

INTERNAL AND EXTERNAL DRIVERS OF RADICAL STRATEGIC CHANGES IN HIGH TECHNOLOGY NEW VENTURES

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***Abstract:** High-technology new ventures, often funded by venture capital firms, operate in a turbulent environment. Consequently, these ventures frequently make radical changes in their strategies, adapting internal resources and capabilities to their changing environment. Those changes involve relatively high risk, as well as involvement of the investors. Building on previous research of strategic changes in established corporations, this study explores the common causes for radical changes in strategy of high-technology new ventures from the perspective of their venture capital investors, using a SWOT model. A dataset of 60 phrases extracted from interviews with 16 venture capital investors from 8 developed countries regarding their experience of 36 radical strategic changes in their 76 portfolio companies was analysed. The findings indicate significantly more unfavourable than favourable events. Internal factors were considered more likely than external factors to drive radical strategic changes, but only with marginal significance. Further research is required to validate these findings.*

***Keywords:** Strategic change, venture capital, entrepreneurship, high technology ventures, SWOT model.*

Introduction

A growing body of literature has discussed strategy change and the associated dynamic ability to gain a sustainable competitive advantage. It is assumed that in turbulent environments the ability to reconfigure internal and external competencies will eventually earn higher returns relative to competitors (McKelvie and Davidson, 2009; Teece, Pisano, and Shuen, 1997). This strategic reorientation can be achieved by means of small incremental changes or in a more punctuated and radical manner where radical strategic change (RSC) carries high risks (Hodgson 2013). The term RSC is referred by alternative terms such as firm's game-changing strategies which are the strategic moves that fundamentally alter the nature, domain and dynamics of competition (Abdelgawad et al. 2013) or change in the 'business charter' (Ambos and Birkinshaw 2007). Research has shown that despite the risk involved, radical changes in strategy are especially likely to occur in turbulent environments. However, as Pajunen noted, 'One of the basic objectives in strategy research is to discover causes' (Pajunen, 2005, p.416).

Previous research broadly explored exits and failures of new ventures and their drivers (e.g. DeTienne, 2010). This research fills the gap where even though radical strategic change is a common event in high-technology new ventures, not much

research has addressed the question of their causes or triggers in new ventures. Such changes represent a dilemma between a proposed new opportunity and the risk of departing from the planned and approved strategy. Substantial theoretical and empirical work has been published regarding strategy changes in mature organizations; these studies indicated poor performance as the main cause for RSC (e.g. Gioia and Chittipeddi, 1991; Rajagopalan and Spreitzer, 1996; Stacey, 1995). However the general subject of RSC and particularly its causes in new ventures has been limitedly explored (Benjamin and Gimmon, 2012; Ambos and Birkinshaw, 2007; Nicholls-Nixon, Cooper, and Woo, 2000).

Companies succeed or fail due to how well they fit with their environment and follow change of action by transforming one action portfolio into another one (Zeleny 2008). In contrast to the environmental view, resource-based theory (RBT) stresses the importance of internal resources in shaping the strategy of high-technology new ventures (Barney, 1991; Lieberman and Montgomery, 1998; Newbert, Kirchoff, and Walsh, 2007). The dynamic capabilities of the firm (Teece, Pisanso, and Shuen, 1997) together with its resources represent a bundle that enables it to carry out strategic changes. For example Chang et al. (2010) found that the compatibility of manufacturing capabilities and business strategy is necessary in order to achieve better performance in the introduction of new products therefore firms should invest resource and time to develop dynamic capabilities. Changes in a firm's resources or resource bundles are considered to cause changes in strategy (Bergmann Lichtenstein and Brush, 2001; Lau et.al. 2008; Borch, Huse, and Senneseth, 1999). Accordingly, resource availability and resource configuration are the main factors in strategizing the new venture's competitive advantage in a given environment and RSC is driven mostly by change in the internal aspects – mainly resource-related – of the new venture.

Miller, Friesen, and Mintzberg (1984, p.28) asserted that organizations 'reinforce or extend their past structures and strategy-making practices, adhering to previous directions of evolution'. This momentum also applies to the repetition of changes experienced in the past. In other words, organizations continue to extrapolate past trends in the face of environmental changes. Hence, while environmental changes may require strategic changes, the firm's resources affect the likelihood and the magnitude of such change (Morrow et al., 2007). However, the question remains whether RSC is initiated mainly externally, by environment-related causes, or internally, by resource-related causes.

