INVESTORS’ PERCEPTION OF CAUSES FOR RADICAL STRATEGIC CHANGE IN HIGH TECHNOLOGY NEW VENTURES.

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ABSTRACT

New ventures dealing with high technology operate in a turbulent environment are frequently involved in radical changes in their strategy while aligning internal resources and capabilities to the changing environment. This study explores the common causes to radical strategic changes in high technology new ventures and whether they are predominately initiated more by external rather than internal events, and by favorable rather than unfavorable factors. We analyzed a dataset of 60 phrases extracted from interviews with 16 venture capital investors of 8 developed countries regarding 36 radical strategic changes they had experienced in their 76 investments. Findings show unfavorable events are significantly more common than favorable events and internal factors were found only marginally significant more likely than external factors in causing radical strategic changes. Further research is required to validate these findings.

INTRODUCTION

A growing body of literature refers to strategy change and the associated dynamic capabilities aimed at obtaining competitive advantage. It is assumed that in turbulent environments the ability to reconfigure internal and external competencies will eventually earn higher returns over competitors (Teece, Pisano and Shuen 1997, McKelvie and Davidson 2009). This strategic reorientation can be performed by small incremental changes or by a more punctuated and radical manner. Research has shown that despite the risk involved, radical changes in strategy are likely to occur specially in turbulent environments. However, as stated by Pajunen (2005:416) "One of the basic objectives in strategy research is to discover causes", and the question of what causes or initiates radical changes in strategy of new ventures is mostly uncovered.

Radical Strategic Change (RSC) is a common event in high technology new ventures, representing a conflict between the proposed new opportunity and the risk of departing from the planned and approved strategy. Substantial theoretical and empirical work has been done regarding strategy changes in mature organizations; indicating poor performance as a main
cause for the RSC (e.g. Gioia and Chittipeddi, 1991; Stacey, 1995; Rajagopalan and Spreitzer, 1996). There is an uncovered area in research regarding RSC in new ventures in general, and particularly in exploring the causes for RSC (Nicholls-Nixon, Cooper and Woo, 2000; Ambosh and Birkinshaw, 2007).

As opposed to the environmental view, the Resource-Based Theory (RBT) presents a different perspective indicating the importance of internal resources in carving 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, Pianso and Shuen, 1997) along with its resources represent a bundle enabling it to handle strategic changes.

Changes in firm’s resources or resource bundles are considered to cause changes in strategy (Borch, Huse and Senneseth, 1999; Bergmann and Bursh, 2001). According to this view, resources availability and resource configuration are the main factors in strategizing the new venture's competitive advantage in a given environment. Hence RSC will be driven more by change in the internal aspects of the new venture, mainly resource related.

Miller, Friesen and Mintzberg (1984:28) asserted that organizations "reinforce or extend their past structures and strategy-making practices, adhering to previous directions of evolution". This momentum also applies to repeating 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 the upcoming strategic change (Morrow et.al. 2007), yet the question rises whether the RSC are mainly initiated externally by environment related causes, or internally by resource related causes.

Venture Capitalists (VCs) in general assess policies of new ventures survival such as competitive rivalry predominately in consistence with those arising from the strategy literature (Shepherd, 1999a). Due to the rapidity of change in emergent industries, and especially in high technology, new venture strategies require changes in order to survive, as suggested by Shepherd, Douglas and Shanley (2000a: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 a strategic change can have a crucial impact on organizations (Beaver, 2003). Since venture capitalists are a major funding source to the high technology industry, and are involved in the strategy process of their portfolio companies (Sapienza and De Clerq 2000), they seem to be a good source to explore the issue of causes for RSC in high technology new ventures.

This study explores, through venture capitalist's perspective, the causes of radical changes in high technology new ventures and whether these causes are driven internally or externally as well as by either favorable or unfavorable events.
THEORETICAL BACKGROUND

Strategy in high technology new ventures

Business strategy is well accepted as a major factor affecting new venture performance (Baum, Lock Smith, 2001; Chrisman, Bauerschmidt and Hofer, 1998; Gartner, 1998; Vesper, 1980). Furthermore, new venture strategic typologies are broader and in many cases different from corporate strategies (Carter et al. 1994). High technology new ventures face a broad span of strategic technological alternatives and have technology markets play a role in strategy formation (Gruber, Macmillan and Thompson; 2008). Hence the strategy formation process in such companies is likely to be a complex matter (Arora et al., 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 developing entrepreneurial strategy: planned strategy and emergent strategy (Harries, Forbes and Fletcher, 2000). Most texts on entrepreneurship indicate planned strategies should take place prior to launching 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 benign environments, such as start-up companies. 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 this way (Patterson, 1986). Matthews and Scott (1995) found an inverse relationship between environmental uncertainty and level of planning sophistication in entrepreneurial firms; they contend that as environmental uncertainty increases, sophistication of planning decreases. They further argue that since successful entrepreneurs are extremely sensitive to the perishable nature of the opportunities emerging in a rapidly changing environment, taking the time to plan under conditions of high uncertainty may result in the loss of an opportunity (Bhide, 1994).

