



Managing High-Growth Firms: A literature review

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Summary

Research on high-growth firms (HGFs) is a rapidly growing field in management, entrepreneurship, and economics, but research on the skills, experiences, and strategies of leaders in HGFs has been scant. While some research hints at the unique nature of rapidly growing firms (Delmar, Davidsson, & Gartner, 2003; Powell & Sandholtz, 2012), there is a dearth of research addressing the unique managerial challenges facing such firms. In terms of public policy, there is growing interest in HGFs. Specifically, the Organization for Economic Cooperation and Development (OECD) conducts several programs to foster HGFs in various countries.

This report aims at furthering the research on HGFs from a management perspective. The report includes a comprehensive literature review of the last 30 years of academic papers and reports published on HGFs, looking specifically at empirical research on the leaders (defined as either individual entrepreneurs or the top management teams [TMTs] in HGFs). The review of 134 published studies between 1985 and 2013 reveals only 30 empirical studies with data on the founding entrepreneurs or TMTs of HGFs. Among the 30 studies, the review indicates that HGFs are more often founded and/or managed by a larger management team than more general firm samples. Further, managers of HGFs seem to more often be highly educated and exhibit prior industry and leadership experience but not necessarily prior entrepreneurial experience. Studies on the innovation-growth relationship suggest that *different types of innovativeness* may be *differentially related to rapid growth*. While some studies have revealed that R&D and product innovations are important for rapid growth, in many other studies, they exhibit no relationship with rapid growth. However, measures of market *innovativeness* or contact with markets and customers often seem to be distinguishing features of HGFs. The review indicates tension in the current literature in that some studies argue that HGFs need to establish formal managerial structures to manage growth, while other studies argue that the “the capacity to adapt” is more important. Given that the evidence to date has primarily been based on small-sample cross-sectional studies in certain industrial contexts and settings, this evidence must be taken as tentative.

In the concluding section of the report, the literature review of extant research on managing HGFs is used to identify areas in which research is lacking, highlighting “what is known” and “what is not known” in current research on HGFs. The policy section presents a set of recommendations based on the literature review and the aforementioned empirical studies in Sweden, outlining what specific areas should be targeted by policymakers, educators, and investors seeking to enhance the managerial potential in HGFs.

Theories of leadership and management skills in HGFs

Until Birch and Medoff (1994) coined the terms “Mize and Gazelles” to describe the different growth patterns of new slow-growing and new fast-growing firms, with a few exceptions, the literature on HGFs was virtually nonexistent. Since then, a large number of studies in economics, management, innovation studies, and regional science has investigated the growth patterns among HGFs, notably finding that HGFs have generated the bulk of new net jobs in modern economies (Brüderl & Preisendörfer, 2000; Davidsson and Henrekson, 2002; Delmar *et al.*, 2003; Littunen & Tohmo; 2003; Halabisky *et al.*, 2006; Acs and Mueller, 2008; Acs *et al.*, 2008; see Henrekson and Johansson, 2010, for a survey). Most studies have been macro oriented in nature, focusing on the role of HGFs for job creation (Henrekson & Johansson, 2010), productivity upgrades, and industrial dynamics (Bos & Stam, 2011; Delmar *et al.*, 2011) as well as for innovative outcomes (Stuart, 2000).

Consequently, with few exceptions, we still do not know much about management in HGFs. This lack of systematic evidence is a regrettable gap in the literature because without knowledge about the actual founders and managers in HGFs as well as about their strategies and actions, policymakers, educators, and investors seeking to facilitate rapid growth in firms or to increase the likelihood of more HGFs emerging have no scientific evidence on which to base their recommendations. Managers of HGFs often have difficulty determining what kinds of organizational changes or transitions are needed because they face greater managerial complexity than managers of firms growing more slowly (Covin & Slevin, 1990).² Before the review, we present an overview of the theoretical work relevant for management and leadership in HGFs.

What is an HGF?

HGFs are often created as small units (Davidsson & Delmar, 1998). Some evidence suggests they are more likely than other startups to be “spinoffs” whose founders previously worked in large companies (Andersson & Klepper, 2013; Klepper, 2009). One reason why most HGFs start small can be found in the type of growth characterizing small versus large firms; another reason can be found in the criteria used to identify HGFs.

Criteria used to define high growth. The criteria used to identify HGFs constitutes one important reason why most HGFs are identified as small and young. Some use *relative growth rates*. This could be either a relative growth rate over time (e.g., 20% annual growth over a period of time) or a growth rate relative to the overall population of firms in an industry, region, or country (e.g., the 1%, 5%, or 10% fastest-growing firms in a population of firms). Others use absolute measures, such as firms that grow by a fixed amount in sales, employees, or productivity from one point in time to another (Havnes & Senneseth, 2001). Delmar (1997) reviewed 55 articles on growth and concluded that findings differ greatly as to whether empirical analyses concentrate on relative or on absolute growth. For example, to grow 100% in either employees or sales revenues over three years is obviously much easier for a 10-person company with €1 million in annual sales revenues than for a 100-person firm with €10 million in annual sales revenues. Hence, studies focusing on *relative growth* tend to oversample smaller firms, while studies focusing on *absolute growth* tend to oversample larger firms. One way to strike a balance between the disproportionate focus on very small or large firms is to use a combination of relative and absolute growth rates or to use some sort of minimum size criterion for inclusion in a study.³ An increasingly accepted procedure for the latter type is to use the OECD definition of HGFs which avoids having the results of studying a sample of HGFs being skewed by the

² Not all HGFs are young firms; however, on average, HGFs tends to be younger than the general population of companies (Henrekson & Johansson, 2010).

³ Another remedy is to estimate statistical models that control for business size when studying absolute growth, which decreases the inferential problems of samples dominated by small firms. This approach, however, does not control for the sample selection problem of including primarily small firms in the sample in the first place.

inclusion of very small firms below 10 employees, which represents the majority of all firms in any economy.

Measures of growth. The most predominant measures of growth in the literature to date are *growth in sales* (interchangeably called turnover or revenue) or *growth in employees* (Delmar, 1997; Shepherd & Wiklund, 2009). Another important but somewhat less common measure is *growth in productivity* (Nelson, 1991).

Type of growth. It is fairly well established in the literature that small- and medium-sized enterprises (SMEs) tend to grow organically by increasing turnover and hiring more employees. Larger companies, however, almost exclusively grow through mergers and acquisitions by purchasing or merging operations with other companies and then seeking to increase efficiency in the merged operations (Davidsson and Delmar 2003; McKelvie, Wiklund & Davidsson, 2006).

Managerial skills in HGFs

In what follows, we discuss how managerial theories of firm growth (originating primarily in Penrose's [1959] work) may contribute to our understanding of how to organize a rapidly growing firm. This theory emphasizes upgrading and enhancing the knowledge base of managers and key employees (Lockett, Wiklund, Davidsson, & Girma, 2011). Our literature review will focus on identifying what type of knowledge bases among managers and employees seem to be conducive for rapid growth. Before this, we will discuss how influential management theories discuss the conditions for rapid growth.

