

FACULTEIT ECONOMISCHE EN  
TOEGEPASTE ECONOMISCHE  
WETENSCHAPPEN



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KATHOLIEKE  
UNIVERSITEIT  
LEUVEN

**CORPORATE ENTREPRENEURSHIP: AN  
INTEGRATIVE ANALYSIS OF A RESOURCE-BASED  
MODEL. EVIDENCE FROM FLEMISH ENTERPRISES**

Proefschrift voorgedragen  
tot het behalen van de graad  
van Doctor in de Toegepaste  
Economische Wetenschappen  
door

**Johan MAES**



## **Doctoral commission**

Prof. dr. Luc Sels (promotor)	Katholieke Universiteit Leuven
Prof. dr. Maddy Janssens	Katholieke Universiteit Leuven
Prof. dr. Filip Roodhooft	Katholieke Universiteit Leuven
Prof. dr. Wim Vanhaverbeke	Universiteit Hasselt en TU Eindhoven
Prof. dr. Roy Thurik	Erasmus Universiteit Rotterdam

Daar de proefschriften in de reeks van de Faculteit Economische en Toegepaste Economische Wetenschappen het persoonlijke werk zijn van hun auteurs, zijn alleen deze laatsten daarvoor verantwoordelijk.



---

## DANKWOORD

“Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.” Met deze gevleugelde woorden wist Winston Churchill 64 jaar geleden de belangrijke geallieerde overwinning in de slag om El Alamein tot haar ware proporties te herleiden. De geallieerde eindoverwinning in Tweede Wereldoorlog was nog lang niet verzekerd, maar een belangrijke horde op de weg er naar toe was genomen. Hier en nu neem ik mij de vrijheid om diezelfde woorden te extrapoleren op het doctorale traject dat met dit proefschrift wordt afgerond. Het proefschrift markeert voor mij persoonlijk het afsluiten van een belangrijke, afgebakende leer- en transformatiefase als beginnend onderzoeker. Het weerspiegelt een belangrijk resultaat van de groei op het vlak van kennis en onderzoekskunde die ik de afgelopen jaren soms heb moeten maar bovenal ook heb mogen meemaken sinds mijn aantreden als onderzoeker binnen de onderzoekseenheid Personeel & Organisatie. Een groei waar ik trots op ben in termen van omvang en verloop, ook al is er nog veel ruimte voor verdere groei. En onmiskenbaar een groei waarin de doorslaggevende rol en bijdrage van een aantal personen en organisaties erkend moeten worden.

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# TABLE OF CONTENTS

<b>DANKWOORD .....</b>	<b>I</b>
<b>TABLE OF CONTENTS .....</b>	<b>V</b>
<b>LIST OF TABLES .....</b>	<b>XI</b>
<b>LIST OF FIGURES .....</b>	<b>XII</b>
<b>GENERAL INTRODUCTION .....</b>	<b>1</b>
<b>AIM OF THE STUDY .....</b>	<b>1</b>
<b>Research question 1 .....</b>	<b>9</b>
<b>Research question 2 .....</b>	<b>9</b>
<b>Research question 3 .....</b>	<b>10</b>
<b>STRUCTURE OF THE THESIS .....</b>	<b>10</b>
<b>CHAPTER 1</b>	
<b>THE CORPORATE ENTREPRENEURSHIP CONSTRUCT .....</b>	<b>13</b>
<b>INTRODUCTION .....</b>	<b>13</b>
<b>TOWARDS CONCEPTUAL FINE-TUNING .....</b>	<b>14</b>
<b>THE ENTREPRENEURSHIP DOMAIN .....</b>	<b>15</b>
<b>The entrepreneurship construct: trait approach .....</b>	<b>16</b>
<b>The entrepreneurship construct: from traits to behavior .....</b>	<b>17</b>
<b>Towards a framework for the entrepreneurship field .....</b>	<b>20</b>
<i>The number of components .....</i>	<i>21</i>
<i>The framework .....</i>	<i>25</i>
1. The creator .....	26
2. The creating process .....	27
3. New value created .....	28
4. The environment .....	31
The close environment .....	32
The remote environment .....	33
<i>Advantages of the framework .....</i>	<i>34</i>
<b>DEFINING CORPORATE ENTREPRENEURSHIP .....</b>	<b>35</b>
<b>CONCLUSION .....</b>	<b>47</b>

---

<b>CHAPTER 2</b>	
<b>BUILDING A RESOURCE-BASED MODEL OF CORPORATE ENTREPRENEURSHIP .....</b>	<b>49</b>
<b>INTRODUCTION .....</b>	<b>49</b>
<b>BUILDING THE MODEL .....</b>	<b>50</b>
<b>A resource-based perspective on corporate entrepreneurship .....</b>	<b>50</b>
<i>The creating process and resource-based theory .....</i>	<i>54</i>
<i>The creator and resource-based theory .....</i>	<i>55</i>
<b>The resource-based model: components and meaning .....</b>	<b>56</b>
<i>New value created .....</i>	<i>56</i>
Innovation .....	57
Venturing .....	57
Renewal .....	57
<i>The creating process .....</i>	<i>58</i>
Patents and commercial secrets .....	58
R&D investment .....	58
Employee human capital .....	59
Knowledge creating and sharing HRM .....	60
Networking .....	60
Market orientation .....	61
<i>The creator .....</i>	<i>62</i>
Composition .....	64
Top management team .....	64
Ownership .....	65
Learning and selection mechanisms .....	66
Management's perception of the environment .....	66
Strategic orientation .....	68
Intended strategy type .....	69
<b>PRIOR MODELS OF CORPORATE ENTREPRENEURSHIP .....</b>	<b>70</b>
<b>CONCLUSION .....</b>	<b>75</b>
<b>CHAPTER 3</b>	
<b>SAMPLE AND METHODS .....</b>	<b>77</b>
<b>INTRODUCTION .....</b>	<b>77</b>
<b>SAMPLE .....</b>	<b>77</b>
PASO 2004 survey .....	77
Sample and breakdown .....	78
<b>METHODS .....</b>	<b>81</b>
Partial mediation .....	81
Path analysis .....	83
Direct, indirect, and total effects .....	85
<b>CONCLUSION .....</b>	<b>88</b>

---

---

<b>CHAPTER 4</b>	
<b>CORPORATE ENTREPRENEURSHIP: INTEGRATIVE</b>	
<b>ANALYSES .....</b>	<b>91</b>
<b>INTRODUCTION .....</b>	<b>91</b>
<b>THEME 1: THE RELATEDNESS OF INNOVATION, VENTURING</b>	
<b>AND RENEWAL .....</b>	<b>92</b>
<b>Content .....</b>	<b>92</b>
<b>Model and hypotheses .....</b>	<b>92</b>
<i>Theoretical background and focus .....</i>	<i>92</i>
<i>Hypothesis development .....</i>	<i>96</i>
<b>Measures .....</b>	<b>99</b>
<i>Innovation .....</i>	<i>99</i>
<i>Venturing .....</i>	<i>100</i>
<i>Renewal .....</i>	<i>101</i>
<i>Financial performance .....</i>	<i>101</i>
<b>Results .....</b>	<b>102</b>
<b>Conclusion .....</b>	<b>105</b>
<b>THEME 2: CREATING PROCESS ELEMENTS AS</b>	
<b>DETERMINANTS OF NEW VALUE CREATED .....</b>	<b>107</b>
<b>Content .....</b>	<b>107</b>
<b>Model and hypotheses .....</b>	<b>109</b>
<i>Patents and commercial secrets .....</i>	<i>109</i>
<i>R&amp;D investment .....</i>	<i>110</i>
<i>Employee human capital .....</i>	<i>111</i>
<i>Knowledge creating and sharing HRM .....</i>	<i>112</i>
<i>Networking .....</i>	<i>113</i>
<i>Market orientation .....</i>	<i>114</i>
<b>Measures .....</b>	<b>116</b>
<i>Patents and commercial secrets .....</i>	<i>116</i>
<i>R&amp;D investment .....</i>	<i>116</i>
<i>Employee human capital .....</i>	<i>116</i>
<i>Knowledge creating and sharing HRM .....</i>	<i>116</i>
<i>Networking .....</i>	<i>118</i>
<i>Market orientation .....</i>	<i>118</i>
<b>Results .....</b>	<b>118</b>
<b>Conclusion .....</b>	<b>123</b>
<b>THEME 3: CREATOR ELEMENTS AS DETERMINANTS OF NEW</b>	
<b>VALUE CREATED .....</b>	<b>125</b>
<b>Content .....</b>	<b>125</b>
<b>Model and hypotheses .....</b>	<b>127</b>
<b>Measures .....</b>	<b>136</b>
<i>Top management team .....</i>	<i>136</i>
<i>Ownership .....</i>	<i>136</i>

---

---

<i>Management's perception of the environment</i> .....	136
<i>Entrepreneurial orientation</i> .....	137
<i>Intended strategy</i> .....	137
<b>Environmental settings</b> .....	<b>137</b>
<b>Results</b> .....	<b>142</b>
<i>Effects of the creator elements on the NVC drivers</i> .....	142
<i>Explanatory power of composition vs. learning and selection</i> .....	153
<b>Conclusion</b> .....	<b>155</b>
<b>THEME 4: CREATING PROCESS ELEMENTS' RELATEDNESS</b> .....	<b>158</b>
<b>Content</b> .....	<b>158</b>
<b>Hypothesis</b> .....	<b>158</b>
<b>Element relatedness: patterns or configurations</b> .....	<b>160</b>
<i>Fit as covariation</i> .....	160
<i>Fit as gestalts</i> .....	163
<b>Conclusion</b> .....	<b>165</b>
<b>THEME 5: THE CORPORATE ENTREPRENEURSHIP NEXUS</b> .....	<b>167</b>
<b>Content</b> .....	<b>167</b>
<b>Model and hypotheses</b> .....	<b>168</b>
<i>Hypotheses with regard to the element profiles</i> .....	168
<i>Hypotheses linking the creator to the creating process</i> .....	169
<b>Measures</b> .....	<b>171</b>
<b>Results</b> .....	<b>171</b>
<i>Relationships within the creator</i> .....	178
<i>Creating process elements: reciprocal effects</i> .....	181
<i>Effects of creator on creating process elements</i> .....	181
<i>Effects on the NVC drivers</i> .....	182
<i>Resource profiles and the NVC drivers</i> .....	191
<b>Conclusion</b> .....	<b>194</b>
<b>CONCLUDING OVERVIEW OF THE CHAPTER</b> .....	<b>200</b>
<b>GENERAL CONCLUSIONS</b> .....	<b>203</b>
<b>SUMMARY OF THE MAIN CONCERNS AND FINDINGS</b> .....	<b>203</b>
<b>Conceptual base and model</b> .....	<b>204</b>
<b>Findings</b> .....	<b>207</b>
<i>Research objective 1</i> .....	208
<i>Research objective 2</i> .....	211
<i>Research objective 3</i> .....	218
<b>The study's contributions and limitations</b> .....	<b>223</b>
<i>Contributions to theory</i> .....	223
The corporate entrepreneurship nexus .....	224
Corporate versus independent entrepreneurship .....	224
Towards an enriched conceptualization of the upper echelon ....	226
Towards an enriched resource-based view of the firm .....	228

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---

Towards a clarification of the EO – CE relationship .....	229
<i>Methodological contributions</i> .....	231
<i>Limitations</i> .....	233
<b>EPILOGUE</b>	
<b>SUGGESTIONS FOR A CORPORATE</b>	
<b>ENTREPRENEURSHIP AGENDA .....</b>	<b>237</b>
<b>IMPLICATIONS FOR A CORPORATE ENTREPRENEURSHIP</b>	
<b>RESEARCH AGENDA .....</b>	<b>237</b>
<b>PUTTING CORPORATE ENTREPRENEURSHIP ON THE</b>	
<b>AGENDA IN PRACTICE .....</b>	<b>242</b>
<b>DIRECTIONS FOR A CORPORATE ENTREPRENEURSHIP</b>	
<b>POLICY AGENDA .....</b>	<b>252</b>
<b>LIST OF REFERENCES .....</b>	<b>257</b>
<b>ANNEX 1</b>	
<b>DESCRIPTIVE STATISTICS AND CORRELATIONS .....</b>	<b>283</b>
<b>ANNEX 2</b>	
<b>DETAILED RESEARCH HYPOTHESES .....</b>	<b>287</b>
<b>ANNEX 3</b>	
<b>KNOWLEDGE-RELATED HR PRACTICES .....</b>	<b>293</b>
<b>ANNEX 4</b>	
<b>FACTOR STRUCTURES .....</b>	<b>297</b>
<b>LIST OF DOCTORAL DISSERTATIONS FROM THE</b>	
<b>FACULTY OF ECONOMICS AND APPLIED ECONOMICS ...</b>	<b>301</b>

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## LIST OF TABLES

<b>Table 1.</b> Entrepreneurship definitions .....	19
<b>Table 2.</b> Entrepreneurship components .....	22
<b>Table 3.</b> Corporate entrepreneurship: terms and definitions .....	38
<b>Table 4.</b> Independent and corporate entrepreneurship .....	45
<b>Table 5.</b> Comparison of corporate entrepreneurship models .....	74
<b>Table 6.</b> Size distribution of the sample .....	79
<b>Table 7.</b> Age distribution of the sample .....	80
<b>Table 8.</b> Industry distribution of the sample .....	80
<b>Table 9.</b> Family business distribution of the sample .....	81
<b>Table 10.</b> Direct, indirect and total effects on innovation (example) .....	87
<b>Table 11.</b> NVC relatedness and link with financial performance .....	103
<b>Table 12.</b> Creating process – NVC: path coefficients .....	119
<b>Table 13.</b> Creating process – NVC: direct, indirect and total effects .....	121
<b>Table 14.</b> Squared multiple correlations of model 1 and 2 .....	123
<b>Table 15.</b> Environmental clusters: results of ANOVA .....	139
<b>Table 16a/b/c.</b> Model 3: path coefficients (NVC, TMT, EO and strategy) ..	144
<b>Table 17.</b> Total effects of entrepreneurial orientation on strategy .....	148
<b>Table 18.</b> Effects of environment on EO and strategy .....	148
<b>Table 19.</b> Creator – NVC: direct, indirect and total effects .....	151
<b>Table 20.</b> Squared multiple correlations of model 1 and 3 .....	154
<b>Table 21.</b> Creating process elements: bivariate correlations .....	159
<b>Table 22.</b> Creating process elements: path coefficients .....	161
<b>Table 23.</b> Creating process element clusters: results of ANOVA .....	164
<b>Table 24.</b> Goodness-of-fit comparison of the competing models .....	174
<b>Table 25.</b> Corporate entrepreneurship nexus: stand. path coefficients .....	175
<b>Table 26.</b> Total effects of entrepreneurial orientation on strategy (review) ..	179
<b>Table 27.</b> Effects of environment on EO and strategy (review) .....	180
<b>Table 28.</b> Direct, indirect and total effects on the NVC drivers .....	183
<b>Table 29.</b> Resource profiles – NVC: path coefficients .....	191
<b>Table 30.</b> Resource profiles – NVC: direct, indirect and total effects .....	192

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## LIST OF FIGURES

<b>Figure 1.</b> Corporate entrepreneurship: the dissertation's approach .....	7
<b>Figure 2.</b> Entrepreneurship framework .....	27
<b>Figure 3.</b> Entrepreneurship hierarchy .....	43
<b>Figure 4.</b> Zahra (1991) model of corporate entrepreneurship .....	73
<b>Figure 5.</b> A schematic representation of partial mediation .....	82
<b>Figure 6.</b> Simple path model .....	84
<b>Figure 7.</b> Illustrative path model .....	86
<b>Figure 8.</b> Expected relatedness of the NVC drivers (model 1) .....	98
<b>Figure 9.</b> Expected creating process - NVC links (model 2) .....	117
<b>Figure 10.</b> Expected creator - NVC links (model 3) .....	128
<b>Figure 11.</b> Corporate entrepreneurship nexus: expected links (model 5) ..	172
<b>Figure 12.</b> Innovation as a multi-layered construct .....	225
<b>Figure 13.</b> General path strengths .....	243
<b>Figure 14.</b> General resource-based perspectives on CE .....	248



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## GENERAL INTRODUCTION

“Παντα ρεῖ καὶ οὐδὲν μένει - Nothing endures but change”

Heraclites of Syracuse

“Every day you may make progress. Every step may be fruitful. Yet there will stretch out before you an ever-lengthening, ever-ascending, ever-improving path.

You know you will never get to the end of the journey. But this, so far from discouraging, only adds to the joy and glory of the climb.”

Sir Winston Churchill

### AIM OF THE STUDY

Today’s business environment is changing rapidly. And change itself is evolving to become discontinuous, abrupt, and seditious (Hamel, 2000), making it difficult for many established firms to cope with its accelerating and altering pace. However, failure in anticipating or following change may result in organizational fossilization or even death (Burns, 2005). But fossilization is not inescapable: it can be warded off. Corporate entrepreneurship can safeguard firms from fossilization, allowing existing companies to embrace or even seek change and turn it into use (Thornberry, 2001). It leads firms towards new value creation through business development, innovation and renewal (Kuratko et al., 1990; Lumpkin & Dess, 1996; Miles & Covin, 2002; Zahra, 1991; Zahra & Covin, 1995; Zahra et al., 1999b). Corporate entrepreneurship is thus seen as the complex of a company’s innovation, venturing and renewal efforts (Guth & Ginsberg, 1990; Zahra, 1995).

When looking for explaining the “why” of corporate entrepreneurship, we must therefore focus on major changes in the business environment and the shifts these changes engender. Present-day business is colored by many diverse yet related changes and developments, including accelerating technological advance,

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increasing global competition and ever more demanding shareholder expectations (Burns, 2005; Collins & Porras, 1996; Dess et al., 1999). The growing importance of a developing venture capital industry also plays its part (Chesbrough, 2000). Many of these developments are further reinforced by the growing attention flowing towards entrepreneurship from various policy levels (domestic and international) (e.g. Lisbon Agenda (European Union), Pact van Vilvoorde (Flanders)). Increasingly, entrepreneurship and its outcomes (e.g. innovation) become major policy targets, recognizing its crucial role in the economic system. As a result, firms (large and small, mature and young) are pushed towards retaining or regaining an entrepreneurial drive.

Additionally, the described shifts in the business environment tend to favor small entrepreneurial firms, increasing the pressure on incumbent or established firms. Small entrepreneurial firms have been able to capitalize most on today's turbulent business environment. They excel in their ability to provide quality products and flexibility of service in a more speedy fashion (Baldwin & Gellatly, 2003), an ability of great value in most economies in view of the observed shift away from manufacturing towards service sectors. In the service sectors, delivering a personalized, flexible, tailor-made service at a local level grows evermore important. Technological change also plays its part in making the business environment more favorable for small firms (Buckland et al., 2003). It eases communication (allowing smaller market segments to be served) and it often reduces fixed costs so that 'production' can be economically viable in smaller units. The venture capital industry too drives the number of emerging small firms. Its growing pool of money lures many talented managers and technical staff out of successful established companies into small entrepreneurial firms (Chesbrough, 2000). Without intervention, change thus seems to favor small entrepreneurial firms as a population (Burns, 2005). As a result, entrepreneurial small firms not only are subject to environmental turbulence: they are partly responsible for it. New entrepreneurial small firms that are better able to respond to changing customer requirements in an economically viable way are constantly replacing other firms that are less able to do so (Baldwin & Gellatly, 2003). This

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continual arrival of new small firms generates new combinations of products and services that may be better to meet evolving customer requirements. In this respect, entrepreneurial small firms force a discipline on incumbent firms, a discipline to fight back and cope with change.

As a result, pushed by the changing business environment, incumbent or established firms become interested to regain the entrepreneurial spirit they once had in an attempt to inculcate some of the thunder of these entrepreneurial small firms. And theory and research follow this evolution. Whereas entrepreneurship research has long focused on establishing new small firms as suitable vehicles for entrepreneurial endeavors, it has more recently developed a research strand studying the brushing up of established firms by means of regaining an entrepreneurial spirit. A widely accepted label for this branch in entrepreneurship theory is corporate entrepreneurship. As McGinnis and Verney (1987: p.19) state: the purpose of corporate entrepreneurship is “to harness the entrepreneurship spirit of the small organization and blend it into the culture of the larger, more established firm”. Companies are turning towards corporate entrepreneurship because they have lost their innovativeness or because they are not getting the value creation rate or change coping vigor they once had (Hamel, 1999; Thornberry, 2001).