Venture capitalists (VCs) generally assess policies regarding a new venture's survival, such as competitive rivalry, based on the strategy literature (Shepherd, 1999a). Due to the rapid rate of change in emergent industries, and especially in high technology, new ventures must change their strategies in order to survive. As suggested by Shepherd, Douglas, and Shanley (2000, p.399): 'Performance will deteriorate . . . if new strategies are not formulated and implemented.' The successful execution of a recommended strategic change is a rare achievement; hence strategic changes can have a crucial impact on organizations (Beaver, 2003). Since venture capitalists are a major funding source of the high-technology industry, and are involved in the strategy processes of their portfolio companies (Sapienza and De Clercq, 2000), they seem to be a good source for exploring the causes of RSC in high-technology new ventures.

The contribution of this study is in exploring the drivers which cause strategic changes in new ventures which is under-researched field while applying a well-used tool in established corporations. The study explores investors' perceptions related to

the causes of radical changes in high-technology new ventures then classifying these causes as driven by either (a) internally or externally, and (b) by favourable or unfavourable events.

Theoretical background

Strategy in high-technology new ventures

Business strategy is widely considered as a major factor affecting new venture performance (Rexhepi 2014, West and Noel 2009, Baum, Locke, and Smith, 2001; Chrisman, Bauerschmidt, and Hofer, 1998; Gartner, Starr, and Bhat, 1999; Vesper, 1990). Furthermore, new venture strategic typologies are broader and often differ in other ways from corporate strategies (Carter et al., 1994). High-technology new ventures may choose from a wide range of technological strategies, a decision affected by technology markets (Gruber, Macmillan, and Thompson, 2008). Hence the strategy formation process in such companies is likely to be complex (Arora, Fosfuri, and Gambardella, 2001; Mathews, 2003). Shepherd, Ettenson, and Crouch (2000b) found that the most important criteria that VCs consider in assessing the profitability of a new venture are strategy-related: the founders' industry-related competence, followed by educational capability (e.g., resources and skills available to overcome market ignorance), competitive rivalry, and timing.

Two main approaches are common in the development of entrepreneurial strategy: planned strategy and emergent strategy (Harris, Forbes, and Fletcher, 2000). Most texts on entrepreneurship indicate that planned strategies should precede the launching of new businesses (e.g., Delmar and Shane, 2003; Timmons and Spinelli, 2003), but the impact of planning for venture survival is context-dependent (Castrogiovanni, 1996). Slevin and Covin (1997) found that planned strategies are positively related to growth in firms with a mechanistic approach operating in hostile environment, whereas emergent strategies are more positively related to growth in firms with organic structures that operate in friendly environments, such as start-up companies. Strategizing within turbulent environments is yet a greater challenge (Pettus, Kor and Mahoney, 2009). While large firms respond to a perceived rise in environmental turbulence with increased planning (Lindsay and Rue, 1980), small firms with limited resources (in terms of managerial time and financial resources) are less likely to respond in this manner (Patterson, 1986). Following Bhidé (1994) Matthews and Scott (1995) found an inverse relationship between environmental uncertainty and level of planning sophistication in entrepreneurial firms; they argued that as environmental uncertainty increases, sophistication of planning decreases. They further suggested that since successful entrepreneurs are extremely sensitive to the perishable nature of the opportunities emerging in a rapidly changing environment, under such conditions of high uncertainty, taking the time to plan may result in the loss of an opportunity.

Strategic leadership has been defined as 'the ability to anticipate, envision, maintain flexibility, and empower others to create strategic change as necessary' (Hitt, Ireland, and Hoskisson, 2008, p.489). Hence, in cases where small incremental changes are insufficient, the leadership team may decide to perform a radical change in strategy and redefine the new venture's strategic approach.

Radical changes in strategy

Changes in business orientation can be classified by magnitude as incremental vs. dramatic (Miller, Friesen, and Mintzberg, 1984, p.203) or, alternatively, as incremental vs. radical (Ginsberg and Abrahamson, 1991), where radical changes involve the status and behaviour of the business. Rajagopalan and Spreitzer (1996) defined strategic change as 'a difference in the form, quality, or state over time in an organization's alignment with its external environment, [where this alignment is] the fundamental pattern of present and planned resource deployments and environmental interactions that indicates how the organization will achieve its objectives' (p.49). Hopkins (1987) defined a strategic change in an organization as 'radical' rather than 'ordinary' if it combines three distinct factors: (a) significant departure from the organization's former way of doing business; (b) far-reaching effects, and (c) the creation of uncertainty and insecurity among organizational members. Aldrich (1999) suggested a set of criteria for evaluating the degree to which a given event constitutes a significant transformation while resulting in key changes as follows: (a) changes in *organizational goals* such as going from nonprofit to profit status or entering a new product market; (b) changes in *boundaries* such as expansion through merger or contraction through divestiture; and (c) changes in *activity systems* such as adoption of new technological systems. These events lead to developing new knowledge, new skills, and to the implementation of new strategic goals and objectives.

