the study is on explaining how these decisions affect profitability, which is justified by the observation of a 5 to 8 times difference in variability in profitability between firms than across industries. Rumelt (1984) described the role of entrepreneurship as the “production of new production functions” (p. 135) in reference to the strategic decisions that drive firm heterogeneity. Entrepreneurs decide whether to enter, and if so, with what mix of resources. Firm growth is achieved through economies of scope according to Wernerfelt (1984). This can be achieved by seeking out related activities to which these unique resources can be profitably applied or by finding *attractive* resources for which demand is not high, but can be combined with existing in-house resources. Inorganic growth as a result of mergers and acquisitions can be explained as a method of obtaining bundles undervalued resources. Adjustments such as these may be required in response to changes in the environment, for example in technologies, consumer tastes, or a new discovery or invention (Rumelt, 1984). They may present challenges to preserve existing rents or create opportunities for sources of new rents. As Wernerfelt (1984) stated, “the optimal growth of the firm involves a balance between exploitation of existing resources and development of new ones” (p.178). He went on to explain that long-term strategies may involve a series of *stepping stones* – the incremental development of new resources leading to product diversification and growth.

Commitment and First-Mover Advantage

The resource-based view has been criticised for its lack of empirical evidence to support its claims, as discussed in Lieberman & Montgomery (1998). These authors proposed that

first mover advantage (FMA) may provide the additional support needed to reinforce the resource-based view. The study addresses two issues that the authors deemed to be pivotal to understanding the concept of FMA: (1) the importance of early entry in accumulating resources and capabilities, and (2) the role of a firm's initial complement of resources and capabilities in determining the timing of entry.

Firms are able to obtain above normal rents by exploiting market imperfections in obtaining resources required to implement product strategies at less than their future value (Barney, 1986). This study of *strategic factor markets* raises the possibility that first movers would be in a position to gain control of all resources, or specific unique resources, required to implement a strategy. This relates to the first issue of FMA raised by Lieberman and Montgomery (1998). This claim was also supported by Rumelt (1984), in his explanation of *isolating mechanisms*, and Wernerfelt's *resource-position barriers* in which the holder of these strategic resources is "able to maintain a relative position *vis-à-vis* other holders and third persons, as long as these act rationally" (Wernerfelt, 1984, p. 173). These include not only resources in the form of assets but also information, patents, reputation and built-in switching costs.

Barney (1986) also addressed the second issue raised by Lieberman & Montgomery by explaining that particular firms may have lower cost of capital (which could be considered a capability) enabling them to implement their strategy before competitors. Imperfect information about the resources, and variability in this information between firms, may allow some firms an advantage in judging the actual future value of these *strategic* resources. This also relates to the influence of initial

resources and capabilities on the economic performance of the results of entrepreneurial strategy (Barney, 1986).

Being the first to enter the market is not a guarantee of success however. In some cases the first-movers may obtain resources which may no longer be useful as the industry and related technologies evolve (Lieberman and Montgomery, 1998). Rumelt actually put FMA in terms of the first *successful* mover who uses these advantages as a means of preserving rents. On the other hand, speed of response is essential though as waiting until the market is completely understood will result in loss of the FMA and the information gathered will no longer be of use (Rumelt, 1984). FMA is an entrepreneur's dilemma and, as concluded by Lieberman and Montgomery (1998), there are "no simple managerial prescriptions" (p. 1122) to determine optimal entry timing.

Knowledge-Based Theory

The knowledge-based view of the firm builds on RBV theory and organisational learning to establish information or knowledge as being central to the issue of sustained competitive advantage (Kogut and Zander, 1992). This research assumed that firms are better (less costly) than markets for transferring the knowledge of individuals or groups in the form of information (explicit knowledge) and know-how (tacit knowledge) and that this provides an explanation for the existence of the firm.

Foss (1996) however disagreed with the claim that organisational knowledge as a resource and the *higher organizing capability* of the organisation (as compared to contracts) can explain the existence of the firm, its boundaries or internal structure, though it may be able to explain a firm's competitive advantage. In response to the Kogut and Zander (1992) and Connor (1991) papers, Foss criticized their dispensing of

opportunism and moral hazard which Foss considers to be the drivers for firm formation where resources are brought under common ownership to avoid the incentive problems that might occur in a market contract. Foss asserts that a knowledge-based view compliments, though does not replace, a contract-based approach to understanding the economic basis for the firm.

In response to Foss' criticisms, Connor and Prahalad (1996) provided an explanation for this based on the mechanisms of specialisation and knowledge-substitution. The two methods of organising transactions (in the market or within the firm) are seen as polar choices that are decided based on economy of knowledge transfer. Specialisation within the firm compensates for the limited cognitive capability of individuals through the mechanism of knowledge-substitution, for example between a manager and subordinate. Those individuals in the manager role leverage their knowledge by imparting sufficient detail to the subordinates to complete the task, yet at the same time attempting to maintain a degree of 'intellectual independence' (Connor and Prahalad, 1996). They argued that the restrictions on working with an autonomous contractor reduce the efficiency of these two mechanisms, thereby resulting in a higher cost of knowledge transfer. Knowledge-based theory also differs from the transaction cost view of the firm as a *bundle of contracts* (Kogut and Zander, 1992) in that it suggests a social role for the firm that organizes individual and group knowledge in a socially beneficial manner. The transaction cost view is similarly rejected by Madhok (1996) who considered the firm as a *bundle of knowledge* and underlying processes which owes its existence to the organizing capabilities available within the firm. Madhok emphasized the

value-creating function of the firm over minimizing transaction costs or avoiding opportunism.

In knowledge-based model, individual knowledge is not lost to employee turnover as it becomes embedded into the routines of the firm (Kogut and Zander, 1992). This however implies an element of inertia due to the stability of knowledge with the firm which can result in difficulty in developing new knowledge and capabilities. The authors explain that knowledge-creation occurs dynamically through *combinative capability* that describes the process of building onto existing capabilities. In their view competition is based on the ability of firms to reproduce and create knowledge. Assuming no entry barriers, renewal of knowledge and capabilities allows the firm to make better strategic decisions for future opportunities as well as to deter potential imitation.

There are however constraints on the knowledge-based view of the firm. Kogut and Zander (1992) considered the firm's knowledge to be of little or no value if it does not reflect market demand. Grant (2002) reminded us of the cost of maintaining knowledge within the firm and the need to have proper systems in place to 'manage ignorance'. While organisational knowledge may increase, knowledge within individuals tends to decrease. Finally, it takes time for an organisation to develop resources and knowledge, therefore neither RBV nor KBV entirely explain the mechanism behind the ability to maintain competitive advantage in a highly dynamic market.

Capabilities and Competence-Based Theory

While resources relate to the content component of strategy, capabilities make up the process component. Capabilities and competence-based theory can therefore be considered either a logical extension of the resource-based view, or a part of it. Penrose

(1959) explained the link between resources with capabilities in stating that it is the heterogeneity of productive services available from its resources that gives firms a unique advantage. Penrose however clarified that strategic advantage is not necessarily available to firms that have better resources, but to those that have the competencies to makes better use of their unique resources. Managerial perceptions, which act to influence the use of resources, were however considered by Wernerfelt (1984) to be related to the firm's resource profile. It seems therefore difficult to decouple resources from capabilities or competencies in their relationship with strategic competitive advantage.

There is much theoretical literature on capabilities, including Leonard-Barton (1992) on the nature of core capabilities within the firm, which drew attention to the paradox of innovation-inhibiting *core rigidities* that are the by-product of these deeply entrenched values and processes. To fill the empirical gap, Henderson and Cockburn (1994) developed an econometric model based on the pharmaceutical industry to explain productivity, measured by number of important patents, as dependent on a number of inputs including R&D variables, control variables, and a set of variables representing the firm's core competencies. Competence was measured along two dimensions: component, and architectural. Although controlling for firm size and scope, program size and spillovers, they found that *idiosyncratic firm effects* accounted for a large portion of the variance in research performance. Their research suggests that unique capabilities or competencies may be the source of "enduring strategic advantage" (p. 63) and are an important complement to the structure-conduct-performance paradigm in the study of strategic management.

Walsh and Linton (2001) introduced the issue of path-dependency in describing the process of firm capability development. The study describes a strategy of matching of assets with particular technological competencies and managerial capabilities in a *competence pyramid* designed to gain competitive advantage in the market. They propose that firms can employ a systematic process of identifying competencies and capabilities that can be developed on top of those that they currently possess in order to achieve success in their chosen markets.

A static set of resources does not however provide the basis to explain a company's behaviour, in particular how it adapts and manoeuvres in turbulent conditions. Rapid changes in technology, environment or markets favour what Schumpeter (1950) termed *creative destruction*. According to the dynamic capabilities view, a firm relies on its ability to creatively redeploy existing resources and develop innovative products and services to meet evolving demands (Teece et al., 1997).

To understand the mechanism of value creation under such conditions requires a deeper analysis of the firm, not just of its content in terms of its resource, but of the capabilities it has developed to manipulate these resources in response to change. It is through development of dynamic capabilities that particular companies are able to evolve in dynamic environments (Grant, 1996; Pisano, 1994; Henderson and Cockburn, 1994). These are manifested either by well defined rules and processes for dealing with clearly defined scenario at one end of a continuum to need-driven heuristic responses at the other. Eisenhardt and Martin (2000) suggested that the type of response depends upon the level of dynamism involved in the process. They defined dynamic capabilities as the

“organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die” (p. 1107).

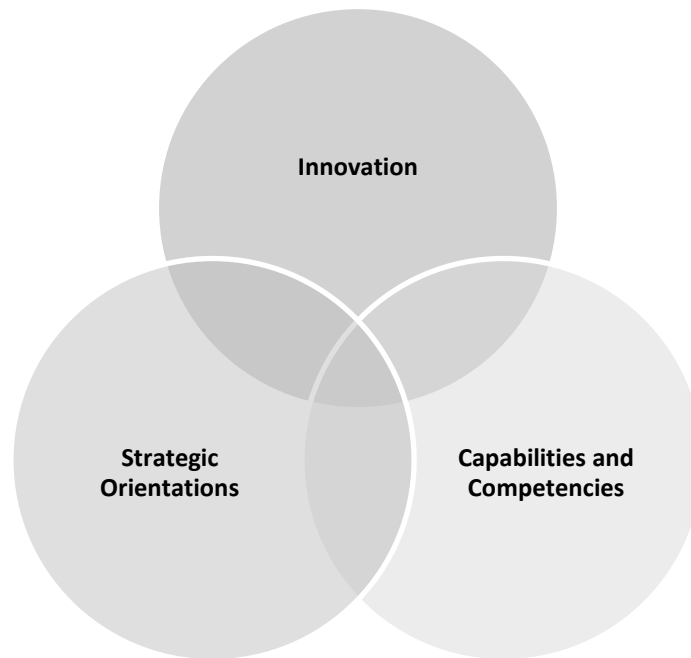
While RBV has been criticised for being vague in explaining the mechanisms behind maintaining competitive advantage (Williamson, 1999), dynamic capabilities theory fills the gap by describing the processes and procedures that allow companies to operate efficiently in times of rapid change (Teece et al., 1997).

2.2. A Strategic View of Sustainable Competitive Advantage

While the previous section explained the function of resources and capabilities and the timing of their commitment to a new entrant or existing business, it assumes rationality and competence on the part of those responsible for the decisions. In fact, resource-based theory does not comment on the role of management as the ultimate decision-makers in problems of resource commitment. This is normally a multi-criteria decisional problem where the optimal expected value of an investment depends on a number of factors both internal and external to the firm. Due to the impact of this type of decision on the firm, as supported by resource-based theory, it is likely that successful firms make these decisions within the context of a vision, goals and strategy. It is the particular orientations of the decision makers that comprise the strategy of the firm. Strategic orientations are therefore the drivers responsible for setting in motion the resources and focusing the capabilities of the firm towards achieving its goals. As observed by Morgan and Strong (2003), they reflect “the manner in which business strategy content is manifest in a firm” (p. 164). This research proposes however that in order to explain the effect of strategic orientations on competitive advantage it must be examined in the context of innovation and

competencies and capabilities (see Figure 4). The addition of these aspects of the firm provide a more complete picture of the both the process and content components of strategy.

Figure 4 Strategic View of Sustainable Competitive Advantage



2.2.1. Strategy and Strategic Orientations

There has been much academic focus on strategic orientation in the last couple decades and the management literature provides numerous definitions. Prahalad and Hamel (1990) formulated the link between competencies and strategy by stressing the importance of establishing a *strategic architecture* to focus the efforts of the firm. Using the analogy of a tree with its branches being the various products, the company establishes strong roots by considering aspect of their core competencies in relation to

their current products and customers and to future opportunities. Doyle et al. (1992) recognized that a firm can have attitudes, or *strategic orientations*, that reflect the objectives of its managers as well as the “myriad of pressures which arise from the product, labour and capital markets in which they operate and the constraints provided by shareholders and other stakeholders” (p. 59). The strategy and marketing literature has defined a number of strategic orientations including market, entrepreneurial and learning orientation.

Entrepreneurial Orientation

One particular set of firm capabilities is associated with its ability to act entrepreneurially. While the term entrepreneurial is often applied to an individual involved in the creation of a new venture, the new venture itself can be characterised as entrepreneurial (Covin and Slevin, 1991). The term is not, however, limited to describing new ventures. Schumpeter (1950) claimed that entrepreneurship may be more common in larger organisations that are able to allocate more resources to innovation. He in fact equated entrepreneurship with technological progress and business growth. More recent literature covers a wide range of topics related both to the individual entrepreneur and new business entry (Shane, 2003) as well as corporate entrepreneurship (Dess et al., 2003) which includes the role of opportunities, decisions to exploit, resource gathering, strategy, leadership, modes of organisation and internationalisation.

Building on the strategy and entrepreneurship literature, the constructs of autonomy, innovativeness, risk taking, proactiveness and competitive aggressiveness are considered together to describe an entrepreneurial orientation, or EO. The construct was developed by Lumpkin and Dess (1996) who clearly distinguished EO from

entrepreneurship, which they considered to be related to the new entry itself. EO, on the other hand, describes the manner in which the new entry is made, referring to the decision-making styles of managers, their methods and practices used when acting entrepreneurially. EO is a latent construct associated with the attitudes and behaviours of an organisation rather than its morphology or age, and with its capabilities rather than resources. A great deal of empirical evidence has been gathered on the effect of an EO and a firm's performance. Both Dess et al. (2003) and Jantunen et al. (2005) underscored the importance of dynamic capabilities development and EO and describe the relationship between EO, dynamic capabilities and performance. The effect of EO on growth and profitability is however highly dependent on industry and environmental factors according to Lumpkin and Dess (1996).

In later empirical tests of the construct Lumpkin and Dess (2001) examined the effects of dimensions of EO among companies operating within various industries and competitive groups each with their peculiar market dynamics. The study found that mature, slow growth industries tend to breed intense competition between the major players and require a particularly aggressive entrepreneurial style for a new venture to succeed. Competition on price and the conservative exploitation of scarce resources for cost reduction is the *modus operandi* in such hostile competitive environments (Lumpkin and Dess, 2001). Industries in their early stages, on the other hand, tend to have higher growth rates, more resource availability and are less competitive (Porter, 1980). A dynamic environment allows for more exploration, risk taking and innovativeness as higher levels of slack resources allow companies the luxury of experimentation (Bourgeois, 1981). There would therefore tend to be a high degree of variation among

offerings and levels of firm performance and growth within an industry in its early stages when demand uncertainty is high. This reinforces the importance of the strategy and strategic orientations driving entrepreneurial decisions.

Market Orientation

Market orientation (MO), as conceptualised by Narver and Slater (1990), comprises *customer orientation*, *competitor orientation*, and *inter-functional coordination* as properties of organisational culture that promote behaviours leading to “creation of superior value for buyers and, thus, continuous superior performance for the business” (p. 21). A customer orientation is established through developing an understanding of their customer’s needs. Slater and Narver (1999) advised though that being customer oriented does not only mean being customer-led but also customer-leading, that is anticipating unmet needs when appropriate. Competitor orientation involves an ongoing assessment of the capabilities and apparent strategies of current or potential competitors. Inter-functional coordination is critical in actually achieving value for the customer as it involves aligning all the functional areas towards this goal.

Kohli and Jaworski (1990) took a somewhat different perspective with an emphasis on knowledge. They also defined MO as a multi-dimensional construct, in this case including *intelligence generation*, *intelligence dissemination* and *responsiveness*. Intelligence is considered to include more than just customers’ expressed needs but an analysis of exogenous factors related to competitors and the market in general that may influence customers’ future needs. Similar to concept of inter-functional co-ordination developed by Narver and Slater (1990), intelligence dissemination is the mechanism through which information is shared and activities coordinated between all the

departments involved in delivering customer value, which represents the responsiveness component.

Narver et al. (2004) distinguished between *responsive* market orientation, whereby the company is led by customers' expressed needs, and *proactive* market-orientation in which the firm attempts to satisfy customers' latent needs.

Learning Orientation

The gathering and dissemination of market intelligence is considered to be a key factor in establishing a market orientation within an organisation (Narver and Slater, 1990; Kohli and Jaworski, 1990; Slater and Narver, 1999). A firm must know about its customers, its competitors, consumer tastes, and technology or industry trends in order to make an informed response. Entrepreneurs that innovate without adequate knowledge the market risk failing to meet market demand (Calantone et al., 2002). This does not imply however that all innovation must be market led, that is based on explicit customer demands. It may also involve leading the market in providing products or services for which there may be latent or implicit demand due to shifts in the market environment (Atuahene-Gima et al., 2005). Both these types of innovation require information or knowledge from outside the boundaries of the organisation. This raises the question of how effective are companies in managing the information and how well they are able to absorb it within their knowledge base. Individuals in the firm learn, but collectively as an organisation a firm is able to assemble and maintain a store of knowledge about its customers, competitors, the market and its internal processes that transcends the individual (Levitt and March, 1988). In other words, as staff turn over this knowledge is retained within the organisation. How

well a company is able to gather, manage and maintain this knowledge, and to learn as an organisation corresponds to its learning orientation (Slater and Narver, 1995).

The ability to generate knowledge from learning was found by Baker and Sinkula (1999) to enhance an organisation's market orientation by providing a more effective mechanism for intelligence gathering and dissemination. They also provided evidence of a direct link between learning orientation and performance explained by the occurrence of *generative learning* that leads to organisational and technological innovation (Baker and Sinkula, 1999). The notion that this type of learning is necessary to create and sustain competitive advantage is supported by the work of Cyert and March (1963) on the relationship between organisational learning and economic decisions within the firm. Behavioural and evolutionary theories of firm maintain that organisations learn by encoding information related to events in their history and incorporating it into routines and processes (Levitt and March, 1988, Nelson and Winter, 2002). This theory argues that organisations have memory and are able to learn from history and adapt which in fact implies a form of intelligence. Organisation learning, according to Eisenhardt and Martin (2000), is involved in the development of dynamic capabilities which are considered to allow firms to sustain their competitive advantage as their environment changes.

Strategic Orientations and Performance

Strategic orientations, according to Gatignon and Xuereb (1997), are the means by which firms enhance and sustain performance. The study analyses the impact of three different strategic orientations on innovation performance: (1) customer orientation: understanding current customers' needs and provide them with ongoing superior value, (2) competitor orientation: following and responding to competitors' actions, and (3) technological

orientation: meeting emerging needs through technology developments. In highly uncertain markets, a high level of customer and technological orientation both result in enhanced innovation performance. This was hypothesised to be related to superior information gathering to reduce uncertainty. Both these orientations are considered to be ineffective when market demand is clearer; in these times a competitive orientation is advantageous. Manu and Sririm (1996) also observed that such factors as industry and market concentration, product cycles, competitive forces or opportunities influence a firm's innovation strategies and its effectiveness

These findings were later supported by Lumpkin and Dess (2001) in their study of two aspects of entrepreneurial orientation and their effect on firm performance. They found that industry cycle played an important contingency role in determining the effect of a company's orientation. In later stage mature industries, a highly competitive orientation was associated with higher performance. In more dynamic, growth-stage industries, a proactive orientation yielded better results as firms were more in tune with opportunities and able to react with innovative market offerings. A firm's effectiveness in implementing these strategies however may depend on the cohesiveness of the top management team (Auh and Menguc, 2005), particularly in diverse cross-functional teams.

2.2.2. *Innovation*

Innovation involves the development of products or processes that are new to the market, or possibly just new to the firm. New to market innovations are important sources of competitive advantage according to the resource-based perspective in that they are a

unique and immobile resource, assuming of course that the innovation is difficult or costly to replicate. An innovation, which may be causally ambiguous, will at least provide a head-start over competing firms that may eventually implement similar technologies or processes (Peteraf, 1993).

Amit and Schoemaker (1993) considered process and product innovations to be among a firm's *strategic assets*, which are "the set of difficult to trade and imitate, scarce, appropriable and specialized resources and capabilities that bestow the firm's competitive advantage" (p. 36) and are capable of generating organisational rents. One cannot assume however that every innovative product or service leads to competitive advantage. This point was clarified by Ahujah and Lampert (2001) as they differentiated between invention and innovation in which the latter implies successful commercialisation of the new product or service. Their research explained how the ability for a company to create radical or breakthrough inventions is actually a form of *meta-learning* or dynamic core competence that reflects "a firm's unique and specialized problem-solving capabilities" (p. 523). Siguaw et al. (2006) also defined an *innovation orientation* knowledge structure that identifies a firm's innovation-related competencies that are the result of organisational learning. The research states that this type of learning is part of a continuous process that allows long-term survival through sustained competitive advantage.

Innovation not only results in learning, but is also a product of organisational learning, as reported by Calantone et al. (2002) who found that innovation was positively related to learning orientation. This study went on to prove that innovation is in turn positively related to firm performance due to the competitive advantage obtained through

a commitment to learning customer needs as well as gathering competitive and technological information. The relationship between innovation and performance is also evident in Siguaw's (2006) study.

This may be a complex relationship though, as demonstrated in the research of Cozzarin and Percival (2006), and Percival and Cozzarin (2008) that investigated complementarities between organisational strategies and innovation. A number of strategic factors were tested for complementariness in respect to profitability. For example a firm with both a market focus and world-first innovation was found to perform better than a firm with only one of these factors. The research showed that as strategies for innovation become more complex, a firm is more likely to achieve a sustainable competitive advantage.