However, methods of corporate management often deeply embedded in established (large) firms (e.g. detailed regulations, strict hierarchy, short term focus, premeditation with cost minimization and cutting slack, narrowly defined jobs) are increasingly perceived to be ill-suited to evoke the entrepreneurial spirit in these firms. Such management methods can lead companies onto a bureaucratic and inert or fossilizing pathway, often ignoring the need for change and smoldering innovative initiatives (Kanter, 1985; Thornberry, 2001). In addition, this type of management is expected to be self-reinforcing since disappointed entrepreneurial-minded employees and executives tend to leave a company managed by strict bureaucratic rules and regulations (Hayes & Abernathy, 1980; Kuratko et al., 1990). Slavishly going after waste and redundancy, minimizing risk and following strict procedures and rules may have

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rendered success in safeguarding the bottom line. But these practices do not help in reaching the top line since they rarely create long-term sustainable value (Thornberry, 2001). The perceived inability of such management practices in terms of entrepreneurial revitalization has stimulated the emergence of corporate entrepreneurship as a field of research and practice. The main task for this field of research is thus to detect organizational practices that are able to rekindle the entrepreneurial performance of the established firm.

Corporate entrepreneurship is thus thought of as an antidote for fossilization, allowing established firms to rejuvenate and revitalize. It is brought into practice as a tool for business development, revenue growth, profitability enhancement and pioneering the development of new business, products and services (Kuratko et al., 1990; Lumpkin & Dess, 1996; Miles & Covin, 2002; Zahra, 1991; Zahra & Covin, 1995; Zahra et al., 1999b). However, it is not meant as an occasional drug, administered whenever the firm is in need of a competitive boost. Rather, it proclaims a more architectural, lasting approach, building entrepreneurial firms by concentrating on the organizational characteristics and behaviors of entrepreneurially performing companies. This study sets its sights on such an approach.

Given the promising nature of corporate entrepreneurship for established firms, researchers and practitioners are eager to identify those factors that stimulate a firm's corporate entrepreneurial success. Although the empirical research on corporate entrepreneurship is growing increasingly rich, the main research models (e.g. Antoncic & Hisrich, 2001; Covin & Slevin, 1991; Hornsby et al., 1993; Ireland et al., 2003a; Lumpkin & Dess, 1996; Zahra, 1991) can be criticized from several respects, as we will discuss later on. In particular, past research has failed to empirically recognize corporate entrepreneurship as a sound behavioral construct and has favored 'entrepreneurial orientation' and other opinion-like measures instead of measurable outcomes of overt and demonstrable firm behavior and actions. Sound theoretical and empirical

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knowledge regarding the effective conduct of building successful entrepreneurial firms remains limited and biased (Burns, 2005; Miles & Covin, 2002).

Following, it will not come as a surprise that - although some remarkable successes in creating new value or wealth through corporate entrepreneurship have been achieved - the number of failures still appears to surpass the number of successes (Sykes, 1986; Thornberry, 2001). The corresponding responsibility of the field of research in (corporate) entrepreneurship should not be underestimated. As Miles and Covin (2002: p.22) note: "Solid theoretical frameworks and empirically grounded and managerially useful prescriptions involving corporate entrepreneurship have not progressed as quickly as enthusiasm for the practice". This can be attributed to two main, interrelated causes.

First, a major source for these conflicting results can be found in the problem of defining corporate entrepreneurship. Corporate entrepreneurship is generally considered to be ill defined (Sharma & Chrisman, 1999; Stopford & Baden-Fuller, 1994). Authors may use many terms to refer to different aspects of corporate entrepreneurship (Zahra, 1991). Authors have not been consistent in the use of the labels they attach to the phenomenon they purport to study, using labels such as entrepreneurship, corporate entrepreneurship, intrapreneurship and entrepreneurial orientation. Despite the ubiquity of labels used, many have turned to very similar measures to capture the phenomenon (Zahra et al., 1999a). As a consequence, there is no consensus on what it means for firms to be entrepreneurial and researchers are often talking about different phenomena, although using the same label (Covin & Miles, 1999). This gives rise to a misfit between the labeled phenomenon and its actual operationalization. Thus, although the interest in corporate entrepreneurship is high, our knowledge of the concept remains limited and fragmented (Miles & Covin, 2002; Schildt et al., 2006). The origin of the problem of defining corporate entrepreneurship can be attributed to the lack of a generally accepted definition of its underlying construct, i.e. entrepreneurship. The emphasis on corporate entrepreneurship serves only to heighten the complexity (Carrier, 1996). Entrepreneurship is seen as

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a broad and fuzzy label under which a hodgepodge of research is housed (Shane & Venkataraman, 2000). Hence, the development of a general theoretical framework for (corporate) entrepreneurship is seriously hindered.

Second and following, the reasons why and how corporate entrepreneurship works still remain something of a mystery. The logic of corporate entrepreneurship has not been adequately explained (Covin & Miles, 1999). Research has only allowed deriving a large body of very general and often contradictory principles for corporate entrepreneurship (Dess et al., 1999; Sykes, 1986). Thus, current knowledge regarding the effective conduct of building entrepreneurial firms remains limited (Miles & Covin, 2002). Consequently, the need for research aimed at refining and empirically testing the construct of corporate entrepreneurship is soaring. As the majority of empirical corporate entrepreneurship research has been done in the United States or by U.S. based researchers, there is also an urgent call to study the corporate entrepreneurship phenomenon outside the U.S. (Zahra et al., 1999a).

This study works towards addressing these gaps in (corporate) entrepreneurship theory and empirical research. It aims at delineating an appropriate theoretical basis for understanding and describing the corporate entrepreneurship phenomenon. And it subsequently develops a conceptual model of corporate entrepreneurship and tests it empirically with data on Flemish enterprises.

Conceptually, corporate entrepreneurship is thought of in this dissertation as involving three components or building blocks. As depicted in Figure 1, we distinguish between the creator, the creating process and the drivers of new value creation (NVC). The NVC drivers block stands for the targeted (operational) outcomes of corporate entrepreneurship. It consists of the firm's innovation, venturing and renewal accomplishments. The creating process can be described conceptually as the complex of activities and resources through which the company pursues its entrepreneurial opportunities. And the creator represents the force propelling all aspects of the creating process.

*NEXUS*

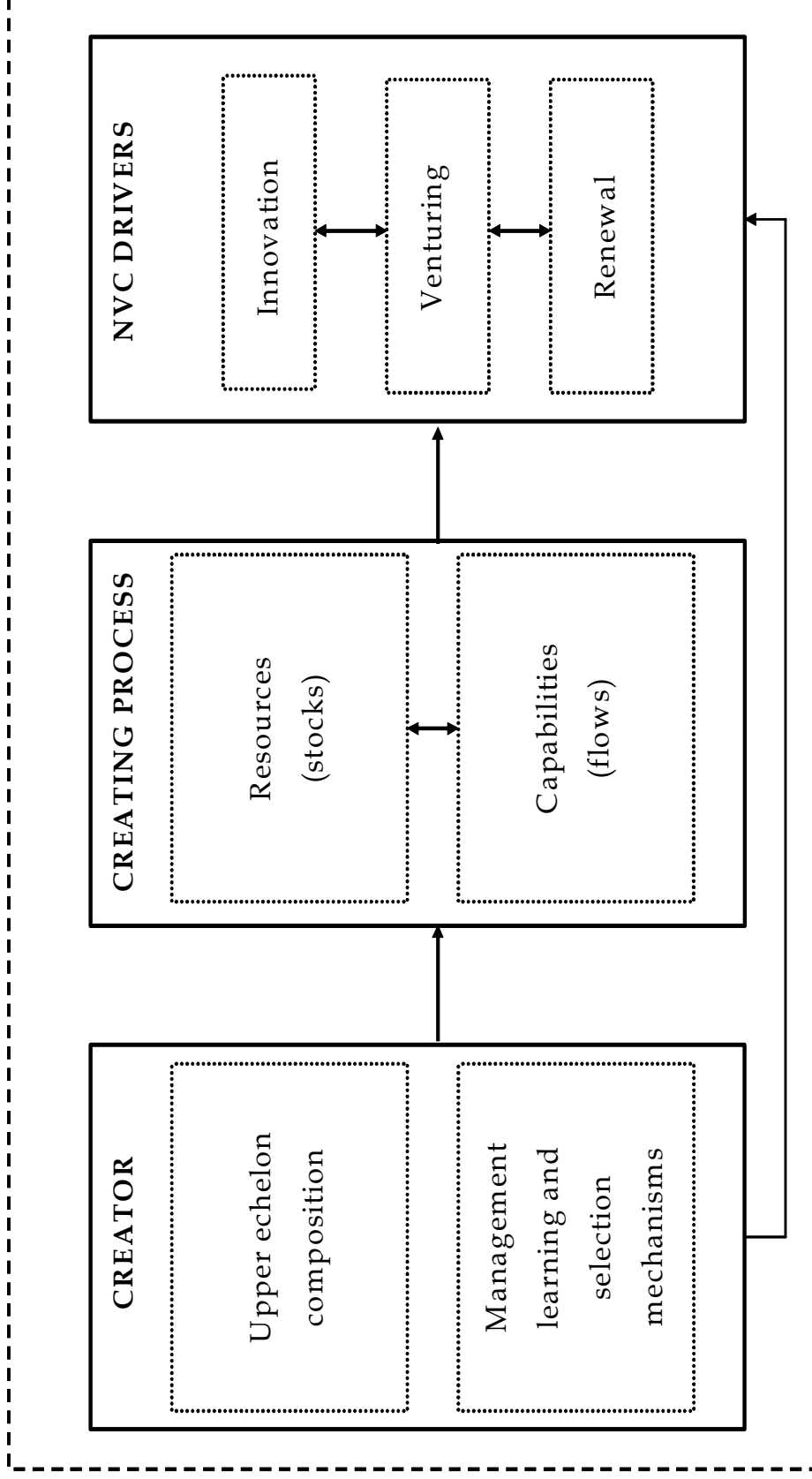


Figure 1. Corporate entrepreneurship: the dissertation's approach.

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The three components are closely related to each other and form a nexus. It is our contention that the general nexus model can be applied to the entire entrepreneurship research field.

In designing the empirical part of our study, we approach the general corporate entrepreneurship nexus with a specific focus, leading to the conceptual model reflected by Figure 1. Foremost, we adopt a resource-based perspective of the corporate entrepreneurship nexus model in this dissertation. As suggested by literature, one promising way of sketching the design to build entrepreneurial firms is by looking at companies from a resource-based perspective, focusing on firm-specific assets and capabilities as fundamental determinants of different instances of firm innovation performance. This helps to discern the building blocks and practices on which the entrepreneurial success of firms is based. The resource-based perspective colors our conceptualization and operationalization of (in particular) the creator and the creating process. Our specific approach comprises resources in se (stocks) as well as capabilities or practices developing and deploying resources (flows), thus advancing current resource-based studies which are centered on stocks. And as far as the creator is concerned, driven by a refined application of upper echelon theory, we stretch the boundaries of the traditional upper echelon and focus not only on its composition but also on its action propensities and learning and selection mechanisms.

This set-up is to lead to a more advanced application of resource-based insights on the corporate entrepreneurship setting. And this might prove to be worthwhile. After all, although researchers have used resource-based theory to study corporate entrepreneurship in the past, it has often been inadequately applied. In particular, two critical questions on this front remain unanswered: how can resources and capabilities as elements of the firm-internal configuration contribute to innovation performance (Teng, 2003) and which resources, capabilities or configurations prove to make a difference (Branzei & Vertinsky, 2006; Hewitt-Dundas, 2006)? Providing these particular questions with a theoretically solid and an empirically grounded answer is the focal point of this



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doctoral thesis. We will focus on several topics to explore and assess the contribution of diverse resources to corporate entrepreneurial activity.

From an outcome or 'value' point of view, corporate entrepreneurial activity is defined as the *complex* of innovation, venturing and renewal (Guth & Ginsberg, 1990; Zahra, 1995). Consequently, in assessing the contribution of diverse resources to corporate entrepreneurial activity, we are in need of a better understanding of this 'complex' of innovation, venturing and renewal. These three types of newly created value through corporate entrepreneurship not only are distinct from each other: they are also considered to be related (as graphically reflected by the double-headed arrows in the NVC drivers block in Figure 1). We will formulate an answer to the following (general) research question:

*Research question 1: How do innovation, venturing and renewal relate to each other?*

Resources and capabilities too can be related (Dierickx & Cool, 1989). They can be bundled and/or they can be part of resource configurations (Ireland et al., 2003b). This study will depart from specific relationships among the elements studied (as graphically reflected by the double-headed arrows in the creating process block in Figure 1). Only by modeling the interrelatedness of the elements the question of how intense resources and capabilities affect corporate entrepreneurial activity can be answered. We therefore adopt an additional series of research questions that accounts for the relatedness of resources and capabilities. The following question underlies this series:

*Research question 2: How do the resources and capabilities studied relate to each other?*

Only after the primary mechanisms of corporate entrepreneurial activity type and of element relatedness have been revealed, we can turn to a final series of research questions. This series digs into deeper detail as far as the actual contribution of the resources and capabilities to corporate entrepreneurial activity is concerned. It

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provides descriptive information that can be used to deduct theoretically solid managerial implications. This final series can be characterized as follows:

*Research question 3: What is the contribution of the resources and capabilities to innovation, venturing and renewal?*

## **STRUCTURE OF THE THESIS**

The thesis is structured to theoretically develop, substantiate and empirically test the corporate entrepreneurship nexus model of Figure 1 in order to formulate our answers to the above research questions. So we start with creating a theoretical basis by means of a clarification of the concept of corporate entrepreneurship (the corporate entrepreneurship nexus). However, the corporate entrepreneurship definition dilemma cannot be solved without first exploring its “source” field of research, i.e. entrepreneurship. After all, the first step in defining corporate entrepreneurship is to determine those dimensions of entrepreneurship that translate to corporate entrepreneurship (Barrett & Weinstein, 1998). **Chapter 1** thus encompasses two parts. First, we explore the field of entrepreneurship and delineate the general entrepreneurship nexus. Following, we apply the nexus framework to the corporate entrepreneurship domain.

Once the construct of corporate entrepreneurship has been clarified, we review in **Chapter 2** the main existing conceptual models of corporate entrepreneurship and we elucidate the research model (concisely presented in Figure 1) that will be empirically tested in this thesis. This includes the discussion and the development of a more thorough application of the resource-based perspective in the context of corporate entrepreneurship. It also encompasses the operationalization of the variables (resources, capabilities, drivers of newly created value) included in the research model.

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**Chapter 3** elaborates on the sample used to test the model and on the methodology that allows us to discern the contribution of the various resources and capabilities studied. The general set-up of the sample is discussed and descriptive statistics that allow getting in touch with the data are provided. The analytical aspects of the model as well as the method used to calculate the elements' contribution are explained in detail.

**Chapter 4** discusses our empirical findings. In this chapter we present a gradual presentation of the findings regarding the various building blocks of the model. The gradual approach is chosen for in order to limit the complexity of the discussion of the results and in order to account for specific choices that had to be made. In this chapter we also comment on all research questions.

The chapter on the **general conclusions** contains the dissertation's main concerns and findings and its contributions and limitations. Finally, in the **epilogue** we list recommendations and topics in need of attention on three avenues: research, practice and government policy.

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## CHAPTER 1

# THE CORPORATE ENTREPRENEURSHIP CONSTRUCT

### INTRODUCTION

As indicated earlier, in general terms corporate entrepreneurship refers to firms' efforts to rejuvenate and create new value through innovation, venturing and renewal. A more specific, widely accepted definition of corporate entrepreneurship is not available since it is generally considered to be ill defined (Burns, 2005; Sharma & Chrisman, 1999; Stopford & Baden-Fuller, 1994). Authors have used many terms to refer to different aspects of corporate entrepreneurship. They have not been consistent in the use of the labels they attach to the phenomenon they purport to study, using labels such as entrepreneurship, corporate entrepreneurship, intrapreneurship and entrepreneurial orientation (Zahra, 1991). Despite the ubiquity of labels used, many have turned to very similar measures to capture the phenomenon (Zahra et al., 1999a). As a consequence, there is no consensus on what it means for firms to be entrepreneurial and researchers are often talking about different phenomena, although using the same label (Burns, 2005; Covin & Miles, 1999).

A generally accepted definition of corporate entrepreneurship can thus not be imposed or even assumed. In this respect, the search for an appropriate theoretical basis for understanding and describing the phenomenon of corporate entrepreneurship creates a challenging problem for entrepreneurship researchers. In order to be able to develop a research model of corporate entrepreneurship and test it subsequently, we are bound to start with creating such a basis by means of a clarification of the concept of corporate entrepreneurship. In what follows, we more accurately locate and demonstrate the definitional problem and its roots.

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Doing so, we dig into the entrepreneurship construct and how it can be approached conceptually. Following, we work towards a descriptive framework for the entrepreneurship field, including multiple dimensions. Finally, we apply this framework to the corporate entrepreneurship domain.

## **TOWARDS CONCEPTUAL FINE-TUNING**

As explained by Hoy and Verser (1994), a valuable approach to bridge a definitional gap consists of describing the domain or research field of the term that needs to be defined. However, the corporate entrepreneurship definition dilemma cannot be solved without first exploring its “source” field of research, i.e. entrepreneurship. The origin of the problem of defining corporate entrepreneurship can be attributed to the lack of a generally accepted definition of its underlying construct, i.e. entrepreneurship (Carrier, 1996).

The term ‘entrepreneurship’ has been used to define a wide range of activities, such as creating, founding, adapting, and managing a venture (Cunningham & Lischeron, 1991; Hoy & Verser, 1994). The existence of the many different views of entrepreneurship became particularly apparent in the study of Gartner (1990). In a first phase of a policy Delphi he asked 283 respondents (academics, business leaders and politicians) to define entrepreneurship. In the answers of the 44 respondents no less than 90 different attributes of entrepreneurship could be discerned. Examples of such attributes include the creation of a new business, bringing resources to bear on a perceived opportunity, purchasing an existing business, destroying the status quo, refining a creative idea and adapting it to a market opportunity. A recent citation analysis study by Grégoire et al. (2006) confirms the low degree of conceptual convergence within the entrepreneurship field (including corporate entrepreneurship).

Current entrepreneurship research is still burdened by this attribute-driven approach (Shane, 2003). Given the variety of interpretations, the entrepreneurship strand is seen as a broad and fuzzy label under which a hodgepodge of research is housed (Shane & Venkataraman, 2000). This problem is rooted in the fact that the

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entrepreneurship (and corporate entrepreneurship) field remains in a theory-building stage (Busenitz et al., 2003). The issue of defining “entrepreneur” and establishing the boundaries of entrepreneurship research has still not been solved (Bruyat & Julien, 2001; Shane, 2003; Ucbasaran et al., 2001). The division of the field into several ‘camps’ has stymied the development of the field of entrepreneurship. By focusing solely on only one aspect of the entrepreneurial process, each camp fails to provide a comprehensive explanation of the phenomenon (Shane, 2003). Hence, the development of a general theoretical framework for entrepreneurship is seriously hindered. This entails the danger of researchers speaking after one another, rather than to one another.

Additionally, because of the lack of a conceptual framework that explains and predicts a set of empirical phenomena not explained by conceptual frameworks already in existence in other, related fields of research, the distinctive contribution of the entrepreneurship field is difficult to identify (Shane & Venkataraman, 2000). Hence, the field’s legitimacy is seriously threatened. The interdisciplinary nature of the entrepreneurship field does not make the search for a theoretical framework any easier (Ucbasaran et al., 2001).

The first step in defining corporate entrepreneurship is then to determine those dimensions of entrepreneurship that translate to corporate entrepreneurship (Barrett & Weinstein, 1998). The remainder of this chapter thus encompasses two main parts. In a first section we explore the field of entrepreneurship from a definitional perspective. Next, we aim to define corporate entrepreneurship by customizing our findings with regard to the entrepreneurship construct to the corporate entrepreneurship setting.