Strategic leadership is defined by Hitt Ireland and Hoskinsson (2008:489) as: "...the ability to anticipate, envision, maintain flexibility, and empower others to create strategic change as necessary". Hence, in cases where small incremental changes are insufficient, the leading team may decide to perform a radical change in strategy and redefinition of 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 behavior of the business. Rajagopalan and Spreitzer (1996) define 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) defines a strategic change in an organization to be ‘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.

In analyzing the process of evolution and change in high technology new ventures, where both resource levels and expertise are constrained, Ambos and Birkinshaw (2007) chose to use 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. They 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 favorable 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. 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 new ventures (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.

Venture Capitalists and RSC
Strategic change can have a crucial impact on organizations, yet the successful execution of RSC is a rare achievement (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 as risky for organizations (Hannan and Freeman, 1984; Hopkins, 1987).

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 (2000a) argue that ‘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’ (p.399).

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. Hence the investors’ views of RSC are of major importance.

Causes for Radical changes in strategy of new ventures:

Empirical evidence has shown a correlation between corporate strategy and performance (Desarbo et al. 2005; Forte et al. 2000; Cheng and Kesner 1997) hence it is not surprising to find radical changes in strategy associated with poor performance. Nevertheless, for a number of reasons such correlation could not be easily applied to new ventures: First, 'performance' of new ventures is not clearly defined and measured (Delmar 2008). Second the dynamic nature of new venture strategy, may it be incremental or radical, implies a 'moving target' dynamics vastly different of the corporate goal setting approach. Furthermore, associating performance to radical changes in strategy does not indicate whether the cause was internal resources, industry change or any other event resulting in poor performance.

Andrews (1971) is credited for being first to define strategy formulation as a process of aligning firm capabilities and constrains with environmental opportunities and threats. This definition typical for the 'design school' later evolved to the well known SWOT scheme (Strengths, Weaknesses, Opportunities, and Threats) used by many for strategic formulation and analysis. Although scholars had questioned the use of SWOT (Mintzberg 1990, Hill and Westbrook 1997); Valentin (2001) had expanded its use to include a Resource Based View.
From this perspective we can outline four basic causes for radical change in strategy: Favorable Internal causes (e.g. new application for a technology), Unfavorable Internal cause (e.g. missing technological goals), External Favorable causes (e.g. supportive regulation) and External Unfavorable cause (e.g. market crash).

Both internal and external factors influence the ventures strategic path as described in the model (see Figure 1) presented by Borch, Huse and Sennesth (1999b:50). In this model an internal / resource dependent horizontal path merges with the external vertical influence to perform a strategic orientation (bolded arrows and dashed rectangle are marked by authors of this paper).

Reviewing the literature we find that environmental events include national changes (Lyles Saxton and Watson 2004; Tan and Litscher 1994), industrial events (Meyer, Brooks and Goes 1990), economical changes or technology cycles (Anderson and Tushman 1997). Internal events include various types of resources (Kraatz and Zajac 2001; Borch 1999a; Bergman and Brush 2001) as well as factors related to dynamic competence (Lee, Lee, and Pennings 2001, Helfat and Peteraf 2003, Teece, Pianso and Shuen, 1997) while some scholars relate strategic changes on the entrepreneurs.

Though external factors such as the industry structure, financial markets and regulations are beyond the influence of the entrepreneurial team, the strategy of a new venture is subject to change by the entrepreneurs’ views. Brush, Greene and Hart (2001), following Cooper (1993), argued that although 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 2000a).
Many scholars related changes in strategy to environmental causes. Nicholls-Nixon, Cooper and Woo (2000), proposed that the level of perceived environmental hostility affects the level of strategic changes undertaken in new ventures. By this perspective events causing RSC are commonly referred to as 'environmental changes' (e.g. Bhide, 1994; Rajagopalan and Spreitzer, 1996; Kraatz and Zajac, 2001). These strategy changes can also be viewed as 'changes in the strategic ‘recipes’ or ‘formulas’ that managers use to construe their environment', which are advocated internally by members of the top management team or externally by management consultants (Ginsberg and Abrahamson 19911990:174).