According to the Baldwin (1994) study of 1,480 growing Canadian small- and medium-sized firms (GSMEs), 30% of companies attributed success to innovation strategy. These companies reported internal and external sources of innovation, including customers and suppliers on the outside, and management, marketing and production departments on the inside. The study measured success within the set of growing firms in terms of gain in market share and profitability growth over four years. The authors found that innovation strategy and activity were the most important factors differentiating more-successful from less-successful firms. Among these strategies and activities were: building R&D capabilities; developing new markets (particularly international); developing or obtaining technological capabilities; decisions related to new product development or introduction; and improving internal processes (production or management) to increase efficiency. This study complements the results of a similar

report by Baldwin and Johnson (1995) that found that more innovative firms were more successful in gaining market share and achieving higher profits. This study found that innovation is associated with a number of management practices and strategies that lead to success, including: obtaining low-cost financing; maintaining a marketing focus by introducing products that meet customers' needs; making use of government programs; and training of staff and managers.

Freel and Robson (2004) claimed that although there have been numerous empirical studies indicating a relationship between innovation and performance or growth, the measure of superior performance in these studies was variable and not easily compared. Their contribution was to administer a large scale survey to 748 service and 597 manufacturing firms in order to better explain the relationship between various types of innovation and growth of employment, turnover, productivity and profit margin over a three-year period. The authors maintained that although growth may appear to be a stochastic process, there were certain variables strongly associated with growth. For both service and manufacturing firms, one of these variables was the degree of new product development which was found to be related to employment growth. In the case of manufacturers, new product development had a negative effect on sales; the study explained that the benefits could be lagged by 5 to 10 years. Incremental process development was found to be associated with increased sales for service-based firms. The authors caution however that the distribution of performance measures was negatively skewed, implying that a perceived positive relationship between innovation and growth may be due mainly to a small number of high-performing outliers. In addition, the study concluded that future research could benefit from taking into consideration scenario in

which firms try to innovate and fail which, according to their analysis, results in a worse outcome when compared to firms that did not try to innovate.

2.2.3. *Capabilities and Competencies*

Resource-based theory explains the *content* of strategy in terms of the firm's resource base, and the *process* of strategy in terms of its capabilities and competencies. Henderson and Cockburn (1994) considered an organisational competence to be a source of competitive advantage if it satisfies the following conditions: it is heterogeneously distributed among firms in an industry; it is impossible to buy at less than its market value; it cannot be easily reproduced by competing firms. This study described two types of competencies: architectural and component. The latter refers to skills or assets specifically used in day-to-day problem solving while the former implies a process for integrating knowledge gained from these activities to develop new competencies. Component competencies include resources, knowledge and skills, and technical systems while architectural competencies relate to dynamic capabilities as described by Teece et al. (1997).

The dynamic capabilities approach is defined as “the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (p.516). This concept encompasses the development and renewal of unique managerial and organisational processes that become a source of competitive advantage. These processes are shaped by specific asset positions which include not only its technology, intellectual property and customer base but its external network of suppliers and complementary firms (Teece et al., 1997).

Networking as a Dynamic Capability

A company's success is not determined at the industry level, by its position within a competitive group, or by firm-level attributes and resources alone. Companies operate as part of co-operative network that forms their value chain. Ritter et al. (2002) proposed that "firms are not able to decide whether to have relationships or not" (p. 1) as it is the relationships within their networks define them as a company. Mort and Weerwardena (2006) built on the work of Ritter (2002) and Eisenhardt and Martin (2000) to apply a dynamic capability framework in understanding a firm's network capability as "a purposeful set of routines within its networks, resulting in the generation of new resource configurations and the firm's capacity to integrate, reconfigure, gain and release resource combinations" (p. 558).

Not only do these networks form the chain between suppliers and customers, but they may branch out to institutions and universities for research and development, financing partners, consultants, strategic alliance partners, and even to competitors in some cases (Ritter, 2004). It is therefore also important to consider a firm's ability to actively plan the structure of its network, to manage the relationships within it, and to maximize the effectiveness of their network as a means of acquiring knowledge. Ritter (1999) referred to this organisational capability as network competence (NC). It is with this knowledge that the entrepreneurial firm can, depending on its environment, either exploit existing opportunities more efficiently than its competitors, or explore new opportunities and be the first to the market with an innovative product or service (Caloghirou et al., 2006). These are two different, but equally legitimate means, by which

a firm can make use of its network to leverage resources and capabilities beyond its boundaries.

Companies need to develop these networks however, which is not without cost. Seeking, establishing and maintaining partnerships within the firm's network are resource-intensive processes (Wincent, 2005). Ritter and Gemunden (2003) assessed the risk associated with each partnership in that the cost of establishing it will be sunk if the partner ceases operations. Potential gains of resources and knowledge through these partnerships must also be weighed against the possible loss to an opportunistic partner (Hamel and Prahalad, 1994; Williamson, 1981).

2.3. Perspectives on Rapid Growth

Earlier in this section a number of alternate explanations for a firm's growth, and in fact its existence, were examined within the overarching theme of sustainable competitive advantage. After defining rapid growth, the section will conclude with a review of the literature that examines the antecedents of rapid growth in firms.

2.3.1. Definitions

Before considering explanations for rapid growth it will be necessary to provide a definition. The term has been operationalised in a number of studies using both financial and non-financial measures of growth, for various timeframes and with various limits on initial firm size. For the purposes of this study, I have chosen to use the definition developed by the OECD (2008) as it provides an internationally comparable standard. The OECD report categorizes firms as being *high-growth* if they have achieved an

average rate of growth in employment or turnover of at least 20% annually for a period of three years. *Gazelles* are defined as high-growth firms that were founded up to five years prior to the start of the measurement period. Firms of fewer than 10 employees at the start were excluded as the smaller initial numbers introduce a positive skew to growth rates. This is similar to the definition used by Industry Canada (Parsley and Halabisky, 2008) in which companies were categorized as being hyper growth (at least 150%), strong growth (50 to 150%), slow growth (0 to 50%), or declining (negative), in terms of employment growth, over a period of four years. The OECD definition was adopted to allow the data to be compared with those of other OECD countries, as is expected to be the case for this study. Table 5 shows the categories and distribution of Canadian firms within each of the growth categories.

2.3.2. *Theory and Empirical Evidence*

Much of the early literature on rapid growth in companies was descriptive. Birch (1987) examines the nature of change in employment at the firm level across the US economy in which some firms grow rapidly while others, mainly mature firms, decline and shed jobs. In this study however Birch made a remarkable observation: small firms, with up to 19 employees, accounted for 88% of new jobs during the period of 1981 to 1985. Though it seemed counter-intuitive, smaller firms also offered greater job stability. This study was followed up by Birch and Medoff (1994) who popularised the term *gazelles* to describe those small (but not micro) size companies that produce the majority of the jobs in the economy. These works attempted to determine what makes these firms difference from the *elephants* and the *mice* (larger and smaller firms). This created a great deal of interest

from academia and government and promoted further research into determining the mechanisms behind rapid growth, as did a study by Wong et al. (2005) which confirmed the economic importance of fast growing new firms.

Table 5 Measures of Firm Growth

Standard	Construct	Approximate Distribution In Canadian Firms*	Measures	
			Employment Growth	Turnover Growth
OECD	High-growth Enterprises	10% manufacturing, 6% services	> 20% annualised over 3 yrs, >= 10 employees at t-2	> 20% annualised over 3 yrs, >= 10 employees at t-2
	Gazelle Enterprises	.8% manufacturing, .4% services	> 20% annualised over 3 yrs >= 10 employees at t-2, age <= 5 at t	> 20% annualised over 3 yrs >= 10 employees at t-2, age <= 5 at t
Industry Canada	Hyper Growth Firms	4% of employers	>=150% over 4 yrs	N/A
	Strong Growth Firms	12% of employers	50-150% over 4 yrs	N/A
	Slow Growth Firms	41% of employers	0-50% over 4 yrs	N/A
	Declining Firms	43% of employers	< 0% over 4 yrs	N/A

* From OECD (2008) and Parsley and Halabisky (2008)

Feeser and Willard (1990) analyzed the relationship between founding strategy and high, or low, growth. They concluded that if the entrepreneur’s early strategic decisions of scope (market, technologies and products) were good, that is their direction did not switch later, the firm was more likely to grow quickly. The questions that remain unanswered though are: what constitutes a *good* decision – one that will lead to rapid growth, and what characteristics or capabilities are associated good decision-making within the firm?

These implicit questions seem to capture the essence of strategic management, which Ansoff (1985) described as “the adaptation *activity* which changes the markets the firm serves, the technology it offers, the products/services it sells, the way it sells, promotes, advertises ... (that) develops the future growth and profitability of the firm” (p. 2). Ansoff’s definition implies a model of the firm interacting with, and reacting to, its

environment: receiving information from the market, applying technology and resources to inputs to produce products and services to supply the market. It is the difference between the model of the firm as an input-combiner, or black box, and a firm that makes good decisions that will lead to future growth is the realm of strategy. Though the execution of strategy involves individual entrepreneurs or managers, the focus of this review and the study in general is on characteristics and orientations of the firm rather than at the individual level.

Market-related strategy factors into a number of articles on high-growth firms and firm performance, including that of Siegel et al. (1993) who compared the strategic profiles of small- and large- sized firms which had experienced either high or low growth. They found that successful small companies were focused on fewer products, while their larger counterparts were more diversified. Market orientation and the use of advanced technology was associated with the larger high-growth firms, however the smaller younger high-growth firms focused less on customer interaction. Kim and Mauborgue (1997) studied the strategies of 30 companies worldwide finding that the high-growth companies, rather than focusing on the competitors and existing capabilities, produce or provide what most customers value in common. This is effectively a market-oriented innovation strategy. In fact a market-driving orientation has proved to be successful strategy for growth for a number of large retailers including Home Depot, Marks and Spencer and Wal-Mart as explained by Kumar (1997). It involves transforming the marketplace through technology and organisational innovation.

The operational aspects of firms were addressed by Stanley et al. (1996) who note the importance of organisational structure for sustained growth as opposed to production-

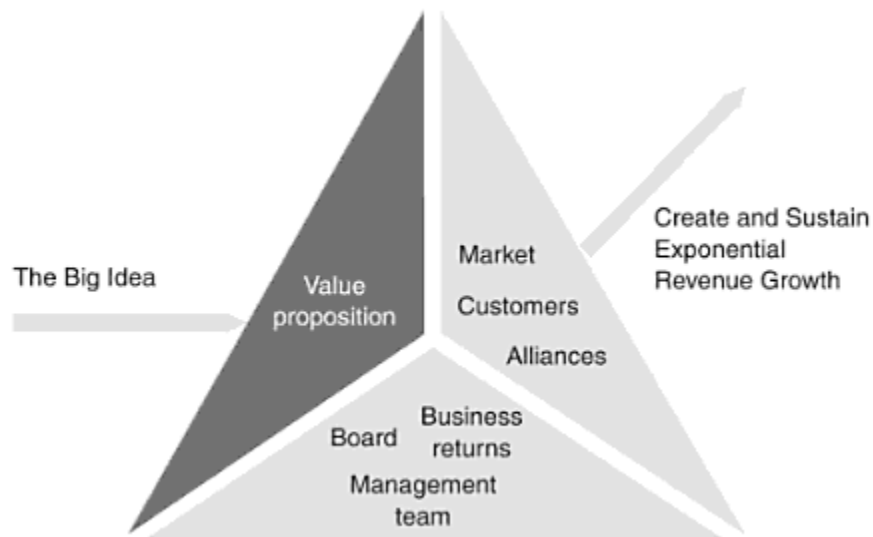
related factors such as capital and R&D investment. However, both Stanley and Amaral et al. (1997) observed that, among companies of the same size over the same period, the distribution of annual growth rates displayed an exponential form related to sales, number of employees, cost of goods sold and assets. This implies that only a small percentage of the companies studied had the required characteristics to achieve rapid growth, which was later confirmed by Bottazzi and Secchi (2003) in a study of Italian manufacturers. Baum and Walley (2003) observed however that the effect of organisational characteristics on growth is moderated by the speed at which strategic decisions are made within the firm. Firms with growth ambitions plan for the desired future state by hiring the people with experience from larger firms and by putting formal processes in place to facilitate the management of a larger organisation (Hambrick and Crozier, 1985; Kotter and Sathe, 1978). This involves selecting, at each level of the firm, the right people with the required skills who are capable of growing with the organisation.

Von Krogh and Cusumano (2001) emphasize the importance of having explicit strategies for growth combined with a learning approach to keep up with changes in industry and supporting technology, as well as with customers' demands. The effect of stagnation was also observed by Almus (2002) in a study of German manufacturing firms where it was again found that only a small percentage of companies grew rapidly.

Barringer et al. (2005) performed a quantitative content analysis of narrative descriptions of rapid-growth and slow-growth firms to build a model around various attributes associated with rapid growth including founder characteristics, firm attributes, business practices, and human resource management practices. A similar study performed by Thomson (2006) led to a model of seven essential firm characteristics that are

considered to be the pre-requisites for exponential growth, as shown in Figure 5. The sample of high-growth firms were selected from the Compustat database according to their size at inception (IPO) and their rate of growth to over one billion US dollars in revenue. After eliminating major acquisitions, Thomson was left with a list of *blueprint* firms that exhibited exponential growth to be used as the subject of an exhaustive analysis of organisational characteristics. The results of interviews, surveys and content analysis were quantified and firms were scored on a number of criteria expected to influence growth. The blueprint firms' scores were compared to a set of normal or low-growth firms resulting in an model consisting of the of the following *seven essentials* for growth: (1) a breakthrough value proposition, (2) a high-growth market segment, (3) *marquee* customers, (4) *big brother* alliances, (5) maximizing shareholder returns, (6) strong leadership for both inside (operations) and outside (markets, customers, alliances), (7) board comprised of experts on growth.

Figure 5 Blueprint Seven Essentials



Adapted from Thomson (2006)

Networks and Alliances

There has been a growing interest in the relationship between social capital, and inter-firm networks or alliances and rapid growth. Entrepreneurs are able to access valuable resources and obtain competitive advantage through *networking activities* (Zhao and Aram, 1995). The study posed questions to managers in a group of low-growth and high-growth new ventures in China which revealed a greater range (the number of contacts) and intensity (frequency of contact and measure of resources obtained) of entrepreneurial networking in the high-growth group. This is supported by Florin et al. (2003) who argued that social capital “leverages the productivity of a venture’s resource base” (p. 374) leading to sustainable competitive advantage. There is however a limit to the usefulness of social and reputational networks beyond the new venture stage. In their

study of high-growth firms, Lechner and Dowling (2003) found that marketing *co-competition* networks begin to take on more importance as the company grows, followed by technology partnering. In later stages network management becomes critical for the future growth and maturation of the firm. Their research has led to a greater understanding of a balance between strong and weak ties, which are considered important for firm growth, and the interplay between egocentric and sociocentric networks. In a similar longitudinal study of social capital, entrepreneurial networks and growth, Partanen et al. (2008) developed a framework for the development of networks during four phases of SME development leading to rapid growth.

Alliances are considered to be a means of achieving rapid growth especially among biotechnology firms, although Niosi (2003) argued that alliances alone are not enough. He found that exports, product specialisation, firm age and access to venture capital to be equally important in explaining rapid growth. Other inter-firm partnerships, including supply chain partnerships, are also important to growth, as found by Wynarczyk and Watson (2005) in their study of sales and employment growth of U.K. subcontractors.

Business networks are also considered to be an important part of the internationalisation process, which is often associated with rapid growth. Chetty and Campbell-Hunt (2003) studied rapid growth through internationalisation of small to medium manufacturing firms in New Zealand, finding that business networks are a critical to the success of the firms that undergo sudden internationalisation. Loane and Bell (2006) applied a knowledge-based view in their analysis of rapidly internationalising

firms in finding that these firms require new networks to be built to support their development.

2.4. Summary

The literature review section has provided a summary of the extant literature on firm growth as well as a theoretical basis for sustainable competitive advantage and growth using IO economics and resource-based theories of the firm. This was supplemented by an explanation of the effects of strategic orientations, innovation, capabilities and competencies on sustained competitive advantage and performance. Finally, the review explored the recent theoretical and empirical literature on rapid growth finding that there appears to be a scarcity of empirical studies and explanatory models of rapid growth. While much of the recent literature points to networking as an important factor in performance and growth, there is a gap when it comes to integrating the concept of networking within a strategic orientation framework to explain rapid growth.

3. Model of the Antecedents of Rapid Growth

This section builds on the literature reviewed in section 2 to develop a model to explain the phenomenon of rapid growth that occurs in a small percentage of the population of firms. The model is based on resource-base theory of the firm and strategic management theory and combines a number of approaches to develop a more complete explanation for rapid growth.

While resource-based theory explains the *content* of strategy in terms of the firm's resource base, and the *process* of strategy in terms of its capabilities and competencies, *strategic orientations* gives us a view of strategy as a set of *vectors*. Strategy has a *direction*, in the terms of goals, but must also have a measure of *force*, as firm resources are limited. In other words, a company has to make choices in allocating key resources to achieve its goals. The net result determines the future profitability and growth of the firm largely through the process of creating innovative products and services.

Two strategic orientations that have been associated in the literature with firm performance and growth are market orientation and entrepreneurial orientation. Market orientation (MO) describes the firm's relationship with the market as being *responsive*, that is to expressed customer demand or to competitors, or *proactive* which involves leading the customer and determining latent demand. Entrepreneurial orientation (EO) describes the style in which a company addresses market demands with terms including *innovative*, *proactive* or *risk-taking*. Depending on the industry, the competitive environment, and aspects of the firm, a company must determine the appropriate balance

or these strategic orientations and their dimensions in order to achieve its goals. A model of the antecedents of high-growth firms must therefore include both these strategic orientations and their interactions.

Although the resources available to a firm to execute its strategies are finite, it is able to extend its capabilities through external business networks. Firms are able to leverage resources outside of their boundaries through social and inter-firm networks, partnerships and alliances for the purposes of innovation, production and marketing. A model must therefore put the firm in the context of an egocentric network to get an accurate view of its resources and capabilities. Network competence (NC) provides a measure of a firm's ability to establish and maintain relationships within its network and evaluate the effectiveness of these relationships towards enhancing collaboration, knowledge sharing and productivity.

3.1. Innovation, Strategic Orientations and High-growth Firms

3.1.1. Innovation

In an analysis of service firms, Cainelli et al. (2005) found that innovation has a positive influence on growth and productivity. In fact, the productivity enhancement acts as a self-reinforcing mechanism to encourage more innovation. Manu and Sriram (1996) argued however that the innovation does not necessarily lead to growth or firm survival as this depends on the type of innovation, the marketing and financial aspects, and the timeframe.

The lack of a clear relationship between innovation and growth may be due to the fact that most empirical studies have developed models based on normally distributed growth rates. Coad and Rao (2008), using a quantile regression analysis of high-technology sector firms, found innovation to be critical to a small number of ‘superstar’ fast-growth firms.

The concept of *innovation orientation* was described by Sigauw et al. (2006), however the study suggested that a priority for future research must be to develop a standard measure. For the purposes of this study, the innovation orientation (IO) construct is operationalised as a measure of both a firm’s commitment to innovation and its innovation performance. By classifying firms as either high-growth or not, this research tests the following hypothesis:

H1: IO has a direct positive effect on high-growth.

3.1.2. Strategic Orientations

Ansoff (1985) defined two distinct but inter-related activities that describe the relationship between the firm and its environment. Competitive (or *operating*) activities are the day-to-day activities of the firm which allow it meet current demand for its products or services. The second type is *adaptation* activity which describes the changes the firm makes in its technology, the products or services it produces, the way it promotes them, and the markets it will target. The latter is considered to be *strategic* in that it “develops the future growth and profitability of the firm” (p. 2). Ansoff stated that since the mid-twentieth century changes have been less predictable as the business environment in all industries becomes increasingly complex and turbulent. Events are

now often discontinuous and novel rather than familiar and extrapolated from experience. Firm have a shorter time in which to respond to unpredictable surprises or *weak signals* (p. 4). In response to this trend, firms have had to develop procedures that, when combined with resources, form complex and dynamic capabilities, directed by *strategic intent* toward attaining competitive advantage (Hamel and Prahalad, 1989). As an embodiment of the firm's strategic intent, *strategic orientations* describe the firm's commitment to particular strategies which, according to Gatignon and Xuereb (1997), are either customer-, competitor- or technology-based and are related to the firm's innovative behaviour.

Firm growth is considered to be influenced by internal (*strategic*) and external (*economic*) factors (Hoskisson et al., 1999). While controlling for external factors so far as is possible, this research focuses on the internal factors that define the strategic direction of the company. Of these strategic orientations, I have chosen to focus on two – market orientation and entrepreneurial orientation – which I consider to be the key antecedents of sustainable competitive advantage and growth. Applying the resource-based view (e.g. Wernerfelt, 1984; Barney, 1991) to include resources made available through business networks, the firm is able to “leverage the complementary capabilities of other organisations” (Coviello and Munro, 1997, p. 379) towards innovation and high-growth.

It is through the examination of these two orientations in the context of other aspects of the firm and its environment that this research will provide an explanation of rapid growth *both directly and through innovation*.

Market Orientation

The market orientation concept, according to Day (1990), includes both customer- and competitor-orientations. Narver and Slater (1990) defined a customer orientation as a firm's ability to continuously generate value for its target customers. Gatignon and Xuereb (1997) concluded that a customer orientation influences a company's innovative behaviour through the "ability and the will to identify, analyse, understand, and answer user needs" (p. 78). A competitor orientation is similar, but firms instead respond to competitors' actions, as described in Narver and Slater's research. Gatignon and Xuereb went on to explain that companies with this type of orientation innovate and compete by developing products that imitate, or improve upon, those existing in the market. Depending on the market conditions one strategy may be preferable to the other, but overall market orientation has been found to be associated with superior performance. Organisational innovation was found by Han et al. (1998) to be directly affected by market orientation (MO). In fact Han's study tested and substantiated innovation's mediating role between MO and corporate performance.