In analysing the process of evolution and change in high-technology new ventures, where both resource levels and expertise are constrained, Ambos and Birkinshaw (2007) used the concept of 'business charter', defined as the shared understanding of the elements of business for which the venture leaders assume responsibility. Charters include three key elements: (a) products and markets targeted, (b) venture capabilities, and (c) the future state of the venture's scope as communicated to external stakeholders. The authors concluded that a changing of charters is generally a healthy event for a venture, since all such cases in their study were beneficial in terms of refocusing on a neglected aspect or pushing the venture to think more ambitiously than it had previously. According to Ambos and Birkinshaw, RSC may be a common and favourable event if it is combined with changes in the venture's charter.

RSC requires substantial thought, courage, and flexibility, as well as personal ability on the part of the entrepreneurial team. Crol (2000) asserted that a successful strategic change should be based upon or even originated from a change in attitude of the employees hence a bottom-up rather than top-down process. Although this event represents high risk in the life of a new venture, it may also be the turning point that saves the venture and places it on a growth track. While substantial theoretical and empirical work has been conducted on strategy changes in mature organizations (e.g., Gioia and Chittipeddi, 1991; Rajagopalan and Spreitzer, 1996; Stacey, 1995), there is a dearth of field research on strategy change in small enterprises and new ventures (Hänninen et al., 2014; Ambos and Birkinshaw, 2007; Nicholls-Nixon, Cooper and Woo, 2000). Since VCs are heavily involved in funding high-technology new ventures, we would expect them to be involved in some way in any RSC of their portfolio companies.

Strategic Entrepreneurship (SE)

Strategic entrepreneurship (SE) has recently emerged as a new concept combining studies of entrepreneurship (opportunity-seeking behaviour) and along with strategic

management (advantage-seeking behaviour) (Hitt and Ireland 2000, Ireland et al., 2003). In their work Ireland et al. (2003) presented a conceptual model for SE showing how entrepreneurial attributes (mindset, culture, leadership) relate to strategic resource management in order to develop a competitive advantage by applying creativity and developing innovation. A further developed model was suggested by different researchers including Hitt et al (2011), Kyrgidou and Hughes, (2010) and Van Rensburg (2013). They ignored flexibility issues and their linear model was lacking feedback and learning systems that would be expected in practice. Kyrgidou and Hughes (2010) further developed a model including those feedback and learning mechanisms. This variation of the SE process supports the dynamic and evolutionary process in which entrepreneurial opportunities dynamically involve both discovery and creation (Garud et al. 2013). Hence, entrepreneurial strategy formation is strongly related to entrepreneurs learning process (Holcomb et al. 2009), raising the question of how changes in strategy would come out from this learning process and get accepted by the venture's investors.

Venture capitalists and RSC

Strategic change can have a crucial impact on organizations, yet the successful execution of RSC is a rare achievement (Wischnevsky and Damanpour 2008; Beaver 2003). The methods used by VCs to assess a new venture's potential for survival, such as evaluating the competition, are generally consistent with those presented in the strategy literature (Shepherd, 1999). Thus investors are expected to dislike RSC, as it is perceived to add an excessive risk for organizations (Hannan and Freeman, 1984; Hopkins, 1987; Yazdipour, 2009).

In light of the rapid rate of change in emergent industries, and especially high-technology industries, strategy changes are vital to new ventures. Shepherd, Douglas and Shanley (2000, p.399) argued: 'Venture capitalists can assess a venture's strategy and projected environment via a business plan, but this only provides the strategic intentions behind the venture. Plans almost certainly will not turn out as predicted, and the environment faced by a venture will not be as anticipated and may change frequently. Performance will deteriorate if changes in the environment are not detected by the entrepreneurs, if strategies are not reassessed and if new strategies are not formulated and implemented'.