Reviewing the literature for favorable as opposed to unfavorable events we find that external factors are interpreted by management (Barr 1998) to be either favorable, i.e. driven by opportunities (e.g. Stevenson and Gumpert 1985) or unfavorable, i.e. driven by threats (Baron and Ensley 2006), hence outlining their strategic response accordingly (Park 2005, Denrell, Fang and Winter 2003; Choi and Shepherd 2004). While Teece (2007) places much emphasis on dynamic capabilities for sensing and seizing opportunities, Sarasvathy (2001a:1) suggested effectual reasoning which '…begins with a given set of means and consists of a set of principles, techniques, and criteria based on the logic of control to generate and select between possible effects that can be created with those means'.

Previous studies tend to deal more with unfavorable than favorable causes to RSC and to some extent more external than internal factors. However the literature does not prominently specify whether the strategic orientation is more influenced by favorable or unfavorable events neither it is clearly influenced more by internal or external events. Therefore it could be assumed that there is no tendency for one factor group to cause RSC more than others. The exploratory research questions for this research can now be stated:

a. Would internal events be more dominant in causing radical changes in strategy of high-technology new ventures as opposed to external ones? Based on indecisive previous studies the null hypothesis is that the number of internal causes for RSC will be similar the number of external causes.

b. Would favorable events be more dominant in causing radical changes in strategy of high-technology new ventures more and unfavorable ones? The null hypothesis is that the number of favorable causes for RSC will be similar to the number of unaffordable ones.

**METHODOLOGY**

In order to explore the causes for RSC in high technology new ventures we sought the investors’ perspective. Several reasons led us to follow the ventures’ private investors in this study: First, upon serving as board members they are involved in the strategic process of their portfolio companies and have certain power to change the strategy (Busenitz et al. 2004; Colombo and Grilli 2009). Second, being professionally exposed to numerous new ventures they have broader view and tend to be less mentally involved compared to the founders.
(Zacharakis and Shepherd, 2001). And third, while dealing with high technology new venture VCs play an important role since they are the major fund providers to this industry (Gompers and Lerner 2001).

Following Van De Ven (2005:1387) 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 variables.’

According to this approach we take the new venture strategy as the dependant variable and the internal or external causes as the independent variables. Since our samples refer in particular to investment backed, early stage high technology new ventures, we can assume that the systems are ‘well behaved’ i.e. causes flow from higher to lower and not vice versa and that these factors operate homogeneously across cases and approximately at the same time scale.

We had selected a sample group of venture capital investors and business angles who invested in high technology new ventures to be interviewed. The inclusion of business angels along with VCs in this sample follows Mason and Stark (2004), who found these two types of investors to 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 included had been recently engaged in early-stage high-technology investments for at least two years. We then applied replication logic conducted 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 16 different interviewees. 10 of the investors are venture capital investors and 6 define themselves as angle investors, with investment fields ranging from software, ICT, medical devices and industrial hi tech, optical devices, clean technologies, digital signal processing and semi conductors.

Data was collected personally from the investors by means of semi-structured interviews. 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 et al. 1988; Shepherd 1999a; 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. We used open-ended questions to ascertain what they considered the reasons for strategic change and their attitudes regarding its occurrence. Following previous research (Zacharakis and Meyer, 1998; Shepherd, 1999b) it
should be noted that this methodology may be limited due to the 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-references 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. As for causes for RSC the investors were asked to refer to RSCs in their portfolio companies or causes for RSC they were familiar with from their fellow investors. For this reason some of the causes could appear more than once within the same interview. The phrases were then sorted independently by two coders. In a later stage their results were compared, discussed and analyzed.

RESULTS

This study explores high technology investors’ perspective regarding causes of RSC in their portfolio companies, through interviews of various private investors. In these interviews the 16 investors reported 38 RSCs in their 76 investments in high-technology new venture and 60 causes were espoused in different phrases by these interviewees.

The phrases describing causes for RSCs were classified by two independent coders for two criteria: (1) as a result of either favorable or unfavorable events, and (2) on the account of either internal or external factor. The disagreement level was checked using the Cohen Kappa test on three levels of disagreement: a) Favorable / Unaffordable b) Internal / External c) Internal / External / Favorable / Unfavorable simultaneously, with results showing very good agreement (Kappa values of 0.931, 0.828 and 0.848 respectively).