Market orientation (MO) is the embodiment of the marketing concept within the processes and routines of the firm (Jaworski & Kohli, 1993). It has been developed through two main streams of research. Narver and Slater (1990) view MO as related to the culture of the firm and define it in terms of customer and competitor orientations along with inter-functional co-ordination. Kohli and Jaworski (1990) promoted a behavioural approach based on the generation and dissemination of information and the organisation's ability to respond to it. The research on MO has evolved in response to criticisms that companies may listen too closely to their customers and miss opportunities

to be innovative. This led Narver et al. (2004) to distinguish between *responsive* market orientation, whereby the company is led by customers' expressed needs, and *proactive* market-orientation in which the firm attempts to satisfy customers' latent needs. The latter may lead to innovation as the firm responds to latent demand with new products or services. MO is considered a latent construct and is measured with two multi-item indices that comprise the dimensions of market orientation. The model makes use of the responsive-proactive market orientation scale developed by Narver.

H2: MO has a direct positive effect on high-growth.

H3: MO has an indirect positive effect on high-growth mediated by IO.

Entrepreneurial Orientation

Entrepreneurial orientation (EO) consists of five dimensions: autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness which can vary independently to impact firm performance (Lumpkin and Dess, 1996). This would imply that a company could still be considered entrepreneurial even though its products are imitative and it has incurred less risk than more innovative companies. The dimensions of EO can each be considered as latent constructs measured by multi-item indices, although innovativeness, risk taking, proactiveness are considered together as the core set of entrepreneurial characteristics by Covin and Slevin (1989). The study finds that this core EO construct has a positive effect on performance for small firms in hostile competitive environments.

Entrepreneurial efforts were considered by Covin and Slevin (1989) to be means of coping with a hostile environment. An entrepreneurial strategic posture can "allow a firm to keep pace with, and possibly define, industry technological changes" as it

represents management's inclination to take risks, to innovate for competitive advantage and aggressively compete, according to Covin et al. (1990, p. 397). The proactiveness dimension of entrepreneurial orientation (EO) can create first mover advantages leading to increased sales (Zahra and Covin, 1995). The authors noted however that empirical results are mixed when reporting the relationship between EO and performance or growth. Their study found though that an entrepreneurial strategic posture does have a positive influence on performance when the firm has a "cohesive and focused strategy mix or pattern of strategic decisions" (p. 408). Lumpkin and Dess (1996) proposed a relationship between EO and performance is that is context-specific depending on environmental and organisational factors, while Zahra and Garvis (2000) suggested entrepreneurship as a modifier between environmental hostility and performance. Hitt et al. (2001) argued however that EO, technological capabilities and financial resources are the main predictors of firm growth. The importance of EO to the success of the firm was acknowledged by Wang (2008) with the caveat that examining its direct effect on performance may not give a complete picture.

Regardless of the lack of consistent empirical evidence, I argue that EO has an important role in value creation in the firm in combination with other organisational and environmental factors. Dimensions of EO, particularly innovativeness and proactiveness, have an impact on the internal practices of a firm. Proactive problem-solving and the resulting innovative internal process improvements contribute to a company's efficiency and effectiveness in leveraging its available resources. The innovation process is itself driven by dimensions of EO including, of course, innovativeness but also autonomy, risk taking and proactiveness.

H4: EO has a direct positive effect on high-growth.

H5: EO has an indirect positive effect on high-growth mediated by IO.

The model includes two complementary strategic orientations (MO and EO) capturing a company's ability to: learn about the market; compete or co-operate; listen to or lead their customers; and determine whether to imitate or innovate. Having an MO appropriate to the industry and to the firm's overall strategy is important to determine what to do, while a firm's EO reflects the manner in which it is done. As Coven and Slevin found, the dimensions of EO can vary independently; this is important in that a successful company will tend to adopt an entrepreneurial strategy that is appropriate to market conditions. In a hostile, highly-competitive market a firm may adopt a reactive MO (by gathering information about what customers want and what competitors are doing) combined with a competitive-aggressive EO (perhaps through cost cutting, aggressive promotion or product imitation) in an attempt to retain or gain market share. In an early stage turbulent market, a firm's growth strategy may be to take a proactive MO (by learning about the market and latent demands) combined with a proactive, risk taking, and innovative EO (for example through R&D, new product development, and innovative marketing). The model includes both these multi-dimensional orientations in order to allow for, as Schreyer (2000) stated, the multiple possible explanations for high-growth firms. The complementary nature of these constructs is captured by the following hypothesis:

H6: The interaction of MO and EO has a direct positive effect on high-growth.

H7: The interaction of MO and EO has an indirect positive effect on high-growth mediated by IO.

3.2. Networking as a Dynamic Capability Leading to High-growth Firms

The resource-based view states that firms gain and sustain competitive advantage through the accumulation and development of valuable, rare, inimitable and non-substitutable resources (Barney 1991; Peteraf 1993). Transaction cost theory explains the existence of the firm as a means of avoiding opportunism and reducing costs by including key contracts inside the firm, in effect defining its boundaries (Williamson, 1981). Network-based business models, as described in Ritter and Gemunden (2003), appear to blur these boundaries by introducing the inter-firm network as both the site of economically efficient transactions and a means to make use of external resources.

Florin et al. (2003) explained the relationship between a firm's social capital and high-growth through increased access to resources within its network. The construct of network competence (NC) is introduced to the model as a measure of the firm's ability to collaborate with customers, suppliers, research institutions and competitors. The construct, developed by Ritter and Gemunden (2003), is found to have a positive association with product innovation success.

An analysis of German manufacturers revealed that network competence (NC) increases the extent of technical collaborations as well as firms' product and process innovation performance (Ritter and Gemunden, 2003). Networking increases the social capital of a firm which, as defined by Yli-Renko et al. (2002), is the total individual and organisational resources that the firm can "access or mobilize by virtue of possessing a

“durable network of relationships” (p. 282). Networks maximize a company’s leverage of its own resources by supplementing them with resources from its network that would be difficult to obtain in the market or prohibitive to keep within the firm (Wincent, 2008). These internal and network resources, in the form of human, social and financial capital, can be applied to entrepreneurial opportunities leading to sales growth , especially in the case of small firms in dynamic market environments (Sarkar et al., 2001).

Knowledge is also a factor when considering the effect of NC on strategy. It is the knowledge obtained from its network that an entrepreneurial firm can use, depending on its competitive environment, to either exploit *existing* opportunities more efficiently than its competitors, or to explore *new* opportunities (Caloghirou et al., 2006). The latter may lead to the introduction of innovative new products or services.

H8: NC has a direct positive effect on high-growth.

H9: NC has an indirect positive effect on high-growth mediated by IO.

Networking is also related to strategic orientations, including market and entrepreneurial orientation. Ritter et al. (2002) considered network competence (NC) to be related to market orientation (MO) since it includes measures of the ability to manage relations with customers or perhaps with competitors in cooperative relationships (aspects of MO). Wincent (2008) found that a firm’s network connectedness has a positive effect on its entrepreneurial behaviour, including innovation. In a study of spin-off companies, Walter et al. (2006) found that NC has a moderating effect on the relationship between entrepreneurial orientation (EO) and organisational performance. The following

hypotheses reflect the synergistic relationships between the strategic orientations and networking that allow for the creation of the appropriate conditions for rapid growth.

H10: The interaction of NC and MO has a direct positive effect on high-growth.

H11: The interaction of NC and MO has an indirect positive effect on high-growth mediated by IO.

H12: The interaction of NC and EO has a direct positive effect on high-growth.

H13: The interaction of NC and EO has an indirect positive effect on high-growth mediated by IO.

3.3. Exogenous Factors

In order to provide a more complete model of the antecedents to high-growth firms, a number of exogenous facts were included in the model. These included firm characteristics, the level of availability of resources, the level of dynamics and hostility in the competitive environment (as perceived by the firm) and the degree of internationalisation.

3.3.1. Firm and Owner Characteristics

A number of studies have been conducted in attempting to determine if high-growth firms are in some way different from the rest of the population by examining non-strategic or static characteristics. The Moreno and Cassillas (2007) study of 6700 SME's compared high-growth firms by age and size. They found, contrary to Gibrat's Law, that

high-growth firms tended to be smaller. The study however found no relationship between firm age and high-growth which implies the possibility for rapid growth is not limited to entrepreneurial start-ups.

The path the firm has taken to develop also has an impact its ability to grow. Mergers and acquisitions are a source of new knowledge which is considered to be an important dynamic capability of high-growth firms (Zahra et al. 2006). Spin-off or spin-out companies, by their nature, take with them knowledge and capabilities often associated with innovation and rapid-growth. The growth of knowledge-based enterprises is influenced both by their organisational legacy and their network of relations (Johansson, 2007). Knowledge intensity was also found by Autio et al. (2000) to be positively related to growth in international sales.

Additional covariates were included in the model to capture the owner's desire to grow, for example the importance of increasing sales or profitability. Goals such as these were found by Orser and Hogarth-Scott (2002) to be related to subsequent firm growth.

3.3.2. Slack Resources

Penrose (1959) considered the relationship between slack resources and growth explaining that expansion provides the possibility of deploying underutilised resources in a more profitable manner. Two resource-intensive processes that are found to be related to expansion are innovation (e.g. Kim and Mauborgne, 1997) and networking (e.g. Zhao and Aram, 1995). These processes would therefore act as mediators or moderators in relation to growth.

The availability of slack resources gives the firm the luxury of experimentation and innovation as supported by Moreno and Cassillas (2007). Their study of SME's found, consistent with resources and capabilities theories, that high-growth firms had a higher availability of idle resources. Conversely, financial resources were less available than for the average firm which is associated with the entrepreneurial motivation to seek out opportunities. Establishing and maintaining partnerships within the firm's network is also resource-intensive (Wincent, 2005) therefore the availability of slack resources would tend to have a positive impact on network competence.

3.3.3. *Competitive Environment*

As Doyle et al. (1992) implied, though strategy is developed within the firm it is heavily influenced by external forces. It can in fact be seen to reflect the firm's (or managers') perceptions of, and responses to, its environment (Hit et al., 2000). This orientation, also known as strategic choice or strategic fit, is described by Manu and Sriram (1996) as the ability for an organisation to align to its environment, or even alter its environment, for competitive advantage. Wright et al. (1995) highlighted the importance of maintaining a balance of internal and external strategic orientations in order to maximize returns and minimize risks. According to this research, firms that can maintain a balanced orientation are more successful than those with either a purely internal and external focus. This balance is alluded to by Voss and Giraud (2000) who constructed a model, the dimensions of which describe how a firm understands and manages the interaction with its environment. Firms may have to adjust their strategic orientations depending on the conditions of the market environment (Gatignon and Xuereb, 1997; Manu and Sriram,

1996; Lumpkin and Dess, 2001). According to Coven and Slevin (1989), hostile environments favour an entrepreneurial orientation whereas benign environments are better suited to a more conservative style.

It is apparent then that strategic orientations are closely tied to environmental conditions, though management teams must implement a balanced response that is in keeping with current market and technological conditions to be effective. This implies that strategic orientations are a form of dynamic capability in that they involve re-focusing and re-combing resources and capabilities for a moving target. It also follows that although each competing firm in an industry may react in the same rational manner to changes in the environment, differences in their abilities to assemble the appropriate resources and capabilities will tend to result in a heterogeneous distribution of economic rents. That does not however diminish the importance of strategic orientation in its role of guiding and directing the organisation towards sustainable competitive advantage (Narver and Slater, 1990).

3.3.4. Internationalisation

The internationalisation process is considered as a form of growth. According to Ansoff's (1965) market matrix, a company may choose to develop a market with existing products in new markets. Whether international growth is fundamentally different, or just an extension of domestic growth, is an open question. Recent studies have explored the concept of the international new venture, or INV, as a unique phenomenon (e.g. Oviatt and McDougall, 1994; Eriksson et al., 1997; Yli-Renko, 2002). The literature on rapid internationalisation has also noted the importance of knowledge networks and

partnerships to provide access to resources required for growth (e.g. Yli-Renko, 2002; Nummela et al., 2005; Bell, 1995; Coviello & Munro, 1997).

3.4. Theoretical Model

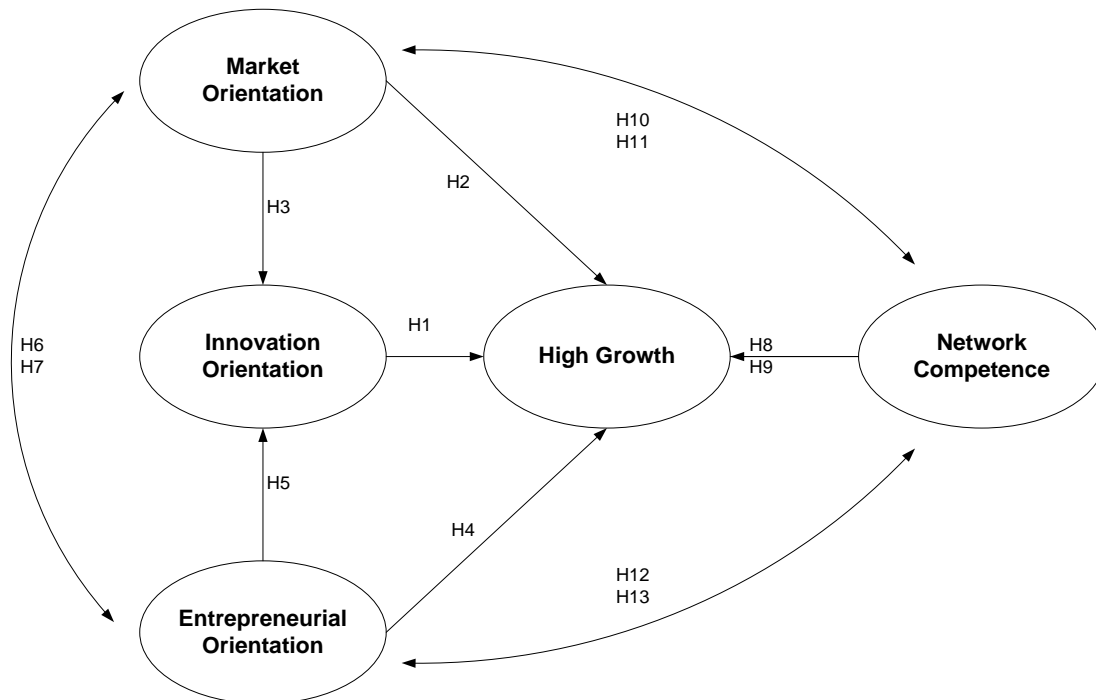
Companies with high levels of NC tend to have control of, or access to, sufficient quantity and quality of resources to design, develop and market innovative new products and services. Those companies also having a high EO are the most effective in leveraging these resources for innovation and growth. High MO firms are more receptive to market opportunities and to customers expressed or latent needs that drive innovation and growth. This was described by Atuahene-Gima et al. (2005) as a reactive or proactive market orientation, respectively.

Though NC does not does it fully explain how particular firms within the same industry or competitive group grow while others fail to thrive, it is through these cooperative relationships that the company is able to overcome resource shortages, partner in the development of entrepreneurial opportunities, and innovate in a dynamic environment (Yli-Renko et al., 2001; Lechner and Dowling, 2003; Walter et al., 2006). I therefore propose that the combination of high strategic orientations (EO and MO) with high NC is a more likely explanation of rapid firm growth than either attribute alone (see Figure 6).

An entrepreneurial company, that is one that is proactive, risk taking and innovative, is likely to leverage its social capital in seeking out or exploiting opportunities (e.g. Coviello and Munro, 1995, 1997; Yli-Renko et al., 2001; Jones and Coviello, 2005). Networks allow for the flow of market knowledge into the firm and the

creation of new knowledge which is considered to be a key component of the innovation process (e.g. Lorenzoni and Lipparini, 1999; Swan et al., 1999). As a result, a firm's NC influences its ability to sense market changes, discover opportunities and develop innovative solutions.

Figure 6 Theoretical Model



Note: For simplicity, not all mediation and moderation relationship paths are shown on the diagram.

In more hostile competitive environments, resources can be shared effectively across networks allowing higher levels of efficiency and the ability to outperform competitors (Pfeffer and Leblebici, 1973). Managing relationships with suppliers in the network also takes on more importance in times of scarce resources as does close contact with customers to maintain a 'feel' for the market.

Network management capabilities thereby enhance the effectiveness of an EO or MO, whether for an innovative *opportunity explorer* in a dynamic environment or an

intensely competitive *opportunity exploiter* in a hostile environment. Furthermore, entrepreneurial firms are more likely to be more proactive in developing and maintaining their networks. They would also tend to have a higher tolerance for the risks associated with entering into partnerships.

In this study, strategic orientations are considered to be the main drivers of innovation and growth however network competence introduces the possibility of extending the limits of a firm's capabilities through the leverage provided by its business networks. While market orientation helps to determine the firm's strategic direction, and entrepreneurial orientation drives the firm forward, networking provides access to additional valuable resources. These may be required, particularly in the case of smaller younger firms, to gain a sustainable competitive advantage through effective marketing and, for some, innovative new products or services leading to high-growth. A number of controls are included in the model to account for exogenous environmental and firm factors.

4. Methods

This study aims to further the research linking entrepreneurial orientation (EO), market orientation (MO) and network competence (NC) with rapid firm growth by providing empirical evidence of the relationships. While case studies at the firm level may in fact reveal more details of the unique resources and capabilities that propel particular firms to achieve stellar performance, there is still a lack of empirical evidence in the literature to explain the basic relationships between these constructs and growth or performance outcomes in firms. For this reason, a field study methodology was chosen using a questionnaire survey of key company informants. To provide a context for the empirical model and a better understanding of the phenomenon, the research will begin by developing a descriptive model of high-growth firms.

4.1. Descriptive Model

The research design involved first generating a demographic profile of high-growth firms based on age, sales, employment, exports, profitability, ownership (public/private) and industry using the entire 20 years (since 1989) of the annual Profit 100 list of Canada's fastest growing companies. These data were assembled from a variety of print and online sources into a SAS data set giving each company a unique id. This allowed tracking growth over a number of years for those companies that appeared in the list multiple times

The growth trajectories of these firms were modeled using growth mixture modeling (GMM), a type of structural equation model (SEM). The fact that many companies appeared in the Profit list more than once meant that at least four annual data points could be used to plot employee and sales growth. GMM requires at least three data points to model a growth curve. It however allows missing data points (assuming they are missing at random) therefore a higher order model is possible as companies in the dataset have between two and eleven annual data points (Jones and Nagin, 2007; Wang and Bodner, 2007). This categorized the firms into a number of latent groups based on rate of growth as a way of describing the distribution of growth trajectories in the data. The results of this study are described in Section 1.1.

This process was then repeated using the survey data gathered for this study in order to see if a similar pattern exists within this set of firms. The results of this analysis are reported in the next chapter.

4.2. Empirical Model

4.2.1. Survey Design

A survey using a structured questionnaire allows the exploration of the nature of the relationships between a number of latent constructs (including EO, MO, NC, strategic intent and competitive environment) and growth (sales and employment) for a very large number of firms in a non-invasive and anonymous manner. Podsakoff et al. (2003) proposed that method bias can be reduced through anonymity which encourages respondents (managers, owners or executives) to provide 'honest' responses to questions

that otherwise may reveal weakness to competitors or disclose proprietary information to the public. Within the bounds of respondent fatigue, a survey can contain numerous questions to measure individual constructs allowing for internal validity checks through convergent and discriminant analysis (Campbell and Fiske, 1959). This method allows the researcher to collect data reflecting behaviours and individual attitudes that are not available from archive data sources.

Surveys can result in large datasets to which statistical analysis technique can be applied. Large sample sizes allow validation of the research hypotheses with acceptable levels of power even in the case of very small effect sizes (Mingers, 2006), which are common in this type of research.

A questionnaire was designed based on a survey done for a Finnish study of international new ventures (INVnet), the results of which were reported in part by Falck (2008). The questions were kept as consistent as possible with the original in order to obtain comparable results. With the exception of some minor changes for grammatical consistency, the wording of scale questions was preserved to insure that the same constructs were being measured as in the original survey. The use of existing scales was preferred over the creation of new measures. There are numerous scales developed and refined over the last three decades to individually test the latent constructs under study. Additional contingency variables, measures of growth and profitability, and other categorical or quantitative data were gathered through the use of existing scale and single-item questions. Creation of new measures would require additional preliminary steps to ensure construct validity before including them in a questionnaire, as described by Diamantopoulos (2005).

4.2.2. Sampling

A large cross-sectional sample of Canadian companies was obtained from various industries in order that the results of the study may be generalised. Due to the size of the sample, an online survey was the only viable option for which almost all of the participants were recruited by email.

The sampling frameworks used in constructing this survey were two marketing databases – the Scott’s Directory (2009) and the Canadian Company Capabilities database maintained by Industry Canada (2009). Companies for which an email address was provided were extracted from these databases as this was required to recruit the participants.

In order to ensure that the sample included fast-growing firms (of particular interest to the study) this list was supplemented with additional company names found in Profit magazine’s annual listing of Canada’s fastest growing companies (Profit, 1999-2008). Companies were selected from the 1999 through 2008 issues in order to focus on companies that had exhibited recent growth and that were more likely to be in existence today. The only contact information provided however was the name of a key executive. Valid email addresses were obtained for 303 of the 766 companies, while phone or fax numbers were available for 174. For this set of companies, participants were recruited through use of email, fax and phone contact as required to ensure participation by some of these firms.

4.2.3. Unit of Analysis

While the key constructs analyzed in this study may be related to attitudes and behaviours of particular individuals in the firm, the survey is designed to capture orientations at the firm level. Other variables quantify demographic aspects of the firm or qualities of the industry to which the firm belongs. The analysis is therefore conducted at the level of the firm.

4.2.4. Key Informants

Since the unit of analysis is the firm, a key informant must be selected to report on behalf of the firm. The constructs measured by this survey include firm strategies as well as financial information therefore it was critical that the respondent have knowledge of and access to this information. For this reason the recruitment letters were sent to the key contact in the organisation, normally the president, CEO, owner or other executive in order that they may provide an accurate picture of the aspects of their firm under study.