## **THE ENTREPRENEURSHIP DOMAIN**

Good science has to begin with good definitions (Bygrave & Hofer, 1991). But no definition is good in itself. It is a construct at the service of research questions that are of interest to a scientific community at a given moment in time. A good definition allows building theory and/or carrying out effective empirical research

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in order to enhance the understanding of the phenomenon studied and to improve the quality of the predictive findings. In addition, researchers in the field must share the definition so as to promote the accumulation of knowledge (Bruyat & Julien, 2001). Disentangling the construct of entrepreneurship thus requires identifying the research questions and topics of interest to the entrepreneurship field and how they have been studied. In general, two approaches dominate the entrepreneurship field: the trait approach and the behavioral approach. We discuss both approaches successively.

### **The entrepreneurship construct: trait approach**

A first approach containing a substantial body of research in the entrepreneurship field has focused on the person of the entrepreneur. The research question of interest here is mainly: “why do certain individuals start firms when others, under similar conditions, do not?” (Gartner, 1989). Unfortunately, many authors asking this ‘why’ question have answered it with ‘who’: the reason why Z started a venture is because Z possesses a number of inner qualities, characteristics or traits. This approach is known as the “trait approach”. In this approach researchers try to identify traits and core human (individual) attributes in order to differentiate entrepreneurs from non-entrepreneurs. The entrepreneur’s traits are seen as the key to explain the entrepreneurship phenomenon (Gartner, 1989).

Within the trait approach, entrepreneurship stands synonym for the *person* who brings entrepreneurial achievements into existence. The primary level of analysis is therefore the individual. Specific entrepreneurial traits often mentioned in literature are locus of control, tolerance for ambiguity, need for achievement, risk taking, the personal value system and age (Begley & Boyd, 1987; Hornaday and Aboud, 1971; Gartner, 1989; Lee & Tsang, 2001; Littunen, 2000). Two schools of thought as distinguished by Cunningham and Lischeron (1991) belong to the trait approach: the great person school and the psychological characteristics school. The great person school is built around snippets of the life story of inspirational individuals such as Henry Ford, Ernest Solvay, Estée Lauder or Ingvar Kamprad. Central to this line of thinking is the intuitive ability of



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“great” individuals to recognize an opportunity and make the appropriate decisions, suggesting that they are endowed with certain qualities or traits differentiating them as entrepreneurs from the rest of society. The great person school as such is an extreme case of the psychological characteristics school. The latter is but a different label for the trait approach described by Gartner (1989).

Despite the attention this approach has received in research and literature, the trait approach still seems to be unable to capture the entrepreneurship phenomenon to the full extent. The flaws in this approach are well documented by Gartner (1989). Above all, the trait approach remains one-dimensional, focusing solely on the person of the entrepreneur. Moreover, many authors use very vague definitions of the entrepreneur in their research and few studies use the same definition. This lack of a shared definition seriously threatens the accumulation of knowledge in this area of research. In addition, the research findings of this approach provide a psychological profile so full of traits and characteristics that the entrepreneur would have to be a sort of generic “everyman” (Gartner, 1989). In spite of these flaws, the trait approach still remains a very popular view as even very recent issues of scientific journals contain articles belonging to this approach (e.g. Ciavarella et al., 2004; Cuervo, 2005; Thorpe et al., 2006).

### **The entrepreneurship construct: from traits to behavior**

The shortcomings of the trait approach have stimulated entrepreneurship researchers to pursue a second approach. In this so-called behavioral approach entrepreneurship is seen as the *process* of creating entrepreneurial achievements, such as new organizations (Gartner, 1989) or surplus value (Jones & Butler, 1992). This approach takes the entrepreneurial object being created (‘the project’) as the primary level of analysis. The objective is not to find out ‘who is the entrepreneur’, but to gain understanding as to why and how the entrepreneurial achievement has come into existence. The behavioral view stresses the contextual nature of the creating process. The entrepreneurial project is therefore seen as an outcome of a complex process with many influences. The role of the individual

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boils down to a series of actions or behavior undertaken to enable the creation of the project. Personal characteristics are considered ancillary to the behavior. By adopting a behavioral approach to entrepreneurship, “the dancer is not artificially separated from the dance” (Gartner, 1989: p. 64).

Even within the behavioral approach, reaching agreement on a definition of entrepreneurship remains problematic. For the purpose of illustration and comparison, a few entrepreneurship definitions (covering a 20-year period) are brought together in Table 1 (ordered by year). These definitions have appeared in leading entrepreneurship publication channels, such as *Academy of Management Review*, *Journal of Management*, *Journal of Business Venturing* and *Entrepreneurship: Theory & Practice*. We want to stress that all definitions of Table 1 belong to the behavioral view on entrepreneurship and that they all explicitly use the label ‘entrepreneurship’.

First of all, there seems to be considerable variation as to the locus of entrepreneurship. Locus refers to where entrepreneurship is taking place. Kanter (1985), Krueger and Brazeal (1994), Schuler (1986), Shane (2003), Shane and Venkataraman (2000) and Stevenson and Jarillo (1990) either leave the locus aspect open for interpretation or explicitly state that entrepreneurship can take place in both newly forming and existing businesses. Gartner (1985; 1989), Kouriloff (2000), Low (2001) and Rocha (2004) on the other hand explicitly restrain entrepreneurship to a process taking shape in new organizations. Miller (1983) and Jones and Butler (1992) connect entrepreneurship with actions of existing firms.

Also the object of pursuit in the process of entrepreneurship varies considerably. As far as a first group of researchers such as Gartner (1985; 1989), Kouriloff (2000), Low (2001) and Rocha (2004) are concerned, the formation of a new organization or venture is the ultimate aim of entrepreneurship. Entrepreneurship ends once the formation process is finished.

Table 1. Entrepreneurship definitions

<b>Source</b>	<b>Definition of entrepreneurship</b>
Miller (1983)	A firm's actions relating to product-market and technological innovation
Kanter (1985)	The creation of new combinations
Gartner (1985; 1989)	The process of new venture creation; the process by which new organizations come into existence
Schuler (1986)	The practice of creating or innovating new products or services within existing businesses or within newly forming businesses
Stevenson & Jarillo (1990)	The process by which individuals – either on their own or inside organizations – pursue opportunities without regard to the resources they currently control
Jones & Butler (1992)	The process by which firms notice opportunities and act to creatively organize transactions between factors of production so as to create surplus value
Krueger & Brazeal (1994)	The pursuit of an opportunity irrespective of existing resources
Kouriloff (2000)	The process of creating a new venture
Shane & Venkataraman (2000)	The discovery, creation and exploitation (including by whom and with what consequences) of opportunities to bring into existence future goods and services
Low (2001)	The creation of a new enterprise
Shane (2003)	An activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes and raw materials through organizing efforts that previously had not existed
Rocha (2004)	The creation of new organizations

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A second group of entrepreneurship researchers puts forward that entrepreneurship concerns the noticing and pursuing of opportunities (Jones & Butler, 1992; Krueger & Brazeal, 1994; Shane, 2003; Shane & Venkataraman, 2000; Stevenson & Jarillo, 1990). Further, some authors explicitly relate entrepreneurship to innovation, whether through forming a new organization or by pursuing novel opportunities (Miller, 1983; Kanter, 1985; Schuler, 1986). Gartner (1989) takes an opposite stand and argues that innovation is not necessarily an issue. In his view, relating entrepreneurship to innovation only serves to increase the ambiguity in what already is a definitional dilemma.

As already mentioned, all definitions summarized in Table 1 use the label 'entrepreneurship' and belong to the behavioral approach of entrepreneurship. However, as we hope to have illustrated, the behavioral approach does not bring unanimity among researchers about what constitutes entrepreneurship. In the absence of a universally accepted definition, it is the responsibility of every author to state clearly what is meant when the term entrepreneurship is used (Bygrave & Hofer, 1991). In order to minimize confusion, authors should be careful and more explicitly state that the entrepreneurship definition given is the definition *they* will use and not necessarily *the* entrepreneurship definition.

As raised earlier, a condition that must be fulfilled in order to obtain a good definition of entrepreneurship is that researchers in the field must share this definition so as to promote the accumulation of knowledge (Bruyat & Julien, 2001). It is clear that we are bound to conclude that this condition – even within the behavioral approach – is not fulfilled. Perhaps, as suggested by Hoy and Verser (1994), describing the entrepreneurship domain or research field by mapping its dimensions or process components can lead entrepreneurship researchers to some degree of consensus.

### **Towards a framework for the entrepreneurship field**

One issue shining through the various behavioral definitions is that the behavioral approach increases complexity. Within the behavioral view,

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entrepreneurship is generally considered a multidimensional construct (Wennekers & Thurik, 1999). It is a nexus of several dimensions or process components that can be distinguished, but not separated from each other. However, this common ground within the behavioral approach does not eradicate all differences with regard to the conceptualization of the entrepreneurship phenomenon. There seems to be no agreement as to the number of components involved. The definitional problem pointed to earlier undoubtedly spurs the discussion about the components.

The purpose of this section is to develop a general framework for entrepreneurship that captures the different parts or components of the entrepreneurial process. Whatever specific definitions of entrepreneurship authors and researchers may propose, all of these definitions should find a place in this general entrepreneurship framework. In view of the disagreement on the number of components involved, we first elucidate our position on this issue before passing on to the actual framework.

#### *The number of components*

Table 2 contains (in alphabetical order) a number of sources and the entrepreneurship process components they propose. As it shows, entrepreneurship researchers have different views about the number and the essence of the process components constituting the entrepreneurship construct. Authors' views with regard to the essence or description of the different components differ. For instance, Bruyat and Julien (2001) acknowledge that any organized living body can act as an entrepreneur. Gartner (1985) and Bygrave and Hofer (1991) on the other hand only recognize the individual entrepreneur.

Table 2. Entrepreneurship components

Source	Individual	Process	Components			
			Environment	Organization	Project	
Bruyat & Julien (2001)	An entrepreneur is an organized living body with its own existence that cannot be divided without being destroyed	-	-	-	The new value creating process and object	-
Bygrave & Hofer (1991)	The characteristics and functions of the individual entrepreneur	The characteristics of the entrepreneurial process (opportunity recognition, tasks in establishing a new organization)	-	-	-	-
Gartner (1985; 1990)	Differences of individual entrepreneurs with non-entrepreneurs (background, ...)	Actions referring to the entrepreneurial function (opportunity recognition, ...)	Push and pull forces coming from outside the organization	Characteristics of the organization created	-	-

Table 2. Entrepreneurship components (*continued*)

Source	Individual	Process	Environment	Components		
				Organization	Project	Opportunity
Gartner (1989)	An individual performing a series of actions that result in the creation of an organization	-	-	-	The organization being created	-
McMullen & Shepherd (2006)	Individuals who exercise judgment under uncertainty	Behavior in response to a judgmental decision under uncertainty about a possible opportunity	-	-	-	Opportunities for profit
Shane (2003)	Individuals who discover, evaluate and exploit opportunities	The discovery, evaluation and exploitation of opportunities through organizing efforts that had previously not existed	-	-	-	Opportunities to introduce new goods and services and ways or organizing markets, processes and raw materials
Shane & Venkataraman (2000)	Individuals who discover, evaluate and exploit opportunities	The discovery, evaluation and exploitation of opportunities	-	-	-	Opportunities to create future goods and services

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The varying views on the essence of the 'individual' component are equally applicable to the other process components. Furthermore, as far as the number of components is concerned, there seems to be a minimum and a maximum approach. Authors as Bygrave and Hofer (1991), Bruyat and Julien (2001) and Gartner (1989) represent the minimum approach. They see entrepreneurship as the nexus of two components, i.e. the individual and the entrepreneurial process or project. The maximum approach considers entrepreneurship to be the combination of four components, i.e. the individual, the creating process, the organization and the environment (Gartner, 1985; 1990).

We believe for various reasons that the maximum approach holds the most promising cards. First, by considering the maximum number of dimensions described above, the diversity of the entrepreneurship research field is respected. After all, the behavioral approach views entrepreneurship as a series of actions or behavior undertaken to enable the creation of the entrepreneurial project. This behavior (opportunity recognition, resource assembly, etc.) can come in many diverse forms (Shane, 2003; Shane & Venkataraman, 2000), some of which may not be specified at this point in time. For a field still in its infancy (Bruyat & Julien, 2001; Ucbasaran et al., 2001) it is imperative to keep an open view on the diversity of entrepreneurial behavior (Sharma & Chrisman, 1999). The maximum approach fulfils this requirement since it is less likely to exclude as-yet-unspecified entrepreneurial behavioral forms. Excluding the components of the environment and the organization from a framework describing the entrepreneurship field (thus relying on the minimum approach) would imply an inexcusable loss of entrepreneurial diversity.

Second and following, although incorporating all four components in the entrepreneurship research field makes it more difficult to point out which project is entrepreneurial and which is not, we think this complexity actually supports the behavioral view of entrepreneurship. After all, trying to identify factors that can distinguish entrepreneurial from non-entrepreneurial projects could lead ending up sooner or later with the trait approach or a variation on that particular



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theme. Gartner (1989) has warned entrepreneurship researchers about the persistence of the trait approach and about the merging of behavior and trait issues in real life entrepreneurship research. Thus, the maximum approach avoids arbitrary decisions that delineate entrepreneurial from non-entrepreneurial projects.

Third, a condition that must be fulfilled in order to obtain a good description of the entrepreneurship field is that the definition should allow building theories and carrying out effective empirical research in order to enhance the understanding of the phenomenon (Bruyat & Julien, 2001). Following the social system framework developed by Van de Ven (1993) that tries to map the social complexity of the entrepreneurial infrastructure (or resource provider), it becomes clear that the 'project' or 'opportunity' dimension (Gartner, 1985; Bygrave & Hofer, 1991; Shane, 2003; Shane & Venkataraman, 2000; Bruyat & Julien, 2001) is itself a nexus of multiple components, encompassing the environment and/or the organization. Working towards a more complete understanding of the entrepreneurship phenomenon therefore requires that these components should not be a priori excluded from the description of the entrepreneurship domain. The mounting evidence that components such as the environment significantly influence entrepreneurship activities (Antoncic & Hisrich, 2001; Zahra, 1993b) illustrates this point.

#### *The framework*

The maximum approach we would like to put forward is slightly different from the approach suggested by Gartner (1985; 1990). Two main points of difference emerge. First, as mentioned earlier, Gartner's view encompasses four components: the individual, the creating process, the organization being created and the environment. Instead of looking upon entrepreneurship as the creation of an organization (in the sense of a legal entity), we propose to see entrepreneurship (encompassing independent entrepreneurship as well as corporate entrepreneurship; cfr. infra) as the process of creating new value. Although Bruyat and Julien (2001) and Vosikis et al. (1999) recognize that the

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notion of value is an issue of much debate, they refer to it as new wealth created in exchange with a market. This new value creation could lead to a new organization, but does not necessarily have to do so. For instance, creating new business in an existing company by means of introducing a new product can also be labeled as newly created value. This broad view on new value creation is in line with Shane and Venkataraman's (2000) appeal to consider the variation in entrepreneurial opportunities that can be identified. Second, for reasons that will be described later on, we differentiate between the close and the remote environment as separate components, whereas Gartner's (1985; 1990) view encompasses a single 'environment' component. Hence, our framework describing the entrepreneurship domain entails five components: the creator, the creating process, newly created value (including its drivers), the close environment and the remote environment. A graphical representation of this approach to entrepreneurship is depicted in Figure 2.

1. *The creator.* Creators appear in multiple shapes. First of all, a single individual can be the creator. This type of creator is recognized throughout literature, as illustrated in Table 2. Some authors however recognize only the individual entrepreneur as creator (Gartner, 1985). Studies have identified five types of individual entrepreneurs: nascent, novice, habitual, serial and portfolio entrepreneurs (Ucbasaran et al., 2001). Yet, entrepreneurship can also be undertaken by a set of people who go through the process either independently or collectively (Shane & Venkataraman, 2000). The importance of entrepreneurial teams is increasingly recognized (Bruyat & Julien, 2001; Ucbasaran et al., 2001). Disregarding the often collective nature of entrepreneurship leads to the common bias of attributing entrepreneurial achievements to a particular individual entrepreneur, inspired at a particular moment by a stroke of genius or by fortune (Van de Ven, 1993).

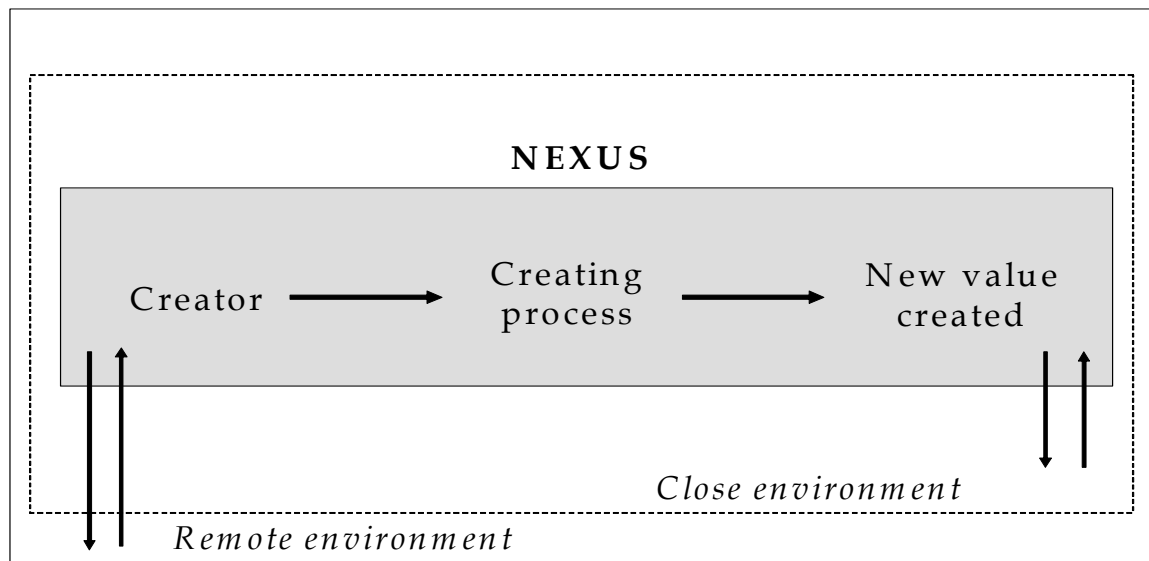


Figure 2. Entrepreneurship framework.

Additionally, entrepreneurship can grow from within existing firms and organizations (Shane & Venkataraman, 2000). The existence of entrepreneurial teams and organizations has led us to use the label 'creator' instead of 'individual'. Therefore, in our conceptualization of the entrepreneurship framework, the creator is an individual or a team of individuals, acting independently or within the logic of an existing organization, propelling (through his/their knowledge and decisions) all aspects of the creating process leading to new value creation (cfr. infra).

2. *The creating process.* When looked upon from a *process* point of view, the creating process encompasses several activities (Gartner, 1985; Shane & Venkataraman, 2000; Ucbasaran et al., 2001). A first one is the discovery and recognition of business opportunities and information search. Opportunity recognition seems to be a function of the joint characteristics of the opportunity and the recognizer (Shane & Venkataraman, 2000). Individual elements playing a prominent role in the process are knowledge differences (different stocks of information), behavioral differences and cognitive differences (different mental

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schemas providing a framework for recognizing new information) (Shane, 2003; Shane & Venkataraman, 2000). Another activity of the creation process is the decision to exploit opportunities discovered, demanding the acquisition and accumulation of resources (Gartner, 1985; Shane & Venkataraman, 2000; Ucbasaran et al., 2001). Choosing the mode of exploitation (Shane, 2003; Shane & Venkataraman, 2000) and developing a business strategy (Ucbasaran et al., 2001) complete the creating process. Gartner (1985) further details the development of business strategy, listing behaviors such as marketing products and services, producing the product or service, building an organization and responding to government and society.

When looked upon from a *content* point of view, the creating process is concerned with acquiring, generating, transforming and leveraging various kinds of resources, such as information, assets (e.g. financial resources) and capabilities (e.g. management practices). Whether we take the process or the content point of view, we use the label 'creating process' since it reflects the interdependence and interconnectedness of the activities and/or means necessary for the new value to come into existence. To summarize, we look upon the creating process as the whole of tangible (e.g. assets) and intangible (e.g. information) resource acquiring, generating, bundling and transforming activities through which the organization pursues entrepreneurial opportunities. It is propelled by an individual's or a group of individuals' knowledge and decisions (i.e. the creator).