One line of research on managing rapid firm growth has focused on the importance of transitions from various stages of firm size (Covin & Slevin, 1990). Such transitions constitute periods when the structures and systems that guide individual actions and interactions in the organization change significantly (Davila, Foster & Jia, 2010). However, such transition may be elusive since macro-oriented research suggests that the growth patterns of HGFs are highly erratic and that periods of rapid growth may be followed by stagnation or even decline in firm size (Daunfeldt & Halvarsson, 2011; Garnsey, Stam & Heggeman, 2006). This means that models of HGF management needs to account for the often dynamic and rapidly changing organizational structure of HGFs (Eisenhardt and Schoonhoven, 1990). Nicholls-Nixon (2005) argued that firms must build their capacity to get things done when the formal structures and systems in place do not keep up with their rapid growth. Such capacity building involves developing new skills and capabilities, which might include hiring new personnel or acquiring new resources (e.g., new sales, accounting, or information systems) aimed at improving organizational efficiency or effectiveness (Davila, Foster & Oyon, 2009). Given the heterogeneous nature of growing firms (Delmar, 1997), it is unlikely that any single approach to management can be singled out to address the issues facing HGFs. However, it is clear from both theory and empirical studies that major changes in systems, structures, and capabilities are required to cope with the increased complexity that accompanies high growth (Garnsey, Stam & Heggeman, 2006; Nicholls-Nixon, 2005; Penrose, 1959). We will focus first on one subset of such capabilities that earlier studies have identified as important —namely, that of *core competencies*—and then, we will focus on what *human resources management tools* can be used to build such capabilities.

Core competencies in HGFs

Core competence is seen as an imperative success factor in new firms. In strategic management, “core competencies” are defined as “those resources and knowledge that are most vital for the production of goods and services in the firm,” particularly “those resources and knowledge that are difficult to copy or imitate by competitors” (Foss, 1993). This includes leadership, organizational structure, access to specific technological advancements, skilled and motivated employees, and a growth-oriented organizational culture. Core competence is thus a critical determinant of firms' decisions to outsource

new work or to grow in employees by recruiting new staff to conduct the work internally (Gottschalk & Solli-Sæther, 2005).

An advantage of core competence is that new firms can concentrate on a specific market segment in which they have developed specific knowledge (MacPherson and Holt, 2007), which further facilitates their potential to retain current customers and attract new customers. Young HGFs need to find market niches not served by existing firms and will thus need to learn about market demands to realize their business opportunities as sales and profits (Casper and Whitley, 2004; Schoonhoven et al., 1990). This provides firms with the necessary cash flow to continue operations as well as market feedback about the future prospects (Delmar, McKelvie and Wennberg, 2013).

An important activity in driving innovation in new firms thus constitutes a systematic yet informal process through which such firms acquire knowledge about the market (Li and Calantone, 1998; Macpherson and Holt, 2007). Understanding what customers want and how a firm can deliver products or services to them is critical for HGFs to establish a sales revenue base (Doyle, 2008). For young HGFs, this process represents expanding the knowledge from the entrepreneur/founding team to a more general firm-based understanding of markets and customers (Peters and Brush, 1996; Wennberg, 2009).

Human resources management in HGFs

Penrose's (1959) theory of the growth of the firm views firms as collections of idiosyncratic resources, and it is the constellation of existing resources that provides the impetus and direction for further growth. This implies that firms may choose to add human resources by first evaluating their current configuration of human resources and then seeking to add those workers who are appropriate matches to existing human resources (Lepak and Snell, 1999). Prior research has shown that recruitment and competence enhancement is imperative for growing firms. The growth potential inherent in competence enhancement is theorized not only as being dependent upon individuals' formal competencies and experiences (Penrose, 1959) but also upon their social skills and motivation (Davisson, Delmar & Wiklund, 2007). Skilled and motivated employees are thus an important aspect of the successful growth of new firms, and employees' human capital has been shown to facilitate the rapid growth of firms (Almus, 2002).

How to organize a growing firm is an important question for firms seeking to actively enhance their competence base in order to build competitive advantage. While work in smaller entrepreneurial firms tends to be characterized by flat decision-making structures and versatility in job tasks (Rajan & Zingales, 2001), research on human resource management (HRM) and managerial control systems (MCSs) suggests that rapidly growing firms will reach a stage in which formalized hiring practices become important (Barnett and Storey, 2001; Davila & Foster, 2005). While large HGFs tend to have extensive internal job markets, smaller HGFs tend to hire mainly externally (Fombrun & Wally, 1989). At first glance, this line of management research suggests that successful competence development in growing firms may be achieved by developing a unified HRM system that is adapted to the firm's industrial context rather than focusing on enhancing a single specific type of HRM practice, such as recruitment or training (Barney & Wright, 1998). Examples of such tools are well-tailored systems for attracting, evaluating, and selecting new personnel; facilitating ongoing learning and socialization in firms; and building appropriate enumeration systems (Wright et al., 1994). Using HRM and other means to develop competencies among employees is important for growing firms since the unique combination of competencies in the firm may help develop advantages that are difficult to imitate by competitors (Wright et al., 1994).

Literature review: Empirical studies on managing HGFs

Here, we present a comprehensive literature review of the last 30 years of academic papers and reports published on HGFs, looking specifically at empirical research on leaders (defined as either individual

entrepreneurs or the TMTs in HGFs). The review identifies a number of skills and experiences in terms of human capital, prior entrepreneurial experiences, and employment background that research to date has found to characterize managers in HGFs.

Literature review methodology

Given the abundant and eclectic literature on HGFs, we decided to follow a systematic process to facilitate other researchers' and policymakers following our procedures. Our review procedure follows that of MacPherson and Holt (2007) but was adapted to focus specifically on research in HGF management. The systematic review involves three processes. First, we experimented with and eventually defined a set of search criteria to identify empirical research on managers in/management of HGFs. Second, we defined review procedures and used these to "map" and judge the relevant research to date. Third, the literature was used to identify gaps and suggests conclusions as to where future research might be usefully directed.

We used a list of 15 core journals in the entrepreneurship, innovation, and management journals frequently appearing in previous literature reviews on entrepreneurship and firm growth (Henrekson and Johansson, 2010; MacPherson and Holt, 2007; Gilbert et al., 2006).⁴ We examined all articles published using the publishers' electronic archive in a three-phase examination. First, we searched for the terms "high-growth firm," "high growth," "gazelles," and "rapid growth" in the keywords and abstracts of the papers, sorting out a total of 134 papers that matched these criteria. We complemented the electronic archives with searches in Scopus and Google Scholar using the same keywords. We read all abstracts and *excluded all papers not explicitly addressing the role of managers, entrepreneurs, or TMTs in such firms*. This narrowed the sample to 53 papers. We carefully read all papers, organizing a table of contents for the sample characteristics, type of analysis conducted, main findings, and national context investigated. We excluded all papers with a practice-oriented focus, such as simple interviews, book reviews, and teaching cases. This further narrowed our sample to final of 30 papers published during the past 28 years. Table 1 in the Annex presents the summarized findings of the review.