Research to date indicates a conflict between the need of high-technology new ventures to radically change their strategy in order to fit market and technology trends, and the mortality risk that such change involves. This conflict has not been explored from the perspective of the VCs, who usually fund these new ventures and thus bear the majority of financial risk, on one hand, and have influence on the strategic process as shareholders, on the other. While strategic changes are natural for firms that operate in dynamic environment, understanding venture capitalists views may lead to better investments decisions as well as for monitoring. Therefore investors' views of RSC represent major importance.

Market turbulences and Radical Changes in the Strategy of New Ventures

The years since the late 1990s marked turbulent changes (Elmendorf, 2009). Penetration of web and mobile technologies has changed much of how people consume and socialize, challenging well established firms to re-thing their strategies (Gershon, 2013). The financial markets were not left untouched, going through the

dot.com collapse and the 2008 and 2010 recessions, having a major impact on fundraising aspects as related to new ventures. Market, technology, entrepreneurial and learning orientations are strongly interlaced (Hakala 2011), as well as strongly affect new venture performance, and having a greater impact during extreme turbulence. The relationship between internal resources such as entrepreneurial leadership and new venture performance is strongly affected by environmental dynamism (Ensley, Pearce, and Hmieleski, 2006). In relation to extreme situations, turbulence was defined by several scholars as 'genuine uncertainty' (Knight, 1921), 'surprise' (Shackle, 1972) and 'black swans' (Taleb, 2007). Yet, while uncertainty has long been recognized as important to strategic management and organization theory there is very little theory that has dealt with the decision-making implications of this kind of uncertainty (Agarwal et al. 2009).

Drivers of Radical Changes in the Strategy of New Ventures

Empirical research has indicated a correlation between corporate strategy and performance (Cheng and Kesner, 1997; DeSarbo et al., 2005; Forte et al., 2000); therefore it is not surprising to find radical changes in strategy associated with poor performance. Wischnevsky and Damanpour (2008) compared key factors that facilitate radical strategic and radical structural change in a sample of American bank holding companies and found that sustained low performance and top executive change facilitate the occurrence of radical strategic but not structural change however neither type of change exhibits a significant effect on firm profitability and survival. Radical strategic change positively influences the likelihood that radical structural change will follow, but not the reverse.

In new ventures a correlation between corporate strategy and performance is not straight forward for a number of reasons,: First, the 'performance' of new ventures is not clearly defined and measured (Delmar, 2008). Second, the dynamic nature of new venture strategies, either incremental or radical, implies a 'moving-target' dynamic that differs vastly from the corporate goal-setting approach. Furthermore, associating performance with radical changes in strategy does not indicate whether the change was generated by internal resources, industry-wide change, or a specific event that resulted in poor performance (Arend and Bromiley 2009).

Andrews (1971) is credited as the first to define strategy formulation as a process of aligning firm capabilities and constraints with environmental opportunities and threats. This definition, which is typical of the 'design school', later evolved to become the well-known SWOT scheme (strengths, weaknesses, opportunities, and threats), which is frequently used in strategic formulation and analysis. Although some scholars have questioned the use of SWOT (Hill and Westbrook, 1997; Mintzberg, 1990; Valentin 2001) expanded its use to include a resource-based view. From this perspective we can outline four basic causes for radical change in strategy: favourable internal causes (e.g., a new application for a technology); unfavourable internal causes (e.g., failure to meet technological goals); external favourable causes (e.g., supportive regulation); and external unfavourable causes (e.g., a market crash).

Strategy can be oriented from internal as well as external points of view (Rexhepi, 2014). Both internal and external factors influence the venture's strategic path, as described in the model presented by Borch, Huse, and Senneseth (1999, p.50). In their model, an internal resource-dependent horizontal path merges with the external vertical influence to create a strategic orientation.

According to a review of the literature, environmental events include national changes (Lyles, Saxton, and Watson 2004; Tan and Litschert 1994), industrial events

(Goll et al., 2007; Meyer, Brooks, and Goes 1990), economic changes, or technology cycles (Anderson and Tushman 1991). Internal events include various types of resources (Bergman and Brush, 2001; Borch, 1999; Kraatz and Zajac, 2001), as well as factors related to dynamic competence (Helfat and Peteraf, 2003; Lee, Lee, and Pennings 2001; Teece, Pianso, and Shuen, 1997).