3. *New value created.* The notion of newly created value in entrepreneurship is not an easy one. Bruyat and Julien (2001) define it as new wealth created in exchange with a market. On the whole, it can be operationalized by financial indicators and/or by operational parameters or drivers such as innovation. Operational parameters, though, received far more attention and instigated fierce discussions, as we discuss next. We reconsider the issue of financial and operational drivers at the end of this chapter (cfr. *infra*).

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Although we explicitly use the label 'new value created' instead of innovation, many authors have intrinsically related entrepreneurship with innovation in some degree (Carrier, 1996; Covin & Miles, 1999; Miller, 1983; Schuler, 1986; Shane, 2003; Shane & Venkataraman, 2000; Stopford & Baden-Fuller, 1994; Zahra, 1993c). In their view, there is no entrepreneurship without innovation. In this respect, Shane and Venkataraman (2000) distinguish between entrepreneurial opportunities and profit opportunities in general because the latter do not require the discovery of new means-end relationships. Others have taken stand against this view. Authors like Gartner (1989), Aldrich and Martinez (2001) and Ucbasaran et al. (2001) recognize that entrepreneurship is equally possible without innovation, leading to 'innovators' on the one hand and 'reproducer organizations' on the other hand (Aldrich & Martinez, 2001). Gartner (1989) issues a warning not to automatically correlate entrepreneurship with innovation, however intuitively appealing this might be. In his view, connecting both constructs would lead to the almost unsolvable problem of identifying which firms in an industry are innovative and which are not, increasing the ambiguity in a field already confronted with a definitional dilemma.

The dissonance just described is likely to be caused by the ambiguity surrounding the broadly conceivable innovation label. Researchers formulating innovation definitions are not always aware of the consequences of the 'newness' they propose. For instance, Sharma and Chrisman (1999) define innovation as the introduction of something new to the marketplace. Although this definition is in no sense wrong in se, by making 'new to the market' mandatory, it might be too strict. Certainly if it is to be automatically related to (corporate) entrepreneurship, as the authors propose.

We think that distinguishing innovations from inventions can bring more clarity on the linkage between innovation and entrepreneurship. Zajac et al. (1991) suggest that an invention implies the development of a process, product or service that is completely new (for the creator, the market and so forth). An innovation is then seen as referring to the adoption of any process, product or service previously foreign to the creator or organization studied. Thus, an

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innovation could in fact be a completely new idea. But the label innovation would equally apply to introducing (old) ideas that are new for the organization, e.g. introducing an existing product into a new market without any modification to the product. Bringing a problem-solving idea (not previously applied in the organization) to use in the organization also comes under the broad innovation umbrella (Mezias & Glynn, 1993). Kanter (1985) summarizes both types of innovation by defining it as creating new combinations. Rothwell and Zegveld (1982) give an interesting overview of various types of ‘new combinations’.

Using the distinction between ‘invention’ and ‘innovation’ as defined by Zajac et al. (1991) could be particularly useful in clarifying and discerning independent versus corporate entrepreneurship (cfr. *infra*). Departing from this invention/innovation distinction, only innovation could indeed be conceptually linked in some degree with entrepreneurship as an overwhelming construct (including independent and corporate entrepreneurship), but invention would not. However, this does not mean that there are no combinations of invention and entrepreneurship. But we can assume that invention is too strict as a construct to link it conceptually with the entire entrepreneurship field. As innovation remains broadly conceivable, it should not increase the entrepreneurship field’s ambiguity to an alarming extent as feared by Gartner (1989). We will continue this discussion further on in this chapter once we have dealt with the existing corporate entrepreneurship definitions.

What is important to take into account at this point in time, is that our (general) entrepreneurship component of new value created (NVC), building on Bruyat and Julien (2001), comprises (among other) innovation in broad terms as defined by Zajac et al. (1991), adopted with the intent of economic rent creation. We prefer the NVC label because it is less likely to result in confusion between innovation and invention when confronted with the different definitions of innovation abundantly present in literature. Further, as will be discussed later on, NVC can comprise more than innovation (even in a broad sense such as proposed by Zajac et al. (1991)) (e.g. establishing a new organization; cfr. *infra*). Additionally, it stresses the fact that NVC is the result of a series of actions in

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order to adopt a product, process, business or concept new to the organization. As such, NVC is approached from a behavioral point of view. All in all, innovation is a major element of new value created. The NVC component thus comprises (among other) various guises of innovation, such as a product or process newly introduced to the firm and/or its markets, developing a new business or a new business concept (cfr. *infra*). We discuss this further at the end of this chapter.

Besides solving the discussion about the link between entrepreneurship and innovation, the approach suggested above has the benefit of consistency in level. This meaning that the newness aspect of NVC is considered on the same level of the 'creator-creating process-NVC' nexus (new to the *firm*). The concepts of NVC and innovation also stress that the 'creator-creating process-NVC' nexus is part of a bigger picture (cfr. *infra*). As indicated by Damanpour (1991), organizational innovation is subject to influences in different categories, including the external environment.

4. *The environment.* The 'creator-creating process-NVC' nexus is embedded in its environment. Entrepreneurs do not operate in vacuums - they respond to their environments (Gartner, 1985). Environmental elements are for example the availability of supporting services, laws and regulations, transportation infrastructure and the availability of a skilled labor force. Two different views of the environment have been developed: the environmental determinism and the strategic choice perspective (Gartner, 1985). The environmental determinism or ecological approach looks at the environment as an external set of conditions to which the organization has to apply if it is to survive (Aldrich, 1979). In the strategic choice perspective the environment is seen as a reality created by organizations themselves through some strategy (Gartner, 1985). In entrepreneurship literature, both perspectives on the environment have been and still continue to be considered. Yet, Low and MacMillan's (1988) critique on the absolute lack of integration of both views is still valid. In most ecological and evolutionary studies, strategies are ignored or taken for granted, whereas studies focusing on strategies tend to ignore the existence of ecological pressures (Aldrich

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& Martinez, 2001). For a complete understanding of the entrepreneurial process, both views have to be taken into account. For this reason we follow Harrison and Shirom (1999), Sathe (2003) and Zahra (1991) and distinguish between two types of environments in our theoretical entrepreneurship framework: the close and the remote environment. It must be noted that both refer to environmental *conditions*, not necessarily to elements. One element (e.g. industry) can give rise to various conditions, some of which can belong to the internal and others to the external environment.

*4a. The close environment.* As mentioned earlier, creators may come in many forms and the creating process requires several choices to be made (mode of exploitation, resource gathering, and etcetera). The preceding steps in the decision process connected to the 'creator-creating process-NVC' nexus create an environment for the subsequent parts of the decision process. In other words, the structure created shapes the further development of the project: the previous steps taken on the entrepreneurial path enable and disable subsequent actions (Bruyat & Julien, 2001). Entrepreneurial background (e.g. family, experience, education, concurrent entrepreneurial projects etc.) for instance is considered to influence the choice for a certain type of firm (manufacturing, service, ...) (Gartner, 1985). And the type of firm chosen for may then affect the mode of exploitation, the resource acquisition, the development of the business strategy and so on. To summarize, the close environment includes all the conditions and forces (within or outside of the further influence of the firm) that are directly related to and originate from within the 'creator-creating process-NVC' nexus.

But as we already know, Gartner (1985) specifically studied the creating process of new organizations by individuals. The close environment from his point of view is a synonym for the organization being created. Yet, when we consider the 'creator-creating process-NVC' nexus from a broader perspective, other elements constituting the close environment appear. For instance, when we are dealing with a team or an existing organization setting up an entrepreneurial project, the close environment becomes more complex, including relationships



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within the team, organization structure, culture, procedures, existing business and so on. Thus we can conclude that the close environment, seen as the inside set of conditions (originating from within the nexus) the entrepreneurial process has to deal or comply with, is dynamic in its varying complexity. The initial degree of complexity varies with the type of the entrepreneurial project. And in the course of the entrepreneurial process the complexity continuously increases since the close environment expands and evolves.

*4b. The remote environment.* The entrepreneurial process also has to respond to and interact with a vast set of conditions originating from outside its nexus. This set of conditions is referred to as the remote or general environment. The remote environment includes forces, conditions and institutions having long-term impacts on the 'creator-creating process-NVC' nexus and its close environment. In determining whether an environmental condition is close or remote, our point of reference is the 'creator-creating process-NVC' nexus. Only a particular condition resulting from outside the nexus can belong to the remote environment. So, different entrepreneurial projects can have different close and remote environments. In this sense, the availability of capital can be a condition of either the remote or close environment for certain independent entrepreneurs starting up their business. But in the case of a continuously successful corporate entrepreneurial firm disposing of substantial financial reserves, the availability of capital to start up yet another venture has a higher probability of being a close environmental characteristic.

To summarize, we have elaborated on a general framework for entrepreneurship from the behavioral point of view. This framework encompasses five components: the creator, the creating process, new value created, the close environment and the remote environment. Thus, entrepreneurship is seen as a multidimensional construct, including a tight nexus incorporating the creator, the creating process and new value creation. This nexus is developed in close interaction with the close and the remote environment. A complete behavioral model for the purpose

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of describing entrepreneurship of whatever nature (novel start-up, corporate entrepreneurship, and so on) should include all five components in some degree. After all, the maximum approach is, as mentioned, the most appropriate approach to develop a descriptive framework for the entrepreneurship domain.

However, this descriptive framework encompasses two components of a more contextual nature, falling outside the actual 'creator-creating process-NVC' nexus: the close and the remote environment. The graphical representation in Figure 2 illustrates this point by providing a grey background for the 'creator-creating process-NVC' nexus only. While the 'full' framework is necessary to describe or model the entrepreneurship phenomenon and research field, the isolated nexus might be more appropriate to work towards a definition of the entrepreneurship research object shared by the research field. These three components (that can be distinguished but not separated from each other) form the true nexus or core of entrepreneurship considered from a behavioral or process point of view. This nexus is the actual object or construct studied in the field of entrepreneurship (Bruyat & Julien, 2001).

To conclude, entrepreneurship as an *object* of research refers to the 'creator-creating process-NVC' nexus whereas entrepreneurship as a *field* of research encompasses all five components. A clear differentiation between both might perhaps serve as a first step in solving the definitional dilemma surrounding entrepreneurship. In this section we have therefore elaborated on all five components since our objective was to describe the full entrepreneurship domain as a field of research.

#### *Advantages of the nexus framework*

Our framework pertains to the behavioral view of entrepreneurship, which has several distinct advantages. Covin and Slevin (1991) list three advantages of behavioral models of entrepreneurship. First, entrepreneurship is shaped by behavior or actions, not by attributes such as psychological characteristics or organizational culture. To build on Gartner (1989): it is by the dance that you can know the dancer while he is dancing. Behavior is therefore the central element in

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entrepreneurship. And this process view significantly contributes to our understanding of the entrepreneurship phenomenon. Second, behavior is by definition overt and demonstrable (Covin & Slevin, 1991). By measuring the behavioral manifestations of entrepreneurship we can reliably, verifiably and objectively measure the entrepreneurial level of individuals and firms. Third, a behavioral model of entrepreneurship is also appealing to practitioners since behavior is manageable. In this sense, the entrepreneurial process is open for intervention.

In addition to the general advantages of a behavioral view on entrepreneurship mentioned by Covin and Slevin (1991), our specific approach has the following strengths. First, our approach enables us to see entrepreneurship as a reiterative process - as proposed by Cunningham and Lischeron (1991) - that does not end with the creation of a specific type of new value. Entrepreneurship does not stop when the organization has been created as Gartner (1989) suggested. Instead, having created (or even before) one type of new value, it is possible to begin a new one. Yet, the specific features of the 'creator-creating process-new value creation' nexus and its close and remote environment can change, as mentioned earlier. Second, the five components we used in our approach should allow us to capture and reflect most (if not all) of the variability in all appearances of entrepreneurship. Thus, by studying all five components we should be able to distinguish all forms of entrepreneurship in an accurate way, such as novel start-ups, corporate ventures and corporate renewal activities. In the subsequent section we will use these five components in order to clarify the corporate entrepreneurship construct.

## **DEFINING CORPORATE ENTREPRENEURSHIP**

In its early stages, corporate entrepreneurship was seen as a behavioral phenomenon aiming at re-energizing large and/or established companies. Stopford and Baden-Fuller (1990) used the term 'rejuvenation'. Later on it has been recognized entrepreneurship activities should not be dependent on firm size

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(Antoncic & Hisrich, 2001; Carrier, 1996; Wennekers & Thurik, 1999). Corporate entrepreneurship is often seen as a school within entrepreneurship theory (Cunningham & Lischeron, 1991; Sharma & Chrisman, 1999). Following, as there is no generally accepted definition of entrepreneurship (cfr. supra), the same definitional gap thus also burdens the corporate entrepreneurship construct. A necessary step preceding the empirical study of corporate entrepreneurship is defining it by determining those dimensions of entrepreneurship that translate to corporate entrepreneurship (Barrett & Weinstein, 1998).

Despite the fact that there remains a considerable degree of definitional ambiguity about the corporate entrepreneurship construct, entrepreneurship and corporate entrepreneurship literature seem to agree on the differentiation between the nature of independent entrepreneurship and corporate entrepreneurship. Independent entrepreneurship is seen as the activities through which a single individual or a group of individuals create a new organization, acting independently of any association with an existing organization (Sharma & Chrisman, 1999). Corporate entrepreneurship is then considered as entrepreneurial (new value creating) activities within an organization and being established by a(n) individual(s) acting as part of the corporate system of one or more existing organizations.

However, the differences in terminology used to describe those particular corporate entrepreneurial activities have created confusion, and still continue to do so. Throughout the years, researchers have used a variety of terms to describe the entrepreneurial efforts associated with existing organizations: corporate entrepreneurship (Carrier, 1996; Covin & Miles, 1999; Covin & Slevin, 1991; Dess et al., 1999; Hornsby et al., 2002; Jennings & Lumpkin, 1989; Stopford & Baden-Fuller, 1994; Ucbasaran et al., 2001; Zahra, 1991; Zahra, 1993b; Zahra, 1995; Zahra et al., 2000), intrapreneurship (Antoncic & Hisrich, 2001; Carrier, 1996; Hostager et al., 1998; Kuratko et al., 1990; Pinchot, 1985), corporate venturing (MacMillan et al., 1986; Miles & Covin, 2002; Von Hippel, 1977), firm-level or organization-level entrepreneurship (Covin & Slevin; 1991; Savage & Black, 1995), entrepreneurial

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orientation (Lumpkin & Dess, 1996; Lyon et al., 2000; Wiklund, 1999) and internal corporate entrepreneurship (Jones & Butler, 1992). Table 3 contains a list of exemplary definitions used in literature for each of these terms (ordered by the term used and by author). We refer to Sharma and Chrisman (1999) for a more detailed overview and a keen clarification of definitions for these related terms.

Table 3 can teach us three lessons with regard to corporate entrepreneurship definitions. First and most obviously, it shows that different authors define the same term differently. Second, it illustrates that certain researchers use different terms (in one study) to label the same phenomenon (e.g. Ucbasaran et al., 2001). Finally, it demonstrates that sometimes the same author defines the terms differently in subsequent articles (e.g. Zahra (1991) versus Zahra (1995)). All of this clearly reveals that the corporate entrepreneurship construct is still evolving, not only through contributions of various researchers, but also within the work of individual researchers. Consequently, at this point in time a generally accepted definition of corporate entrepreneurship is lacking (Burns, 2005; Sharma & Chrisman, 1999).

Confining ourselves to those definitions in Table 3 that specifically use the label 'corporate entrepreneurship', we can make the following observations. First, all definitions go more deeply into the type(s) or drivers of new value created by means of corporate entrepreneurship. Thus, the NVC-component of the corporate entrepreneurship nexus is placed in a central position in corporate entrepreneurship definitions. As we recall, new value created is linked to innovation (as defined by Zajac et al. (1991); cfr. supra). However, innovation is here more broadly conceived than in the case of independent entrepreneurship (cfr. infra). Nonetheless, substantial differences with regard to the nature of the newly created value arise from the corporate entrepreneurship definitions. Some definitions remain very broad or general. For instance, Covin and Slevin (1991) speak about 'internally generated new resource combinations'. Hornsby et al. (2002) point to re-energizing and enhancing the ability to acquire innovative skills and capabilities.

Table 3. Corporate entrepreneurship: terms and definitions

Source	Definition	Synonym used
	CORPORATE ENTREPRENEURSHIP	
Carrier (1996)	A process of creating new business within established firms to improve organizational profitability and enhance a company's competitive position (p.6)	-
Covin & Miles (1999)	The presence of innovation plus the presence of the objective of rejuvenating or purposefully redefining organizations, markets, or industries in order to create or sustain competitive superiority (p.50)	-
Covin & Slevin (1991)	Extending the firm's domain of competence and corresponding opportunity set through internally generated new resource combinations (p.7)	Organization-level entrepreneurship
Dess et al. (1999)	Corporate entrepreneurship may be viewed as consisting of two types of phenomena and processes: (1) the birth of new businesses within existing organizations, whether through internal innovation or joint ventures/alliances and (2) the transformation of organizations through strategic renewal, i.e. the creation of new wealth through the combination of resources (p.85)	-
Guth & Ginsberg (1990)	Corporate entrepreneurship encompasses two types of phenomena and the processes surrounding them: (1) the birth of new businesses within existing organizations (i.e. internal innovation or venturing) and (2) the transformation of organizations through renewal of the key ideas on which they are built (i.e. strategic renewal) (p.5)	-
Hornsby et al. (2002)	Corporate entrepreneurship centers on re-energizing and enhancing the ability of a firm to acquire innovative skills and capabilities (p.255)	-
Jennings & Lumpkin (1989)	The extent to which new products and/or new markets are developed (p.489)	-

Table 3. (continued)

Source	Definition	Synonym used
Russell & Russell (1992)	It includes the initiation and implementation of a wide range of innovation as a means of creating and exploiting opportunities perceived in competitive environments (p.640)	-
Sharma & Chrisman (1999)	The process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization (p.18)	-
Ucbasaran et al. (2001)	A process of organizational renewal associated with two distinct but related dimensions: (1) creating new businesses through markets developments or by undertaking product, process, technological and administrative innovations (2) redefinition of the business concept, reorganization, and the introduction of system-wide changes for innovation (p.63)	Corporate venturing
Zahra (1991)	The process of creating new business within established firms to improve organizational profitability and enhance a company' competitive position or the strategic renewal of existing business (p. 260-261)	-
Zahra (1993b)	A process of organizational renewal that has two distinct but related dimensions: (1) innovation and venturing and (2) strategic renewal (p.321)	-
Zahra (1995)	The sum of a company' s innovation, venturing and renewal efforts (p.226)	-
Zahra et al. (2000)	The sum of a company' s venturing and innovation activities (p.947)	-
Antoncic & Hisrich (2001)	<p style="text-align: center;">INTRAPRENEURSHIP</p> <p>A process that goes on inside an existing firm, regardless of its size, and leads not only to new business ventures but also to other innovative activities and orientations such as development of new products, services, technologies, administrative techniques, strategies and competitive postures (p.498)</p>	-

Table 3. (continued)

Source	Definition	Synonym used
Carrier (1996)	The introduction and implementation of a significant innovation for the firm by one or more employees working within an established organization (p.7)	-
Hostager et al. (1998)	Individuals and groups working within the corporation to: (1) identify ideas for new products or services (2) turn these ideas into profitable products or services (p.11-12)	-
Kuratko et al. (1990)	Entrepreneurship inside of the corporation (p.50)	-
Pinchot (1985)	Entrepreneurship inside large corporations (p.xv)	-
Stopford & Baden-Fuller (1994)	CORPORATE VENTURING	intrapreneurship
Von Hippel (1977)	The creation of new businesses within an existing organization (p.521)	-
Jones & Butler (1992)	An activity which seeks to generate new businesses for the corporation in which it resides through the establishment of external or internal corporate ventures (p.163)	-
	INTERNAL CORPORATE ENTREPRENEURSHIP	
	Internal corporate entrepreneurship refers to entrepreneurial behavior within one firm, or the level of entrepreneurial behavior (p.734)	
	ENTREPRENEURIAL ORIENTATION	
Lumpkin & Dess (1996)	The processes, practices and decision making activities that lead to new entry (p.136)	Firm-level entrepreneurship



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Most definitions, however, explicitly enumerate the types or drivers of newly created value. But even within this 'explicit' kind of definitions there remains a considerable degree of diversity in the conceptualization of new value created. Carrier (1996) for example limits the new value creation to the creation of new business (also called 'venturing'). Dess et al. (1999) also mention the birth of new businesses, but add the transformation of the organization through strategic renewal. Based on Guth and Ginsberg (1990) who link innovation and venturing to the birth of new businesses, Zahra (1993b; 1995) and Sharma and Chrisman (1999) distinguish between three new value creation drivers: venturing, renewal and innovation.