Findings from the literature review

This section outlines the general findings from the literature review in Table 1 under five separate headings. On a general level, we can conclude from the literature review that empirical studies on management in HGFs to date is based primarily upon small-number cross-sectional studies in certain industrial contexts. In particular, only six out of 30 studies reviewed are based on longitudinal panel data, and none of the studies sought to account for the likely selection bias arising from HGFs exhibiting both higher risk of failure and growth (Delmar, McKelvie, & Wennberg, 2013; Denrell, 2003). As such, the empirical evidence to date should be taken as tentative, and further research is needed to ascertain the reliability of the patterns documented in the literature review. We will now attend in detail to the five general topics emerging in the literature review:

- Managers' leadership capabilities in HGFs
- Managers' industry and business experience in HGFs
- Building formal structures or capacities to adapt in HGFs
- The role of innovation in HGFs
- Profitability and growth in HGFs

⁴ The literature search was based on (1) the general management journals (*Academy of Management Journal, Organization Science, Strategic Management Journal, Journal of Management Studies and Management Science*), (2) the entrepreneurship journals (*Journal of Business Venturing, Strategic Entrepreneurship Journal, Entrepreneurship Theory & Practice, Small Business Economics, International Small Business Journal, Entrepreneurship & Regional Development, Journal of Small Business Management*), and (3) the innovation journals (*Industrial and Corporate Change, Research Policy and Technovation*).

Managers' leadership capabilities in HGFs

Perhaps the strongest pattern in the literature review concerns the skills and experiences of managers in HGFs. Hambrick and Crozier's (1985) early study of 30 US HGFs identified in Inc.'s listing of the fastest-growing firms outlined four general characteristics of highly successful HGFs: (1) the CEO/manager growing into the role as a manager of a larger firm, (2) competence hired into the firm and management team, (3) a joint vision communicated in the expanding firm, and (4) the introduction of a more hierarchical structure during growth. Chan, Bhargava, and Street's (2006) more recent survey of perceived challenges related to high growth among managers in 91 Canadian HGFs echoed these findings by reporting the most managerial challenges in their sample as consisting of "customer management," "managing business growth," "financial management," "leadership," and "human resource management" regardless of firm size. As evidenced in our review, these general characteristics and challenges facing HGFs have been substantiated and developed by later studies, and we will here outline to what extent they seem to be generally evident in studies of HGFs.

Managers' leadership capabilities have been measured in a variety of ways across accumulated studies, so it is thus difficult to draw any general conclusions. Siegel, Siegel, and MacMillan (1993) suggested that managers of HGFs more often have businesses with "functionally balanced" leadership teams in terms of managers' work positions and responsibilities (e.g., CFO, CEO, COO). Gundry and Welsch's (2001) study of 240 HGFs and 263 non-HGFs run by women in the United States reported that HGFs tend to (1) show willingness to sacrifice on behalf of the business, (2) actively plan for further growth, (2) use team-based organization design, and (4) focus on leadership questions in the growing firm.

A more psychological-oriented study by Ensley, Pearson, and Sardeshmukh (2007) of family-owned US HGFs suggested that group dynamics, such as cognitive conflict, team potency, and group cohesion, were positively related to becoming an HGF, while affective conflict was negatively related to growth. Barringer, Jones, and Neubaum's (2005) content analysis of narratives from case studies of US regional or national winners of the Ernst & Young LLP Entrepreneur of the Year award highlighted that HGFs are more likely than non-HGFs to have "an entrepreneurial story" as a strong commitment toward growth as well as a growth-oriented mission statement.

The specific details on leadership types or leadership practices in HGFs remains outside the scope of this literature review (see e.g., Antonakis & Autio, 2006); however, there is some evidence highlighting the relative effectiveness of different leadership behaviors in new ventures (Ensley, Hmieleski & Pearce, 2006; Ensley, Pearce & Hmieleski, 2006). Nevertheless, conclusive evidence of the relative impact of various leadership practices in HGFs remains elusive. Taken together, this line of evidence suggests that leadership capabilities in HGFs are pivotal factors for HGFs, perhaps especially so for younger and smaller HGFs founded by a single founder-manager CEO. The review also suggests that for more mature HGFs, having a larger management team with specific competencies and responsibilities is important.

Managers' industry and business experience in HGFs

A second general finding from the literature review relates to the role of managerial competencies in HGFs. Following Penrose's (1959) theory of firm growth, a major pattern in the empirical literature on new firm growth is that managerial competencies—commonly approximated through the founder/CEO's human capital (e.g., education, industry experience, and prior business experience)—are crucial determinants for new firm growth (e.g., Davidsson et al., 2009; McKelvie & Wiklund, 2010). Prior business experience and experience in the relevant industry are believed to provide managers with the skills and know-how necessary to overcome problems in the context of that industry (Pennings, Lee and van Witteloostuijn, 1998). However, since founders' influence on new

firm development is believed to dissipate as the firm grows larger and individual influence becomes weaker or more indirect (Eisenhardt & Schoonhoven, 1990; Roberts, Klepper, & Hayward, 2011), a crucial question is to what extent such managerial competencies also influence rapidly growing firms?

The empirical studies outlined in Table 1 indicate that such managerial competencies do indeed seem to play important roles in HGFs. Siegel, Siegel, and MacMillan's (1993) study of 1,600 small firms in Pennsylvania and 105 larger private firms located throughout the United States suggested that managers of HGFs more often have longer industry experience in the same sector and larger leadership teams than their non-HGF counterparts. Similar patterns emerged in Brüderl and Preisendörfer's (2000) quite different sample of 1,291 start-ups in Munich and Upper Bavaria, Germany, during 1985–1986, which revealed HGFs to have larger team sizes and founders with more prior management experience than non-HGF managers. Also Feeser and Willard's (1989) study of 39 US HGFs in electronic computing showed HGFs to have larger founding team sizes than a control group. Stam and Wennberg's (2009) more recent study of 647 Dutch firms in their first six years of existence similarly found that founding team size as well as managers' leadership and industry experience were positively associated with firms' likelihood of exhibiting rapid growth. The importance of founder's prior industry experience is further elucidated by Feeser and Willard's (1989) study of 39 US HGFs in electronic computing, which showed that HGFs are more likely than a control group to be spinoffs from large corporations and compete in markets and/or technologies closely related to those of the parent firm.

However, the literature review also suggests that firm founders' education and prior business experience—two of the most common predictors of new firm growth and survival (Cooper, Gimeno-Gascon, & Woo, 1994)—do not seem to be as important for HGFs. In our review, only the early study by Shuman, Shaw, and Sussman (1985) of 220 US HGFs identified in *Inc.*'s list of the fast-growing firms suggested that prior experience starting several business ventures is an important predictor of becoming an HGF. No study has suggested that founders' general level of education is an important predictor for becoming an HGF, but Almus' (2002) study of 1,949 German start-ups between 1990 and 1993 showed the HGFs have PhDs in their founding teams more often than non-HGFs. Taken together, this line of evidence suggests that HGF managers' *specific human capital*—most notably their industry and managerial leadership—may be important in HGFs.