4.2.5. Pre-Testing the Survey Instrument

One advantage of using the Finnish survey as a starting point is that it had already gone through pre-testing as well being administered to a large population of firms. The results and feedback from the original survey was provided by the Finnish researchers in order that the questionnaire might be improved. The original questionnaire and the updated version used in this study were subsequently reviewed by five researchers involved in the international study, then by six doctoral students who were not familiar with the research.

The comments on measures, wording and organisation were incorporated into the final version of the questionnaire.

4.2.6. Data Collection

The recruitment emails were sent to the contact named in the database using the email address provided by the company. Both the CCC and Scotts databases provided one or more contact names and titles, normally of the president, CEO, owner or other executive. A contact (and company) was included in the mail-out only if the email address provided corresponded to the contact name; generic company email addresses were not used. In the case of the Profit list of companies email addresses and phone numbers were not provided, but every attempt was made to obtain the email address of a key contact. Some companies in the Profit list were cross-listed in the other databases, which in some cases provided a fax number to which the letter was sent instead.

Follow-up emails were sent to all non-respondents one week after the initial mail-out. This letter served as a reminder and encouraged the recipient to forward the email to a more appropriate person in the company if desired. After four weeks, a call was placed to remaining non-respondents from the Profit list to encourage them to complete the questionnaire online. A total of 1,665 responses were received from the 16,099 contacts.

4.2.7. Response Bias Considerations

Response bias, that is the potential that the results of a survey are biased to reflect respondents rather than the population as a whole, is a growing concern in studies involving online surveys (Dillman and Bowker, 2001). It is important to maximize

response rates in an attempt to reduce the possibility that this bias would affect the results of the survey. Response rates can be increased through thoughtful design of recruitment emails and questionnaire, both from the perspective of content and online usability (Cook et al., 2000). In the case of this study, the body of the email explained the nature of the study, its importance to the participants, and the incentives provided to encourage participation.

The length of the questionnaire was considered to be problematic. Ultimately it was reduced to the minimum number of questions to address the hypotheses of this study while maintaining comparability with the Finnish study. The content of the questionnaire was reviewed by a number of academics (as described section 4.2.5) in order to improve or eliminate ambiguous or redundant questions.

The email contacts were done in phases over a period of two weeks on different days of the week and times in order to find the optimal day and time to maximize the response rate. Also, the time the email was sent was retained, along with the time the survey link was first clicked, in order that response bias could be analyzed in relation to time to respond, as described in the next chapter.

4.2.8. Operationalisation of Constructs

The variables captured by the survey are described in detail in Appendix A and summarized in Table 6. All objective measures are self-reported (or interpolated from self-reports) while subjective measures were assessed using a seven-point Likert scale.

The Use of Latent Variables

Empirical research on various aspects of firm growth can be categorized according to the type of variables measured. That is, there are variables that can be measured directly and there are constructs considered latent which, in the case of this research, correspond to a

Table 6 Summary of Constructs

Construct	(O)bserved / (L)atent?	Type	Description	References(s)
<i>Outcome Variables</i>				
High-growth	O	Binary	> =20% annual growth in employment or sales over 3 yrs.	OECD (2008)
<i>Predictors</i>				
Entrepreneurial Orientation	L	Continuous (scale)	A scale with five dimensions: (1) innovativeness, (2) risk taking, (3) proactiveness, (4) autonomy, and (5) competitive aggressiveness.	Lumpkin and Dess (1996), Chang et al. (2007)
Market Orientation	L	Continuous (scale)	A scale with two dimensions: (1) Responsive MO, (2) Proactive MO	Atuahene-Gima et al. (2005)
Network Competence	L	Continuous (scale)	A scale with seven dimensions: (1) planning; (2) organizing; (3) staffing; (4) controlling; (5) initiation; (6) exchange; (7) coordination.	Ritter and Gemunden (2003)
Innovation Orientation	L	Continuous (scale)	A latent construct comprising several indicators of innovation activity, orientation and outcomes.	This study; OECD (2005)
<i>Covariates</i>				
Employees, Total	O	Continuous (nominal)	Total number of employees.	N/A
Public	O	Binary	The firm is a public company.	N/A
Merger/acquisition	O	Binary	The firm has been involved in a merger or acquisition.	N/A
Spin-off/out	O	Binary	The firm is a spin-off or spin-out of another company or organisation.	N/A
Environmental Dynamism	L	Continuous (scale)	A scale to measure the frequency and degree of change in the market	Jantunen et al. (2005)
Environmental Hostility	L	Continuous (scale)	A scale that measures the level of competition.	Zahra and Garvis (2000)
Goal, Maximizing Profitability	L	Continuous (scale)	A subjective measure of a firm's orientation towards maximizing profitability.	Autio et al. (2000)
Goal, Maximizing Growth	L	Continuous (scale)	A subjective measure of a firm's orientation towards maximizing growth.	Autio et al. (2000)
Slack Resources	L	Continuous (scale)	Level of availability of resources.	Atuahene-Gima et al. (2005)
Knowledge Producer	O	Binary	The firm's industry is classified as a knowledge producer (tier I)	Morissette et al. (2004)
High Knowledge Intensity	O	Binary	The firm's industry is classified as high knowledge (tier II)	Morissette et al. (2004)
Employees, Sales and Marketing	O	Continuous (nominal)	Percentage of employees assigned to sales and marketing functions.	N/A
Sales, % Foreign	O	Continuous (nominal)	Percentage of annual sales from clients/customers outside of the country.	N/A

complex set of strategic orientations or capabilities. More commonly studies in the area of firm performance and growth make use of observable variables, such as the level of research and development spending or the proportion of revenue derived from new product development. These studies have the advantage of readily available and unequivocal evidence to support their arguments, at least in the case of the study of public companies. This type of variable is directly observable not only by researchers but also by those in the companies under study. It is decidedly more difficult, and arguably more valuable, to focus on latent constructs that are indicative of organisational competencies and orientations in the study of firm strategy. Constructs such as these allow us to generalize relationships between idiosyncratic events or variables (Bollen, 2002). I argue that exploration of concepts such as these provides high value when incorporated appropriately into the body of research linking strategic orientations to various measures of firm growth and performance.

4.2.9. Data Analysis

Covariance-based structural equation modelling (SEM) techniques were used to test the hypotheses. SEM is suited for confirmatory studies such as this and requires a sound basis in theory as well as a relatively large sample size (Gefen et al., 2000). Complex relationships between multiple independent and dependent variables can be modelled simultaneously as compared with multiple regression which would require a number of iterations to analyse all paths. SEM is also capable of combining the analysis of the measurement model with the structural model thereby eliminating the need to perform a

separate factor analysis. The main point in its favour over individual regression models is that SEM provides more information to determine the degree of fit between the model and the data (Gefen et al., 2000).

The dichotomous measure of firm growth is associated with a methodological challenge however, as it corresponds to a relatively rare occurrence in the population. The aim of statistical modelling techniques is to demonstrate general relationships rather than idiosyncratic ones. By examining high-growth firms we are looking at the outliers of a normal distribution of growth rates in the overall population of firms. One possible solution is to make these outliers (high-growth firms) into one of a number of categories based on growth rate. For example the normal distribution of firms, along the continuum from negative to high positive growth, could comprise five categories with the high-growth firms making up the sixth. This would effectively allow the use of normal parametric statistical tests. The use of categorical, versus continuous, outcomes has however been addressed by Muthén (2002) and implemented in the Mplus program (Muthén and Muthén, 1998-2007) allowing the data to be fit with a logistic regression-based path model.

Muthén (1984) first described a general model consisting of both continuous and categorical (or dichotomous) dependent or independent latent variables which was implemented as Mplus. The Mplus program was selected for the analysis over other SEM packages, such as AMOS, due to its ability to model a dichotomous dependent variable, in this case high-growth, as well as for its ability to test growth mixture models with dichotomous outcomes (Jung and Wickrama, 2008).

Due to the large number of questions in the survey, missing data would be problematic if only listwise deletion were available. MPlus also provides an optimal full information maximum likelihood (FIML) algorithm for handling missing data which allows the use of all available data points (Muthén and Muthén, 1998-2007).

4.3. Summary

This chapter has outlined the methods used to implement, test and analyze the two types of models developed in the study. The descriptive model is introduced first. It involves the use of archive data in a growth mixture model that demonstrates the common trajectories of firm growth. The study then reviews the design principals and implementation an empirical model used to explain the drivers of rapid growth. This involved a survey administered to a cross-section of Canadian firms. Questionnaire and sample design, as well as potential biases, were considered followed by a discussion of the analytical techniques used to fit models to the data.

5. Results

The primary objective of this research is to explore the relationships between strategic orientations and capabilities, innovation and rapid growth. The previous chapter explained the constructs to be examined and the methods whereby the relationships between these constructs were assessed. This chapter describes the collection and analysis of the data used to test the research hypotheses. The chapter comprises the following sections: data collection, preliminary analysis, reliability and validity testing, and hypothesis testing.

5.1. Data Collection

One of the goals of this study was to collect data that will contribute to an international research project on rapid internationalisation of new ventures (INVNet) already begun in Finland. For this reason, it was imperative that the data collected be compatible, or at least complementary, to those already collected by other researchers involved in the project.

This created a somewhat unique research context in that the study, and the topic, had to work within the data constraints as defined above. For this reason, the decision was made to first review the survey instrument developed by the Finnish researchers and decide what could be retained, what would be modified, and what, if anything, might be added (the original survey was quite long). Once that was done, it would be possible to decide from amongst the constructs that were included in the survey, which ones would

be of interest for a study of rapid growth. As there is in fact much intersection between the topics of rapid internationalisation and rapid growth, this seemed to be a logical approach. The end result of this exercise was that not only was the new questionnaire developed, it was implemented as an online survey and administered to 16,099 Canadian firms in March 2009.

5.1.1. Respondent Demographics

From a total of 1,665 responses, 336 firms were selected for use in this study based on the criterion of at least 10 employees at the beginning of the measurement period and up to 250 at the end. This is to maintain compatibility with the OECD (2008) definition of high-growth and gazelle firms. This dataset was then cleansed of obvious data entry errors including the misinterpretation of the units requested for the dependent variables, that is annual percentage growth of sales and employment. For example, actual sales or employee totals entered instead of percentage growth. Another example was the use of 100% to indicate no growth. Any annual growth number close to, or exceeding, 100% was examined in the context of the rest of the firm's data and the response was removed from the dataset if it appeared incongruous in any way. The remaining data were examined for missing values for the key latent constructs. If a response contained no values for the items that comprise the MO, EO or NC constructs then it was eliminated from the final dataset. The firms in the resultant sample are described in Table 7.

Table 7 Sample Characteristics

Variable Name	N	Min.	Max.	Mean	SD
Years in Operation	251	1	120	24.9	18.7
Employees	251	4	250	45.9	48.2
Employees, Foreign	251	0	200	4.0	18.2
Employees, R&D (%)	247	0	95	12.3	20.9
Employees, Sales & Marketing (%)	247	0	100	22.6	28.1
Sales*	251	1	9	5.9	1.6
Sales, Products (%)	250	0	100	54.8	42.0
International Sales, Proportion of Total (%)	171	0	100	34.4	33.6
R & D Expense (%)	241	0	95	9.2	17.3
Sales & Marketing Expense (%)	241	0	100	17.1	26.9
Employment Growth	251	-72.0	620.0	18.5	56.5
Sales Growth	251	-72.0	530.0	42.9	81.6

* Sales reported by category: 1=\$1-99,999; 6=\$1,000,000-4,999,999; 9=\$50,000,000+

Table 8 shows the breakdown of the occurrence of high-growth and gazelle firms according to their knowledge intensity classification (Clendenning & Associates, 2000). The KBI Tier I is made up mainly of science and technology-based firms, or *knowledge producers*, while Tier II consists of *high knowledge* firms considered to be business innovators. All other industries not included in the KBI categorisation have been grouped in last column which I have labelled *unrated*. As described in Section 1.1 for the Profit 100 data, the table shows that high-growth firms occur across categories including these traditional resource-based industries.

High-growth firms make up 20% of the small-to-medium firms included in the sample, while 5% were gazelles. This is somewhat higher than found in the population which is reported to have between 6 and 10% high-growth firms and less than 1% gazelles. This may, in part, be due to the fact that a given increase in sales or employment represents a larger percentage increase for smaller firms than for its larger counterparts.

Table 8 High-growth and Gazelle Firms by Knowledge Intensity

Category	Percentage	Percentage by Knowledge-Based Industry Category		
		Tier I	Tier II	Unrated
High-growth Firms	20	38	18	20
by Employment	8	38	17	19
by Sales	18	13	8	8
Gazelles	5	25	4	6
by Employment	3	25	4	6
by Sales	5	13	1	5

5.1.2. Response Rate and Non-Response Bias

There were 1,665 responses for an overall response rate of 10.3%. Though low, this is a rate of response is similar to recent online organisational surveys conducted within the department. Every attempt was made to increase the response rate through careful question and user-interface design of the Web survey, use of reminders, and timing of invitation delivery. Respondents were initially contacted by email with a bilingual invitation letter stating the purpose of the survey and emphasizing the benefit to the respondent and the potential implications to policy. Incentives were provided in the form of summary results upon completion (in comparison with other respondents), the option to enter a draw for gift certificates valued between \$100 and \$500 and to receive a summary report upon completion of the survey. The results were analysed for bias introduced due to non-response according to the guidelines outlined in Armstrong and Overton (1977) and Rogelberg and Stanton (2007).

The method described by Armstrong and Overton (1997) involves comparing early with later responders to determine if there are systematic differences in variable values between groups indicating a bias, and in what direction. This is based on the premise that late responders are considered to be more similar to non-respondents the longer they take to respond. By extension, a non-respondent is the same as a very late

respondent and therefore late responses can be used as a proxy to represent non-respondents. If the result from this group is significantly different from the early responders, it indicates a *response bias*.

Rogelberg and Stanton (2007), on the other hand, considered a number of factors when determining, and mitigating, response bias. They argued that it is important to consider whether the variable in question is likely to be logically connected with non-response, for example a study on overwork which many respondents would be too busy to complete. If not, there may be no need to consider bias due to non-response. The study also makes the distinction between passive and active non-response. The former is associated with forgetting about the survey or not having time to complete it. The latter is more likely to be associated with bias as it involves an outright rejection to participate.

Table 9 contains the results of an analysis of the two growth variables using a simple “two-wave” response-bias test as recommended by Armstrong and Overton (1997). Responses from the online survey were categorized as *early* if they were received within five days of the email invitation; otherwise they were categorized as *late*. The number of days was chosen to split the sample into two roughly equal sub-samples. The means of the dependent variables were compared between the two groups to test for response bias using a T-Test to compare unequal sized samples with unequal variances. The null hypotheses (that the means are equal) could not be rejected indicating no response bias.

This test is simplistic however in that it only addresses the two observed variables that are related to the high-growth outcome variable in the path model used to fit the data. To properly determine whether the time taken to complete the survey is relevant one must

analyze its effect on the key constructs used in the structural equation model. The number of hours to respond was regressed on the dependent variable high-growth (hg) and the key latent constructs in the model (i.e. EO, MO, NC and IO). The results shown in Table 10 indicate that there is no significant relationship between these variables which supports the above findings of no response bias.

Table 9 T-test of Early versus Late Responders

Variable Name	Mean Difference	df	Two-Tailed P-Value
Employment Growth	-1.35	249	0.86
Sales Growth	-7.17	249	0.52

Table 10 Multiple Regression on ‘Hours to Respond’

Variable Name	Estimate	S.E.	Two-Tailed P-Value
High-Growth	4.91	13.62	0.72
Entrepreneurial Orientation	-0.01	0.69	0.92
Market Orientation	-8.57	10.91	0.43
Innovation Orientation	-0.59	0.39	0.13
Network Competence	-3.27	2.36	0.16

Another indication that response bias is not an issue is that the responding firms are distributed across industries, as shown in Table 11. Although some industries are underrepresented or overrepresented among the responding firms, there are responses from each sector. Comparing key demographic values in Table 12 shows that responding firms have, on average, more employees and are younger than those contacted. There is however little difference between groups in respect to sales, the other measure of firm size. In conclusion, it appears unlikely that the response rate will affect the results of the analysis, especially given that the statistical models include controls for firm age and employment.

Table 11 Industry Proportions

NAICS Code	Description	% of Sample
11	Agriculture, Forestry, Fishing and Hunting	2.2
21	Mining and Oil and Gas Extraction	1.6
22	Utilities	0.7
23	Construction	3.0
31-33	Manufacturing	18.2
41	Wholesale Trade	5.2
44-45	Retail Trade	2.5
48-49	Transportation and Warehousing	3.4
51	Information and Cultural Industries	3.4
52	Finance and Insurance	2.3
53	Real Estate and Rental and Leasing	0.9
54	Professional, Scientific and Technical Services	26.2
55	Management of Companies and Enterprises	1.0
56	Administrative and Support, Waste Management and Remediation Services	0.8
61	Educational Services	4.8
62	Health Care and Social Assistance	1.4
71	Arts, Entertainment and Recreation	2.5
72	Accommodation and Food Services	0.5
81	Other Services (except Public Administration)	19.2
91	Public Administration	0.2

Table 12 Key Demographics for Contacted and Respondent Firms

Variable Name	Contacted Firms		Respondent Firms	
	Mean	Std. Deviation	Mean	Std. Deviation
Years in Operation	29.9	23.3	19.2	20.3
Employees	113.8	2,680.2	428.4	3,528.3
Sales	4.8	1.8	4.2	2.4

5.2. Latent Growth Class Analysis

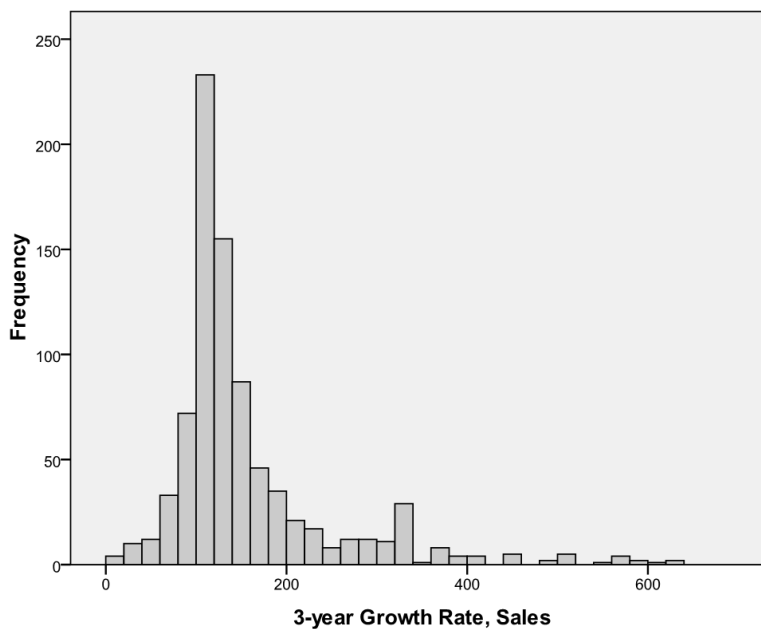
An implicit assumption in the hypotheses put forth in this research, as well as in other studies on high-growth firms, is that they are somehow different from non-high-growth firms. It may be the case that these are in fact a separate sub-population that are mixed together to form what we observe as a non-normal distribution in respect to growth. It is this assumption and observations in other populations that have led to the use of latent growth mixture modelling (LGMM). This technique was used initially in developmental psychology (e.g. Nagin and Tremblay, 2001; Muthén and Shedden, 1999) though its use

is now widespread in the behavioural and social sciences. It has been found to be effective tool to identify a separate *latent class or classes* within the population that warrant research attention.

This initial step can be useful on its own to simply establish that there are latent classes within the population and assign a probability that a case belongs to one of the groups. Further investigation can be done to determine the *predictors* of membership in one or more classes, that is, to test hypotheses about the sub-population of interest (Nagin, 1999). This makes the research actionable, however to find justification one must look at *distal outcomes*. Class membership can be used as a categorical predictor of a future event or condition (Haviland and Nagin, 2005). This type of analysis could be applied to firm growth, for example, to determine if high-growth in firms may be associated with high profitability in later years. This however involves a longitudinal approach that is beyond the scope of this study.

It was possible, however, to develop a simple growth mixture model based on the three data points provided for sales growth. This is the minimum requirement to produce a quadratic growth mixture model; higher-order growth curves can be fit given more data points (Andruff et. al, 2009). The model was tested against the entire results dataset for those cases that reported sales growth, and before the cleanup described in the next section. The distribution of three-year growth in the sample is shown in Figure 7, indicating a non-normal distribution.

Figure 7 Sales Growth Distribution, Mixture

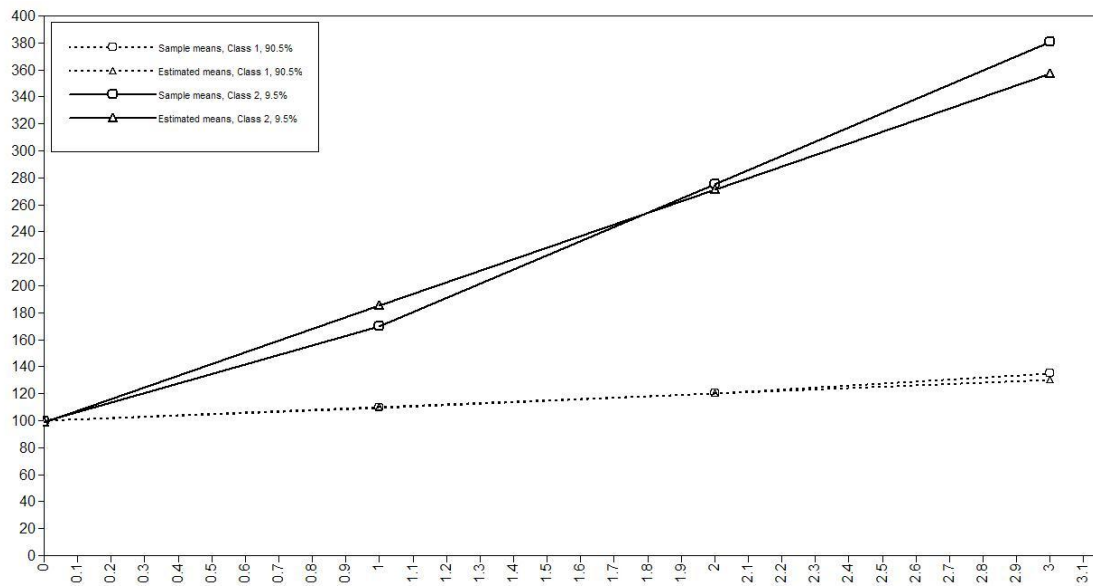


Two variables were added to the model to act as predictors: ‘number of employees’ and ‘years since founding’. These variables however could more appropriately be considered as controlling for size and age rather than predicting high-growth. Theory-testing was not the purpose of this analysis; rather it was to explore the characteristics of the sample therefore distal outcomes were also not part of the model.