A second observation that emerges from the corporate entrepreneurship definitions in Table 3 pertains to the fact that - notwithstanding the explicit focus on NVC - the 'creator and 'creating process' nexus components are implicitly recognized in a few cases. Authors like Ucbasaran et al. (2001) and Zahra (1991; 1993b) stress the process nature of corporate entrepreneurship. As far as the creator is concerned, Sharma and Chrisman (1999), for example, refer to an individual or a group of individuals associated with an existing organization as the creative forces behind corporate entrepreneurship. Other authors (e.g. Zahra, 1995; Zahra et al., 2000) conceive the creator in more general terms by using the term 'company'. Both views on the creator do not conflict since a company can be seen as an organized group of individuals. The latter definitions, though, suggest that corporate entrepreneurship is an issue of (for-profit) firms instead of organizations (the latter covers a much more diverse population including non-profit and public sector organizations). And this is an issue of continuing debate (Morris & Jones, 1999). More importantly, with the exception of the definition of Sharma and Chrisman (1999), no other corporate entrepreneurship definition mentioned explicitly lists all three core nexus components.

A third observation stemming from the definitions is that some authors (Carrier, 1996; Covin & Miles, 1999; Zahra, 1991) include an explicit link with organizational performance and/or strategy in their definition of corporate entrepreneurship. In this way, they recognize that corporate entrepreneurship

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intends to contribute to the performance and the competitive positioning of the adopting organization.

Having elaborated on existing definitions of corporate entrepreneurship, the question now arises of which position we will take. Determining one's position is necessary because a generally accepted definition of corporate entrepreneurship is lacking. Our view with regard to corporate entrepreneurship will be developed within the general entrepreneurship nexus framework formulated earlier, including the three core components creator, creating process and new value created (NVC). After all, the corporate entrepreneurship concept is considered as a hierarchical sub-construct of entrepreneurship (Sharma & Chrisman, 1999). Based on the discussions in this chapter and building on Sharma and Chrisman (1999), we list our descriptive (behavioral) definitions of entrepreneurship and independent/corporate entrepreneurship in Figure 3.

As implicitly suggested by the definitions in Figure 3, the most striking conceptual differences between independent and corporate entrepreneurship can be attributed to the context-specific nature of the creator and new value created. In Table 4 we list the specifics of these two nexus components for independent and corporate entrepreneurship. As far as the creator is concerned, the difference between independent and corporate entrepreneurship boils down to whether or not the individual(s) act(s) as representatives of one or more existing organizations. In the case of independent entrepreneurship there is no such linkage, meaning that the individual(s) do not act as part of an existing corporate system. The reverse holds as far as corporate entrepreneurship is concerned. In this case the individuals operate within the logic of an existing firm. In the case of a joint venture being set up by two or more organizations, the group of individuals concerned in this corporate entrepreneurial activity is likely to consist of members of different organizations.

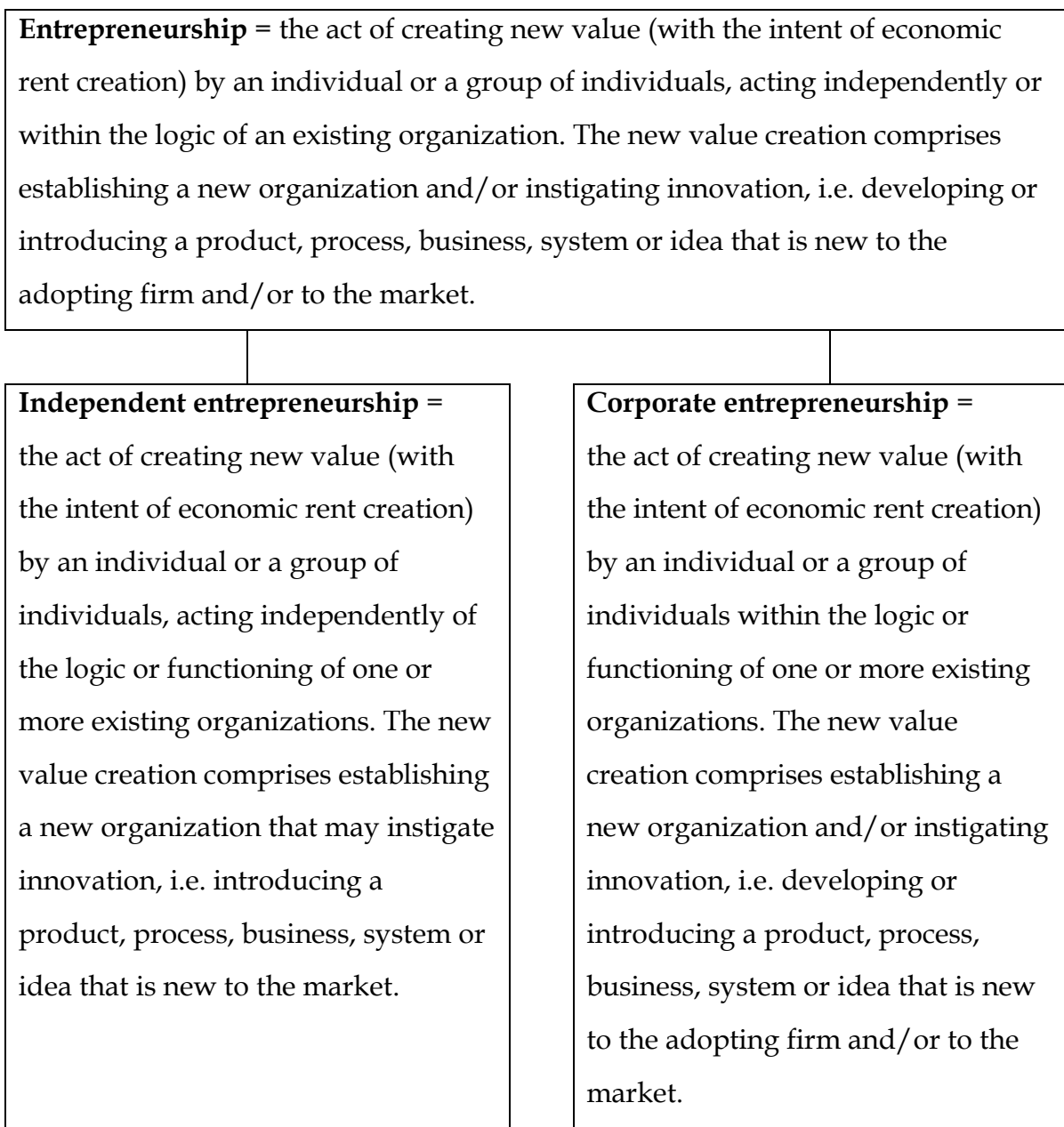


Figure 3. Entrepreneurship hierarchy.

When it comes to new value created, independent entrepreneurship is intrinsically linked with the establishment of a new organization. This start-up may also involve innovation, but does not have to do so. In the case of corporate entrepreneurship, new value created may encompass the establishment of a new organization (which in itself may encompass innovation). But new value created through corporate entrepreneurship can also substantiate through innovation

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without the establishment of a new organization. Only one of both is mandatory: a new organization or innovation.

Also interesting to note is the different delineation of innovation in both constructs. For independent entrepreneurship, innovation comprises the introduction of a product, process, business or idea that is new to the market (more like invention in terms of Zajac et al. (1991)). As far as corporate entrepreneurship is concerned, innovation refers to developing *or* introducing a product, process, business or idea that is new to the market *or* to the firm (Covin & Miles, 1999). The notion of innovation here thus resembles that of Zajac et al. (1991) discussed earlier. As already alluded to by Sharma and Chrisman (1999), this means that activities that are considered innovation in a corporate setting might not be considered as such if accomplished outside an existing organization. Put differently, innovation in a corporate setting is more broadly conceptualized than innovation (if any) associated with independent entrepreneurship.

As we recall, new value created can comprise both financial as well as operational drivers. Following, differences with regard to the operationalization of new value created between independent and corporate entrepreneurship will emerge. First and foremost, in view of the different, broader notion of innovation in corporate entrepreneurship, the range of applicable operational drivers of new value created will be rather extended, including indicators or drivers such as product innovation (new to the firm and/or to the market), process innovation, venturing and renewal (cfr. *infra*). In fact, as far as independent entrepreneurship is concerned, operational drivers are not always apt, since innovation is not a must. But when they are applicable, their range is stricter: 'new to the market' is mandatory. Second, for independent entrepreneurship financial parameters are likely to be deemed considerably more important, especially financial indicators referring to survival (liquidity, solvency, etc.). Financial parameters are secondary to operational drivers for corporate entrepreneurship research. They are most of all used to demonstrate the link between operational drivers of new value created and financial performance.

Table 4. Independent and corporate entrepreneurship: specifics of the nexus components

	<b>Independent entrepreneurship</b>	<b>Corporate entrepreneurship</b>
Creator	An individual or a group of individuals, acting independently of the logic of one or more existing organizations and propelling all aspects of the creating process leading to new value created	An individual or a group of individuals, acting within the logic of one or more existing organizations and propelling all aspects of the creating process leading to new value created
New value created	The establishment of a new organization (with the intent of economic rent creation) that <i>may</i> instigate innovation, i.e. introducing a product, process, business, system or idea that is new to the market.	The establishment of a new organization and/or the instigation of innovation, i.e. introducing or developing a product, process, business, system or idea that is new to the adopting firm and/or to the market (with the intent of economic rent creation).

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Given these insights and in view of the specific corporate entrepreneurship focus of this dissertation, we elaborate briefly on the corporate entrepreneurship context-specific interpretation of the three core nexus components and take our position vis-à-vis existing corporate entrepreneurship definitions.

As far as the *creator* is concerned, *an individual or a group of individuals acting within the logic of one or more existing organizations initiates and propels all aspects of the creating process*. We specifically use the term ‘organization’ instead of ‘firm’ or ‘company’ (terms used by e.g. Covin & Slevin (1991); Zahra (1991) and Zahra et al. (2000)) since corporate entrepreneurship is – at least conceptually – by no means restricted to the profit sector (Morris & Jones, 1999). And at this phase of the study the conceptual point of view takes priority.

The *creating process* of corporate entrepreneurship can then be described as the *complex of activities and resources through which the organization pursues entrepreneurial opportunities*. It encompasses the whole of tangible (e.g. assets, financial resources) and intangible (e.g. opportunity recognition or other types of information, human capital) resource (Gartner, 1985; Shane, 2003; Shane & Venkataraman, 2000; Ucbasaran et al., 2001) acquiring, generating and transforming activities.

Finally, corporate entrepreneurship aims at *creating new value* for the organization. As already indicated, we focus on the operational parameters of new value created. The broad conceptualization of innovation (cfr. Zajac et al. 1991) within corporate entrepreneurship comprises a complex of three major forms. New value created can be achieved (1) by setting up new activities and moving into new markets (new business; corporate venturing), (2) by renewing the business concept and/or its scope (renewal) and (3) by developing new products or services, processes and so forth (innovation (in a stricter sense)). We thus can build on Sharma and Chrisman (1999) and Zahra (1995) and see the newly created value as the complex whole driven by an organization’s innovation, venturing and renewal efforts. We will take on the challenge of accurately defining each of these three NVC types later on in this study.

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As with entrepreneurship, also corporate entrepreneurship is embedded in its environments: the close and the remote environment. The first refers all conditions and forces that are directly related to the 'creator-creating process-NVC' nexus (cfr. supra). The latter pertains to the characteristics of the competitive environment, such as the degree of hostility, munificence, dynamism etc. (Zahra, 1993b). However, as mentioned earlier, these environmental components of the framework are of a more contextual nature, falling outside the actual corporate entrepreneurship nexus.

## CONCLUSION

The expectations for corporate entrepreneurship as a way of rejuvenating existing companies are high. Yet, current knowledge regarding the effective conduct of corporate entrepreneurship remains limited. The corresponding responsibility of the research field is not to be underestimated since a major source of the conflicting research results is rooted in the definitional dilemma burdening corporate entrepreneurship research. The search for an appropriate basis for understanding and describing the corporate entrepreneurship phenomenon therefore creates a challenging problem for corporate entrepreneurship researchers. The development of an empirically verified research model of corporate entrepreneurship in this dissertation must therefore be preceded by a clarification of the concept of corporate entrepreneurship. This has been done by first exploring the source field of research, i.e. entrepreneurship.

We have elaborated on a framework describing entrepreneurship from the behavioral point of view. This framework encompasses five components: the creator, the creating process, new value created, the close environment and the remote environment. Entrepreneurship is seen here as a multidimensional construct, a tight nexus incorporating the creator, the creating process and newly created value. This nexus is developed in interaction with the close and the remote environment. This framework allows us to accurately distinguish between all forms of entrepreneurship, including corporate entrepreneurship. Building on

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this framework, we have then clarified the concept of corporate entrepreneurship. This has been done by first going deeper into a comprehensive series of existing corporate entrepreneurship definitions (regardless of the specific corporate entrepreneurship label used). Next, we have elucidated our own position with regard to the concept of corporate entrepreneurship, providing a thorough description for each of the core components of the nexus framework: the creator, the creating process and new value created. In this way, the definitional gap surrounding corporate entrepreneurship is bridged.



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## **CHAPTER 2**

# **BUILDING A RESOURCE-BASED MODEL OF CORPORATE ENTREPRENEURSHIP**

### **INTRODUCTION**

The previous chapter clarified corporate entrepreneurship on a general, conceptual level. This chapter outlines our specific research model of corporate entrepreneurship taking into account the study's broad set-up. The model is intended to depict elements that relate to entrepreneurial behavior in a wide variety of firms. In a subsequent step, the empirical analyses will substantiate the actual effect of these elements on corporate entrepreneurial performance. The model development responds to the call for increased theoretical and empirical clarity on the subject of how existing firms can reach corporate entrepreneurial outcomes in order to turn their rejuvenation efforts into a success (Covin & Miles, 1999; Dess et al., 1999; Miles & Covin, 2002). We aim to integrate earlier contributions towards modeling corporate entrepreneurship into our model. The resource-based perspective of the firm will serve as the lens for our exploration.

The further outline of this chapter is as follows. In a first section, we elaborate on the link between resource-based theory and corporate entrepreneurship, as the resource-based perspective will be used to explore the corporate entrepreneurial performance of firms. In this section we also clarify the meaning and operationalization of the classes of elements considered. In a second section, we compare the set-up of our model with that of prior models.

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## **BUILDING THE MODEL**

As thoroughly discussed in Chapter 1, we approach the corporate entrepreneurship construct from a nexus framework, comprising the three core components 'creator', 'creating process' and 'new value created'. We refer to Chapter 1 for the essence of the nexus framework. In what follows, we discuss how we aim to substantiate this framework. The resource-based perspective of the firm will provide us with the lens used to study corporate entrepreneurship. The remainder of this section focuses on the application of the resource-based perspective of the firm to our corporate entrepreneurship setting and on clarifying the operationalization of the various nexus blocks.

### **A resource-based perspective on corporate entrepreneurship**

One promising way of trying to map the road leading to successful corporate entrepreneurial activity is by looking at the firm from a resource-based perspective. The resource-based perspective focuses on what happens inside the company. It emphasizes firm-specific resources and capabilities and the existence of isolating mechanisms as fundamental determinants of different instances of firm performance and wealth creation (Barney, 1991; Greene et al., 1999; Stopford & Baden-Fuller, 1994; Teece et al., 1997; Teng, 2003). Competitive advantage and wealth creation are functions of the resources the firm has at its disposal and the capabilities it has to deploy its strategic assets (Amit & Schoemaker, 1993). The term 'resources' is generally used in a broad sense within the resource-based view, referring to assets as well as competencies. Assets are those physical (e.g. equipment), human and organizational elements that serve as inputs for the firm's value-creating activities (Eisenhardt & Martin, 2000; Wernerfelt, 1984). Competencies are local abilities that are fundamental to the competitive advantage of specific groups of firms, such as molecular biology for biotech companies (Eisenhardt & Martin, 2000). Dynamic capabilities are the organizational and managerial routines by which firms alter and adapt their resource base (resource acquisition and disposal, integration, recombination, etc.)

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to changing contexts and priorities. They are the drivers behind the creation, evolution and recombination of other resources (Eisenhardt & Martin, 2000; Teece et al., 1997). The dynamic capability view of the firm can be seen as a complement to the (earlier developed) resource-based view of the firm. It grew out of the assessment that the resource-based view is not apt to adequately explain the competitive advantage of firms in situations of rapid and unpredictable change (Eisenhardt & Martin, 2000). The dynamic capability view stresses the importance of the manipulation and transformation of resources through capabilities (in particular knowledge resources (Kogut, 1996)) for competitive advantage instead of the mere possession of resources.

In the remainder of this chapter, we will use the terms ‘resource-based theory’ and ‘resource-based perspective’, hereby pointing out that the ‘resource-based view’ and the ‘dynamic capability view’ of the firm serve the same purpose in the research developed here. By doing so, we do not aim to erase or neglect the indisputable differences between both views. Rather, we want to stress their similarities. Both perspectives belong to the same class of approaches emphasizing the building of competitive advantage and wealth through capturing entrepreneurial rents stemming from firm-level efficiency advantages. As such, these approaches are fundamentally distinct from the competitive forces and strategic conflict approaches, which share the view that rents flow from privileged product market positions (Teece et al., 1997). Stressing their similarity under the umbrella of ‘resource-based theory’, we will treat the terms ‘resources’ and ‘capabilities’ as stemming from one and the same perspective, as has been done previously (e.g. Ray et al., 2004).

The resource-based perspective is increasingly being used by entrepreneurship scholars to identify and explain persistent performance differences among firms (Ireland et al., 2003b). As wealth creating activities, entrepreneurship and corporate entrepreneurship involve acquiring, accumulating, bundling and (re)deploying resources and capabilities. Looking at corporate entrepreneurship from a resource-based point of view can increase our understanding of how new

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entrepreneurial wealth (through innovation, venturing and renewal) is created. Just as entrepreneurship in general or innovation in particular can be seen as resource transformation processes (Mahoney, 1995; Nonaka, 1991; Schumpeter, 1934), venturing and renewal too refer to specific and direct entrepreneurial actions demanding resource (re)combinations and capabilities (Eliasson, 2003). This view is in line with Schumpeter's (1934) consideration of entrepreneurship as carrying out of new combinations of internal and external resources and capabilities as the basis for future organizational rents (Galunic & Rodan, 1998; Mahoney, 1995). As indicated earlier, the main purpose of this study is then to detect resources and capabilities that actually stimulate new value created. In what follows, we will use the resource-based theory lens to delineate the creating process and creator in more detail. Although both the creator and the creating process can be seen as classes of resources (including capabilities), we discuss them separately in order to get in touch with some of the peculiarities of both. But first we focus on their similarities in view of the resource-based perspective.

The creating process of corporate entrepreneurship as defined earlier (cfr. Chapter 1) entails the acquisition and accumulation of resources through capabilities. The creator drives or propels all aspects of the creating process. This conceptualization points towards (top) management, which is deemed very important within resource-based theory. On the whole, the above suggests that a focus on the discovery, acquisition and accumulation of various kinds of resources (creator and creating process) can sharpen our understanding of the act of new value creation by firms. This view on the creating process is intrinsically linked to the resource-based perspective since it emphasizes firm-specific resources and capabilities as fundamental determinants of different instances of firm value or wealth creation (Galunic & Rodan, 1998; Teece et al., 1997; Wernerfelt, 1984). Competitive advantage lies upstream of product markets and relies upon resources and capabilities (Mahoney & Pandian, 1992; Teece et al., 1997). The more valuable, rare, imperfectly imitable and non-substitutable both these are

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compared to those held by competitors, the more important the competitive advantage built on them should be (Ireland et al., 2003b).