Building formal structures or capacities to adapt in HGFs

A third general finding from the literature review attends to Hambrick and Crozier's (1985) suggestion that highly successful HGFs need to introduce a more hierarchical and formalized management structure at some point during growth. Consequently, a line of research on rapid firm growth has focused on what structures and systems need to be introduced when growing organizations change significantly (Davila & Foster, 2005). It is apparent that this is not an easy process since planning and forecasting problems are likely to compound in rapidly growing firms (Hambrick and Crozier, 1985; Bos and Stam, 2011), and many such firms fail in the growth stage when more formalized managerial structures and systems usually become important (Davila, Foster, & Oyon, 2009). Consequently, there is likely no “one-type-fits-all” solution for management structure in HGFs, and the functionality of various management systems may be contingent on a number of firm-specific or industry-specific factors. In their study of 95 US HGFs drawn from the 1984–1985 *Forbes* and *Inc.* magazines, Fombrun and Wally (1989) found that HGFs often benefit from implementing HRM and cost-control systems. A more intricate picture emerged in Florin, Lubatkin, and Schulze's (2003) study of 275 US HGFs that went public in 1996, which highlighted that human resources were positively associated with sales growth only when social resources in the form of managers' external networks were also highly developed. The importance of managers' external networks is also evidenced in Sims and O'Regan's (2006) study of 207 HGFs in the UK electronic/engineering sector. To manage rapid growth and avoid unanticipated setbacks (Carlsson-Wall, Douglas & Wennberg, 2012), building and upgrading managerial accounting and report systems may be of key importance for HGFs that are experiencing high sales growth. Moreno and Casillas' (2007) study of 6,692 Spanish SMEs suggested

that HGFs differ from moderate-growth firms or declining firms partly due to higher financial liquidity and solvency. This highlights the importance of management accounting systems to ensure that the revenue from sales in HGFs do not lower liquidity by being tied up in accounts receivable rather than being transformed into cash (Howorth and Westhead, 2003). Studying 750 Swedish HGFs in knowledge-intensive manufacturing and business services sectors, Carlsson-Wall, Douglas, and Wennberg (2012) showed that an increasing growth rate may be associated with financial distress and subsequent firm failure, especially in concentrated industries. This line of research thus suggests that managers of HGFs need to build formal management control structures as well as reporting and billing systems to “manage growth” (Davila & Foster, 2005).

A competing view outlined in some studies of growth is that growth is inherently stochastic and difficult to predict and manage by formalized systems (Baker & Nelson, 2005; Bingham, Eisenhardt, & Furr, 2007). This view highlights the importance of “capacity building” rather than planning and formalization in order to be able to adapt to rapidly changing environments during firm growth. In our review, this is apparent in the study by Barringer, Jones, and Neubaum (2005), which highlighted (among other things) that planning and specific goal setting are not systematically related to becoming an HGF but focusing on customers and employees are. Specifically, they highlighted the human resource practices of training, employee development, financial incentives, and stock options as common characteristics of HGFs.

In an interview-based study of 13 rapidly growing Canadian firms, Nicholls-Nixon (2005) argued that sustained high growth depends on building capacity to get things done when formal structures and systems do not keep up with the firm’s rapid growth. She argued that different approaches can be used to cope with the increasing complexity that accompanies rapid growth, such as (1) diffusing complexity by restructuring the organization to ensure specific individuals, groups, or sub-units do not get overwhelmed; (2) reducing complexity by outsourcing some activities or simplifying operations; (3) redefining complexity by bringing together people with a variety of functional perspectives and capabilities to develop a deeper understanding about why operational problems exist and how they can be resolved; and (4) developing new skills and capabilities to cope with increasing complexity. Developing skills and capabilities might include hiring new personnel or acquiring new resources (e.g., new information systems) aimed at improving organizational efficiency or effectiveness. Furthermore, Lopez-Garcia and Puente’s (2012) study of 508 Spanish HGFs suggested that human resource practices, such as employing qualified personnel or offering a mix of personnel contracts can be positively associated with rapid growth. In addition, the idea of managing high growth not by formal management systems but through adaptation and capacity building has some tentative support from the literature review from Fischer et al.’s (1997) study highlighting managers’ ability to shape a collective view of time, deadlines, and production pace in their firms. Further, Littunen and Tohmo’s (2003) study of 44 Finnish HGFs in the metal-based manufacturing and business service industries also indicated that HGFs adapted their operations in production and marketing more often than a control group.

Taken together, this line of evidence indicates a tension in current literature, with some studies arguing that HGFs need to establish formal managerial structures to manage their growth, while other studies highlighting “the capacity to adapt” as being more important. Given the few studies, variability in the designs and measures employed, and the modest number of firms studied, no conclusive evidence can be drawn about the relative merits of these two general claims.

The role of innovation in HGFs

A fourth general finding from the literature attends to the role of innovative activities in HGFs. In their study of 2,113 US firms in SIC sectors 35–38, Coad and Rao (2008) found that innovativeness (measured as patents applied for and R&D spending) is of crucial importance for sales growth among HGFs but not among moderately growing firms. However, given the wide range of indicators of innovativeness (Rosenbusch, Brinckmann & Bausch, 2011), there might be more intricate relationships between innovativeness and growth. For example, Stam and Wennberg (2009) studied

647 Dutch firms during the first six years of their existence and found that past R&D activities aimed at developing both new products and processes were positively associated with the likelihood of a firm exhibiting rapid growth. Goedhuys and Sleuwaegen (2010) found in their survey of 947 African firms in 11 different nations that *product innovation* was positively associated with growing rapidly enough to become an HGF but that *process innovation* exhibited a negative association with growth. Similarly, the study by Parker, Storey, and Van Witteloostuijn (2010) followed 121 British HGFs from 1995 to 2001 and found product development to be *negatively* associated with becoming an HGF but *active use of marketing* to be positively associated with becoming an HGF. The importance of innovative strategies in HGFs is echoed in two other studies. First, O'Regan, Ghobadian, and Galleary's (2006) study of 207 UK HGFs indicated that HGFs are not more likely to invest in R&D or launch new products but are more likely to have a "prospective" strategy for identifying growth opportunities. Second, Brüderl and Preisendörfer's (2000) study of 1,291 start-ups during 1985–1986 in Munich and Upper Bavaria, Germany, revealed HGFs to pursue an "innovative strategy" more often than non-HGFs. Taken together, these studies on innovation in HGFs indicate that various *forms of innovativeness*—that is, product, process, or market *innovativeness*—may be differentially related to rapid growth. Contextual evidence for this relationship was provided in Hölzl's (2009) study of 21,232 manufacturing firms in 16 European countries, where he found that HGFs are only more innovative than non-HGFs in countries close to the technological frontier. Taken together, this line of evidence indicates that HGFs tend to be more innovative than non-HGFs—however, not necessarily in terms of formal R&D and product innovations.

Profitability and growth in HGFs

A fifth and final tentative finding from the literature review attends to the role of profitability and financing in HGFs. The study by Markman and Gartner (2002) of 1233 US HGFs drawn from Inc.'s list of fast-growing companies suggested that high growth in sales or number of employees is only weakly related to firm profitability. Further, the study by Moreno and Casillas (2007) suggested that HGFs often tend to exhibit higher financial liquidity and solvency, while the study by Carlsson-Wall and colleagues (2012) argued that very rapid growth may bring about financial distress and eventually failure unless properly managed. Taken together, this line of evidence indicates that more research is needed on the systematic relationships between profitability and becoming an HGF before any strong conclusions can be drawn. This suggests an interesting and fundamental managerial question: is profitability needed to engage in high growth or may high growth lead to long-term profitability? While some previous studies not fitting the context of the current literature review suggest that profitability is a pre-requisite for engaging in growth (Davidsson et al., 2009; Delmar et al., 2013; Raisch, 2008), the study by Zook and Allen (1999) reported that only one in seven firms achieves sustained growth while remaining profitable. As such, role of profitability for HGFs remains an under-researched area.