Both a two-class and a three-class solution were fit with the results compared using the Satorra-Bentler chi-square difference test for nested structural equation models (Satorra and Bentler, 1999) and the entropy value, a measure of fit specifically for mixture models. While the three-class model showed a modest improvement in the entropy value (0.949 to 0.981 with a higher value indicating better fit) the chi-square difference test was non-significant.

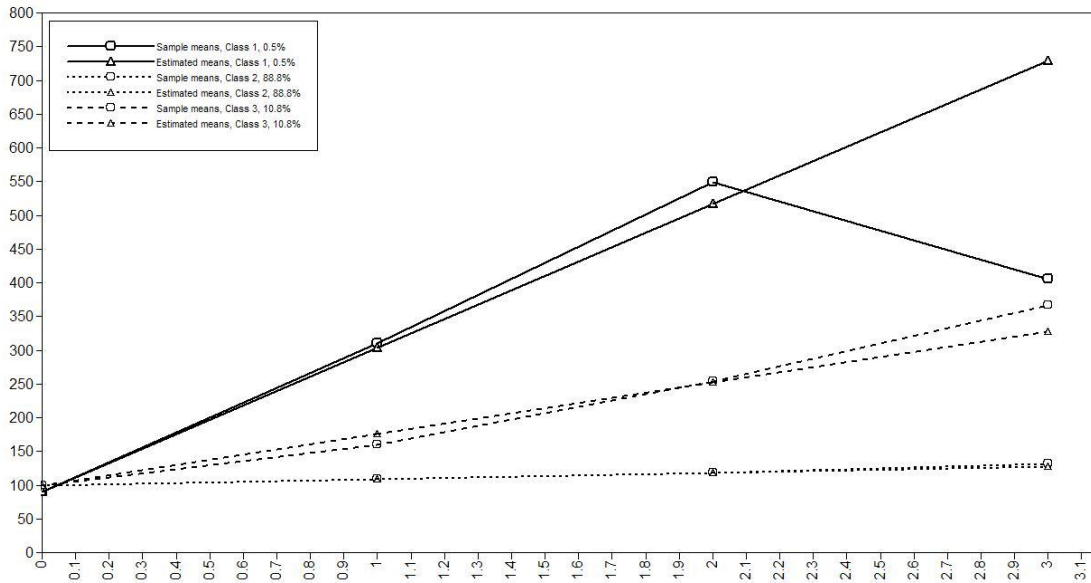
Model fit is not the only criterion for determining the appropriate number of classes however, as Connell and Frye (2006) stated “mixture modelling is an area where the art and science of statistics closely intertwine” (p. 641) and it is determined by a number of decisions. The trajectory plots for the two-class solution in Figure 8 can be compared with that of the three-class solution in Figure 9.

Figure 8 Growth Trajectories, Two Group Model



The two-class solution shows a near-perfect fit between the sample and estimated means for both the high-growth group (class 2) and lower-growth group (class 1) whereas the latter shows a divergence of trajectories for the high-growth group. As the high-growth group is the sub-population of interest, the two-class solution was considered to be a better fitting model for the purposes of this research.

Figure 9 Growth Trajectories, Three Group Model



The next step in the analysis involved breaking the sample into the two groups to analyze the growth distributions separately, as compared with the mixed distribution shown in Figure 7. The lower-growth class of firms, which comprised 90.5 % of the sample, has a more normal distribution of sales growth (though still somewhat positively skewed and leptokurtic) after the high-growth firms have been removed (see Figure 10).

The distribution of sales growth for the remaining 9.5% of firms in the high-growth class is shown in Figure 11. These distributions would seem to indicate two distinct sub-populations in the sample, based on sales growth rates.

Figure 10 Sales Growth Distribution, Lower-growth Class

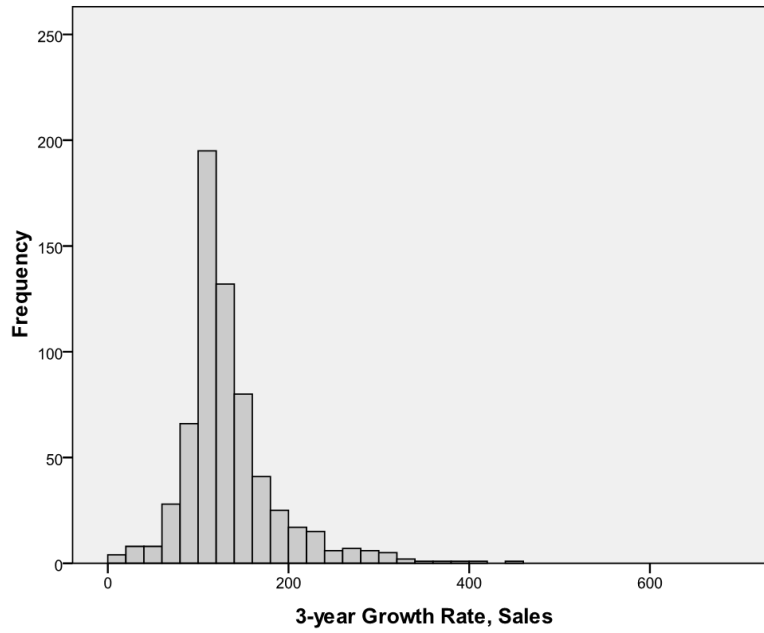
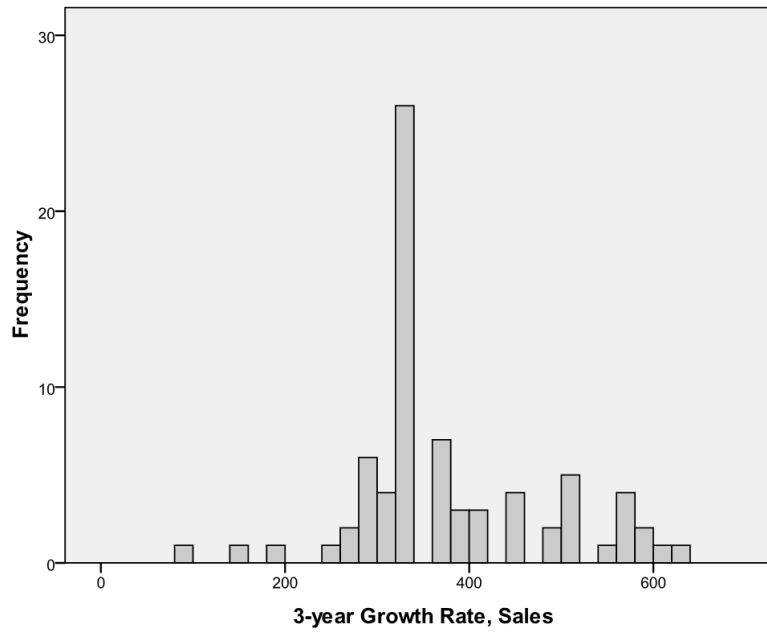


Figure 11 Sales Growth Distribution, High-growth Class



5.3. Preliminary Data Analysis

Survey responses were reviewed for validity, consistency and missing data before inclusion in the research dataset. Reverse coding was performed on some items as required. The remaining data were analyzed at the univariate and bivariate level.

5.3.1. Reverse Coding

The most straightforward type of manipulation of the data involved reversing the value of particular items related to questions of opposite valence to others. See Table 13.

Table 13 Reverse Coded Items

Variable Name	Item
Slack Resources (Q2)	sr2
Competitive Environment, Dynamic (Q1)	ce1
Competitive Environment, Dynamic (Q2)	ce2
Competitive Environment, Dynamic (Q4)	ce4

5.3.2. Invalid Data

For the purposes of this study, only firms that reported having 10 or more employees at the beginning of the study and up to 250 employees at the end were included in the analysis. This was done in order that the results would be compatible with the OECD study of high-growth firms (Ahmad and Hoffman, 2008) as well as the definition of an SME used in most studies (Schreyer, 2000).

5.3.3. *Inconsistent Data*

Wherever possible, constraints were built into the online survey to prevent inconsistencies, for example individual or total percentages were limited to values between 0 and 100 (where applicable) and negative number disallowed for quantities. Logic was added to the interface which disabled follow-up questions based on qualifying answers, for example detailed questions about innovation were not offered if the respondent indicated that no new products and services were introduced.

The measures for growth in sales and employment were manually reviewed for inconsistencies. It was not possible to put constraints on these items as they were percentage growth rates that could conceivably have very high negative or positive values. An initial screening was done to flag responses in which the growth rate for any one year had a value of 100 or more. By examining the responses for the six items (three years for each of employment and sales) it was apparent that there were a number of patterns of inconsistent responses. The first pattern was to incorrectly enter 100 percent to indicate 'no growth'. The second pattern was the occurrence of values -100 (or less) for sales or employment growth in a year, which would be mathematically incorrect. The third pattern was due to a misinterpretation that a quantity was requested rather than a percentage. This resulted in very large positive or negative numbers (out of the expected range) being entered for percentage growth. Other cross checks used to determine the validity of these values included the actual sales (range) and employee counts as well as international sales (if entered). If there was any doubt about its validity, the case was removed as the dependent variable is derived from these measures.

5.3.4. *Missing Data*

It was apparent that many respondents did not continue past a certain point, likely due to respondent fatigue as a result of the length of the questionnaire. All these responses were saved anyway and salvaged wherever possible. A number of these however had no items completed for one or more of the scales that measured the constructs used in the hypotheses. These cases were dropped from the dataset.

For the remainder of the items that had missing values, the Mplus program (used for structural equation modelling) provides maximum likelihood estimation for outcome variables either missing at random (MAR) or missing completely at random (MCAR). Observed covariate ‘missingness’ is handled by bringing these variables into the model, whereby Mplus makes distributional assumptions about them. This avoids listwise deletion in the case of missing covariate data values. (Muthén and Muthén, 1998-2007)

5.3.5. *Descriptive Statistics*

After removal of unusable cases and cleanup, descriptive statistics were calculated for the resulting dataset.

Analysis of the ordinal values that measure the latent constructs (EO, NC, MO, SR, CED, CEH) showed that all but one item (mo8) had the full range of possible responses. Means ranged from 2.63 to 6.01 with standard deviation between 1.09 and 2.14. Skewness values were between -1.34 and 0.79 while kurtosis ranged between -1.4 and 2.33. The single-item scales for ‘Goal Importance, Profitability’ had somewhat more negatively skewed items than the other scales, at -1.9, and a higher kurtosis value of 4.71.

Scale type item values were less normally distributed in the sample than the ordinal measures, as expected, with skewness between 0.12 for 'Sales' and 7.53 for 'Employees, Foreign'. Kurtosis values ranged from -1.2 for 'International Sales %' to 66.65 for 'Employees, Foreign'. Each of these variables was log normalized in the structural equation model to correct for problematic skew and kurtosis. Complete descriptive statistics can be found in Appendix C.

5.4. Construct Reliability and Validity

All constructs were considered to be reflective as opposed to formative; that is the items that make up the measurement model interchangeably reflect the value of the unobserved latent construct.

Hulland (1999) described formative construct validity as driven by theory. There are no measures of internal consistency and researchers are cautioned from removing items without a strong theoretical argument for it. The items that form the construct are not necessarily correlated and are all required to define the construct. A formative latent construct has no intrinsic meaning beyond what is defined by its indicators. In fact, there is a sense of causality between the indicators and the construct (Diamantopoulos, 2006; Coltman, 2008).

There are however some unresolved methodological issues involved with the use of formative indicators. In the absence of at least two independent reflective measures for each of the formative constructs it is difficult to isolate these constructs from the rests of the model (Jarvis et al., 2003). This introduces complexity in interpreting the results as

well as limits the ability to compare constructs across studies, thereby affecting generalizability (Wilcox et al., 2008).

Reflective constructs, however, are more commonly used in social sciences research (Bollen, 2002) as has been done for this study. As opposed to formative constructs, the direction of causality is reversed. Each item interchangeably represents the construct and can be considered an independent measure of that construct (Rossiter, 2002). For example the SR construct in this study has four items based on questions all designed to measure essentially the same thing – the level of slack resources in the firm. The validity of each of these constructs was tested with confirmatory factor analysis (CFA).

In this model, a number of the latent constructs have multiple dimensions. Market Orientation (MO), for example, consists of two dimensions: responsive (MO_RESP) and proactive (MO_PROA) which each have a number of reflective indicators. The first-order factors were analyzed, followed by the second-order factors.

5.4.1. Confirmatory Factor Analysis

All of the scales, with the exception of innovation orientation, were adapted from prior studies therefore a confirmatory rather than exploratory approach is appropriate when determining validity and reliability. Confirmatory factor analysis (CFA) is used to study the relationships between observed values and latent constructs and comprises the measurement model portion of a structural equation model (Bollen, 2002). The observed dependent variables in the measurement model are referred to as factor items while the continuous latent variables are the factors. Bollen (2002) described the measurement

model as the relationship between the factors and items as a series of linear regression equations. The measurement model in this study consists of four independent variables (the reflective latent constructs EO, MO, NC and IO), one dependent variable (hg) and numerous control variables (both latent and observed).

The measurement model was ‘purified’ using an iterative process of dropping items with low factor loadings within each of the first-order constructs. A common rule of thumb for determining the cut-off for keeping a particular factor is .7 as this indicates that half the indicator’s variance is being explained by the factor. This does not seem to be an agreed-upon standard value however, as Hair et. al (1998) considered loadings above .6 to be “high” and loadings below .4 “low”. A number of items were dropped with factor loadings below .6 from the EO, MO, NC, CED and CEH factors. One item which was slightly below the cut-off point was retained for the CEH factor, as removing it would leave only a single item to measure the construct. Hair et al. considered a single factor measure to be problematic except in the case of little, or no, measurement error. This factor is however only a covariate in the model and not involved in the hypotheses. The remaining items were analyzed for reliability within the first-order factors before analyzing the second-order factors for validity. The output of the measurement model, in the form of factor scores, was used as the input to the structural model by saving the output of the CFA as described Muthén and Muthén (1998-2008). The separation of these two steps reduced convergence problems in the structural model and resulted in much faster processing time which was important due to the size of the model and the number of variations tested.

5.4.2. Construct Characteristics

Factor values for the latent constructs used in the structural equation model (with some items dropped during the confirmatory factor analysis) had a somewhat larger range of skewness and kurtosis than their individual items, as indicated in Table 14.

Table 14 Latent Constructs

Construct	Name	Skewness	Kurtosis
EO	Entrepreneurial Orientation	.091	-.692
MO	Market Orientation	-.421	-.449
NC	Network Competence	-.555	.383
IO	Innovation Orientation	.533	.067
SR	Slack Resources	.340	-.849
CEd	Competitive Environment, Dynamic	-.522	.162
CEH	Competitive Environment, Hostile	.613	-.142

Means comparisons and correlations were done to analyze the bivariate relationships between the dichotomous dependent variable high-growth (hg) and the key latent constructs in the model. The means comparison makes use of the factor values generated during the confirmatory factor analysis (CFA). By default, Mplus standardizes these factors to have a mean of zero therefore the means for are close to zero for both the high-growth and other firms in the sample. The results are listed in Table 15.

Table 15 Means Comparison

High-growth Firm	EO	MO	NC	IO
No	0.01 (0.84)	0.00 (1.22)	0.00 (0.30)	0.01 (0.50)
Yes	-0.04 (0.87)	0.02 (1.35)	0.01 (0.32)	-0.03 (0.54)

A point-biserial correlation analysis was done using the factor values of the key latent constructs and the dichotomous dependent variable representing high-growth (hg). All of the latent constructs have significant positive correlations amongst themselves, however not with hg, as shown in Table 16.

Table 16 Correlation Matrix

Construct	hg	EO	MO	NC
EO	-0.02			
MO	-0.03	0.90**		
NC	0.01	0.83**	0.83**	
IO	0.01	0.70**	0.52**	0.43**

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.001 level (2-tailed).

5.4.3. Construct Reliability

After low loading items (though all items were significant) were eliminated from the measurement model, a number of metrics were calculated to determine internal consistency. Factors are considered to have convergent validity, or reliability, with a Cronbach's alpha or construct (composite) reliability score of .7 or more (Nunnally, 1978). An AVE score of greater than .5 implies that measurement error associated with the construct is outweighed by the variance extracted through its indicators (Fornell and Larcker, 1981). Both factor loading and the three factor-level metrics considered when deciding whether an item or factor should be included in the measurement model. The results of this analysis are summarized in Table 17.

Table 17 Reliability Analysis

Construct and Scale	Factor Loading	AVE	CR	α
<i>Entrepreneurial Orientation (EO)</i>				
Autonomy		0.55	0.78	0.78
eo1	0.66			
eo2	0.79			
eo4	0.76			
Competitive Aggressiveness		0.62	0.83	0.83
eo5	0.73			
eo6	0.80			
eo7	0.83			
Innovativeness		0.51	0.76	0.77
eo8	0.77			
eo9	0.73			
eo10	0.64			
Proactiveness		0.62	0.83	0.83
eo11	0.66			
eo12	0.79			
eo13	0.89			
Risk Taking		0.74	0.85	0.85
eo14	0.85			
eo15	0.88			
<i>Market Orientation (MO)</i>				
Responsive		0.50	0.90	0.91
mo1	0.66			
mo2	0.84			
mo3	0.65			
mo4	0.80			
mo5	0.74			
mo6	0.70			
mo7	0.63			
mo8	0.59			
mo9	0.70			
mo10	0.66			
Proactive		0.59	0.92	0.92
mo11	0.62			
mo12	0.72			
mo13	0.75			
mo14	0.79			
mo15	0.83			
mo16	0.77			
mo17	0.81			
mo18	0.84			

CR = composite reliability; AVE = average variance extracted; α = Cronbach's alpha.

Table 17 Reliability Analysis (continued)

Construct and Scale Item	Factor Loading	AVE	CR	α
<i>Network Competence (NC)</i>				
Planning		0.59	0.92	0.92
nc1	0.68			
nc2	0.68			
nc3	0.71			
nc4	0.84			
nc5	0.81			
nc6	0.90			
nc7	0.79			
nc8	0.72			
Organizing		0.63	0.84	0.83
nc9	0.66			
nc10	0.86			
nc11	0.85			
Staffing		0.65	0.79	0.78
nc12	0.77			
nc13	0.85			
Controlling		0.75	0.90	0.90
nc14	0.87			
nc15	0.88			
nc16	0.85			
Initiation		0.68	0.81	0.81
nc17	0.82			
nc18	0.83			
Exchange		0.62	0.77	0.77
nc19	0.81			
nc22	0.77			
Coordination		0.78	0.91	0.91
nc23	0.92			
nc24	0.93			
nc25	0.78			
<i>Innovation Orientation (IO)</i>				
Innovation Performance		0.62	0.89	0.84
innov_ct	0.80			
innov_cv	0.84			
innov_pr	0.80			
innov_wo	0.75			
sales_fi_log	0.75			
Innovation Commitment		0.47	0.72	0.79
emp_rnd_log	0.63			
inv_rnd_log	0.65			
lic_tot_log	0.77			
<i>Uni-dimensional Constructs</i>				
Slack Resources		0.68	0.89	0.87
sr1	0.84			
sr3	0.84			
sr4	0.78			
Competitive Environment, Dynamic		0.45	0.71	0.70
ce3	0.66			
ce6	0.70			
ce7	0.65			
Competitive Environment, Hostile		0.48	0.57	0.41
ce11	0.24			
ce13	0.95			

5.4.4. Construct Validity

Discriminant validity of the latent constructs in the measurement model was determined by comparing the average variance extracted (AVE) with the square of the correlation with other factors, as suggested by Gefen et al. (2000). Correlations between two constructs that exceed the AVE of either construct indicate poor discriminant validity.

The results of this analysis are displayed in Table 18.

Table 18 Validity Analysis

	EO	MO	NC	IO	SR	CED	CEH
EO	0.57						
MO	0.90**	0.67					
NC	0.81**	0.83**	0.73				
IO	0.70**	0.52**	0.43**	0.77			
SR	0.44**	0.53**	0.35**	0.17**	0.68		
CED	0.74**	0.67**	0.49**	0.53**	0.36**	0.45	
CEH	0.26**	0.23**	0.07	0.18**	0.05	0.64**	0.48

*. Correlation is significant at the 0.05 level (2-tailed);
 **. Correlation is significant at the 0.001 level (2-tailed);
 Diagonal contains AVE (average variance extracted).

Examination of the results reveals a potential multicollinearity problem between EO and MO as the square of the correlation between these two constructs is higher than both of the AVE values.

A further test was recommended by Muthén and Muthén (1998-2008) to address this issue. This involved running a chi-square difference test of the factor model against another version of the model with the correlation between EO and MO fixed to a value of one. The test, provided by the Mplus software, compares the chi-square values and degrees of freedom of the two models to determine if there is a significant difference. If there is no difference then one can assume that the two constructs are actually equivalent as they must have near perfect correlation. The result (a p-value of 0.000 for the chi-square difference) however indicated a significant difference between the unconstrained

and constrained models. The EO and MO latent variables are therefore do display sufficient discriminant validity to justify inclusion of both in the measurement model. This is consistent with the strategic orientation literature which considers these as distinct, though complementary, constructs (e.g. Baker and Sinkula, 2009).