In past resource-based corporate entrepreneurship research the critical question of how resources can contribute to company performance through corporate entrepreneurial activities remained unanswered (Teng, 2003). Answering this question requires having an eye not only for the resources ('stocks') themselves, but also for the management and combination of resources (the capabilities or 'flows'). The latter is particularly stressed by the dynamic capability view, emphasizing the development of management capabilities and difficult-to-imitate combinations of various types of resources as sources of advantage (Teece et al., 1997). A growing contingency of scholars acknowledges that resource stocks by themselves rarely are a source of competitive advantage. They are more likely to be a source of competitive or entrepreneurial advantage if they are used to do something, i.e. if they are exploited through business processes and management practices or, in other words, if they are structured, bundled and transformed through capabilities (Baden-Fuller, 1995; Ireland et al., 2003b; Priem & Butler, 2001; Ray et al., 2004; Wernerfelt, 1984). As controlling scarce resources leads to new value and wealth, managerial issues such as skill acquisition, management of information and knowledge become fundamental strategic issues (Teece et al., 1997). Resource stocks can be accumulated by choosing appropriate capabilities (flows) over time (DeCarolis & Deeds, 1999; Dierickx & Cool, 1989; Mahoney, 1995). As such, both resources in se as well as the management (including the acquisition) of resources are to be awarded a prominent role in the study of the process of firm new value creation. Teece et al. (1997) refer to both dimensions as 'positions' and 'managerial processes' respectively. While the positions refer to the stock of specific resources, the managerial processes or capabilities concern the search, integration and transformation or recombination of resources. Both dimensions will be taken into account while operationalizing our research model through specifying the creating process and the creator.

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*The creating process and resource-based theory*

Firm resource stocks or 'positions' – the creating process resources included – are very heterogeneous in appearance. These comprise financial assets, monetary resources, plant and equipment, technology and so forth (Barney, 1991; Borch et al., 1999; Ireland et al., 2003b; Teng, 2003). Earlier we pointed to the importance of considering managerial processes (capabilities or flows) (e.g. skill acquisition, knowledge management) next to resource positions. When both these perspectives are taken into account, the heterogeneity is further increased (Teece et al., 1997). Particularly important in terms of a resource-based perspective on the creating process is that many of the positions and processes constructs used in entrepreneurship and strategic management research were originally developed in an era when physical, financial and labor resources ('tangible resources') were the key resources to create entrepreneurial advantages. Intangible resources (e.g. information, trust, reputation, and knowledge of customer preferences) and their management (e.g. knowledge creation, diffusion, etc.) have received far less attention in empirical research (Camelo-Ordaz et al., 2003). Focusing exclusively on tangible resources leads to passing over the importance of knowledge-related or competence-based resources (such as human, social and intellectual capital) and their management in attaining competitive advantages. These types of intangible resources or invisible assets are becoming ever more salient in firms in emerging industries (Daum, 2003; Dess et al., 2003). Yet, as intangible resources are less amenable to measurement and managerial manipulation (Markman et al., 2004; Priem & Butler, 2001), the implications for researchers and management could be rather nebulous when relying solely on intangible resources in explaining how new value is created by firms. Therefore, studying a mix or portfolio of both tangible and intangible resources and adhering capabilities seems commendable when striving for clear theoretical and practical insights for research and management.

Many of the resource constructs applied in entrepreneurship and strategic management research have not recognized the heterogeneity of resources and capabilities, studying only one or a limited set of one or the other. As such, the

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question of how resource recombination (bundles, configurations) is developed remains unanswered. Still, this very question lies at the heart of (corporate) entrepreneurship research and of the resource-based perspective (Eliasson, 2003; Schumpeter, 1934; Teng, 2003). Our research model aims at recognizing the resource heterogeneity by incorporating a range of tangible and intangible creating process resource stocks (employee human capital, R&D investment, patents) and capabilities or flows (networking, HRM, market knowledge generation and dissemination) that are expected to be important for innovation, venturing and renewal (newly created value). The details of the specific composition of this portfolio will be discussed in the section on the meaning of the model components.

*The creator and resource-based theory*

The 'creator' drives or propels all aspects of the creating process. A major part of the available literature focusing on creator aspects of corporate entrepreneurship generally mentions entrepreneur(s) or top management team members as being key creating actors (Barker & Mueller, 2002, Hoffman & Hegarty, 1993; Lynskey, 2004). This is congruous with the importance assigned to (top) management in resource-based theory. After all, firm capabilities need to be understood in terms of managerial processes and organizational structures that support productive activity (Teece et al., 1997).

Studying the creator side of corporate entrepreneurship from a resource-based perspective therefore points to the top management team or upper echelon. Managers have been recognized as an important element within the heterogeneous constellation of resources and capabilities (Daily et al., 2000; Dimov & Shepherd, 2005; Flood et al., 1997), required in the implementation of almost all strategies (Barney, 1991; Hambrick, 1987; Hambrick et al., 1996). As the management team may be valuable, rare, imperfectly imitable and non-substitutable, the attributes of the management team may satisfy the conditions for achieving and maintaining competitive advantage.

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However, an important idea that has sometimes been overlooked in literature is that management is not just 'a' valuable element. Rather, it is the catalyst for resource-based theory (Mahoney, 1995). In our research model the upper echelon of the firm will play a central role and its catalyst function will be recognized. Thus, managers are a unique organizational resource in se (Daily et al., 2000), previously often classified under the general heading 'human capital resources' (Barney, 1991). And in addition, as a source of human capital, managers implement - through their postures and intentions (learning and selection mechanisms; cfr. infra) - processes, routines and strategies that in turn enhance firm wealth creation (Hambrick et al., 1996; Hitt et al., 2001a; Ray et al., 2004; Teece et al., 1997). As Penrose suggests: "the experience of management will affect the productive services that all its resources are capable of rendering" (Penrose, 1959: p.5). Penrose considers the growth of the firm as limited only in the long-run by its internal management resources. As such, in Penrose's theory management can be the accelerator as well as the brake for the growth and value creating process (Mahoney, 1995; Starbuck, 1965), thus recognizing management as a catalyst. This view has been called the "Penrose theorem" (Marris, 1964). The resource coordinating and recombining ability of management (often termed 'capacity') is generally considered intangible (Amit & Schoemaker, 1993; Camelo-Ordaz et al., 2003; Grant, 1991).

### **The resource-based model: components and meaning**

We will now elaborate on the precise meaning of the model components in view of the resource-based focus: new value created, the creating process and the creator. We discuss their operationalization in this order. The specific measures for all variables included will be elucidated in the empirical chapter (Chapter 4).

#### *New value created*

As indicated earlier, in our operationalization new value created is seen as the complex operationally driven by a company's (radical) innovation, venturing and



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renewal efforts (Guth & Ginsberg, 1990; Zahra, 1995). Whereas in theory new value created can comprise both financial (e.g. revenue, profits, etc.) and operational indicators or drivers (cfr. supra), we focus on the operational drivers (innovation, venturing and renewal). This focus can be justified as follows. First, in this dissertation's set-up we focus on drivers of new value created on all levels (resources/capabilities as well as NVC). Second and related, previous research has been able to demonstrate to a certain extent that the operational drivers studied here (innovation, venturing and renewal) actually function as propellers of financial new value parameters (Zahra, 1991; Zahra & Covin, 1995). Our model will comprise all three types of NVC drivers to be tested simultaneously.

*Innovation.* For reasons to be specified later on, we focus on radical innovation (see Chapter 4). Our definition of radical innovation is congruous with the three out of five specific innovation cases mentioned by Schumpeter (1961): (1) the introduction of a new good not familiar to customers, (2) the development of a new quality of a good and (3) the introduction of a new method of production not yet tested by experience. As such, innovation as conceptualized in this study as well as in previous research (Zahra, 1993c; Zahra, 1996b) stresses creating new value by undertaking radical product and/or process innovations.

*Venturing.* The definition of corporate venturing is adopted from Sharma and Chrisman (1999). Venturing refers to diverse expressions of newly created business within the corporate organization. Examples are corporate start-ups, entering new geographic markets and other forms of market developments. Venturing may or may not result in forming organizational units that are distinct from existing ones in a structural sense. Pivotal in this definition of venturing is the creation of new business (Block & MacMillan, 1993; Miles & Covin, 2002; Zahra, 1995), distinct from innovation as just defined.

*Renewal.* Renewal reflects the transformation of companies through changing the scope of the firm's business and/or its business concept (Guth & Ginsberg, 1990; Stopford & Baden-Fuller, 1994; Zahra, 1996b). Renewal activities are not treated as new business by the organization (Sharma & Chrisman, 1999).

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Examples of renewal activities are writing off fading or less promising business and laying the foundations for new business.

*The creating process*

In operationalizing the creating process building on resource-based theory, we recognize the element heterogeneity by incorporating a range of tangible and intangible resources (stocks) and their management (capabilities or flows). The following resource stocks and capabilities or flows will be considered: patents and commercial secrets (stock), research and development (R&D) investment (stock), employee human capital (stock), human resource management (flow), networking (flow), intelligence generation (flow), and intelligence dissemination (flow). We will discuss the meaning of each of these resources in the context of our model.

*Patents and commercial secrets.* Patents confer firm-specific capabilities and processes to invent, innovate and discover new wealth-generating opportunities (Markman et al., 2004). As synonyms for protected, non-imitable products, processes and technology, patents are also referred to as technology resources (Borch et al., 1999). Commercial secrets are legally protected commercial knowledge, securing its value and giving the firm market power. As firm-specific, intangible resources they are difficult if not impossible to imitate (Teece et al., 1997). As such, both patents and commercial secrets constitute valuable and non-imitable, unique resources. Additionally, as patents are only granted to inventions that are useful, novel and non-obvious and firms pay very high fees to obtain and maintain ownership, they can also be considered as rare and non-substitutable. This confirms their strategic nature and increases their theoretical likelihood of leading to sustainable competitive advantage (Camelo-Ordaz et al., 2003; Hall, 1993; Mahoney & Pandian, 1992).

*Research and development (R&D) investment.* R&D investment is in itself a tangible resource. However, it is also often used as a reasonably effective proxy for capturing an enterprise's endowment of unique knowledge (an intangible

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resource) possessed by individuals and teams within the organization (Caves, 1982; Mahoney & Pandian, 1992). Firms that invest more in R&D should expect to gain greater knowledge and develop greater capabilities than firms that invest less (Dierickx & Cool, 1989; Helfat, 1997; Yeoh & Roth, 1999). This type of knowledge-based capabilities is considered to be more valuable, rare, inimitable and non-substitutable than strictly tangible assets, due to its increased tacitness and firm specificity (Galunic & Rodan, 1998).

To further substantiate the operationalization of the creating process, we will expand it from a human-resource-based perspective. We consider employee human capital and human resource management (HRM) as additional constituting elements of the creating process. The distinction between employee human capital and HRM is in alignment with the distinction in resource-based theory between the positions view and the managerial processes view. This distinction has also been made within strategic human resource management theory, using labels as 'human capital pool' (a highly skilled and motivated workforce) versus 'HR practices' (Boxall, 1996; Wright et al., 2001). Both are linked with two types of competitive advantage: human capital versus human process advantage (Boxall, 1996). A growing number of entrepreneurs and managers recognize the importance of human resources and their management (HRM) for developing the business (Katz et al., 2000).

*Employee human capital.* Recent innovation studies have moved away from research and development (R&D) centric approaches by focusing more broadly on the diversity of internal activities that help shape the innovation process. Managerial processes and resources other than formal R&D may be more appropriate for some small and newly established firms and service companies. Start-ups often cannot afford to establish separate R&D departments (Sundbo, 1999) and, in the service sector, innovation consists almost entirely of non-R&D related practices (Baldwin & Gellatly, 2003). Innovation and development in these types of companies must be taken care of by creative employees coming up with ideas and participating in developmental activities simultaneously. Obviously, in

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these circumstances employee human capital is of crucial importance (Sundbo, 1999). However, in contrast to the ample attention this topic has received on a more macro-economic level by for instance the development economics literature, little is known of the relationship between workforce characteristics and innovation or other value creation on the firm level. Management researchers have tended to focus more on the effects of workforce management practices and work organization on various measures of company performance (Michie & Sheehan, 1999; Shaw, 2004). Human capital is an intangible resource and is most valuable when it is firm and context-specific (Camelo-Ordaz et al., 2003; Hitt et al., 2001a; Hitt et al., 2001b). However, the same isolating mechanisms that safeguard human capital from expropriation also hinder our research efforts to identify, measure, and estimate its effect on competitive advantage (Hatch & Dyer, 2004). One solution to this problem is to look at the raw material of a firm's (employee) human capital: its (employee) human resource pool.

*Knowledge creating and sharing HRM.* Effective management of the human resources can spell success or failure of all firms, but especially of the entrepreneurial ones (Cardon, 2003; Leung et al., 2006). As such, next to the nature of the employee human resource pool also management practices developing it are likely to be conducive to corporate entrepreneurial activity. HR practices can engender human capital (e.g. through selection) and human process advantages (e.g. through team based pay) (Boxall, 1996). They support firms in implementing knowledge management to instigate innovation (Michie & Sheehan, 1999; Shadur & Snell; 2002). A basic premise of human capital theory is that firms do not own it; individuals do (Wright et al., 2001). Firms may have access to this valuable human capital through a series of HR practices effectively deploying and disseminating the (intangible) knowledge incorporated in the employee human resources. This system of HR practices can be unique, causally ambiguous and synergistic, and thus very difficult if not impossible to imitate.

*Networking.* Networking is an important element, often classified under the label 'organizational capital', 'social resources' or 'social capital' (Barney, 1991; Borch et

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al., 1999; Ireland et al., 2003b). Social capital is generally conceived in a very broad sense and can be defined as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or a social unit (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998). It is a multidimensional construct comprising a structural, a relational and a cognitive dimension. In our study we will concentrate on the structural dimension of social capital, meaning that we are concerned with the presence or absence of network ties between actors (here: organizations) (Wasserman & Faust, 1994). This focus on networks is not unusual, as on the organizational level social capital is most often operationalized through network relationships (Davidsson & Honig, 2003). Social networks refer to the particular ties that organizations use to connect with other stakeholders in the course of business activities (Shi et al., 2003). Networks serve as conduits of information about innovation, the availability and characteristics of resources, products and markets (Davidsson & Honig, 2003; Rogers, 2004; Vanhaverbeke et al., 2002). Such networks can be built on partnership-based (e.g. other firms, universities, etc.) and/or sponsorship-based (e.g. commercial banks) linkages (Lee et al., 2001). We will focus on the mere number of network ties used as a knowledge resource to improve and/or develop products, processes and so forth (network intensity).

*Market orientation.* Market orientation refers to a group of activities put into practice in order to provide greater value to the firm's customers (Vazquez et al., 2001). It is generally considered an important but complex resource providing a foundation for creating dynamic organizational capabilities and for organizational learning, thus having the potential for generating competitive advantage, especially for firms in dynamic and turbulent markets (Liu et al., 2002; Mahoney, 1995; Wright et al., 2001). Some have suggested that market orientation could also curb innovation and entrepreneurship through a (too) narrow focus on the markets known by the firm, leading to a tension or trade-off between the market orientation and the entrepreneurial proclivity of the firm (Christensen, 1997). We have reasons to believe otherwise. We are convinced that an

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entrepreneurial firm must find a right balance between both a customer-led and a customer-leading market approach in view of its combined exploration/exploitation efforts (cfr. *infra*). Highly responsive or customer-led firms focus exclusively on articulated customer needs and are likely to miss emerging entrepreneurial opportunities, being blinded by the tyranny of the market. A highly customer-led market approach can indeed lead to successful incremental adaptations of products or services to customers' needs, but might render the firm blind for renewal and for radical innovation opportunities in markets not known by the firm. A purely entrepreneurial, customer-leading approach on the other hand entails the high risk of market failure of the opportunities embarked upon, endangering the very survival of the firm. All things considered, this indicates the necessity for firms to combine exploitation (acting upon articulated customer needs) with exploratory learning and proactive initiative (Atuahene-Gima & Ko, 2001; Hamel & Prahalad, 1994). In view of this strive for balance, two particular market orientation aspects are of importance in the context of corporate entrepreneurship: market intelligence generation and dissemination. Intelligence generation pertains to present and future customer needs and it includes environmental scanning activities to detect how the customer needs are affected by government regulation, technology, competitors and so forth. Intelligence dissemination refers to the distribution of the generated market knowledge throughout the firm (Kohli & Jaworski, 1990). Market intelligence generation and dissemination can be seen as intangible resources and capabilities (Ray et al., 2004).

#### *The creator*

A major part of the available literature focusing on creator aspects of corporate entrepreneurship generally mentions entrepreneur(s) or top management team members as being key creating actors (Barker & Mueller, 2002, Hoffman & Hegarty, 1993; Lynskey, 2004). Although the influence of other management levels within the firm (such as middle management) can be considerable (Hornsby et al., 2002; Kanter, 1985), in this study we also focus on the firm's top

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management to substantiate the creator. Various reasons account for this focus. First, the average size of the firms investigated (cfr. *infra*: Chapter 3) reveals that the top management level is likely to stand for the bulk of the creator influence. Further, it can be argued that the creating process elements in general and capabilities or flows in particular reflect to a considerable extent the quality and competences of the other managerial levels (middle management etc.) closely connected to the capabilities concerned. Third and following, as managerial responsibilities mostly require a degree of higher education, the employee human capital variable (again a creating process resource) can serve as some kind of proxy for the non-top managerial levels.

Top management teams are seen as 'creators' because they have an impact on new value creation through their decisions affecting all elements of the creating process (Dimov & Shepherd, 2005). As a consequence, the logic of the management team or upper echelon as a resource is relatively dominant (Mahoney, 1995; Mahoney & Pandian, 1992). Moreover, the knowledge residing in the upper echelon is deeply embedded in the social context of the firm. This leads to an increase of the tacit component of that knowledge (Dimov & Shepherd, 2005; Spender, 1996). As most of a firm's knowledge and skills reside in its human capital, including that of the upper echelon, and as the ability to access and absorb knowledge affects the firm's efforts to create new value, it is imperative to include upper echelon human capital elements (or its proxies) into the research model as creator aspects. In addition and in the line of upper echelon theory (Hambrick & Mason, 1984), the human capital of the upper echelon is expected to exhibit a profound influence on all other resources and capabilities within the firm, such as access to information or other resources and social capital (Carpenter et al., 2004). Further, as the upper echelon functions as the aggregate knowledge and decisional centre through which value creation activities are propelled, we also include management learning and selection mechanisms as creator elements in our study. Whereas the demographics of the top management team refer to its human capital (position or stock), the learning and selection mechanisms pertain to management's perceptions, postures and strategic

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intentions as drivers for its decisions (cfr. *infra*). Considering both these classes of creator elements helps us to depict two different yet complementary sides of the creator coin.

The *demographic or composition side* of the top management team is stressed by upper echelon theory, stating that an organization and everything that goes on inside is a reflection of its top management or upper echelon (Carpenter et al., 2004; Hambrick & Mason, 1984). Upper echelon theory generally links observable characteristics such as management team member age, tenure, functional track and other career experiences, formal education and management team heterogeneity to the nature of managerial processes and organizational outcomes. As already noted, such demographic variables function as proxies for the human capital embodied in the upper echelon.

However, when it comes to its composition, the upper echelon is not a universally apt unit of analysis (Carpenter et al., 2004; Jackson, 1992; Pettigrew, 1992). If we are to understand the role of the upper echelon in a wide range of firms we may want to consider other important actors shaping the composition, behavior and orientation of the top management team in se. The demarcation of the upper echelon in this study includes human capital indicators of the top management team in se, as well as elements referring to ownership. The literature focusing on creator aspects of corporate entrepreneurship generally has recognized this demarcation of the upper echelon. It considers ownership structure to be of key importance in order to understand how new value comes into existence (Hoskisson et al., 2002; Love et al., 1996; Zahra, 1996b; Zahra et al., 2000).

The *top management team* is generally considered as a key creator (Barker & Mueller, 2002; Hoffman & Hegarty, 1993; Lynskey, 2004). Demographic variables frequently used as proxies for the human capital embedded in the top management team are age, educational background and industry experience (Carpenter et al., 2004; Cooper et al., 1994; Gimeno et al., 1997; Hsueh & Tu, 2004). A substantial amount of upper echelon research has focused almost exclusively



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on the chief executive officer instead of on the top management team as a whole (Carpenter et al., 2004; Hambrick & Mason, 1984). In this study we focus on the entire team, allowing inquiry into dispersion characteristics such as education and industry experience heterogeneity. Both these variables are highly relevant in terms of management team task relatedness (Pelled, 1996). A higher degree of heterogeneity is expected to improve team performance outcomes (Srivastava & Lee, 2005). When studying such characteristics, including top management team size is a necessity (Carpenter et al., 2004).