In the below we discuss what conclusions may be drawn from the general findings presented in the literature review.

Discussion and Policy Conclusions

This report has presented a comprehensive literature of the last 30 years of academic papers and reports published on HGFs, looking specifically at empirical research on leaders in HGFs. A set of in-depth descriptions of recruitment and HRM practices in Swedish HGFs serves as an illustration of the importance of management and competence development highlighted by both theories of growth (Penrose, 1959) and the data summarized in the literature review. The review identified five broad areas of managing HGFs: (1) managers' leadership capabilities in HGFs, (2) managers' industry and business experience in HGFs, (3) the need to build formal structures or capacities to adapt in HGFs, (4) the role of innovation in HGFs, and (5) the role of profitability in growth among HGFs. Below, we discuss what policy conclusions can be drawn from the evidence presented to date in these areas.

Fostering leadership and experience among managers in HGFs

As noted, perhaps the strongest pattern in the literature review from which we can safely draw conclusions relates to the skills and experiences of managers of HGFs. Our systematic review—similar to earlier reviews (Barringer et al., 2005)—highlights that larger management teams with extensive industry experience as well as experienced managers (in an established organization or prior business venture) are more likely to run HGFs. What, then, *is* the “specific human capital” constituting managers’ industry and management experience? In regards to *industry experience*, it has been argued that managers with experience in the same industry as their new venture should have more established professional networks and more applicable marketing and management expertise than founders without relevant industry experience (Barringer et al., 2005). Industry-related experience includes both “soft” managerial skills, such as how negotiations are conducted in specific industries (Leach & Kenny, 2000), as well as specific business experience, such as standards of planning and forecasting in the specific industry (Olson & Bokor, 1995). In regards to management experience, practical experience from an established organization or prior business venture may facilitate functional, technical, and managerial knowledge, such marketing, HRM, communication, change management, and finance (Smith & Gannon, 1987; Sexton et al., 1997; Carson & Gilmore, 2000; Kakati, 2003). Policymakers seeking to improve the chances that experienced founders with such specific skills starting growth-oriented businesses may consider the role of non-compete covenants (Stuart & Sorenson, 2003), which are asymmetrically applicable to highly capable individuals (Folta, Delmar & Wennberg, 2010).

To facilitate the existence of competencies in HGFs, policymakers, investors, and business advisors should be aware that starting and managing a new firm is one thing, but managing a rapidly growing firm requires a different set of leadership competencies (Holmquist, 2005). Less experienced managers in HGFs may well be aware of problems but lack the time and resources to invest in training and enhancement among their top-level managers (Tansky & Heneman, 2003). Consequently, while problems with recruiting skilled personnel are often exogenously related to the economic and institutional conditions in which such firms operate, problems with managing employees in the growing business are often endogenous and internally related to the firm because managers do not always have the correct skills to manage the growing firm (Green & Ashton, 1992). It goes without saying that while even novice managers may sometimes create successful HGFs⁵, policymakers might improve the odds of nurturing HGFs by either focusing on mentoring inexperienced managers (e.g., through a highly involved company board) or suggesting external managers with extensive experience as potential recruits or replacements (Willard et al., 1992). Alternatively, policymakers, investors, and business advisors may consider how such competencies can be recruited by expanding the TMT (Littunen & Tohmo, 2003) through hired experts (Kaulio, 2003) or consultants (Hill et al., 2002).

Policy solutions like publicly funded business support services are often questioned since evaluations of such approaches are sparse, and we still do not know if they are in fact beneficial for HGFs or merely serve to distort competition (e.g., Bessant, 1999; Huggins & Williams, 2009). However, two recent papers suggest that certain publicly funded business support may be beneficial. Mole and colleagues (2008) investigated UK SMEs receiving support from the UK “Business Link” program and found evidence that such support positively impacts firms’ employment growth (but not revenue growth). In an even more rigorous quasi-experimental study, Rotger, Gørtz, and Storey (2012) investigated the effectiveness of a “guided preparation” advice service for new Danish firms and revealed positive effects on subsequent firm growth. As such, there seems to be tentative support for the notion that certain policy interventions related to leadership training and skills enhancement may in fact be beneficial for HGFs (Littunen & Tohmo, 2003).

Fostering growth-oriented innovation strategies in HGFs

⁵ The financial services company Klarna, one of Europe’s most rapid HGFs was created by three 22-year-old university students and is still managed by the same three students after 10 years of rapid growth.

Our review shows that various *forms of innovativeness*—namely, product, process, or market *innovativeness*—may be differentially related to rapid growth. While some studies have suggested that formal R&D spending (Coad & Rao, 2008) or more general “R&D activities” (Stam & Wennberg, 2009) facilitate rapid growth, studies in other contexts have suggested that *process innovation* is more important for HGFs than *product innovation* (Goedhuys & Sleuwaegen, 2010) or that the *active use of the marketing department* (Parker et al., 2010) or a more general *innovative strategy* (Brüderl & Preisendörfer, 2000; O'Regan et al., 2006) are most important. Hözl's (2009) suggested that the institutional conditions in various countries, regions, and industries may hamper or enhance the emergence of HGFs. This indicates that policies supporting HGFs should not be uniform across various national economies or even sectors (Eckhardt & Shane, 2011). Without more cross-country and cross-industry research on HGFs, innovative policies are difficult to tailor to these types of firms (Hoffmann & Junge, 2006). As such, policy initiatives seeking to promote innovation in HGFs are likely to have distinct impacts across different sectors (e.g., manufacturing versus services, high-tech versus traditional sectors) as well as in firms of various sizes. Policymakers need to carefully consider these distinct impacts before initiating any new measures. Policy initiatives that are too general, such as very general innovation subsidies, may even hamper growth (Acemoglu, Akcigit, Bloom, & Kerr, 2013). If one seeks radical economy-wide reforms, one suggestion advocated in a recent paper by Acemoglu and colleagues (2013) is to introduce taxes to incumbents while simultaneously subsidizing R&D by *both* incumbents and new entrants. If one seeks more sector-specific reforms, carefully designed and subsequently evaluated “experimental programs” can be evaluated before they are permanently introduced or expanded more broadly (Kaiser & Kuhn, 2012), especially in fast-growing sectors (Ejermo, Kander, & Svensson Henning, 2011). Mason and Brown (2013) argued that the heterogeneous nature of HGFs makes it impractical to target support for particular sectors or technologies (e.g., new or R&D-intensive technologies and sectors). Instead, they suggested that public policy should focus on the *retention* of HGFs acquired by non-local businesses. Finally, policymakers need to properly reflect upon the specificities of their entrepreneurial environment when devising appropriate policy interventions.

Fostering competence development and the recruitment of key personnel in HGFs

Putting the lack of research on HGF management aside, several studies have highlighted the importance of key employees' skills and competencies for growth (Almus, 2002; Barringer et al., 2005; Florin et al., 2003). In rapidly growing firms, the recruitment, training, and motivation of personnel is imperative to fuel further growth (Penrose, 1959). The review herein and the illustrative Swedish study suggest that one important condition for firm growth is *the institutional conditions for recruitment*. HGFs often report problems with rapidly finding new employees when they are expanding (Tansky & Heneman, 2003). The reasons for such problems are often tied to current economic conditions and the institutional settings of the country and region in which the HGFs operate. In countries where employers carry the full responsibility for employees' medical insurance, high costs for medical insurance may make it relatively more expensive for HGFs than for established firms to hire skilled employees. In countries where labor market security is tied to tenure at a specific workplace or salaries are centrally negotiated by labor unions and employee associations, switching costs and high labor costs may diminish the potential for HGFs to hire skilled personnel (Folta, Delmar, & Wennberg, 2010).