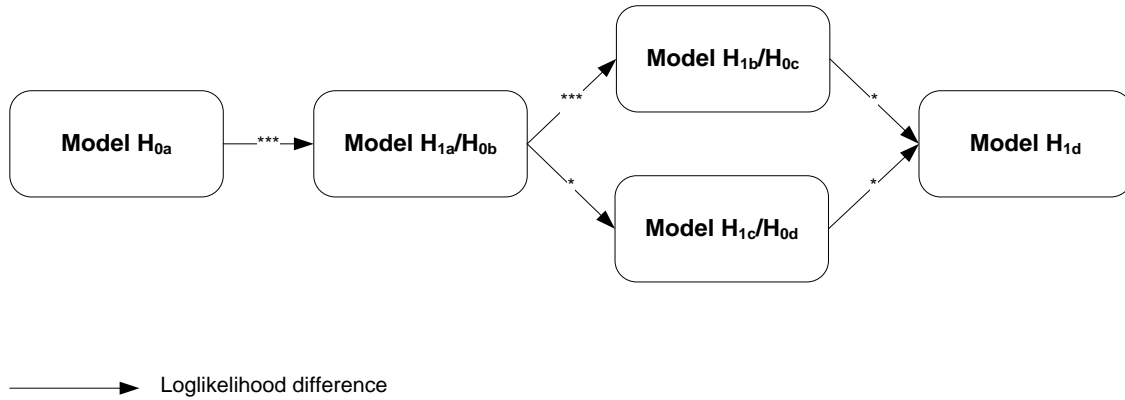
5.5. Hypothesis Tests

Having confirmed the reliability and validity of the measurement model, as described in the previous sections, the structural model can now be assessed. This analysis was done using a series of nested models, starting with ‘control’ variables (covariates) only, then introducing the key latent constructs to the model, followed by separate tests of the mediating and moderating relationships, and finally the full structural equation model. The paths in the full model were examined in order to validate the hypotheses.

5.5.1. Nested Model Fit

The tests of model fit were recorded for each model to be used in a series of chi-square difference test to determine if each alternate model displayed an improvement in fit over its corresponding null model. This test was developed by Satorra and Bentler (1999) for use with maximum likelihood (ML) estimation in comparing the fit of structural equation models. One must keep in mind that the model fit statistics provided are not absolute measures of fit, but can be used to compare fit between nested models only. The results of these tests determined that each successive alternate model was an improvement in fit over the null model to which it was being compared, as shown in Figure 12.

Figure 12 Nested Model Comparison



Model H_{1a}, which introduces the key latent constructs, had a significantly better fit to the data than model H_{0a}. Models H_{1b} (mediation relationships) and H_{1c} (moderation relationships) was then compared against H_{0b} (the alternate model in the previous test) to show further improvement in fit. The full model (H_{1d}) was finally compared with models H_{0c} and H_{0d} (the alternate models in the previous tests) indicating an improved fit over both null models. The summarized results of these tests and calculations are provided in Table 19.

Global fit indices were not available for this analysis. Muthén and Muthén (1998-2007) explained that “path analysis with a categorical dependent variable and a continuous mediating variable with missing data” (p.37) should be conducted using MLR (maximum likelihood estimator with robust standards errors). This makes use of a numeric integration algorithm, which in this case was the Monte Carlo algorithm. In this case only comparative fit indices were available, as shown in Table 19. There is debate however of the utility of global fit indices, as explained by Macdonald and Ho (2002) that

stated that “no global index of fit (together with a criterion for its acceptability) can substitute for a detailed examination of the discrepancies”. (p.73)

Table 19 Difference Tests on Nested Models

Value	Null Model	Alternative	Null Model	Alternative
	H_{0a}	H_{1a}		
L	-2405.637	-2394.697		
C	0.957	0.954		
P	29	33		
cd		0.932		
TRd		23.470		
Sig. Diff.		0.000		
	H_{0b}	H_{1b}	H_{0b}	H_{1c}
L	-2394.697	-2281.871	-2394.697	-2390.856
C	0.954	0.935	0.954	0.94
P	33	39	33	36
cd		0.830		0.786
TRd		271.706		9.774
Sig. Diff.		0.000		0.021
	H_{0c}	H_{1d}	H_{0d}	H_{1d}
L	-2281.871	-2278.029	-2390.856	-2278.029
C	0.935	0.924	0.940	0.924
P	39	42	36	42
cd		0.781		0.781
TRd		9.839		9.839
Sig. Diff.		0.020		0.020

L = loglikelihood; C = scaling correction factor for MLR; P is the number of free parameters; cd = difference test scaling value based on C and P values in each model; TRd = chi-square difference between the two models.

5.5.2. Path Analysis

Once it had been determined that the basis of structural model as a whole was sound, as described in the previous section, the full model was analyzed at the path level in order to test individual hypotheses. The model explains 59 percent of the variance between innovation orientation (IO) and related constructs, and 51 percent of the variance is explained by the overall model in predicting high-growth (hg). Unstandardised model results for direct effects (on IO and hg) are listed in Table 20; standardized output and logistic regression log odds ratios can be found in Appendix D.

Table 20 Model Results (unstandardised)

Model Variable	Description	Estimate	S.E.	Two-Tailed P-Value
<i>IO On</i>	<i>Innovation orientation model</i>			
EO	Entrepreneurial orientation	0.462	0.033	0.000
MO	Market orientation	-0.227	0.062	0.000
NC	Network competence	-0.072	0.019	0.000
EOxNC	Interaction term	0.000	0.211	0.833
MOxNC	Interaction term	-0.009	0.004	0.027
MOxEO	Interaction term	0.012	0.004	0.004
<i>HG On</i>	<i>High-growth model</i>			
IO_SC	Innovation orientation	0.323	0.102	0.002
EO_SC	Entrepreneurial orientation	0.073	0.084	0.385
MO_SC	Market orientation	-0.328	0.106	0.002
NC_SC	Network competence	0.071	0.030	0.016
EOxNC	Interaction term	-0.013	0.007	0.065
MOxNC	Interaction term	0.018	0.009	0.039
MOxEO	Interaction term	-0.004	0.009	0.664
METHOD	Common method bias factor*	0.000	0.000	999.000
CED	Competitive environment, dynamic	0.224	0.397	0.572
CEH	Competitive environment, hostile	0.112	0.731	0.879
SR	Slack resources	0.284	0.166	0.086
GOAL_PRO	Goal, profit maximization	-0.455	0.183	0.013
GOAL_GRO	Goal, growth	0.241	0.185	0.193
KBI_KP	Knowledge producer (KBI indicator)	-0.242	1.155	0.834
KBI_HK	High-knowledge (KBI indicator)	-0.799	0.429	0.062
PUBLIC	Public company	2.067	0.802	0.010
SPIN_OFF	Spin-off or spin-out	-0.141	0.518	0.785
MERGERAC	Involved in merger or acquisition	0.334	0.423	0.430
EMP_LOG	Total employees (log)	0.666	0.284	0.019
EMP_SNM_LO	Employees in sales and marketing (log)	0.172	0.190	0.366
IM_SAL_LOG	Sales in international markets (log)	-0.100	0.168	0.553

* First-order latent 'method' factor contains all the measures in the research model. Including this factor in the model controls for any systematic variance associated with the method, as suggested by Podsakoff et al. (2003).

Based on these results, a number of the hypotheses were supported. Innovation orientation (IO) was found to be directly and positively related to high-growth as proposed in Hypothesis 1, as was network competence (NC) as proposed in Hypothesis 8. The interaction of market orientation (MO) with NC was also found to have a direct positive effect on high-growth in support of Hypothesis 10. Entrepreneurial orientation (EO) was found to have an indirect positive effect on high-growth through IO, as proposed in Hypothesis 5. The interaction of MO with EO was also found to have an indirect positive effect on high-growth through IO as proposed in Hypothesis 7. Using the model constraints difference method specified by Muthén and Muthén (1998-2007), the

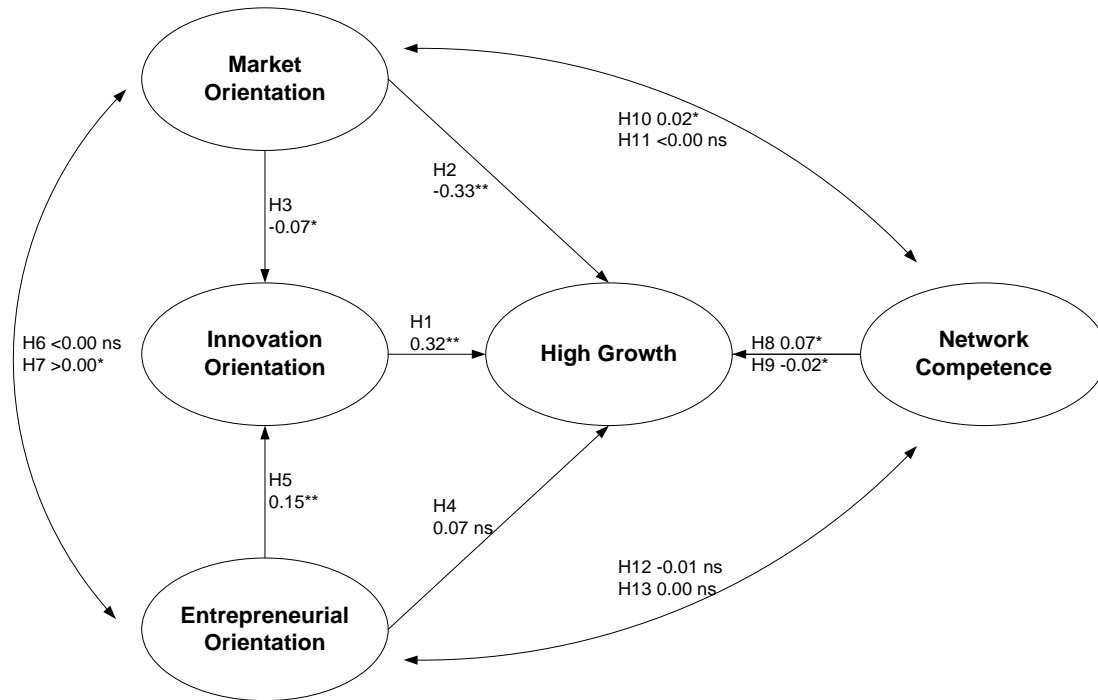
portions of the effects on IO that represent the direct effects on high-growth have been broken out. These values are provided in unstandardised form in Table 21.

Table 21 Indirect Effects (unstandardised)

Model Variable	Estimate	S.E.	Two-Tailed P-Value
EOi	0.149	0.048	0.002
MOi	-0.073	0.030	0.013
NCi	-0.023	0.010	0.023
EOxNCi	0.000	0.001	0.832
MOxNCi	-0.003	0.002	0.070
MOxEOi	0.004	0.002	0.042

Three remaining significant paths in the model had negative weights contrary to the hypothesised relationships. MO had a significant negative effect both directly and indirectly (through IO) on high-growth, which is the contrary to the relationships predicted by Hypotheses 2 and 3. Also, NC had a significant negative indirect effect (through IO) on high-growth which is the opposite of the relationship proposed in Hypothesis 9. The results of the complete path analysis are summarized in Figure 13.

Figure 13 Hypothesis Test Results



Note: For simplicity, not all mediation and moderation relationship paths are shown on the diagram; path weights are unstandardised; indirect path weights represent portion affecting high growth.

5.6. Common Method Bias

Organisational research, as with most social sciences research, has the potential to be affected by common method bias. Podsakoff et al. (2003) noted that common method biases arises from “having a common rater, a common measurement context, a common item context, or from the characteristics of the items themselves” (p. 885) and, according to Bagozzi and Yi (1991), is one of the main sources of measurement error which threatens the validity of conclusions based on constructs measured in the study.

This study does have the potential to be affected by common bias due to the fact that the latent constructs defined in the model are based on self-reported measures which are subject to common rater bias (Podsakoff et al., 2003). All data were collected via a

questionnaire, therefore within a common measurement and item context. Some items may be subject to social desirability biases for example selectively reporting what would normally be considered desirable business practices or positive performance.

The recommended mitigation approach, in studies where this is thought to be an issue, is to carefully consider the manner in which the data were obtained in light of possible sources of method biases. Podsakoff summarized these to include: a common rater (for independent and dependent variables), a common measurement or item context, and peculiarities of the items themselves that may contribute to method bias. Once identified, the issues can be addressed through procedural or statistical means. Both procedural and statistical methods have been applied to first reduce the impact, and then test for the affects of, common method bias as described in the following sections.

5.6.1. Procedural Remedies

The aim of procedural remedies to common method bias is to dissociate the predictor and criterion variables. This is ideally done by obtaining the two types of variables from different sources.

This was not practical in this study due to the fact that organisational performance data, though available from archival sources for public companies, could not be correlated with survey data as the respondents were anonymous. These data are, for the most part, unavailable for private firms. The dependent variable, i.e. growth of sales and employment, is also not likely to be subject to respondents' biases as these are concrete and measurable values that are well known to the key informants. The choice of one key informant for the organisation, rather than two, was also weighed against the effect on

response rates to the survey. In many smaller organisations, there may only be one individual available and with access to the information required to complete the questionnaire.

Although the measures of the predictor and criterion variables were obtained from the same source, there was some methodological separation (Podsakoff et al., 2003) in that the key latent constructs were measured by Likert scale items whereas the latter requested the respondent to enter percentage values, i.e. growth in employment and sales. The use of six different growth variables (two values over three years) also provided a means of cross-checking for consistency among the values entered.

While respondent anonymity prevents correlation with archive organisational performance data, it was ensured by design as a means of eliciting meaningful and accurate responses to survey questions, including those measuring organisational performance. Anonymity reduces method biases associated with social desirability, acquiescence and consistency (with the researchers' goals) that were likely to affect this study.

Varying the order of questions can control for the effects of item context, thus reducing another type of method bias. In this study however this was not considered practical as it would affect the flow and funnelling procedures (that is moving from broader or simpler questions to more specific or difficult ones) implemented in the questionnaire. The question items themselves were however carefully reviewed to make their meaning as clear and concise as possible to reduce any other item-related biases. Constructs related to orientations, which are likely to be affected by item-level biases, are

based on many indicators which would tend to reduce possibility of misinterpretation or bias on a single response.

5.6.2. *Statistical Remedies*

This study implemented procedure remedies for common method bias to the extent that it was practical and did not interfere with the goals of the research. Once the survey has been administered though it is still possible to assess and remedy the effects of common method bias through statistical means. Podsakoff et al. (2003) proposed a number of possible remedies depending on: (1) whether predictor and criterion values come from different sources; (2) if these values can be measured in different contexts; (3) whether or not method bias sources can be identified; and (4) if these biases can be measured.

The design limitations of this research narrow the choice of remedies to the use of a single-common-method-factors approach as recommended which is a more conclusive test of common method bias than Harman's one-factor test, according to Podsakoff. Although there was one other possible method it was complex and would have introduced methodological challenges. The simpler test involves the estimation of any residual affects (after procedural remedies have been implemented) with the use of a single first-order latent 'method' factor that contains all the measures in the research model. Including this factor in the model controls for any systematic variance associated with the method (Podsakoff et al., 2003; Meade et. al, 2007). It does not however identify the cause of the method bias, nor does it capture possible interactions between the method factor and other constructs in the model (Bagozzi and Yi, 1991).

The full structural model was modified to include one new factor – the ‘method’ factor which had all indicators in the model double-loaded onto it. The results of the two models were then compared on fit and significance of paths within the model. A chi-square difference test, as described by Satorra and Bentler (1999), was done using the research model and the model that included the new method factor. Overall fit of the model did improve which indicates that inclusion of the method factor adds explanatory power; therefore common method bias (as represented by the factor) appears to have had some impact in this study.

The next step involved reviewing the estimate and significance of each of the paths involved in the hypotheses. All paths that were significant in the original model remained significant, with similar estimated weights and directions, with the exception of the path between NC and the dependent variable (hg). The standardized estimate for the NC to hg path changed from positive significant ($\beta=0.33$, $p=.010$) to negative non-significant ($\beta=-0.43$, $p=.291$). Its path through IO remained significant however, as did the interaction terms involving NC that were significant in the initial model.

Although the results of these tests indicate the common method bias may only have affected one of the hypotheses being tested, it is recommended that future studies of the relationships examined in this analysis be designed in a manner that separates the measurement of predictor and criteria variables.

6. Discussion and Conclusions

This final chapter discusses the results of the study then reviews the research questions in light of these findings. It addresses any limitations associated with the research and suggests possible directions of future investigation before drawing final conclusions.

6.1. Discussion of Results

This section discusses the results of the study in detail within the theoretical context of the strategy and entrepreneurship literature. To summarize, the results indicate that (1) a firm's innovation orientation (IO) is positively associated with high-growth; (2) a firm's market orientation (MO) is negatively associated with high-growth both directly and (3) indirectly through IO; (4) EO is positively associated with high-growth indirectly through IO; (5) the interaction of EO and MO in a firm is positively associated with high-growth indirectly through IO; (6) a firm's NC is positively associated with high-growth directly, but (7) is negatively associated through IO; and finally, (8) the interaction of NC and MO in a firm is positively associated with high-growth. See Table 22 for a summary of the hypotheses and findings. This table indicates, for each hypothesis, if a statistically significant effect was found in the predicted direction (supported), in the opposite direction (refuted), or if there was no significant effect (not supported).

Table 22 Summary of Findings

Hypothesis	Findings
H1: IO has a direct positive effect on high-growth.	Supported
H2: MO has a direct positive effect on high-growth.	Refuted
H3: MO has an indirect positive effect on high-growth mediated by IO.	Refuted
H4: EO has a direct positive effect on high-growth.	Not Supported
H5: EO has an indirect positive effect on high-growth mediated by IO.	Supported
H6: The interaction of MO and EO has a direct positive effect on high-growth.	Not Supported
H7: The interaction of MO and EO has an indirect positive effect on high-growth mediated by IO.	Supported
H8: NC has a direct positive effect on high-growth.	Supported*
H9: NC has an indirect positive effect on high-growth mediated by IO.	Refuted
H10: The interaction of NC and MO has a direct positive effect on high-growth.	Supported
H11: The interaction of NC and MO has an indirect positive effect on high-growth mediated by IO.	Not Supported
H12: The interaction of NC and EO has a direct positive effect on high-growth.	Not Supported
H13: The interaction of NC and EO has an indirect positive effect on high-growth mediated by IO.	Not Supported

* Note: this relationship was found non-significant in the model adjusted for common method bias.

6.1.1. Direct Effects on High-growth

The study analyzed the direct relationships between innovation orientation (IO), market orientation (MO), entrepreneurial orientation (EO), and network competence (NC) on high-growth. The effects of interactions between these constructs, as well as indirect effects, are discussed in later sections.

There is considerable support in the literature for the positive effect of innovation on performance and sustained competitive advantage. For example, Peteraf (1993) and Amit and Schoemaker (1993) considered innovation as a means of gaining a strategic advantage over competitors. It is a type of dynamic capability that involves organisational learning and is therefore difficult to acquire (Ahujah and Lampert, 2001). This capability was described as innovation orientation by Siguaw et al. (2006). There is less evidence however showing a relationship between innovation and high-growth and it is conflicting. Calantone et al. (2002) found a positive relationship with innovation and performance while OECD (2002) linked innovation directly with rapid growth. The result was not successfully replicated in later studies, perhaps until Siguaw et al. (2006) which

may be due to the operationalisation of the IO construct as a more accurate measure of a firm's capacity to innovate. Birch (1987) observed that high-innovation firms, based on knowledge rather than raw materials, have been responsible for most of the US economic growth and job creation. Birch and Medoff (1984) later described the 'gazelle' firms that are more innovative than their larger, slower-growing counterparts. The results, as expected, are in support of H1 which states that IO has a direct positive effect on high-growth.

The relationship between MO, EO and high-growth is somewhat more conflicting in the strategic orientation literature, which may explain the results found in this study. Hypothesis 2 proposes a direct positive relationship between MO and high-growth which the results refute. No support is provided for hypothesis 4 claiming a direct relationship between EO and high-growth; though the path weight was positive, it was not significant. Ruokonen and Saarenketo (2009) examined clusters of high- and low-growth software companies and found that the high-growth cluster did have a strong market orientation, although its effect may be mediated by the firm's learning orientation. The synergistic relationship between these two orientations is also supported by Slater and Narver (1995) and Baker and Sinkula (1999). Due to the limitations of this research however, learning orientation was not included or tested as a possible mediator of high-growth. Ruokonen and Saarenketo (2009) also stated that "there does not seem to be a wide consensus on whether an entrepreneurial orientation contributes to better company performance" (p. 20) as a comment on the conflicting relationships found in prior research. Their study does however point to the possible relationship between rapid international growth and EO, however it is not clear whether this would be direct relationship.

Evidence of the relationship between networking and high-growth, as found in hypothesis 8 in this study, is supported by the research of Chetty and Campbell-Hunt (2003) which describes how SMEs use business networks to internationalise. In addition, OECD (2002) found that networking with customers, competitors, suppliers, distributors and others was critical for high-growth firms, while OECD (2007) concluded that “networking is fundamental in successful firms” (p.18).

The study also tested the interactions of EO and MO with each other and with NC. No support was found for hypothesis 6, which states that the interaction of MO and EO would have a positive effect on high-growth. There is little doubt though that these constructs are highly correlated and are important factors in performance (Grinstein, 2008). The results of this test however does not appear to be consistent with a recent study (Baker and Sinkula, 2009) that found a complementary relationship between MO and EO and profitability. Their study does not however describe the mechanism by which these orientations affect profitability, nor does it offer an explanation for high-growth.

A firm with a strong NC would tend to be better connected to its customers, competitors and other contacts. This would enhance the effect of its market orientation as well as raise awareness of, and enable acting on, entrepreneurial opportunities (Mort and Weerawardena, 2006). The interaction of NC with MO was in fact found to be positively associated with high-growth, in support of hypothesis 10. The relationship between EO, NC and high-growth was, although positive, not significant in this study therefore no support was found for hypothesis 12. Many studies however describe the effects of strategic orientations and networking in terms on an indirect relationship with performance or growth, as discussed in the next section.