Second key creator composition element is *ownership*. Agency theory predicts that ownership structure (e.g. ownership concentration) and composition (e.g. institutional ownership) influence the degree of freedom and power possessed by executives (agents), be it directly or through the firm's governance structure. Ownership structure may therefore be considered as falling within the demarcation of the dominant coalition: the upper echelon. After all, ownership concentration has been identified as an important tool to curtail managers' propensity to pursue inefficient (i.e. endangering shareholder wealth) strategies (Hoskisson et al., 2002). Left alone, these executives may pursue objectives possibly thwarting the goals of the owners (principals) (Zahra & Pearce, 1989). Four elements with regard to ownership are included in the model: ownership concentration, foreign ownership, the presence of institutional owners and of private owners. Ownership by powerful and vigilant shareholders such as institutional owners (pension funds, banks, investment companies and so forth) or private owners (corporate or individual third party owners) is believed to affect manager's incentives to pursue corporate entrepreneurship (Gamble, 2000; Hoskisson et al., 2002; Zahra et al., 2000). Ownership concentration has been identified as an important tool to stimulate managers' propensity to pursue efficient strategies, enhancing value creating activities (Hoskisson et al., 2002). Foreign ownership is also believed to affect the likelihood of innovation and corporate entrepreneurship (Love et al., 1996).

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As far as *learning and selection mechanisms* are concerned, we include indicators for management's perception of the remote environment, its entrepreneurial strategic orientation and its strategic intentions. These perceptions, postures and intentions refer to management's action propensities, decision-making styles and learning and selection mechanisms (Atuahene-Gima & Ko, 2001; Dess & Lumpkin, 2005; Eliasson, 2003; Hayton, 2005; Lumpkin & Dess, 1996). We discuss each learning and selection mechanism consecutively.

*Management's perception of the environment.* As explained in Chapter 1, we can discern two types of environment on the conceptual level: the close and the remote environment. The close environment includes all the conditions and forces that are directly related to the 'creator-creating process-NVC' nexus (cfr. supra). It refers to the inside set of conditions (originating from within the nexus) the entrepreneurial process has to respond to. In essence, it thus is a dynamic concept, with its complexity varying in time. The initial degree of complexity depends on the type of the entrepreneurial project. And in the course of the entrepreneurial process the complexity continuously increases since the close environment expands and evolves. While growing research evidence suggests that such organizational conditions have a sound influence on firm entrepreneurial activities (Covin & Slevin, 1991; Zajac et al., 1991), agreement on which internal environmental conditions enhance corporate entrepreneurship is lacking (Hornsby et al., 2002). Consequently, exploratory research on this topic is needed. But in order to obtain sound, empirically grounded evidence a research design that suits the purpose is a necessary condition. Adequately studying this environmental aspect demands a longitudinal research design or at least a retrospective process focus. Our cross-sectional research design is not in line with this purpose (cfr. infra). In view of this, we reluctantly opt to exclude the internal environment from our model.

The remote environment, though, is included in the study. There is general consensus that the characteristics of the remote environment play an important role in firms' pursuits of corporate entrepreneurship (Guth & Ginsberg, 1990; Katila & Shane, 2005; Sathe, 2003). Though the relationship between the (remote)

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environment and company performance (including new value created) has been the subject of a fierce discussion in the literature (Boyd et al., 1993; Zahra & Bogner, 2000), there is agreement that managers' perception of their firm's environment significantly influences the firm's behavior and pursuit of corporate entrepreneurship (Grant, 2005, Zahra, 1993b). Eisenhardt and Martin (2000) and Zahra and Bogner (2000), for instance, postulate that the pattern of firm capabilities is triggered or shaped by environmental characteristics, such as market dynamism. Further, literature expresses the need to use multiple dimensions to capture executives' perceptions of their firm's environment and to tie these dimensions to the goals of the research (Zahra, 1993b; Zahra & Pearce, 1989). Two such dimensions in particular are: munificence and hostility (Tsai et al., 1991; Zahra, 1993b). *Munificence* reflects the richness of opportunities for corporate entrepreneurship in an industry (Aldrich, 1979; Zahra, 1993b). In our study it is embodied through two sub-dimensions: technological opportunities (perceived availability of new pockets of demand for new or existing technologies) and the importance of new products (weight assigned by an industry to the role of new products for creating and retaining a competitive position) (Zahra, 1993b). *Hostility* shows the unfavorability of environmental forces for a firm's business (Zahra, 1991; 1993b). Hostility will be represented in the model by means of the competitive rivalry sub-dimension, referring to the intensity of competition in a certain market. Fierce rivalry is expected to stimulate corporate entrepreneurship (Zahra, 1993b). To summarize, as a first learning and selection mechanism we consider top management's perception of the technological opportunities, the demand for new products and the competitive rivalry in their firm's environment. In Chapter 4 we elucidate the role of these environmental aspects in our model.

The two final learning and selection mechanisms (strategic orientation and intended strategy type) refer to business strategy. Business strategy determines how resources are structured, managed or deployed (Chrisman et al., 1998). The theoretical perspective on strategy such as the one offered by the resource-based

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perspective tends to view strategy development in terms of building resource strengths that did previously not exist (Page West III & DeCastro, 2001). Formulating or developing an (intended) strategy implies making choices about the accumulation of the resources required (Dierickx & Cool, 1989). This does not only apply to the strategy type, but also to the strategic orientation as the latter is recognized as a posture affecting the allocation of resources (Venkatraman, 1989a). In other words, including business strategy type and strategic orientation as model components is in line with the resource-based perspective used to approach the corporate entrepreneurship construct.

*Strategic orientation.* A strategic orientation can be seen as decision-making style, a posture or a frame of mind coloring the practices used to identify and pursue entrepreneurial opportunities (Covin & Slevin, 1989; Dess & Lumpkin, 2005; Lumpkin & Dess, 1996). Particularly in a corporate entrepreneurship context, an entrepreneurial strategic orientation (also known as ‘entrepreneurial orientation’) can bring benefits to firms (Dess & Lumpkin, 2005; Wiklund & Shepherd, 2005). It involves a willingness or a disposition towards rejuvenating and regaining or maintaining an entrepreneurial spirit (Eliasson, 2003; Hayton, 2005, Zahra, 1991). As an orientation it serves as a learning and selection mechanism that aims to maintain coherence between management’s intent (i.e. corporate entrepreneurship) and exploratory behaviors or activities such as resource accumulation and (re)combination (Atuahene-Gima & Ko, 2001). It is intangible, dispersed and can color the firm’s capabilities and routines (Lee et al., 2001). An entrepreneurial orientation involves multiple dimensions that can vary independently from each other (Lumpkin & Dess, 1996; Dess & Lumpkin, 2005). We select two dimensions that are particularly important to consider in a resource-based context: aggressiveness and futurity. *Aggressiveness* refers to the posture adopted by a business’ management in its allocation of resources for improving market conditions and market development in order to outperform its competitors (Dess & Lumpkin, 2005; Venkatraman, 1989a). *Futurity* reflects proactive, temporal considerations in key strategic areas (Venkatraman, 1989a). It suggests a forward-looking perspective and is manifested by an increased

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emphasis on areas deemed important to create future firm wealth, such as resource accumulation and (re)combination.

*Intended strategy type.* Resources are more likely to be a source of competitive or entrepreneurial advantage if they are used to do something, i.e. if they are exploited through business processes and management practices or if they are structured and bundled to form capabilities and leveraging these (Baden-Fuller, 1995; Ireland et al., 2003b; Priem & Butler, 2001; Ray et al., 2004; Wernerfelt, 1984). As Grant (1991) argued in his resource-driven strategy framework, extending and upgrading the firm's pool of resources and capabilities based on a selected strategy is a promising path toward building resource-based competitive advantages. Resource bundling and structuring are thus assumed to be affected by business strategy. Strategy type then describes the content characteristics of management's intended strategy: the importance attached to what is intended to be played as the company's trump while competing on the market. We focus on two particular strategy types (technology and innovative differentiation) for two reasons. First, both these have been identified as important in the context of (corporate) entrepreneurship (Carter et al., 1994; Durand & Coeurderoy, 2001; Zahra & Covin, 1993). And second, both reflect choices or intentions that can be considered valuable for exploitation as well as exploration, whereas other types of strategy (e.g. cost leadership) usually affect only one of both (e.g. exploitation). Zahra (1993c), for example, found price competition as a chosen strategic arena to be negatively associated with new product introduction (innovation). Strategies such as a cost leadership strategy are therefore not necessarily strategies leading to new entrepreneurially created value (through innovation, venturing or renewal).

The strategic management of technology is considered an extremely important issue in the corporate entrepreneurship literature (Zahra & Covin, 1993). A company can use technology to create a competitive advantage by raising entry barriers for rivals, by developing and introducing novel products creating innovation and new business or by changing the rules of competition in an industry (Zahra, 1996a). However, technology is closely linked certain industry

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sectors (especially the medium or high-tech sectors). In order to be able to study corporate entrepreneurship in a more economy-wide setting (including low-tech, services and so on) we discern a second type of strategy deemed important in the context of corporate entrepreneurship: innovative differentiation. This strategy focus reflects firms seeking to distinguish themselves by means of distinctive (contemporary, attractive) products or services (regardless of technology) (Carter et al., 1994; Durand & Coeurderoy, 2001).

To summarize, this study's model contains the following classes of elements: (1) new value created drivers (innovation, venturing and renewal), (2) creating process resources (portfolio) and (3) creator elements (composition (TMT and ownership) elements and learning and selection mechanisms, including management's perception of the remote environment, entrepreneurial strategic orientation and intended strategy). In the following paragraph, we will compare our research model with models previously conceptualized in literature.

## **PRIOR MODELS OF CORPORATE ENTREPRENEURSHIP**

As far as its set-up is concerned, our model of corporate entrepreneurship is distinct from prior models in several respects. We discuss six prior models frequently cited in literature and/or published in major management journals (e.g. *Academy of Management Review*, *Journal of Business Venturing*, etc.) or presented at high-profile entrepreneurship conferences (e.g. *Academy of Management Annual Meeting*). The models concerned are (in order of discussion): the model of Hornsby et al. (1993), Covin and Slevin (1991), Lumpkin and Dess (1996), Ireland et al. (2003a), Antoncic and Hisrich (2001) and Zahra (1991). Afterwards, we compare the composition of these models with that of our own model. Although some of the prior models mentioned might seem outdated at first sight, even today they continue to belong to the very core of the corporate entrepreneurship field, as reflected through their citations (Schildt et al., 2006).

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The model of Hornsby et al. (1993) outlines a decision process model describing the antecedents of an individual (associated with an organization) deciding whether or not to “act intrapreneurially”. It is rather limited in scope, focusing solely on the drivers of individuals to act as an intrapreneur. Corporate entrepreneurship is seen here as the development and implementation of an entrepreneurial idea (not further specified) by individuals in an organizational context. As such, this model is purely concerned with corporate entrepreneurship as an informal and bottom-up phenomenon (‘intrapreneurship’), thus disregarding the fact that corporate entrepreneurship can also be undertaken top-down and from a formal, strategic point of view. Elements of the remote environment and strategy are not included in the model.

The models of Covin and Slevin (1991) and Lumpkin and Dess (1996) are very similar. They both focus on corporate entrepreneurship as firm behavior. They include elements of the remote environment and strategy. As far as the latter is concerned, Covin and Slevin (1991) conceptualize strategy as an antecedent and as an outcome of corporate entrepreneurship, whereas Lumpkin and Dess (1996) study only strategy’s antecedent side. Both models explicitly suggest moderating or mediating effects (such as strategy, environment or organizational variables such as structure) in their conceptualization of corporate entrepreneurship. In these models, however, corporate entrepreneurship is put equal to the firm top management having an entrepreneurial posture or orientation, i.e. the presence of organizational behavior reflecting innovativeness, risk taking and proactiveness. As a result, the models can be criticized in several respects (Ireland et al., 2003a). First, they look solely at the top management level as playing a role in obtaining corporate entrepreneurial success within the organization. So the possibility of corporate entrepreneurship growing from the bottom up is put aside here. Second, these models lack the action orientation of true behavioral models of corporate entrepreneurship. After all, risk taking, proactiveness and striving for innovation can hardly be considered as solid corporate entrepreneurial outcomes, as examples of newly created value. Rather than to see entrepreneurial orientation

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as a synonym for corporate entrepreneurship, entrepreneurial orientation should in fact be considered an antecedent (Eliasson, 2003).

The model of Ireland et al. (2003a) runs parallel with the Covin and Slevin (1991) and Lumpkin and Dess (1996) models on several issues. It includes elements of the remote environment and strategy. It focuses on corporate entrepreneurship as firm behavior, although this behavior is operationalized through more solid indicators. As opposed to both previous models, the Ireland et al. (2003a) model does specify where to look for the roots of corporate entrepreneurship: at the top, middle and first levels of management. As such, corporate entrepreneurship is seen as a pure top-down phenomenon, instigated by management. Furthermore, the model solely focuses on corporate entrepreneurship as a strategy, as a formal and planned phenomenon. In this respect, it can be seen as the mirror image of the Hornsby et al. (1993) model.

The Antoncic and Hisrich (2001) model looks upon corporate entrepreneurship (although labeled 'intrapreneurship') as firm behavior. It includes elements of the remote environment and strategy (as an antecedent). Corporate entrepreneurship is conceptualized by means of four dimensions: venturing, renewal, innovativeness and proactiveness. All four dimensions refer to outcomes of corporate entrepreneurship, regardless of the methods used and practices implemented to obtain the outcomes. As such, it is – albeit implicitly – receptive for both top-down and bottom-up, formal and informal corporate entrepreneurship. Unfortunately, the corporate entrepreneurship or new value outcomes Antoncic and Hisrich (2001) propose cannot easily be differentiated from each other, as for example new business venturing and self-renewal can overlap with proactiveness. Both can be undertaken proactively in order to lead rather than be lead by competitors. However, distinctiveness of corporate entrepreneurial outcomes is a mandatory definitional condition (Zahra, 1993b).

Finally, the Zahra (1991) model of corporate entrepreneurship is again a behavioral model. It also includes elements of the remote environment and strategy (as an antecedent). Moderating or mediating effects are not mentioned. Corporate entrepreneurship is defined very thoroughly, including venturing,



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renewal and innovation outcomes. It explicitly states that corporate entrepreneurship may take place at the corporate, division, functional or project levels, thus acknowledging the fact that corporate entrepreneurship can be induced top-down as well as bottom-up. The Zahra (1991) model (Figure 4) has the greatest similarity to the one developed in this dissertation.

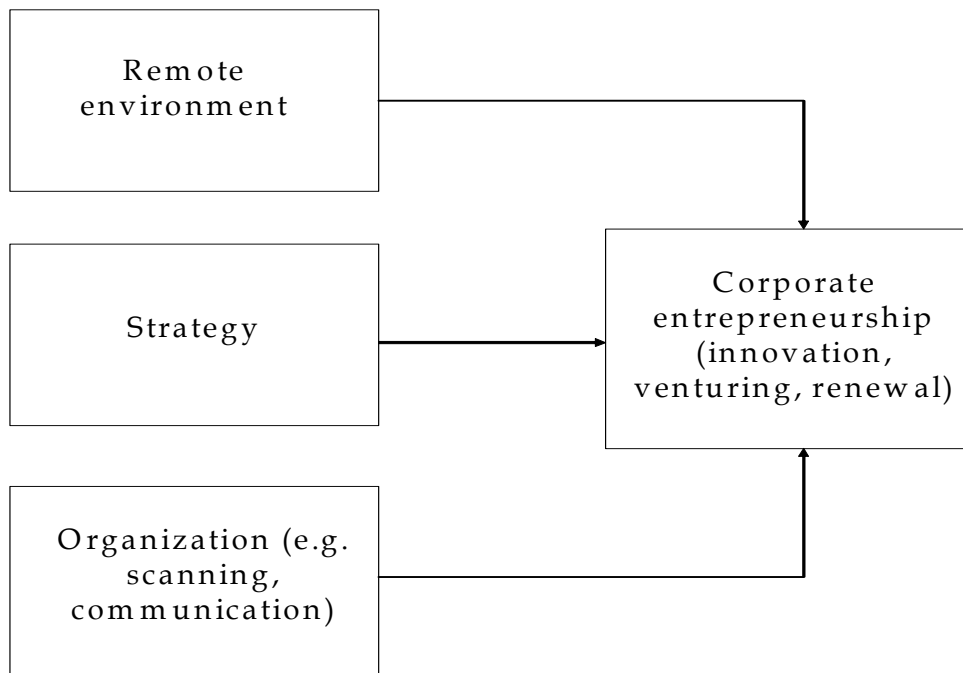


Figure 4. Zahra (1991) model of corporate entrepreneurship.

Compared to the prior models of corporate entrepreneurship discussed above, our conceptual model has the following strengths as far as its composition and set-up are concerned. First of all, it departs from the nexus framework of corporate entrepreneurship. To date, no empirical entrepreneurship or corporate entrepreneurship research building on the nexus framework is at hand. This aspect clearly differentiates our approach from all previous corporate entrepreneurship models.

Table 5. Comparison of corporate entrepreneurship models

	CE nexus	Environment	Strategy as antecedent and/or outcome	Firm-level behavior outcomes	Top-down and bottom-up	Inclusion of mediating or moderating effects
Hornsby et al. (1993)	N	N	N	N	N	N
Covin & Slevin (1991)	N	Y	Y	N	N	Y
Lumpkin & Dess (1996)	N	Y	Y	N	N	Y
Ireland et al. (2003a)	N	Y	Y	Y	N	N
Antoncic & Hisrich (2001)	N	Y	Y	Y	Y	Y
Zahra (1991)	N	Y	Y	Y	Y	N
Our model	Y	Y	Y	Y	N	Y

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Second, the outcome component of the corporate entrepreneurship nexus (new value created) includes venturing, renewal and innovation. It thus focuses on measurable outcomes of overt and demonstrable firm behavior and actions, as opposed to the entrepreneurial orientation models. Third, the model considers elements of the remote environment of the corporate entrepreneurship nexus. Fifth, it takes business strategy (intended strategy and entrepreneurial strategic orientation) into account (as an antecedent of new value created). Finally, mediating effects (e.g. of the creating process) will be explicitly included (cfr. *infra*).

Table 5 compares the composition (on all six topics raised in the discussion) of our conceptual model with the six prior models of corporate entrepreneurship discussed. A topic taken into account in a model is marked with 'Y', otherwise 'N' is used. As far all topics are concerned our model is distinct from several prior models, but not from all. On the whole, table 5 illustrates that the composition of our model offers considerable value added compared to that of the existing major corporate entrepreneurship models.

## CONCLUSION

Using the resource-based perspective of the firm as a lens can be a promising way of charting the corporate entrepreneurship phenomenon through its focus on firm internal activities and resources to explain performance differences among firms. However, although researchers have used resource-based theory to study corporate entrepreneurial performance in the past, it has often been inadequately applied. Most research seems to have concentrated on resource stocks (e.g. Thomson & McNamara, 2001; Wiklund, 1999; Zajac et al., 1991). The capabilities or flows have thus been largely neglected although these might also be appropriate to explain performance differences. Further, intangibles resources have received little attention in empirical research, notwithstanding that these resources can be very apt for pursuing wealth creation and sustainable competitive advantage. Still further, many of the resource constructs used in

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corporate entrepreneurship research failed to recognize the heterogeneity of resources, studying only one or a limited set of resources in a research setting rarely reflecting a true-type complexity (excluding business strategy and the remote environment).

All in all, the critical question of how resources and their management (capabilities) contribute to company performance through corporate entrepreneurial activities remained unanswered (Teng, 2003). Advancing knowledge on this particular question by means of a theoretically solid and an empirically grounded approach is the focal point of this dissertation. From that intent, we have developed a model of which the composition excels that of existing major corporate entrepreneurship models. Further, we have operationalized the model to use the resource-based lens in a more adequate way. Doing so, we depart from an elaborate portfolio (including creator and creating process elements) containing both tangible and intangible resources and managerial processes. This portfolio explicitly takes into account the importance of managerial practices (flows) for developing new firm value, next to resource stocks or positions. In order to obtain a real-life mirror image of the complex corporate setting, we have also included business strategy (strategic orientation and strategy type) and the remote environment (management's perception of important environmental dimensions) as model elements.