A distinguishing feature of HGFs in the United States is the prevalence of stock options and financial incentives (Barringer et al., 2005). The prevalence of stock options in the United States greatly increased when the tax code was changed in the early 1980s, which has been shown to have spurred the emergence of several HGFs in Silicon Valley and elsewhere (Gompers & Lerner, 1999). Stock options are a crucial mechanism to encourage and reward individuals supplying key competencies to a firm since the payment for labor is intimately related to the long-term success of the firm. However, such tools can only be fruitfully used by HGFs in countries where employees who accept stock options can defer the tax liability to the time when the stocks received upon exercise of the options are eventually sold (Henrekson & Johansson, 2008). The effectiveness of stock options as an HRM tool for HGFs is further enhanced if there are no negative tax consequences to employees upon granting or

exercising the option. As such, this is a potential policy tool that could be considered to foster competence development and the recruitment of key personnel in HGFs.

Enhancing conditions for profitability in HGFs

A strand of research holds that profitability is a pre-condition for engaging in growth (Coad, 2010; Davidsson et al., 2009; Delmar et al., 2013). Zook and Allen (1999) reported that only one in seven firms achieves sustained growth while remaining profitable. However, a study of HGFs by Markman and Gartner (2002) suggested that high growth in sales or number of employees is not always related to firm profitability. Hence, the role of profitability among HGFs remains an under-researched area of paramount importance. Without profits, there will be little internal cash to manage growth (Delmar et al., 2013), and owner-managers will be reluctant to trade short-term earnings for the very uncertain future outcomes of growth (Davidsson et al., 2009). Carlsson-Wall and colleagues (2012) suggested that very rapid growth may bring about financial distress and eventual failure unless it is properly managed. Conditions for profitability are also naturally affected by formal institutional rules and procedures, such as tax legislation. A crucial mechanism how tax legislation affects HGFs lies in the majority of these firms being self-financed at an early stage (by founder's equity and retained earnings from profits made), hence they are specifically exposed to taxes that affects individual's savings (which are invested) and taxes affecting their level of profitability. As Henrekson and Johansson (2008) writes, "Given the complexity of the tax code in a typical OECD country, the incentive effects of the tax system on entrepreneurs are highly multifaceted...high labor taxation may induce people to become self-employed, but it is likely to weaken their incentives to develop HGFs". Other determinants of cross-country differences in the prevalence of HGFs may lie in the level of corporate taxation, taxation on savings and taxation on private wealth where small and young firms to a larger extent rely on retained earnings and private equity. To the extent that policy makers seeks to encourage the emergence and growth of HGFs through changes in the fiscal system, these are important policy mechanisms to consider.

Fostering networking and market contacts in HGFs

Several studies in our review suggested that networking activities could be one area to encourage the transfer of knowledge and competencies to help facilitate firm growth (Florin et al., 2003; Sims & O'Regan, 2006). Networking facilitates the establishment of customer and supplier relationships (Sims & O'Regan, 2006) as well as the recruitment of skilled personnel (Fergin et al., 2013). Could policy play a role in developing the networks of HGFs? Some have argued that networks are best developed through the active involvement of venture capitalists and business angels (Harrison & Mason, 2000). Other research has suggested that policy may also contribute through knowledge-bridging activities conducted by universities (Jones and Craven, 2001) and business support programs (Bessant, 1999) as well as from the support of industrial clusters (Wennberg & Lindqvist, 2010). Networks and market contacts could facilitate firm growth through business incubation or active training programs (Chrisman, McMullan & Hall, 2005). However, the detailed study of British HGFs by Parker and colleagues (2010) argued against "advising HGFs" on the basis that the routine application of "best practice" strategies is unlikely to foster firm growth in a changing economic environment. This cautious view against the rapid expansion of incubator and accelerator programs of any kind was echoed in the most comprehensive study to date: Amezcua and colleagues' (2013) quasi-experimental studies of the near total population of US incubators. Their 2013 study of 178 university-based US incubators hosting 2,110 firms did not indicate that incubator programs are universally effective in facilitating new firm growth and survival (Amezcua, Grimes, Bradley, & Wiklund, 2013). Only certain companies in certain industries may actually benefit from being incubated (Amezcua & McKelvie, 2011). Specifically, the most comprehensive study to date indicates that incubators having a "network approach" that aims to encourage and assist incubated companies to establish contacts with external actors tend to be more successful than incubators with a "teaching approach" that tries to teach specific business strategies or skills to the incubated companies (Amezcua, Grimes, Bradley, & Wiklund, 2013). These findings suggest that policymakers may want to consider incubator and

accelerator programs to foster the emergence of HGFs, but the design and scope of such programs could constitute a double-edged sword, with too much support actually lowering the likelihood of long-term survival and growth among incubated firms.

Conclusions

This report represents one of the first systematic reviews of academic research on the skills, experiences, and strategies of leaders in HGFs. Based on the 30 published academic studies to date, the reviews suggests that HGFs are more often founded and/or managed by a larger management team, managers of HGFs are likely to be highly educated and have prior industry and leadership experience, and that *different types of innovativeness* may be *differentially related to rapid growth*. Rather than investing heavily in R&D, HGFs seem to be characterized by having innovative business strategies, targeting profitable niche segments, and focusing on customers to develop unique products and services. As such, advisors and policymakers should be aware that it is not necessarily the most technologically innovative firms that become HGFs but rather firms that are able to create close contacts with customers. While the review also suggests that certain training and networking support may be beneficial for HGFs, the evidence was not conclusive, and specifically, the studies of incubator and accelerator program suggested that to become an HGF, firms need to be encouraged to rapidly “get to the market” rather than being “protected from the market.” Finally, the review highlights the importance for firms to attract and develop key employees if they are to become an HGF. Certain labor legislation and personnel taxation, such as those concerning stock options, may affect such aims.