The entrepreneurial team does not have influence over external factors such as industry structure, financial markets, and regulations. However the strategy of a new venture is subject to change at the entrepreneurs' discretion. Following Cooper (1993), Brush, Greene, and Hart (2001) argued that while strategic decisions influence performance, they are dependent on the entrepreneur, who is the primary resource of the new venture. Furthermore, the entrepreneurial team has far more control over the venture business strategy than it does over any other factor related to the venture resources and its environment (Shepherd, Douglas, and Shanley, 2000). Abdelgawad et al. (2013) proposed that entrepreneurial capability is instrumental for realizing a firm's game-changing strategies.

Reviewing the literature for a comparison of favourable with unfavourable events, we found that external factors are interpreted by management as either favourable, i.e., driven by opportunities (see, e.g., Barr 1998, Stevenson and Gumpert, 1985; Teece, 2007) or unfavourable, i.e., driven by threats (Baron and Ensley, 2006). The strategic responses are guided by these events (Choi and Shepherd, 2004; Denrell, Fang, and Winter, 2003; Park 2005).

Previous studies tend to focus on unfavourable more than favourable causes of strategic changes and to some extent, more on external than internal factors. However, the literature does not unequivocally specify that strategic orientation is influenced more by favourable or unfavourable events, or that it is clearly affected more by internal or external events. Therefore we cannot assume a tendency for one factor group to cause RSC more than the others. Building on the SWOT model (Mintzberg, 1990; Valentin 2001) the exploratory research questions in this study are posited as follows:

- a. Are favourable events more dominant than unfavourable ones in causing radical changes in strategy of high-technology new ventures? The null hypothesis is that the number of favourable causes for RSC will be similar to the number of unfavourable causes.
- b. Are internal events more dominant than external ones in causing radical changes in strategy of high-technology new ventures? Based on lack of consensus among previous studies, the null hypothesis is that the number of internal causes for RSC will be similar to the number of external causes.

Methodology

In order to explore the causes of RSC in high-technology new ventures, we sought the investors' perspective. Several reasons led us to follow the private investors for this purpose. First, by virtue of their position as board members, they are involved in the strategic process of their portfolio companies and have certain power to change the strategy (Busenitz, Fiet, and Moesel, 2004; Colombo and Grilli, 2009). Second, their professional acquaintance with numerous new ventures affords investors a broader

view and, generally, less emotional involvement in the ventures compared with the founders (Zacharakis and Shepherd, 2001). Finally, VCs play an important role in high-technology new ventures, since they are the major funders of this industry (Gompers and Lerner, 2001).

Following Van de Ven (2005), we used the variance change approach, since 'a variance methodology [is] particularly well suited for examining research questions such as: what are the causes or correlates of change in organizations? This approach treats change in an organizational entity as a dependent variable and explains it as a function of independent factors (p.1387).

Since our samples were composed of investment-backed, early-stage high-technology new ventures, we can assume that the systems were 'well behaved', i.e., the causes flowed from higher to lower and not vice versa, and the factors operated homogeneously across cases and approximately along the same time scale.

We selected a sample group of venture capital investors and business angels who invested in high-technology new ventures to be interviewed. The inclusion of business angels along with VCs in this sample was based on Mason and Stark's (2004) finding that these two types of investors behave similarly. The selection procedure began with a secondary data analysis of 48 investors, including available archival data and open sources on venture capital firms and business angels. All the investors interviewed had been engaged in early-stage high-technology investments recently and for at least two years prior to the interview. We then applied replication logic under three different experimental conditions: investor type (business angel or VC); industry sector related to high-tech; and country of operation. In order to control for cultural differences, an additional sub-sample of seven investors operating in the US, UK, Norway, Germany, Singapore, Korea, and Taiwan was added to the original sample of six investors operating in Israel, giving us a total of sixteen different interviewees. Ten of the investors were venture capital investors, investing by portfolio criteria and investment committee. The other six investors defined themselves as angel investors, investing based on their own personal tendency and not restricted to any formal investment criteria. All investors are involved in high technology investment fields ranging from software, ICT, medical devices, and industrial high tech to optical devices, clean technologies, digital signal processing, and semiconductors. See Table 1 for details of the sampled investors.

Table 1: Investments portfolio as reported by all 16 interviewees

Code	Type	Country	Number of investments	Number of early-stage investments	Investment Field
A1	BA	United Kingdom	3	3	Optical
A2	BA	USA Israel	4	4	Diverse portfolio
A3	BA	Singapore	10	1	Industrial High Tech
A4	BA	USA	10	10	Medical Devices, Medical Services
A5	BA	Israel	4	1	Biotechnology, Digital Signal Processing.