6.1.2. *Indirect Effects through IO*

Hypothesis 3 proposes that MO has an indirect effect on high-growth through IO. In this study, however, a significant negative relationship was found for both the indirect and direct relationships between MO and high-growth. This would seem to contradict most studies of MO in respect to its effect on performance or innovation. A number of studies (e.g. Baker and Sinkula, 2005; Atuahene, 2005; Grinstein, 2008; Han et al, 1998) have observed a positive relationship between MO and innovation or new product development. EO was however found to have an indirect positive effect on high-growth through IO, as stated in hypothesis 5. This is to be expected, as a high IO is a natural consequence of innovative, risk taking and proactive behaviour (Lumkin and Dess, 1996) that leads to the introduction of innovative new products into the market. Market orientation plays a role as well, as evidenced by the support for hypothesis 7 which states that MO and EO interact to positively affect high-growth through IO. A study by Frishammar and Horte (2007) found that MO interacts with the innovativeness component of EO to have a positive effect on new product development.

The results of this study refute Hypothesis 9, which proposes an indirect positive relationship between NC and high-growth through IO. This is counterintuitive as it contradicts the findings of Ritter and Gemunden (2003), specifically, a clear and strong positive relationship between NC and innovation success. Interactions of EO and MO with NC were not found significant; therefore there was no support for hypotheses 11 and 13. One possible explanation for these unexpected results may be that the NC construct in this study has been affected by common method bias, as discussed in the results section, and is not an accurate measure of the concept. This study is however not only attempting

to find relationships with innovation, but with the dichotomous dependent variable high-growth. This may explain some of the seemingly incongruous results.

6.2. Review of Research Questions

As suggested by resource-based and dynamic capabilities theories (e.g. Barney, 1991; Nelson, 1991; Conner and Prahalad, 1996; Teece et al., 1997; Eisenhardt and Martin, 2000), firms are able to renew themselves by combining resources and capabilities in unique bundles that provide them a sustained competitive advantage. The literature acknowledges this relationship in studies of EO, MO, NC and innovation in relation to performance and profitability.

There is however a gap in the literature to which this research responds: to explain the existence of high-growth firms in light of their importance to job creation and economic growth. It does so by forming a descriptive model of high-growth firms, then an empirical study to investigate the relationships between various strategic orientations, networking, innovation and high-growth. It is through this methodology that the study addresses four research questions.

Is a market-driven (customer or competitor) and/or opportunity-driven (entrepreneurial) orientation associated with rapid growth?

On the basis of dynamics capabilities theory, both strategic orientations are important for establishing competitive advantage. MO is a knowledge-based capability allowing the firm to obtain market knowledge while EO provides the resources and capabilities to act on this knowledge. The literature supports a relationship between both

of these orientations and performance or profitability but not with high-growth. This study does not find any evidence to link MO or EO directly to high-growth.

Does innovation mediate the influence of these orientations on the occurrence of high-growth firms?

Innovation was proposed by Schumpeter to be the means by which firms are able to re-invent themselves in the market-place through the process of creative destruction. Innovative products and services are the means through which firms achieve this. Miller (1983) defined an entrepreneurial firm as one that “engages in product market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch” (p. 771). Narver et al. (2004) broke down the MO construct into proactive and responsive components to describe their relationship to new product development. Innovation has been linked to firm growth in a study by Mason et al. (2009) which found that “innovative firms grow twice as fast, both in employment and sales, as firms that fail to innovate” (p. 5). This study supports the relationship between IO and high-growth, as well as the role of IO as a mediator for the effect of EO on high-growth.

Does network competence moderate the effectiveness of either, of both, of these strategic orientations?

According to the knowledge-based theory of the firm (e.g. Madhok, 1996; Kogut and Zander, 1992; Grant, 2002), firms would make use of their networks build market knowledge that becomes a valuable and unique resource to gain strategic competitive advantage. MO is still however critical in processing this knowledge, whereas an EO is

required to transform knowledge into innovation. Networks not only increase the flow of market knowledge into the firm, but expand opportunities for growth including internationalisation (Johanson and Vahlne, 2009). This research does find a positive relationship between NC and high-growth as well as a positive effect of the interaction between MO and NC on high-growth.

Is rapid growth most likely in the presence of both orientations, along with the ability to innovate and network effectively?

The theme of complementarity is recurrent in the resource-based theory, dynamic capabilities and strategic orientations literature in describing the manner in which resources and capabilities are combined in a firm to gain competitive advantage (e.g. Slater and Narver, 1995; Baker and Sinkula, 1999). EO and MO are natural complements as a means of turning market knowledge into an opportunity and acting upon it, with innovation as the result. Networks not only act as a channel for market information, but extend the capabilities of the firm in achieving their goals with limited resources. As stated earlier, MO and NC interact to affect high-growth through IO. This study also supports a synergistic relationship between MO and EO in finding a positive relationship between their interaction and high-growth.

6.3. Theoretical Contribution

This research attempts to contribute to the strategic management and entrepreneurship literature in three ways.

Firstly, the study identified a gap in the strategic management and entrepreneurship literature in the area of empirical studies of rapid growth. Few such studies exist, and there were no studies found relating multiple strategic orientations with rapid growth in the context of networking. This study builds on the literature that examines the relationships between EO, MO and sustained competitive advantage which results in superior performance. Using the same theoretical framework, this research extends the model beyond firm performance, or growth in general, to rapid growth. Consistent with work on the interaction between MO and EO and performance (e.g. Li et al., 2008; Baker and Sinkula, 2009), this study provides evidence that the combination of these strategic orientations has a direct positive effect on high-growth.

Secondly, the study supports the work of Schindehutte et al. (2008) that explained how strategic orientations influence incremental innovation and allow the firm to gain, and sustain, competitive advantage. This study found IO to be a direct driver of high-growth as well as a mediator for the effects of EO, MO and NC.

Finally, the empirical evidence extends the work of Ruokonen et al., 2006 and Loane and Bell (2006) on the role of networks in firm growth and rapid internationalisation. NC was found both to have a positive effect on high-growth on its own, but also when combined with MO.

6.4. Practical Contribution

Determining the factors that are associated with rapid growth can have implications for management as well as policy. The point has been made that a firm's resources are constrained, which is even more of an issue in times of economic turmoil. Managers need

to make choices about where to focus their energies for the best possible return. In addition, economic downturns have historically been associated with patterns of growth and recovery beginning with smaller firms. Small-to-medium sized firms, which comprise the population of this study, are considered to be more flexible and are more likely to be able to adapt their strategies quickly in response to market changes or new information. It is anticipated that studies such as this may contribute to business and industry policy and decision-making towards stimulating and supporting enterprise growth.

Based on the findings of this study, the following specific recommendations are offered for management:

1. Maintain a balance between a market-driven (both customer and competitor) and opportunity-driven orientation when developing a strategy for growth. Exclusive focus on customers' requests while ignoring latent demand, new or enabling technologies, or competitors' activities would lead to sub-optimal results;
2. Dynamic capabilities can be developed at any time within the firm to drive innovation and growth. Rapid growth is not only possible in start up firms; and finally,
3. Establish competence in building and maintaining the firm's business network as an important component of a growth strategy, particularly if the firm is considering internationalisation as a means of achieving rapid growth.

6.5. Limitations and Future Research

While it is hoped that the results of this study provide a useful contribution to entrepreneurship and strategic management theory and practice, I acknowledge that aspects of the study may raise questions about the validity of the research. Of particular concern are the issues of common method, non-response and selection bias. There are also, of course, other factors associated of growth that may explain more of the variance in high-growth than those captured in the model.

Web-enabled surveys provide access to a large number of potential respondents with relative ease but they are also associated with poor response rates, particularly in organisational studies. Fortunately, the number of responses was sufficient in this case to conduct the analyses required to test the hypotheses. However the overall response rate was low which may bring the external validity of the study into question. The use of a single method to gather the data, for both independent and dependent variables, may also have contributed to bias in the results.

Selection bias must also be considered in that firms with fewer than ten employees at the start of the measurement period were eliminated in order to be compatible with the OECD (2008) study of firm growth. The sample does not reflect the entire population of Canadian SME's, perhaps under-representing the smaller service-based firms, thereby limiting its generalizability.

In addition to the potential biases associated with data gathering, there are some issues surrounding the measurement of the dependent variable which may have an impact on the generalizability of this research. A study by Shepherd and Wiklund (2008) found that the various measures of firm growth (sales, employment, profitability, assets and

equity) are not necessarily correlated. Further complication is introduced when comparing relative with absolute measures, and growth over different time periods. In this study, a firm is considered to be a high-growth firm if it has experienced at least a 20% annualized increase in sales or employment over a three-year period, as per the OECD (2008) definition. These two relative measures of growth, according to Shepherd and Wiklund's findings, have a moderate correlation (.336) for a one-year time span. Not all combination of measures and time periods were compared, however based on the one-year findings, it is likely that there is at least moderate correlation between relative employment and sales growth over a three-year period. It may however be beneficial to perform separate analyses on firms categorized as high-growth by virtue of employment or sales.

It is also important to note that growth in sales or employment does not necessarily guarantee the success or stability of the firm in the long term. Growth in sales does not necessarily imply profitability, nor does an increase in the number of employees. In addition, the perceived value of each of these measures of firm growth varies according to the stakeholder. While increased employment may be a valid goal for policy-makers, increased sales (and profitability) may be the primary motivation of the entrepreneur.

Future research is required to attempt to replicate these results, perhaps in a different population using multiple methods including a shorter, more focused, questionnaire and interviews. In addition, a true longitudinal study could be performed on growth outcomes over time in an attempt to establish causal direction. For example, it is important to determine whether innovation causes high-growth, or if it is a result of re-

investment after a period of intense growth and profitability, or increased availability of slack resources to devote to R&D.

This study could lead to further investigation into the mechanisms whereby networking leads to rapid growth. For example, the role of learning orientation and knowledge management as it relates to knowledge creation and innovation within networks. Does knowledge management complement network competence and market orientation in improving a firm's ability to gather, disseminate and react to market information? Would this involve an IT solution, a cultural change in the firm, new management processes, or all three?

In addition the means by which many companies have grown in the past may be unsustainable due to environmental and social impacts. On the opposite end of the spectrum, the social enterprise is becoming an increasingly popular model in which the business is built around corporate social responsibility. Is it possible to have rapid growth that is sustainable from an environmental and social perspective?

6.6. Conclusions

The purpose of this study was to establish and test an empirical model of rapid firm growth based on the theories of the firm, sustainable competitive advantage and strategic orientations and capabilities. The first task is to develop a descriptive model of high-growth firms in terms of their demographic characteristics, their growth trajectories, their frequency of occurrence in the population of firms, along with some specific case examples. This provided the context for the main study, to produce an empirical model of the antecedents to rapid growth.

Using structural equation modelling (SEM), the relationships between two strategic orientations (MO and EO), innovation orientation (IO) and network competence (NC) were examined in relation to the dichotomous outcome variable high-growth. A high-growth firm was defined as having greater than 20% annual growth in sales or employment over a period of three years. The data showed that NC, the interaction of NC with MO, and IO are all positively associated with high-growth firms.

The importance of innovation is highlighted by the fact that IO acts as a mediator for the positive effect of EO, and the interaction of EO with MO, on high-growth. Furthermore, the significance of a number of interactions between the strategic orientations and NC confirms that high-growth does not depend on one, but many, complementary capabilities and orientations with the organisation.

The study contributes to the entrepreneurship and strategic management literature by providing empirical evidence of the complementary nature of the relationships associated with high-growth firms. Although these findings may make an incremental contribution to the literature, they should be interpreted as tentative in light of the limitations of the study. Further research is required to explore and provide further empirical evidence of the nature of the relationships between strategic orientations, innovation, networking and high-growth.

Appendix A. Construct Descriptions

Outcome Variables

The first outcome variable is a dichotomous measure of high growth rates based on OECD (2008) standards. Although some of the companies targeted were public, the survey was anonymous therefore validation of actual firm growth rates through secondary data sources was not possible.

High-growth. These firms have reported at least 20% annualised growth in either sales or employment over the measurement period (2005 through 2008).

Predictors

Four scales were included in the model as independent variables: EO, MO, NC, and IO. The EO scale was adapted from Lumpkin and Dess (1996) and Chang et al. (2007). The MO scale came from Atuahene-Gima et al. (2005). NC was developed by Ritter and Gemunden (2003). IO is a new scale developed as an objective measure of innovation orientation comprising a number of variables related to innovation goals, strategies and performance criteria based mainly on the OECD (2005) guidelines for collection and interpretation of innovation data.

Entrepreneurial Orientation. The EO scale has five dimensions: (1) innovativeness, (2) risk taking, (3) proactiveness, (4) autonomy, and (5) competitive aggressiveness.

(1) *Innovativeness.* (a) In general, the top managers of my company favour a strong emphasis on R&D, technological leadership, and innovations; (b) Very many new

lines of products/services have been marketed in the past 5 years; (c) Changes in product or service lines have usually been quite dramatic.

(2) *Risk taking.* (a) A strong proclivity for high risk projects (with chances of very high returns; (b) Owing to the nature of the operational environment, bold and wide-ranging acts are necessary to achieve the company's objectives; (c) When confronted with decisions involving uncertainty, my company typically adopts a bold posture in order to maximize the probability of exploiting opportunities.

(3) *Proactiveness.* (a) In dealing with its competitors, my company typically initiates actions which competitors then respond to; (b) In dealing with its competitors, my company is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc; (c) In general, the top managers of my company have a strong tendency to be ahead of others in introducing novel ideas or products.

(4) *Autonomy.* (a) We develop independent work units such as 'skunk works' to enhance creative thinking; (b) We develop effective ways to allow employees and project teams access to the resources needed to try their new ideas; (c) We make efforts to create autonomy via actions such as bending rules and bypassing procedures and budgets; (d) We implement necessary structural changes such as forming small autonomous groups to stimulate new ideas.

(5) *Competitive aggressiveness.* (a) My company typically adopts a very competitive 'undo-the-competitors' posture; (b) My company is very aggressive and intensely competitive.

Market Orientation. The MO scale has two dimensions: (1) Responsive MO, (2) Proactive MO.

(1) *Responsive MO.* (a) Our business objectives are driven primarily by customer satisfaction; (b) We constantly monitor our level of commitment and orientation to serving customer needs; (c) We freely communicate information about our successful and unsuccessful customer experiences across all business functions; (d) Our strategy for competitive advantage is based on our understanding of customers' needs; (e) We measure customer satisfaction systematically and frequently; (f) We have routine or regular measures of customer service; (g) We are more customer-focused than our competitors; (h) I believe this business exists primarily to serve customers; (i) We poll end users at least once a year to assess the quality of our products and services; (j) Data on customer satisfaction are disseminated at all levels in this business unit on regular basis.

(2) *Proactive MO.* (a) We innovate even at the risk of rendering our own products obsolete; (b) We help customers anticipate developments in the markets; (c) We continuously try to discover additional needs of our customers of which they are unaware; (d) We incorporate solutions to unarticulated customer needs in our new products and services; (e) We brainstorm on how customers use our products/services to discover new customer needs; (f) We search for opportunities in areas where customers have a difficulty expressing their needs; (g) We work closely with lead users who try to recognize customer needs months or even years before the majority of the market recognizes them; (h) We extrapolate key technological, business and customer lifestyle trends to gain insight into what customers in our current market would need in the future.

Network Competence. The NC scale has seven dimensions:(1) planning; (2) organizing; (3) staffing; (4) controlling; (5) initiation; (6) exchange; (7) coordination.

(1) *Planning.* (a) We evaluate the way our relationship with each partner depends on our relations with other partners; (b) We evaluate the way our relationship with each partner interferes with our relations with other partners; (c) We evaluate the way our relationship with each partner helps our relations with other partners; (d) We evaluate the way each of our partners contributes to success of our company; (e) We evaluate the way the results of collaboration with each of our partners fit together; (f) We evaluate the way our collaboration with our partners contributes to achieving our company's strategic objectives; (g) We compare our partners in terms of their knowledge; (h) We compare our partners in terms of their productivity.

(2) *Organizing.* (a) We allocate financial resources to each relationship with our partners (e.g. travel budgets); (b) We establish objectives for relationships with each partner; (c) We initiate meetings and discussions among those in our company involved in relationships with our partners.

(3) *Staffing.* (a) We assign people to each relationship with our partners; (b) We coordinate the activities involved in different relationships with our partners.

(4) *Controlling.* (a) We assess how much effort our people put into relationships with technical partners; (b) We monitor the extent to which relationships with our partners work to our advantage; (c) We monitor differences between expected and actual performance in relationships with our partners.

(5) *Initiation.* (a) We search actively for new potential partners; (b) We visit potential partners in order to get to know them.

(6) *Exchange*. (a) We exchange general information with our partners; (b) We exchange confidential information with our partners; (c) Our people discuss social and personal matters with people from our partners; (d) We inform others in our company about the requirements of our partners.

(7) *Coordination*. (a) We put people from our partners in contact with key people in our company; (b) We put people in our company in contact with key people from our partners; (c) We initiate personal contacts between people in our company and our partners.

Innovation Orientation. In addition to the innovativeness measure of within the EO scale a number of objective measures (OECD, 2005) were used including: (1) percentage of sales rolled back into research and development; (2) percentage of employees in research and development; (3) number of new or significantly improved first-to-the-market products or services introduced (before competitors) in the last three years; (4) percentage of sales in the last year from first-to-the-market products or services introduced in the last three years; (5) the main source of development of innovation (within the company, with other firm/organisation, other firm/organisation; (6) whether *any* new products or services have been introduced that were (a) first-to-the-world, (b) first in North America, (c) first in Canada, (d) first in your province or territory; (7) a subjective measure of level of goal to achieve technological superiority.

Covariates

A number of additional variables were included as covariates in the model to capture additional variance in the data.

Age. The age of the firm is calculated as the number of years since founding.

Size. Firm size is indicated by the total number of employees and a range of annual sales.

Origin. The firm is classified as to whether it is public, a spin-off or spin-out, or has been involved in a merger or acquisition.

Competitive Environment. Two scales were used to measure competitive environment. Jantunen *et al.* (2005) developed the scale to measure environmental dynamism measuring the frequency and degree of change in the market. This is complemented by the Zahra and Garvis (2000) environmental hostility scale that measures the level of competition.

(1) *Environmental dynamism.* (a) Our operational environment changes slowly; (b) In our field of business the life cycle of products (goods and services) is typically long; (c) In our field one cannot succeed, if one is not able to launch new products continuously; (d) In our field of business customers' preferences are quite stable. (e) The ability to operate quickly is crucial for success in our field of business; (f) Technological development offers remarkable possibilities in our field of business; (g) Technological development is rapid in our field of business.

(2) *Environmental hostility.* (a) Access to channels of distribution is difficult; (b) Access to capital is difficult; (c) Access to skilled labour is difficult; (d) Bankruptcy among companies in the industry is high; (e) Products become obsolete quickly; (f) Demand for industry products is declining.

Goals and Objectives. The relative importance of the firm's key goals, including growth and profitability, is measured with a scale developed by Autio *et al.* (2000). Respondents were asked to indicate the importance of the maximizing profitability and maximizing sales growth.

Slack Resources. The level of availability of resources is measured with a scales developed by Atuahene-Gima et al. (2005) as follows: (a) Our company has uncommitted resources that can quickly be used to fund new strategic initiatives; (b) Our company has few resources available in the short run to fund its initiatives; (c) We are able to obtain resources at short notice to support new strategic initiatives; (d) We have substantial resources at the discretion of management for funding strategic initiatives.

Knowledge Intensity. Industries are divided into groups based on knowledge intensity (Morissette et al., 2004) with the most knowledge-intensive described as *high knowledge*, followed *knowledge producers*, then all other industries.

Sales and Marketing Commitment. The level of commitment to sales and marketing is represented by the percentage of employees assigned to these functions as well as the percentage of sales invested back into sales and marketing.

Internationalisation. The degree internationalisation is measured by the percentage of sales in foreign markets, the number of international clients and the percentage of employees working outside the country.

Appendix B. Survey Instrument

1. Welcome		
#	Question Title	Answer

2. Introductory Questions		
#	Question Title	Answer

1. Has your company ever had clients or customers in countries outside of Canada?
2. Does your company currently have clients or customers in countries outside of Canada?
3. How many new or significantly improved products or services has your company introduced onto the market during the last three calendar years? (enter 0 if none)

3. Demographic Items		
#	Question Title	Answer

4. In what year was your company founded?
5. How would you describe the ownership and structure of your company?
 Your company is ... (Private / Public)
 Is it a subsidiary of another company?
6. What is your position in the company? (e.g., CEO, Principal owner or President, General Manager, etc.)
7. What is the primary industry of your company?

4. Demographic Items (continued)

#	Question Title	Answer
8.	How many employees does your company have ...	In Canada: Outside of Canada:
9.	What proportion of your company's personnel work in ... ()	Research and development: Marketing and sales:
10.	What were your approximate total sales for the last calendar year? (CAD\$)	
11.	What proportion of your company's total sales is derived from ... ()	Products: Services:
12.	On average, what proportion of your company's annual sales will be invested in ... ()	Research and development: Marketing and sales:

5. Growth

#	Question Title	Answer
13.	What was the approximate annual percentage change in your company's sales and employment in ... (; use negative numbers to indicate a decline)	Sales Employment
	2006	
	2007	
	2008	
14.	Was your company either the buyer or target of an acquisition or involved in a merger between 2006 and 2008?	
15.	Would you describe your company as either a <u>spin-out</u> * or <u>spin-off</u> **?	

6. Innovation

#	Question Title	Answer
16.	Has your company introduced any <u>first-to-the-market</u> * innovations during the last three calendar years?	
17.	Please estimate (as best as you can) the percentage of sales in 2008 from these <u>first-to-the-market</u> innovations that were introduced during the last three calendar years: ()	
18.	Has your company introduced any <u>already-on-the-market</u> ** innovations during the last three calendar years?	
19.	Please estimate (as best as you can) the percentage of sales in 2008 from these <u>already-on-the-market</u> innovations that were introduced during the last three calendar years: ()	
20.	Has your company acquired licenses (for intellectual property) from other firms or organisations during the last three calendar years?	
21.	Please indicate the number of licenses from each source. (enter 0 if none)	A Canadian firm: A foreign firm: A Canadian university: A Canadian federal government lab A provincial/territorial government lab Other, please specify:
22.	How many patents has your company applied for during the last three calendar years? (enter 0 if none)	

7. Innovation (continued)		
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#	Question Title	Answer
23.	The majority of first-to-market/already-on-the-market innovations introduced during the last three calendar years were developed by:	
24.	On average how many months does it take your company to develop a first-to-market/already-on-the-market innovation:	
25.	Has your company introduce any new or significantly improved products or services onto the market during the last three calendar years that were <u>first in the world</u> ?	
26.	... first in <u>North America</u> ?	
27.	... first in <u>Canada</u> ?	
28.	... first in your <u>province or territory</u> ?	