ANNEX

Table 1: Published studies on management / managers of HGFs

Study	Sample	HGF definition	Analysis	Findings
Hambrick & Crozier, 1985	30 US HGFs identified in <i>Inc.'s</i> listing of the fastest-growing firms.	Growth calculated over a four-year period with sales the starting year between \$100,000 and \$25 million. Mean annual growth of the HGFs was 62.5%.	Casual analysis of descriptive data, news archives, and “discussions with executives.”	Arguments are made for several challenges for HGFs as well as for managerial qualities needed to overcome such challenges: (1) CEO growing in role as a manager of a larger firm (2) competence hired into the team, (3) joint vision communicated, and (4) hierarchical structure introduced during growth.
Shuman, Shaw, & Sussman, 1985	220 US HGFs identified in <i>Inc.'s</i> listing of the fastest- growing firms.	770% growth in sales for 1978–1982 and 523% growth in employees.	Bivariate statistical analysis using cross-tabs and chi-square statistics.	The majority of HGF executives have prior experience in starting three or more ventures.
Feeser & Willard, 1989	39 US HGFs identified in <i>Inc.'s</i> listing of the fastest-growing independent and publicly traded firms and a similar set of 39 low-growth firms in SIC 3573 (electronic computing).	Growth calculated over a four-year period with sales the starting year between \$100,000 and \$25 million. Mean annual growth of the HGFs was 62.5%.	Bivariate statistical analysis using cross-tabs and chi-square statistics.	HGFs are more often spinoffs from large corporations and compete in markets and/or technologies closely related to those of the parent firm.
Fombrun & Wally, 1989	95 US firms surveyed from a list of HGFs from the 1984–1985 <i>Forbes</i> and <i>Inc.</i> magazines (29% response rate).	Growth between 1980 and 1985 amounting to a mean annual growth of 159% with 25+ employees in the starting year.	Multivariate analysis of variance (MANOVA) and ordinary least squares (OLS) regression of various industry and firm characteristics on HGFs’ strategic orientation and HRM practices.	HGFs often implement HRM and cost control systems, which vary depending on the firm’s strategic orientation and product diversity. Large HGFs have extensive internal job markets; smaller HGFs hire mainly externally.
Feeser & Willard 1990	39 US HGFs identified in <i>Inc.'s</i> listing of the	Growth calculated over a	Bivariate statistical	HGFs are more likely than the comparison

	fastest-growing independent and publicly traded firms and a similar set of 39 low-growth firms in SIC 3573 (electronic computing).	four-year period with sales the starting year between \$100,000 and \$25 million. Mean annual growth of the HGFs was 62.5%.	analysis using cross-tabs and chi-square statistics.	group to (1) have larger team size, (2) maintain initial product/focus, (3) be exporters.
Willard, Krueger, & Feeser, 1992	155 manufacturing HGFs identified in <i>Inc.</i> 's listing of the fastest-growing independent and publicly traded firms; 110 were founded by the CEO.	Growth calculated over a four-year period with sales the starting year between \$100,000 and \$25 million. Mean annual growth of the HGFs was 151%.	Bivariate statistical analysis using t-tests.	There is no difference between HGFs managed by a founder or a non-founder for a number of measures (i.e., firm sales growth, sales, net income, return on equity, return on sales, or sales per employee)
Siegel, Siegel, & MacMillan, 1993	1,600 small firms in Pennsylvania (mean sales \$1.35 million, min: \$100,000, max: \$15 million) matched with 105 private firms located throughout the United States and audited by Price Waterhouse (mean sales \$10 million, min: \$200,000, max: \$48 million).	Annual sales of 25% over a three-year period.	Discriminant analysis of the likelihood of belonging to the sample of HGFs.	Managers of HGFs have (1) longer industry experience in the same sector, (2) technology-focused products, and (3) functionally balanced leadership teams.
Fischer et al 1997	Interviews with top managers in eight organizations that had either recently achieved several years of rapid growth or were relatively young and attempting to grow.	Five firms growing at more than 20% a year and three comparison firms growing at or below the average for their industry.	Textual analysis and interviews on perceptions of time and pace among managers in HGFs.	HGF managers focus on <i>simultaneity</i> (i.e., focus on events in the present and future outcomes desired), <i>selectivity</i> (i.e., seek customers and staff who share a pace in congruence with firms goals), and <i>shaping</i> (i.e., adopt/develop systems and procedures that allow managers to shape collective view of time in their firms).
Brüderl & Preisendörfer 2000	56 HGFs among 1,291 start-ups from the Munich Founder Study, a stratified random	Growth rates of 100% or more over four years.	Logit models on the likelihood of becoming a HGF.	HGFs more often have a larger team size and founders with management

	sample of 6,000 firms registered by chamber of commerce in 1985–1986 in Munich and Upper Bavaria, Germany.			experience and pursue an “innovative strategy.”
Almus, 2002	Stratified sample of 1,949 German start-ups between 1990 and 1993 drawn from the ZEW Entrepreneurship Study.	Top 10% growing firms.	Probit models on the likelihood of becoming a HGF.	HGFs more often have PhDs on their founding teams but not on larger teams.
Gundry & Welsch, 2001	240 HGFs and 263 non-HGFs run by women in a survey of firms randomly sampled by industrial sector in the United States from Dun's marketing database.	HGFs defined as those firms whose sales exceeded the industry average (23% or higher over a two-year period).	Bivariate statistical analysis using T-tests, and Factor analysis.	HGFs tend to (1) emphasize market growth and technological change, (2) show willingness to sacrifice on behalf of the business, (3) plan for business growth, (4) use team-based organizational designs, and (5) focus on leadership questions.
Markman & Gartner, 2002	Three cohorts of Inc.'s 500 firms followed for three years (1992–1996, 1993–1997, and 1994–1998).	Growth rates of 500% to 31,000% over five years in terms of sales or number of employees.	OLS regression of employment and sales growth on an ordinal scale of profit level.	High growth in sales or number of employees are not related to firm profitability, while younger firms experience slightly higher profitability.
Florin, Lubatkin, & Schulze, 2003	275 independent US firms that went public in 1996 with fewer than 800 employees and less than \$500 million in assets.	No clear definition. Some firms going public “shortly after founding” and some up to 30 years after founding. Mean age at IPO was 7.22 years and mean sales at IPO were \$475 million, indicating most are HGFs.	OLS regression of human resources (i.e., industry experience, start-up experience, and VC directors) and <i>social resources</i> (i.e., firm network, TMT networks, and underwriters) on sales growth.	Human resources are positively associated with sales growth only when interacted with social resources, suggesting that HGFs are more profitable when social resources are high.
Littunen & Tohmo, 2003	44 HGFs and a control group of 45 non-HGFs in the Finnish metal-based manufacturing and business service industries; surveyed biannually 1990–1997.	152% increase in employment over a seven-year period.	Cluster analysis and logistic regression.	HGFs exhibit reliance on management with a “group management style” and more often use external expert help during start-up. HGFs also adapt in production and

				marketing and expand their network more often than non-HGFs.
Barringer, Jones & Neubaum 2005	Randomly selected a set of narrative case studies consisting of US regional or national winners of the Ernst & Young LLP Entrepreneur of the Year; 50 of them classified as HGFs and 50 as non-HGFs (i.e., slow growers).	Three-year compound annual growth rate of 80% or higher.	Content analysis of narratives with subsequent t-tests of narratives across HGFs and non-HGFs.	HGFs are distinct from non-HGFs in three <i>founder characteristics</i> (i.e., industry experience, college education, “an entrepreneurial story”), three <i>firm attributes</i> (i.e., growth commitment, mission statement, interorganizational relationships), two set of <i>business practices</i> (i.e., unique value creation and customer knowledge), and four <i>HRM practices</i> (i.e., training, employee development, financial incentives, stock options).
Nicholls-Nixon, 2005	15 founder/CEOs of high-growth small- to medium-sized enterprises in Canada interviewed on “how manage rapid growth.”	Firms 4–13 years of age with 30–2,500 employees and annual sales \$10–\$390 million having experienced mean annual sales growth over the past three years between 35% and 266%.	Triangulation of interview data, literature on complex adaptive systems and self-organizing behavior, and interpretation of interview transcripts.	The management of HGFs involves (1) capturing and sharing information, (2) building relationships, (3) managing politics, and (4) a leadership style that focuses on facilitating rather than directing or controlling.
Chan, Bhargava, & Street, 2006	91 firms surveyed from the “Best Managed” Canadian firms with revenues between C\$10 million and C\$1 billion that were Canadian-majority owned; selected by a committee of five judges from academia and private practice.	Firms achieving high business growth for three or more consecutive Years.	Bivariate statistical analysis using cross-tabs and chi-square statistics for a survey about the “top three business challenges/opportunities.”	All HGFs regardless of size expressed identical frequency of challenges regarding “customer management,” “managing business growth,” “financial management,” “leadership,” and “human resource management.”
O'Regan, Ghobadian, & Gallear, 2006	207 HGFs randomly sampled from a database of 15,000 electronic/engineering small firms in the United Kingdom.	Sales growth rate of at least 30% per year for three or more consecutive years.	Tabulations without univariate or bivariate tests.	HGFs are not more likely to invest in R&D or launch new products but are more likely to have a “prospective” strategy