Code	Type	Country	Number of investments	Number of early-stage investments	Investment Field
VC1	VC	Israel	9	6	Industrial High Tech
VC2	VC	Israel	4	2	Software
VC3	VC	Europe USA	5	5	Biotechnology, Clean Technology
VC4	VC	Korea	14	2	Information Technology Biotechnology
VC5	VC	Israel	4	4	Information and Communication Technology
VC6	VC	Israel	15	10	Diverse portfolio,
VC7	VC	Israel Taiwan	6	5	Software, Semiconductors, Medical Devices
VC8	VC	Israel	5	5	Information Technology, Software.
VC9	VC	Israel	7	7	Internet, New Media
VC10	VC	Israel	11	11	ICT, Clean Tech,
VC11	VC	Norway	3	3	Diverse portfolio

Note: BA, Business Angel; VC, Venture Capital firm

Data was collected personally from the investors by means of semi-structured interviews, as commonly conducted in qualitative studies. The questions were designed to reveal the views of the investors regarding RSC, including the importance of strategy as an investment criterion (Fried and Hisrich, 1994; Mintzberg and Water, 1985; Sandberg, Schweiger, and Hofer, 1988; Shepherd, 1999; Tyebjee and Bruno, 1984). Interviewees were also asked for their perceptions of the causes of RSC and the rarity of its occurrence in their portfolio companies. The focus of the interviews was on radical rather than non-radical incremental strategic changes. We used open-ended questions to ascertain what they considered the reasons for strategic change and their attitudes regarding its occurrence. As noted by other researchers (Shepherd, 1999; Zacharakis and Meyer, 1998), a limitation of this methodology is the possibility of differences between investors' espoused criteria and their actual in-use criteria.

The interviews were transcribed and then examined for patterns by looking for consistencies and inconsistencies in the explanations given by the VCs. For this purpose, we tabulated the data and compared responses across all respondents, as recommended by Miles and Huberman (1994). The interviews were analysed using Nvivo software (Richards, 1999), by marking cross-referenced statements made in the interviews. Phrases were marked and coded according to nodes, including positive attitude to RSC, negative attitude to RSC, rarity of RSC, initiation of RSC, and the

like. In order to control for inter-coder reliability two independent coders then sorted the phrases. At a later stage their results were compared and discussed. Then we utilized Cohen's kappa to test the agreement between the two raters since this statistics measures the agreement between two raters who each classify N qualitative items into C mutually exclusive categories (Carletta 1996). Eventually results showed good agreement between the two independent coders.

To examine perceived causes of RSC, the investors were asked to cite causes of RSCs in their portfolio companies or in RSCs they were familiar with from their fellow investors. For this reason, some of the causes might appear more than once in the same interview.

Results

In the present study, we explored high-technology investors' perspective regarding the causes of RSC in their portfolio companies by means of interviews of various private investors. In these interviews, the 16 investors reported 38 RSCs in the 76 high-technology new ventures in which they invested and cited 60 causes using different phrases.

The phrases describing causes for RSCs were classified by two independent coders for two criteria: (a) as a result of either favourable or unfavourable events, and (b) due to either internal or external factors. The disagreement level was checked using the Cohen's Kappa test on three levels of disagreement: (a) favourable/unfavourable, (b) internal/external, (c) internal/external and favourable/unfavourable simultaneously, with results showing very good agreement (Kappa values of 0.931, 0.828, and 0.848 respectively).

The coders then discussed the differences and created an agreed classified list of all the causes, with the exception of one phrase, on which they did not reach agreement. This phrase was therefore excluded from the internal/external sample analysis. Table 2 presents examples of the phrases used by the interviewees and their classification by the coders.

Table 2: Examples of causes for RSC in high-technology new ventures

	Internal (37)	External (22)
Favourable (15)	'Identifying alternative or additional sources of revenues'; 'key personnel change position'	'Government policy easing regulations'; 'accessible sources of funds'
Unfavourable (45)	'The technology was not adequate'; 'wrong assumptions about market trends'	'New competitors entered the target market'; 'declining market needs'

Finally, the 60 causes were classified as follows:

1. Forty-five causes indicated unfavourable events and 15 causes indicated favourable events, as perceived by the investors. In a two-tailed Z test for a single proportion, the null hypothesis was rejected ($Z = 3.87 > 1.96$; $p < 0.05$); there were significantly more unfavourable events than favourable events cited as the causes of the reported RSCs.