8. Goals and Objectives		
-------------------------	--	--

#	Question Title	Answer
29.	Please indicate the overall importance to your company of each of the following goals:(1=not at all important, 7=extremely important)	
		1 2 3 4 5 6 7
	Maximizing profitability	
	Maximizing sales growth	
	Maximizing technical superiority	
	Maximizing value of the company for eventual acquisition	
	Maximizing stability and longevity of the company	

9. Operations and Practices (part 1 of 7)

#	Question Title	Answer
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30. Please indicate how well the following statements describe your company: (1=not at all, 7=to a great extent)

1 2 3 4 5 6 7

We develop independent work units such as ‘skunk works’ to enhance creative thinking.

We develop effective ways to allow employees and project teams access to the resources needed to try their new ideas.

We make efforts to create autonomy via actions such as bending rules and bypassing procedures and budgets.

We implement necessary structural changes such as forming small autonomous groups to stimulate new ideas.

1 2 3 4 5 6 7

In dealing with its competitors, my company typically initiates actions which competitors then respond to.

In dealing with its competitors, my company is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.

In general, the top managers of my company have a strong tendency to be ahead of others in introducing novel ideas or products.

10. Operations and Practices (part 2 of 7)

#	Question Title	Answer
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31. Please indicate how well the following statements describe your company: (1=not at all, 7=to a great extent)

1 2 3 4 5 6 7

In general, the top managers of my company favour a strong emphasis on R&D, technological leadership, and innovations.

Very many new lines of products/services have been marketed in the past 5 years.

Changes in product or service lines have usually been quite dramatic.

1 2 3 4 5 6 7

A strong proclivity for high risk projects (with chances of very high returns.

Owing to the nature of the operational environment, bold and wide-ranging acts are necessary to achieve the company's objectives.

When confronted with decisions involving uncertainty, my company typically adopts a bold posture in order to maximize the probability of exploiting opportunities.

1 2 3 4 5 6 7

My company typically adopts a very competitive ‘undo-the-competitors’ posture.

My company is very aggressive and intensely competitive.

11. Operations and Practices (part 3 of 7)

#	Question Title	Answer
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32. When evaluating partners in your value chain*, please indicate how well the following statements describe your company: (1=not at all, 7=to a great e

1 2 3 4 5 6 7

We evaluate the way our relationship with each partner depends on our relations with other partners.

We evaluate the way our relationship with each partner interferes with our relations with other partners.

We evaluate the way our relationship with each partner helps our relations with other partners.

We evaluate the way each of our partners contributes to success of our company.

We evaluate the way the results of collaboration with each of our partners fit together.

We evaluate the way our collaboration with our partners contributes to achieving our company’s strategic objectives.

We compare our partners in terms of their knowledge.

We compare our partners in terms of their productivity.

12. Operations and Practices (part 4 of 7)

#	Question Title	Answer
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33. When managing relationships with partners in your value chain, please indicate how well the following statements describe your company: (1=not at all

1 2 3 4 5 6 7

We allocate financial resources to each relationship with our partners (e.g. travel budgets).

We establish objectives for relationships with each partner.

We initiate meetings and discussions among those in our company involved in relationships with our partners.

We assign people to each relationship with our partners.

We coordinate the activities involved in different relationships with our partners.

We assess how much effort our people put into relationships with technical partners.

We monitor the extent to which relationships with our partners work to our advantage.

We monitor differences between expected and actual performance in relationships with our partners.

We search actively for new potential partners.

We visit potential partners in order to get to know them.

13. Operations and Practices (part 5 of 7)

#	Question Title	Answer
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34. When exchanging information with partners in your value chain, please indicate how well the following statements describe your company: (1=not at all

1 2 3 4 5 6 7

We exchange general information with our partners.

We exchange confidential information with our partners.

Our people discuss social and personal matters with people from our partners.

We inform others in our company about the requirements of our

partners.

We put people in our company in contact with key people from our partners.

We put people from our partners in contact with key people in our company.

We initiate personal contacts between people in our company and our partners.

14. Operations and Practices (part 6 of 7)

#	Question Title	Answer
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35. To what extent have the following practices been adopted by your company: (1=not at all, 7=to a great extent)

1 2 3 4 5 6 7

Our business objectives are driven primarily by customer satisfaction.

We constantly monitor our level of commitment and orientation to serving customer needs.

We freely communicate information about our successful and unsuccessful customer experiences across all business functions.

Our strategy for competitive advantage is based on our understanding of customers' needs.

We measure customer satisfaction systematically and frequently.

We have routine or regular measures of customer service.

We are more customer-focused than our competitors.

I believe this business exists primarily to serve customers.

We poll end users at least once a year to assess the quality of our products and services.

Data on customer satisfaction are disseminated at all levels in this business unit on regular basis.

15. Operations and Practices (part 7 of 7)

#	Question Title	Answer
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36. To what extent have the following practices been adopted by your company: (1=not at all, 7=to a great extent)

1 2 3 4 5 6 7

We innovate even at the risk of rendering our own products obsolete.

We help customers anticipate developments in the markets.

We continuously try to discover additional needs of our customers of which they are unaware.

We incorporate solutions to unarticulated customer needs in our new products and services.

We brainstorm on how customers use our products/services to discover new customer needs.

We search for opportunities in areas where customers have a difficulty expressing their needs.

We work closely with lead users who try to recognize customer needs months or even years before the majority of the market recognizes them.

We extrapolate key technological, business and customer lifestyle trends to gain insight into what customers in our current market would need in the future.

1 2 3 4 5 6 7

Our company has uncommitted resources that can quickly be used to fund new strategic initiatives.

Our company has few resources available in the short run to fund its initiatives.

We are able to obtain resources at short notice to support new strategic initiatives.

We have substantial resources at the discretion of management for funding strategic initiatives.

16. International Markets (historical activity)

#	Question Title	Answer
37.	In which years (as applicable) did your international sales surpass ...	(0/25/50/75 of total sales)
38.	Your company's first international activities ... consisted of: involving this country:	
39.	Three years after your company's first international activities ... the approximate total of your domestic and	

foreign sales was: (CAD\$)
 with the following proportions from each
 market: ()

17. International Markets (current activity)

#	Question Title	Answer
40.	What proportion of your clients or customers is located outside of Canada? ()	
41.	In how many countries besides Canada does your company operate or have clients or customers?	
42.	What proportion of your company's total sales was derived from foreign markets in the last calendar year? ()	
43.	What proportion of your company's total sales is derived from the following markets in the last calendar year? ()	
44.	What is the most important distribution mode in your largest foreign market?	

18. Competitive Environment

#	Question Title	Answer
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45. Thinking back over the past three years, please indicate how well the following statements characterizes the competitive environment in which your fir

1 2 3 4 5 6 7

Our operational environment changes slowly.

In our field of business the life cycle of products (goods and services) is typically long.

In our field one cannot succeed, if one is not able to launch new products continuously.

In our field of business customers' preferences are quite stable.

The ability to operate quickly is crucial for success in our field of business.

Technological development offers remarkable possibilities in our field

of business.

Technological development is rapid in our field of business.

Access to channels of distribution is difficult.

Access to capital is difficult.

Access to skilled labour is difficult.

Bankruptcy among companies in the industry is high.

Products become obsolete quickly.

Demand for industry products is declining.

19. Thank You!

#	Question Title	Answer
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Appendix C. Univariate Analysis

Table 23 Descriptive Statistics, Observed Categorical and Continuous Variables

Variable	Item	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Entrepreneurial Orientation (EO)	eo1	249	1	7	2.63	1.74	0.79	-0.50
	eo2	251	1	7	4.15	1.73	-0.18	-0.80
	eo3	251	1	7	3.63	1.73	0.05	-0.95
	eo4	251	1	7	3.79	1.88	0	-1.09
	eo5	251	1	7	4.39	1.69	-0.42	-0.67
	eo6	251	1	7	4.51	1.73	-0.40	-0.78
	eo7	250	1	7	4.63	1.58	-0.34	-0.67
	eo8	250	1	7	4.56	1.69	-0.47	-0.50
	eo9	250	1	7	3.72	1.83	0.16	-1.12
	eo10	250	1	7	3.42	1.70	0.28	-0.88
	eo11	250	1	7	3.54	1.66	0.22	-0.88
	eo12	249	1	7	3.71	1.63	0.19	-0.99
	eo13	249	1	7	4.06	1.48	-0.10	-0.69
	eo14	251	1	7	3.82	1.75	0.12	-0.91
	eo15	251	1	7	4.45	1.64	-0.13	-0.78
Network Competence (NC)	nc1	250	1	7	4.24	1.70	-0.20	-0.87
	nc2	250	1	7	4.04	1.75	-0.04	-0.90
	nc3	251	1	7	4.49	1.65	-0.39	-0.57
	nc4	249	1	7	5.24	1.40	-0.91	0.82
	nc5	250	1	7	4.80	1.50	-0.61	0.01
	nc6	251	1	7	5.12	1.40	-0.83	0.53
	nc7	251	1	7	4.65	1.64	-0.31	-0.61
	nc8	251	1	7	4.77	1.59	-0.50	-0.31
	nc9	251	1	7	3.50	1.67	0.20	-0.74
	nc10	251	1	7	4.11	1.70	-0.16	-0.90
	nc11	249	1	7	4.64	1.70	-0.46	-0.55
	nc12	251	1	7	4.49	1.75	-0.29	-0.89
	nc13	249	1	7	4.33	1.69	-0.24	-0.78
	nc14	251	1	7	3.98	1.70	0.05	-0.99
	nc15	251	1	7	4.39	1.69	-0.21	-0.94
	nc16	251	1	7	4.20	1.72	-0.07	-1
	nc17	251	1	7	4.88	1.72	-0.55	-0.60
	nc18	250	1	7	4.70	1.77	-0.41	-0.84
	nc19	251	1	7	4.99	1.45	-0.65	0.03
	nc20	251	1	7	3.84	1.80	0.02	-1.03
	nc21	250	1	7	3.54	1.68	0.16	-0.89
	nc22	250	1	7	4.55	1.60	-0.23	-0.71
	nc23	251	1	7	5.12	1.51	-0.68	0.02
	nc24	251	1	7	5.08	1.54	-0.74	0.15
	nc25	250	1	7	4.60	1.67	-0.30	-0.72

Table 23 Descriptive Statistics, Observed Categorical and Continuous Variables (continued)

Variable Name	Item	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Market Orientation (MO)	mo1	251	1	7	5.92	1.11	-1.03	1.03
	mo2	251	1	7	5.68	1.23	-0.93	0.72
	mo3	251	1	7	5.11	1.60	-0.74	-0.23
	mo4	251	1	7	6.01	1.09	-1.34	2.33
	mo5	251	1	7	4.89	1.71	-0.44	-0.88
	mo6	251	1	7	4.71	1.75	-0.26	-1
	mo7	251	1	7	5.52	1.33	-0.68	-0.14
	mo8	251	2	7	5.94	1.18	-1.12	0.79
	mo9	250	1	7	4.22	2.14	-0.10	-1.40
	mo10	250	1	7	4.15	1.91	-0.05	-1.07
	mo11	248	1	7	4.17	1.93	-0.19	-1.15
	mo12	251	1	7	4.76	1.70	-0.50	-0.62
	mo13	251	1	7	5.43	1.48	-0.90	0.34
	mo14	250	1	7	5.12	1.53	-0.69	-0.17
	mo15	250	1	7	4.96	1.71	-0.53	-0.65
	mo16	251	1	7	4.96	1.61	-0.56	-0.37
	mo17	249	1	7	4.36	1.84	-0.19	-1.04
	mo18	250	1	7	4.17	1.86	-0.08	-1.09
Slack Resources (SR)	sr1	251	1	7	3.15	1.78	0.53	-0.76
	sr2	250	1	7	4.27	1.96	-0.17	-1.21
	sr3	248	1	7	3.92	1.78	0.02	-1.07
	sr4	250	1	7	3.34	1.89	0.37	-1.10
Competitive Environment (CED, CEH)	ce1	247	1	7	4.26	1.70	-0.10	-0.93
	ce2	247	1	7	3.04	1.68	0.70	-0.37
	ce3	244	1	7	3.57	1.74	0.08	-1.07
	ce4	246	1	7	3.44	1.47	0.46	-0.50
	ce5	246	1	7	5.53	1.34	-0.91	0.57
	ce6	244	1	7	5.01	1.64	-0.63	-0.44
	ce7	246	1	7	4.27	1.79	-0.15	-0.95
	ce8	242	1	7	3.50	1.78	0.20	-1.08
	ce9	245	1	7	4.30	1.85	-0.10	-1.05
	ce10	246	1	7	4.66	1.70	-0.39	-0.71
	ce11	245	1	7	3.62	1.85	0.37	-0.94
	ce12	244	1	7	2.97	1.59	0.50	-0.64
	ce13	242	1	7	3.18	1.83	0.55	-0.71
R&D Expense (%)	inv_rnd	241	0	95	9.21	17.33	3.35	11.82
Employees, R&D (%)	emp_rnd	247	0	95	12.34	20.94	2.47	5.66
Licenses, Total	lic_tot	185	0	100	8.96	17.67	3.26	12.23
Innovation, First in World	innov_wo	251	0	2	0.55	0.81	1.01	-0.70
Innovation, First in Continent	innov_ct	251	0	2	0.51	0.72	1.05	-0.30
Innovation, First in Country	innov_cy	250	0	2	0.54	0.68	0.87	-0.44
Innovation, First in Province/State	innov_pr	249	0	2	0.58	0.66	0.70	-0.57
Sales, First-to-Market (%)	sales_fi	185	0	100	8.96	17.67	3.26	12.23
Goal Importance, Profitability	goal_pro	251	1	7	6.25	1.08	-1.90	4.71
Goal Importance, Growth	goal_gro	251	2	7	5.56	1.33	-0.53	-0.63
Employees	emp	251	4	250	45.94	48.22	2.27	5.12
Employees, Sales & Marketing (%)	emp_snm	247	0	100	22.65	28.15	1.77	1.95
International Sales (%)	im_sal	171	0	100	34.43	33.62	0.60	-1.20

Table 24 Descriptive Statistics, Dichotomous Variables

Variable	Item	% No	% Yes
KBI, High Knowledge	kbi_hk	96.8	3.2
Public Company	public	96.4	3.6
Spin-off or Spin-out	spin_off	88.4	11.6
Merger or Acquisition	mergerac	82.9	17.1
High-growth	hg	80.5	19.5

Figure 14 Frequency Distributions, Latent Constructs

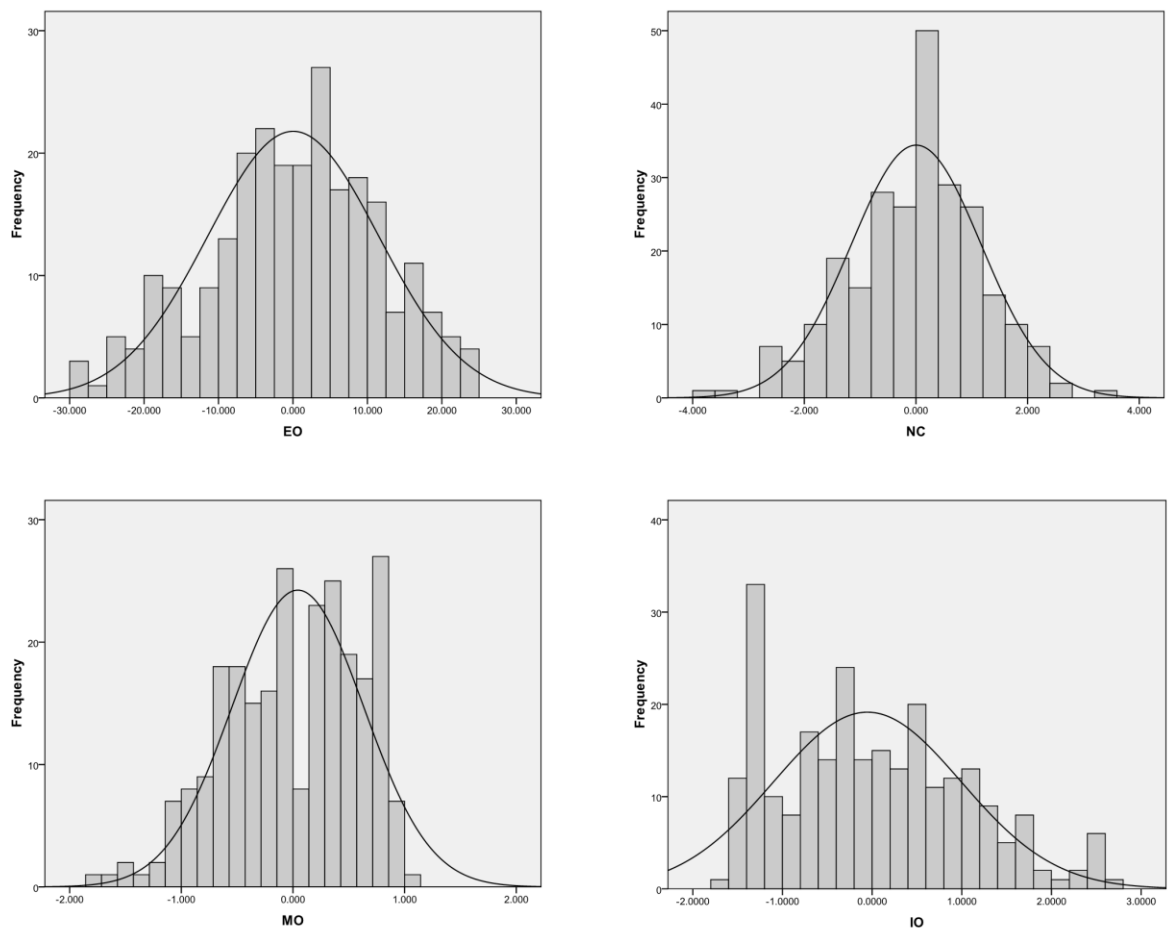
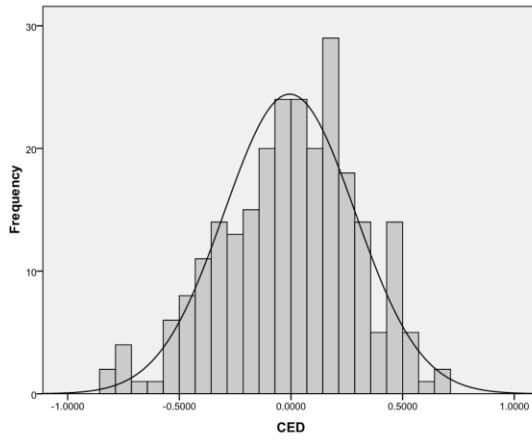
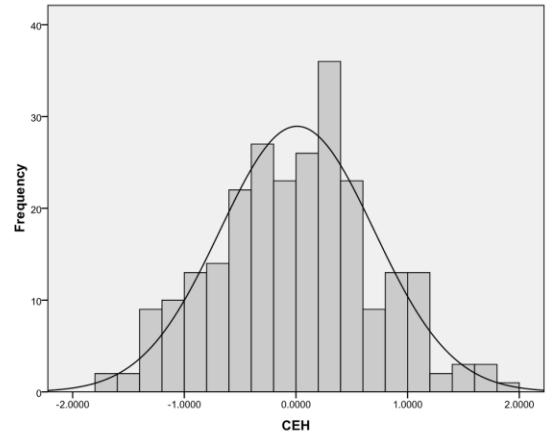
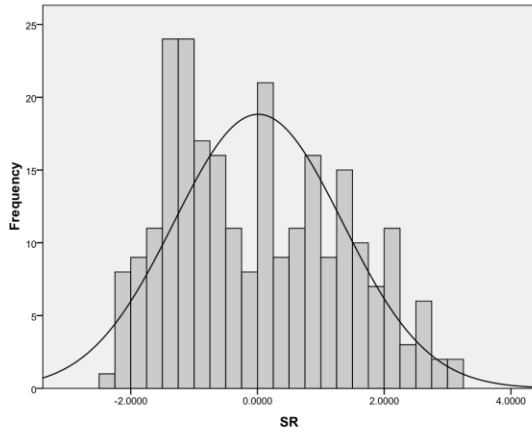


Figure 14 Frequency Distributions, Latent Constructs (continued)



Appendix D. SEM Output

Table 25 Model Output (standardised)

Model Variable	Estimate	S.E.	Two-Tailed P-Value
<i>IO On</i>			
EO	1.27	15.15	0.000
MO	-0.38	-3.66	0.000
NC	-0.29	-3.77	0.000
EOxNC	0.02	0.21	0.833
MOxNC	-0.24	-2.22	0.027
MOxEO	0.22	2.88	0.004
<i>HG On</i>			
IO_SC	0.37	3.29	0.001
EO_SC	0.23	0.88	0.377
MO_SC	-0.63	-3.52	0.000
NC_SC	0.33	2.57	0.010
EOXNC	-0.66	-2.18	0.029
MOXNC	0.52	2.44	0.015
MOXEO	-0.08	-0.44	0.664
METHOD	0.00	999.00	999.000
CED	0.09	0.58	0.565
CEH	0.02	0.15	0.879
SR	0.15	1.68	0.093
GOAL_PRO	-0.18	-2.73	0.006
GOAL_GRO	0.12	1.32	0.188
KBI_KP	-0.01	-0.21	0.834
KBI_HK	-0.15	-1.97	0.049
PUBLIC	0.14	2.82	0.005
SPIN_OFF	-0.02	-0.27	0.785
MERGERAC	0.05	0.80	0.423
EMP_LOG	0.21	2.60	0.009
EMP_SNM_LO	0.07	0.89	0.373
IM_SAL_LOG	-0.06	-0.60	0.549

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