The coders than discussed the differences, outlining an agreed classified list of causes, except for one phrase which then was excluded from the Internal / External sample analysis. Table 1 provides examples of the phrases espoused by the interviewees as classified by the coders into the four categories.

<table>
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<tr>
<th>Fruitable (15)</th>
<th>External (22)</th>
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<tbody>
<tr>
<td>“Identifying alternative or adding sources of revenues”; “Key personnel change position”.</td>
<td></td>
</tr>
<tr>
<td>“Government policy easing regulations”; “Accessible sources of funds”.</td>
<td></td>
</tr>
<tr>
<td>Unfavorable (45)</td>
<td>“The technology was not adequate”; “Wrong assumptions about market trends”.</td>
</tr>
<tr>
<td>“New competitors entered the target market”; “Declining market needs”.</td>
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Table 1: Examples of causes for RSC in high technology new ventures.
Finally the 60 causes were classified as follows:

a. 45 causes indicated unfavorable events and 15 causes indicated favorable events as perceived by the ventures’ investors. While applying a two-tailed Z test for a single proportion the null hypothesis was rejected (Z=3.87>1.96 for p<0.05), meaning there were significantly more unfavorable events than favorable events causing the reported RSCs.

b. 37 causes indicated internal factors and 22 indicated external factors as perceived by these investors (note one phrase was omitted in the section). While applying a two-tailed Z test for a single proportion the null hypothesis was marginally accepted (z=1.95<1.96 for p<0.05), meaning there were marginally more internal factors than external factors causing the RSCs.

It should be noted that if this hypothesis would apriori refer to a larger number of internal factors than external factors, a one-tail Z test would be applied for which the result (z=1.95>1.645 for p<0.05) is marginally significant.

The Z test requires each of the two variables to be normally distributed which can be assumed since n>30. Also applying two different Z tests requires the two variables to be independent, which was verified by a Chi Square test for the total 59 cases (P= 0.889 < 0.05).

In order to present the functional nature of the causes we grouped them into five major clusters: Financial (10 phrases), Market / Marketing (17 phrases), Performance (7 phrases), Technological (7 phrases) and Other causes (espoused in 18 phrases). Table 2 provides examples of the phrases given in each category. 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 counted the next largest group with 10 phrases out of the 59, mainly referring to 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 about the same magnitude, 7 causes each, and were more related 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 unexpected lawsuit".

Though this research does not focus on cultural aspects we compared the number of phrase made by Israeli vs. non-Israeli interviewees to (a) the internal/external classification and (b) the favorable/non-favorable classification and found no significant differences in both comparisons.
DISCUSSION

This study contributes to the exploration of the different causes for RSC in new ventures. While strategic changes in established corporations had received broad attention, same issue has been under-researched regarding new ventures. We found that the likelihood of unfavorable events was significantly higher than favorable events in causing RSC, this is coherent with the findings related to established organizations stating poor performance is correlated with RSC. However this finding raises a question regarding the 'opportunity seeking' nature of entrepreneurial performance (Baron and Ensley 2006; Denrel, Fang and Winter 2003; Gruber, MacMillan and Thompson 2008). Based on the notion that opportunities are the main drivers for new ventures, it would be expected to find more favorable than unfavorable events as causes for RSC, which is not the result according to our study. This contradiction might be explained by the maturity of the ventures: since all the ventures had already been VC-backed, it might be that the 'opportunity seeking' process was reduced upon investment, in favor of fulfilling the original plans.

Surprisingly, in some contrast to previous research which related environmental changes to new venture survival (Teece, Pisano and Shuen 1997, McKelvie and Davidson 2009) this study shows that the likelihood of RSC caused by internal factors such as venture’s resources and capabilities was higher (almost marginally significant) than the likelihood of RSC caused externally by the environment. On one hand this finding supports the need for 'alignment' between the new venture internal resources and capabilities to the environment within it operates, on the other hand we could not clearly determine whether high technology new ventures act faster than their environment or vise versa.

These findings have implications to practitioners, both entrepreneurs and investors, who should be ready to handle more unfavorable unexpected events, mainly regarding marketing and financial perspectives. The implications for researchers refer mainly to the drivers for change in high technology new ventures. Although we are more confident that the drivers for change are mainly unfavorable events, the enigma of external environment factors vs. internal resources as triggering RSC is yet to be untangled.
The limitations of this study lay in the quite small sample of about 60 phrases as were espoused by 16 interviewed investors of 8 different developed countries. Further research is needed to validate these findings with larger sample of causes and possibly through interviews with practitioners other than investors. Also further classifications can be tested such as whether the causes are related to technology or to market needs.

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