2. Thirty-seven causes indicated internal factors and 22 indicated external factors as perceived by these investors (one phrase in this section was omitted due to lack of coder agreement). In a two-tailed Z test for a single proportion, the null hypothesis was marginally accepted ($z = 1.95 < 1.96$; $p < 0.05$); the number of internal causes for RSC was not significantly different from the number of external causes. However, it should be noted that marginally more internal factors than external factors were cited as causing the RSCs.

The Z test requires a normal distribution of each of the two variables; this can be assumed, since $n > 30$. In addition, when applying two different Z tests, the two variables must be independent; this was verified by a Chi Square test for the total 59 cases ($P = 0.889 < 0.05$).

In order to examine the functional nature of the causes, we grouped them into five major clusters: financial (10 phrases), market/marketing (17 phrases), performance (7 phrases), technological issues (7 phrases), and others (cited in 18 phrases). Table 3 presents examples of the phrases given in each category.

Table 3: Examples of causes of RSC, classified by category

Category	Example for Causes
Market/Marketing (17)	<i>'Identifying alternative or additional revenue generators'</i> <i>'Wrong assumptions about the market'</i>
Financial (10)	<i>'Not able to raise expected amount of cash'</i> <i>'Change in the funding environment'</i>
Performance (7)	<i>'Failure to materialize the business potential'</i>
Technological (7)	<i>'Failure in delivery of the technology'</i>
Others (18)	<i>'The regulator has not acted as expected'</i> <i>'Internal reasons, such as an unexpected lawsuit'</i>

The market-related causes were the most dominant ones, including 17 phrases, such as *'identifying alternative or additional revenue generators'* or *'wrong assumptions about the market'*. Financial causes represented the next largest group, with 10 phrases out of the 59, mainly referring to a lack of funding: *'not able to raise expected amount of cash'* or *'change in the funding environment'*. The technology cluster and performance cluster of causes were of about the same magnitude, with 7 causes each, and were related mainly to management performance: *'failure to materialize the business potential'* or *'failure in delivery of the technology'*. The other 18 causes included various issues such as *'the regulator has not acted as expected'* and *'internal reasons, such as an unexpected lawsuit'*.

Although the present research did not focus on cultural aspects, we compared the number of phrases made by Israeli with those of non-Israeli interviewees in terms of (a) the internal/external classification and (b) the favourable/non-favourable classification. These comparisons revealed no significant differences in relation to national culture which may be due to the small sample size.

Discussion

The originality of the present research is in the exploration of the different causes of RSC in new ventures as perceived by their investors. It broadens the strategic entrepreneurship discussion by further bridging the literature between strategic management and entrepreneurship. While strategic changes in established corporations have received broad attention, the case of new ventures has been under-researched.

Moreover this study is related to investors' perceptions which should be differently explored since investors and entrepreneurs are likely to face conflicts which undermine cooperation (Zacharakis, Erikson and George, 2010). However investors' population is relatively small which yielded a sample with a limited number of phrases espoused by the interviewees, but albeit the rather small size it provided statistically measurable results. We found that the likelihood of unfavourable events causing RSC was significantly higher than that of favourable events. This is consistent with the findings reported in research of established organizations, where poor performance is likely to be the cause for RSC (Gioia and Chittipeddi, 1991; Rajagopalan and Spreitzer, 1996; Stacey, 1995). However, this finding is surprising with regard to new ventures, since it raises a question regarding the 'opportunity-seeking' nature of entrepreneurial performance (Baron and Ensley, 2006; Denrell, Fang, and Winter, 2003; Gruber, MacMillan, and Thompson, 2008).

Based on the notion that opportunities are the main drivers for new ventures, we might have expected to find more favourable than unfavourable events as causes for RSC, but this was not borne out by our findings. This may be explained by the relative maturity of the ventures, which were already VC-backed; the 'opportunity-seeking' process was probably diminished once the investment was made, in favour of concentration on fulfilling the original plans.

The results indicate that the likelihood of RSC being caused by internal factors such as the venture's resources and capabilities was to some extent higher (though merely marginally significant) than the likelihood of RSC being caused externally, by environmental factors. Previous research has largely related new venture survival to environmental changes rather than internal factors (McKelvie and Davidson 2009; Teece, Pisano, and Shuen, 1997). Our findings highlight the need for 'alignment' between the new venture's internal resources and capabilities to adapt to the environment within it operates. See descriptive model in figure 1.