				for identifying growth opportunities.
Sims & O'Regan, 2006	207 HGFs randomly sampled from a database of 15,000 electronic/engineering small firms in the United Kingdom.	Index of (1) employee growth, (2) sales growth, (3) profit growth, and (4) profit margin growth.	Univariate ranking of the four growth measures supplemented with CEO interviews.	HGFs are often managed by CEOs under 40 years old. Interviewees stressed "networks and relationships" as important for growth.
Ensley, Pearson, & Sardeshmukh, 2007	Longitudinal study of family and non-family HGFs drawn from Inc's. 500 list; surveyed biannually (response rates 14.7%–19%).	Mean three-year growth rate between 1,591% and 2,084%. Yearly mean employees ranging from 53 to 95 and yearly mean sales ranging from \$6.5 million to \$14.5 million.	Structural equation model (SEM) with stock option dispersion and pay dispersion fitted to perceptual measures of conflict and eventually to firm growth.	Group dynamics, such as cognitive conflict, team potency, and group cohesion, positively relate to growth, while affective conflict negatively relates to growth.
Moreno & Casillas, 2007	6692 small- and medium-sized enterprises selected from a homogeneous database of firms in Spanish Andalusia.	Percentage of three-year growth (1998–2001) more than 100% higher than median growth in the same industry sector.	Discriminant analysis.	HGFs are different from moderate-growth firms or declining firms partly due to higher financial liquidity and solvency and, in some cases, lower availability of financial resources.
Coad & Rao, 2008	2,113 US firm in SIC sectors 35–38 from the Compustat database; matched with NBER patent database.	Firms at the top 10% growth distribution.	Innovativeness (i.e., patent applied for and R&D) regressed on sales growth fixed effects and quantile regression.	In all four sectors investigated, innovativeness is of crucial importance for sales growth among HGFs but not among moderately growing firms.
Hölzl, 2009	21,232 manufacturing firm from the Community Innovation Survey (CIS) in 16 European countries over the period 1998–2000; HGFs and non-HGFs matched using propensity score matching.	Firms in the top 10% and 5% growth distribution with a firm size of less than or equal to 250 employees in 1998	Quantile regression how six indicators of formal and informal R&D affect the growth of HGFs and non-HGFs.	HGFs are only more innovative than non-HGFs in countries close to the technological frontier.

Parker, Storey & Van Witteloostuijn, 2010	121 HGFs sampled in 1995 from the British ICC/One Source database; interviewed in November 1996 and followed until 2001.	Independent firms with sales between £5 million and £100 million and annual sales growth exceeding 30%	Multinomial logit of “marginal,” “high-growth,” and “acquired” firms.	Product development is <i>negatively</i> associated with becoming an HGF, but active use of the marketing department is positively associated.
Goedhuys & Sleuwaegen, 2010	947 firms from the World Bank’s 2006 Investment Climate Survey (ICS) in Angola, Burundi, Rwanda, Congo, Guinea Bissau, Guinea, Tanzania, Gambia, Swaziland, Botswana and Namibia.	At least 10% annual employment growth in 2002–2005 for owner-manager firms in manufacturing industries with more than five employees in 2002.	OLS and quantile regression.	Product innovation is positively associated with becoming an HGF, but process innovation is negatively associated.
Lopez-Garcia, & Puente, 2012	5,089 firms from the Spanish National Statistics Institute’s Central Directory of Firms dataset with a sample bias toward medium- and large-sized firms and a slight overrepresentation of the manufacturing sector.	10% fastest-growing firms with the highest “Birch-Schreyer indicator” value (i.e., a mix between absolute and relative growth rates).	Probit model with fixed firm effects.	Human resource practices, such as employing qualified personnel or having a mix of contracts offered, are positively associated with rapid growth, but firm age and access to credit are not.
Stam & Wennberg, 2009	647 Dutch firms followed 1994-2000 in the “Start-Up Panel: Cohort 1994”; drawn from a random sample of all Dutch firms registered as independent start-ups in 1994.	10% fastest-growing firms in terms of employment.	OLS regression on determinants of firm growth and the likelihood of rapid growth.	R&D, founding team size, and managers’ leadership and industry experience are positively associated with the likelihood of rapid growth.
Senderovitz, Klyver, Steffens & Evald, 2012	964 surveyed HGFs (39% response rate) in Denmark; identified through Dun & Bradstreet.	Firms grew at least 20% per year from 2004 to 2007 from a base of at least \$100,000 in revenue.	OLS regressions of firm and manager characteristics on return on equity (ROE) in 2007.	Past growth positively associated with ROE, especially for firms pursuing a broad rather than a focused market orientation.
Carlsson-Wall, Douglas & Wennberg 2012	750 Swedish HGFs in knowledge-intensive manufacturing and business services sectors in 1998–2002.	At least 20% annual sales growth over a three-year period.	OLS models on how growth rate affects risk of financial distress and logit models on how TMT skills moderate the	Increasing growth rate is associated with financial distress and subsequent firm failure, especially in concentrated industries.

			chance that distress will lead to failure.	
Keen, C., & Etemad, H. 2012	1,140 Canadian HGFs From <i>Canadian Business</i> magazine's annual listing. Firms categorized in size classes according to number of employees: micro (1–9), small (10–99), medium, (100–499,) and large (500 or more employees).	(1) Five or more years of annual revenue growth, (2) 179%+ five-year revenue growth, (3) \$100,000+ in revenue in the base year, and (4) \$1,000,000+ in revenue in year five.	Bivariate statistics with t-tests of differences across size classes among HGFs.	Growth patterns among HGFs are similar across the four size classes as well as across regions. Firms with international operations exhibit higher growth.
Coad, Daunfeldt, Johansson & Wennberg, 2013	50,000+ firms and 500,000+ individuals employed in the total population of HGFs during 1999–2002 in Swedish knowledge-intensive sectors.	(1) 1% fastest growing in employees, (2) 5% fastest growing in employees, (3) 1% fastest growing in revenue, and (4) 5% fastest growing in revenue.	Probit models on the likelihood that an individual (1) is employed in a HGF and (2) becomes hired by an HGF.	HGFs more likely to employ young people, poorly educated workers, immigrants, and individuals who experience longer periods of unemployment.

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