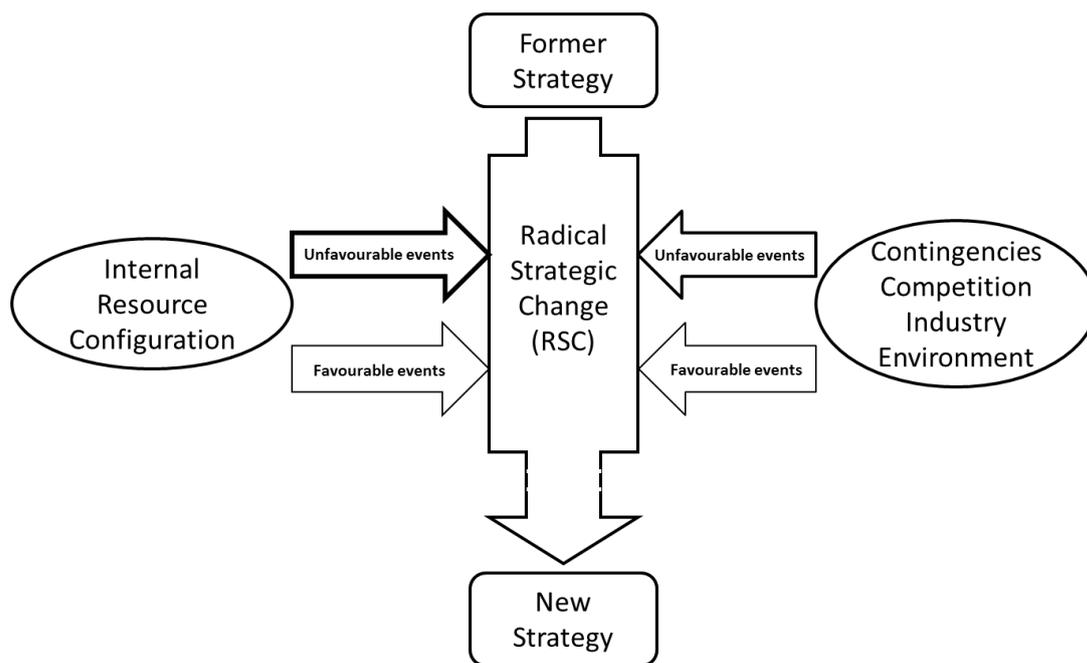


Figure 1: Suggested model: types of causes for RSC in high tech new ventures

executed in a given new venture, investors can be expected to follow the ‘exploitation’ mindset and use classic strategic management tools which potentially contradict the inherently ‘exploration’ nature of the start-up founders. The results above demonstrate the impact of ‘failed exploration action’ on the ‘the future exploitation strategy’ as crafted by the new venture top management team.

Conclusions

The theoretical contribution of this research is in exploring strategic changes in new ventures while applying a well-used tool in established corporations such as SWOT (Mintzberg, 1990; Valentin, 2001). The findings of this study (see Figure 1) suggest implications for practitioners, both entrepreneurs and investors, who should be prepared to handle more unfavourable unexpected events which are mostly in the fields of marketing and finance. Surprisingly and sometimes counter-intuitively (cf. Brush, Greene, and Hart, 2001) these events relate to internal factors more than to the environment. The main implications for researchers concern the drivers for change in high-technology new ventures.

While this study shows that the drivers for change are mainly unfavourable rather than favourable events, the enigma of external environment factors versus internal resources as the triggers of RSC is yet to be untangled. This finding may suggest that the heart of strategic focus lies on the boundary lines between the organization and the environment, moving the venture's challenge to be a ‘fit issue. Hence, evaluating strategic planning via the perspective of internal-external fit, shed some light on the issue of RSC in turbulent environments such as high-technology industries. Policy makers, entrepreneurs and investors may wonder if they really agree that RSC in new ventures should be driven more by unfavourable than favourable events and more by internal rather than external factors. The main limitation of this study is the fairly small sample of about 60 phrases espoused by 16

interviewed investors in 8 different developed countries. Further research of comparable dataset is needed to validate these findings with a larger sample of causes and, possibly, by means of interviews with practitioners that are not investors. In addition, it would be useful to test further classifications, such as whether the causes are related to technology or to market needs.

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