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## **CHAPTER 3**

### **SAMPLE AND METHODS**

#### **INTRODUCTION**

In this chapter we briefly elaborate on the sample and the methods used to perform the analyses. In particular, we discuss the PASO 2004 survey and we provide a breakdown of the sample on which the analyses are based. As far as the methods are concerned, we focus on the why's of partial mediation and on the how of path analysis and of the calculation of the resources and capabilities' indirect and total effects.

#### **SAMPLE**

Before we focus on the sample breakdown, we briefly summarize the basic features of the PASO 2004 survey from which the sample draws.

##### **PASO 2004 survey**

The PASO 2004 survey was jointly financed by the Policy Research Center "Entrepreneurship, Enterprises and Innovation" and by Panel Study on Organizations (PASO) Flanders. Congruous with the PASO methodology (De Winne et al., 2003), an economy-wide and stratified random survey sample was chosen, with industry and size as stratification variables. It covered all sectors of the Flemish economy, including public and non-profit organizations such as schools, hospitals, police stations et cetera. A minimum size limit of one employee at establishment level was the only inclusion criterion applied. A comparison of the PASO 2004 survey with both its predecessors (PASO 2002 and 2003) reveals two points of difference. First, PASO 2004 was specifically developed to focus on

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innovation in the very broad sense (including corporate entrepreneurship). PASO 2002 and 2003 respectively had internal labor markets, work systems and HRM as their primary focus. Second, whereas for PASO 2002 and 2003 the firm's HR manager was the targeted respondent, PASO 2004 aimed at contacting the firm's chief executive officer (CEO) or the organization's chief responsible. Executives are the best knowledgeable sources of firm-level information (Norburn & Birley, 1988). For some types of information (e.g. strategic or other process information) chief executive officers may be the only viable source (Cycyota & Harrison, 2006).

The PASO 2004 survey's content topics were innovation and corporate entrepreneurship, approached from many angles. These include product and process innovation, venturing, workforce, HRM, company structure, finance, project management, market characteristics, strategy, top management team, ownership and so forth. Based on an extensive review of relevant literature, all angles were operationalized by means of specific innovation and/or corporate entrepreneurship oriented questions.

Three versions of the questionnaire were distributed, either electronically or by mail. The first version is the full questionnaire (counting 40 pages). This version was sent to all for-profit organizations (firms) with at least 10 employees. The second version is a shortened copy of the first version whereby some questions have been deleted. This was done in view of the population it was sent to: firms with 1 to 9 employees. Questions that were not deleted were identical to those of the full version. The third version was also a shortened copy of the full questionnaire. However, since this version targeted quaternary sector organizations, some questions were reformulated in order to match the specific organizational target group. The general response rate for the PASO 2004 survey was 21.36%.

### **Sample breakdown**

The sample on which the analyses will be based forms a subset of the full PASO 2004 sample. This subset was delineated as follows. First, in view of this study's focus on corporate entrepreneurship and new value creation, we eliminated all

non-profit firms. Second, in order to obtain data on the full range of variables of interest for this study (e.g. the TMT demographics are not available for the firms with 1 to 9 employees (second questionnaire version)), focusing on firms that had received and filled in the first version of the questionnaire (full version) was a necessity. This implies that only firms with at least 10 employees make part of the subset studied. The subset thus demarcated counts 844 firms. However, as the path analytical tool used only accepts cases with complete data, not all 844 firms will in fact be used to estimate the models. Cases with one or more missing values will be dropped, leading to a final sample size of 213 firms.

We will now give a brief, descriptive overview of the sample in order to profile the firms we are dealing with in the analyses. More specifically, we will focus on demographic dimensions such as size, age, industry and family business character. All these dimensions can be relevant as background information in interpreting the results. For each dimension we will compare the final sample (N=213) with the full one (N=844).

Table 6. Size distribution of the sample (%)

<b>Size range</b>	<b>N=844</b>	<b>N=213</b>
=< 49 employees	59.3	66.7
50-99 employees	19.7	19.2
100-199 employees	14.7	8.9
>=200 employees	6.3	5.2
Total	100	100

Table 6 reflects the size distribution of the sample. We notice the dominance of small and medium sized enterprises (SMEs) (up to 99 employees). Large firms (100 employees or more) account for about 14% of the final sample. Differences with the full sample are small. Still, compared to the full sample, the share of small and medium sized companies is even more striking. This could suggest that the SMEs did a somewhat better job in filling in the questionnaire compared to

their larger counterparts, resulting in fewer missing values (and fewer case dropouts).

Table 7. Age distribution of the sample (%)

<b>Age range</b>	<b>N=844</b>	<b>N=213</b>
=< 5 years	15.2	15.0
6-10 years	17.6	15.0
11-15 years	22.3	25.8
16-25 years	19.8	20.2
>= 26 years	25.1	23.9
Total	100	100

The age distribution of the final sample (Table 7) is comparable to that of the full one. Seventy percent of the (final) sample is 11 years or older. Even “second generation” firms ( $\geq 26$  years) are well represented (24%). On the whole, we can say that our sample counts about 70% mature firms and 30% young firms (10 years or less).

Table 8. Industry distribution of the sample (%)

<b>Industry</b>	<b>N=844</b>	<b>N=213</b>
Manufacturing and energy	32.7	36.6
Construction	10.2	9.4
Wholesale and retail	25.4	26.3
Catering	5.1	5.2
Transport and communication	12.0	10.3
Finance, real estate and services to firms	14.7	12.2
Total	100	100

The demarcation of the industry sectors of Table 8 is based on the Nace-Bel codes. As far as industry representation is concerned, we again don’t observe striking differences between the full and the final sample. On the whole, two sectors



together almost represent two thirds of the final sample (63%): manufacturing and energy plus wholesale and retail. Manufacturing and energy itself stands for about 37% of the sample.

Table 9 reflects to which extent our sample's firms can be typified as family businesses (i.e. businesses that are owned and managed by members of one family). About half of our sample can be put in the family business category. In these firms management and ownership go hand in hand.

Table 9. Family business distribution of the sample (%)

<b>Industry</b>	<b>N=844</b>	<b>N=213</b>
Family business	46.2	53.5
No family business	53.8	46.5
Total	100	100

## **METHODS**

As stated in the introduction, the focal point of this dissertation boils down to investigating how resources and capabilities can contribute to corporate entrepreneurial success and which elements (or configurations) prove to make a difference. As far as the methods to achieve this objective are concerned, three (related) issues need clarification: the general model set-up (partial mediation), the tool used to estimate the model and the path coefficients (path analysis) and the further handling of these coefficients (calculating indirect and total effects). In view of the set-up of Chapter 4 (research themes with separate model development and immediate analysis) it is necessary to discuss these issues beforehand. In the methods section we therefore elaborate on the why's and/or how's of these three issues. We begin with explaining partial mediation.

### **Partial mediation**

Some of the models that will be developed in Chapter 4 will be mediated models. Mediation is a specific operationalization of co-alignment or fit among variables

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(Venkatraman, 1989b). *Mediation* tests specify the existence of an important intervening mechanism (e.g. a creating process element) between an independent variable X (e.g. a creator element) and the dependent variable Z (e.g. an NVC driver). *Partial mediation* implies that a direct relationship between the independent and dependent variables exists next to an indirect relationship that includes the mediating ('intervening') variable Y (Edelman et al., 2005; Venkatraman, 1989b). To illustrate this with an example from our analyses (cfr. *infra*; see Theme 5 of Chapter 4), a creator element X (e.g. TMT size) for instance is hypothesized to have a direct effect on the newly created value drivers (Z) (e.g. innovation) as well as an indirect effect via a creating process element (e.g. HRM) that is itself connected to newly created value. In this simplified example, HRM is the mediating variable Y. This example is reflected in Figure 5.

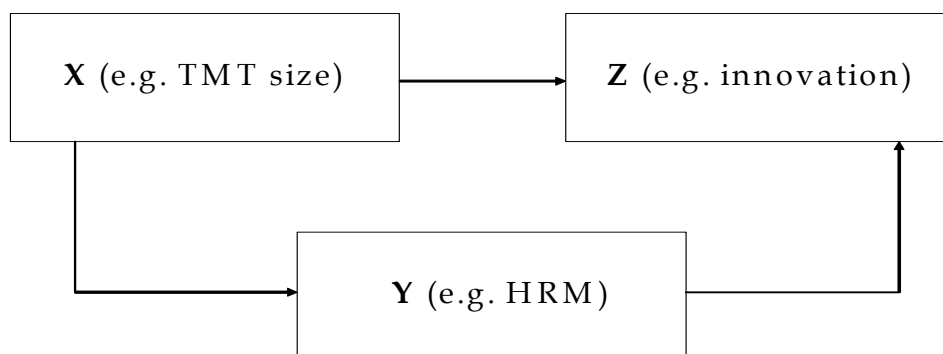


Figure 5. A schematic representation of partial mediation.

Another simple example is the relationship between an ownership variable (e.g. ownership concentration) and a creating process variable (e.g. R&D) mediated by a TMT element (e.g. TMT size). In practice, though, a series of variables (e.g. *all* creating process elements) will constitute the intervening mechanism in our model. We thus consider more than two variables in specifying their “fit”.

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It is this specific feature of co-alignment in our model that points to the use of mediation instead of moderation. The latter is only applicable to modeling fit between two variables (Schoonhoven, 1981; Venkatraman, 1989b). Although moderation also has its strengths (e.g. it allows more advanced functional forms of fit, such as quadratic effects), we – building on Venkatraman (1989b) – prefer (partial) mediation because it better suits the purpose of our study. It represents the generative mechanism through which the independent (antecedent) variable affects the dependent variable of interest (Baron & Kenny, 1986). Technically, it decomposes the effects independent and mediating variables have on the dependent variable(s) into direct and indirect effects (Edelman et al., 2005; Venkatraman, 1989b) (cfr. *infra*). In doing so, it reveals *why* and *how* certain events occur (e.g. the creator – NVC link), as opposed to moderation which addresses *when* particular events will hold (Baron & Kenny, 1986). As such, it fits the study’s objective as it clarifies how resources affect the NVC drivers (direct/indirect). And it enables a more accurate estimation of the resources’ total contribution to innovation, venturing and renewal.

### **Path analysis**

Tests of fit as mediation usually are carried out within a path-analytical framework (Duncan, 1972; Venkatraman, 1989b). In what follows, we will briefly explain the essence of path analysis. In doing so, we build on Figure 5 (cfr. *supra*). The model reflected here assumes that (1) Z is affected by X and Y and (2) Y depends on X. All of this is visualized by means of arrows.

In this dissertation we turn to recursive path analysis with manifest (i.e. directly measured, non-latent) variables. A first important issue that needs clarification is the distinction in path analysis between endogenous and exogenous variables. An *endogenous* variable is one whose variability is predicted to be affected by other variables in the model (Hatcher, 1994). In graphical terms, any variable that has an arrow (directed path) pointing at it is an endogenous variable. Applied to the simple model depicted in Figure 5, variables Y and Z are endogenous variables. An *exogenous* variable is then a variable that is influenced

only by ‘variables’ that lie outside of the model tested. Graphically, it does not have any arrow pointing at it. In Figure 5, X is the exogenous variable. In terms of the model specified, exogenous variables are always independent. Endogenous variables can be dependent (e.g. Z) or both dependent and independent (e.g. Y). The model of Figure 5 is a *recursive* model. Its causation flows in only one direction. In *non-recursive* path models causation may flow in more than one direction, either directly (e.g. A affects B and B affects A) or through feedback loops (A affects B, B affects C and C affects A). Non-recursive models are considered even more complex than their recursive counterparts.

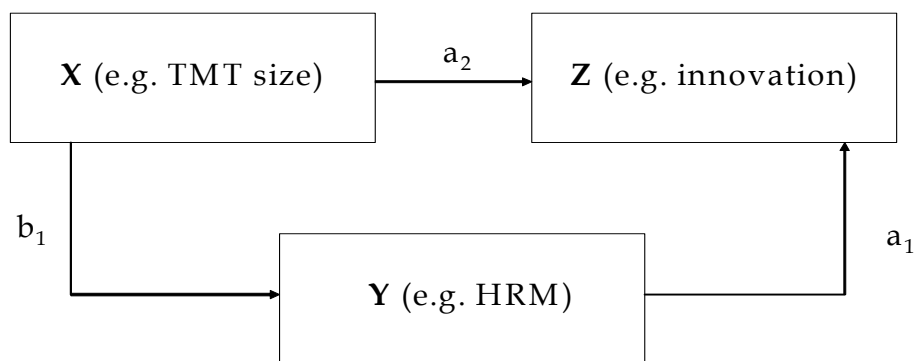


Figure 6. Simple path model.

When it comes to statistically modeling the proposed causal flow in order to test it, we must translate the model into a set of equations. For each endogenous variable we must provide an equation which reflects the paths affecting the variable concerned. The following set of two equations models the flow of Figure 6:

$$Z = a_0 + a_1 Y + a_2 X + e_1 \text{ (or: } Z \text{ is affected by } Y \text{ and } X\text{)}$$

$$Y = b_0 + b_1 X + e_2 \text{ (or: } Y \text{ is affected by } X\text{)}$$

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Put differently, the model of Figure 6 is now translated into a set of related (linear) equations whereby each equation resembles a normal, linear regression equation (including intercept (often put equal to zero) (e.g.  $a_0$ ) and error term (e.g.  $e_1$ )).  $Y$  is a mediator since in this set of equations it is both a dependent (left hand side) and an independent (right hand side) variable. Model estimation boils down to estimating the set of equations. In this dissertation this was executed by means of the CALIS procedure in SAS.

### **Direct, indirect and total effects**

Once the set of equations has been estimated, we can calculate the total effects of the (relative) independent and dependent variables of interest. In doing so, we follow the approach explained by Sharma (1996). These total effects are important since they reflect the full influence of one variable on another. We first illustrate the calculation by means of the simple, full model presented in Figure 6. Afterwards, we turn to a somewhat more advanced, hands-on example.

Building on Figure 6, the direct effect of  $Y$  on  $Z$  is given by the estimated coefficient  $a_1$ . Since there are no variables intervening or mediating the relationship  $Y \rightarrow Z$ , there is no indirect effect of  $Y$  on  $Z$ . The total effect of  $Y$  on  $Z$  equals the sum of its direct and its indirect effects on  $Z$ . In this case, the total effect is the same as its direct effect. In the case of the relationship  $X \rightarrow Z$ ,  $Y$  is an intervening variable. So, here there will not only be a direct effect of  $X$  on  $Z$ , but also an indirect effect (via  $Y$ ). The following equation illustrates this.

$$\begin{aligned} \text{Total effect}_{(Z, X)} &= \text{Direct effect}_{(Z, X)} + \text{Indirect effect}_{(Z, X)} \\ &= a_2 + b_1 * a_1 \end{aligned}$$

The direct effect of  $X$  on  $Z$  is represented by the estimated coefficient  $a_2$ . The indirect effect is obtained through multiplying the estimated coefficients of the two paths that run from  $X$  over  $Y$  to  $Z$ :  $b_1 * a_1$ . Again, the total effect is the mere sum of the direct and the indirect effects.

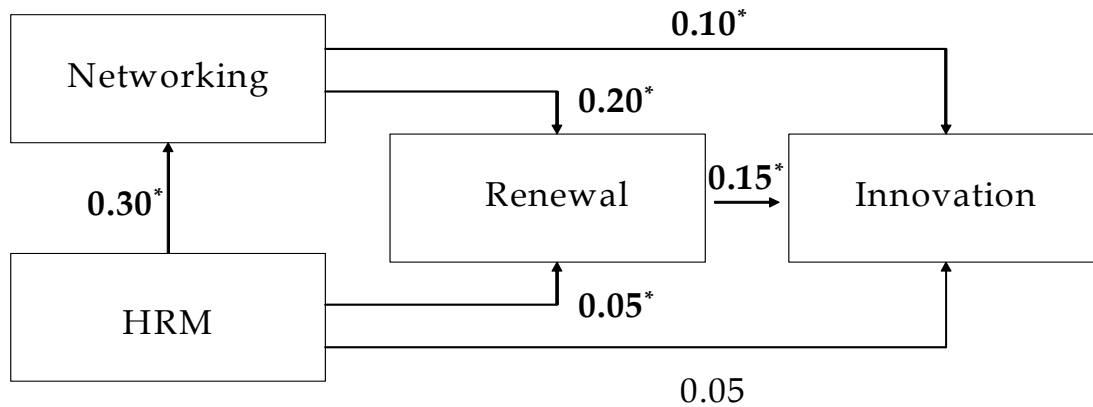


Figure 7. Illustrative path model.

Let us now turn to the slightly more complex, estimated path model illustrated in Figure 7. We assume that its goodness-of-fit is acceptable so that we can pass on to the calculation of the indirect and the total effects. In the calculation we only use the coefficients of the significant paths (in bold and marked with \* in Figure 7). Non-significant paths coefficients need to be considered equal to zero, which makes it pointless to use them in further calculations.

In this example, we are particularly interested in the total effects of networking, HRM and renewal on innovation. The coefficients of the (significant) paths going directly to innovation reflect the direct effects (if any) of renewal, networking and HRM on innovation. Further, as can be deduced from Figure 7, renewal has no indirect effects on innovation.

Table 10. Direct, indirect and total effects on innovation (example)

Effect of ... on innovation (INNO)	Direct effect (D)	Indirect effect (I)	Total effect (D+I)
Renewal (REN)	0.15	/	0.15
Networking (NTW)	0.10	$0.20 * (\text{REN-INNO})$ $= 0.20 * 0.15 = 0.03$ $0.15 * (\text{HRM-REN}) +$ $0.30 (\text{NTW-INNO})$ $= 0.15 * 0.11 + 0.30 * 0.15$ $= 0.06$	0.13
HRM	/		0.06

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The indirect effect of networking on innovation goes through renewal, whereas that of HRM runs through networking and renewal. In view of this, we will first calculate the total effect of renewal on innovation, followed by that of networking and last of all by that of HRM. Table 10 summarizes the calculation.

Table 10 illustrates that the calculation of the indirect effect of HRM on innovation depends on (1) the (total) effect of HRM on renewal and (2) the (total) effect of networking on innovation. The latter followed from the previous step (NTW-INNO) and stands at 0.13. The indirect effect of HRM on innovation via networking is therefore:  $0.30 * 0.13$ . In order to be able to calculate the indirect effect of HRM on innovation via renewal, we need the total effect of HRM on renewal. This particular total effect is itself the sum of the direct effect of HRM on renewal (0.05) plus the indirect effect of HRM on renewal via networking ( $0.30 * 0.20$ ). This gives us a total effect of HRM on renewal of 0.11. The indirect effect of HRM on innovation via renewal is then  $0.15 * 0.11$ . The full indirect effect of HRM on innovation is then 0.06. As there is no (significant) direct effect of HRM on innovation, the total effect of HRM on innovation is also 0.06.

Although more complex than the theoretical example of Figure 6, the illustrative calculations of Figure 7 are still simple compared with the calculations that will be necessary to obtain the total effects of the resources and capabilities in the models in Chapter 4. However simple, the example above demonstrates how the indirect and total effects of the variables are calculated.

## CONCLUSION

In order to prepare for the subsequent empirical chapter, we have briefly described the sample on which the analyses will be based, including the PASO 2004 survey from which the sample draws. In addition, we have also explained three method issues important to keep in mind when going through the empirical results. We have elaborated on partial mediation, we have explained path analysis in general terms and we demonstrated how indirect and total effects are



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calculated. Armed with this important background knowledge, we can now turn to the empirical chapter of this dissertation.

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# **CHAPTER 4**

## **CORPORATE ENTREPRENEURSHIP: INTEGRATIVE ANALYSES**

### **INTRODUCTION**

In this chapter we present the empirical findings of our research. The chapter is structured around the following five themes that refer to our general research questions listed earlier:

1. The relatedness of innovation, venturing and renewal as drivers of NVC
2. Creating process resources as determinants of new value created
3. Creator resources as determinants of new value created
4. The relatedness of creating process resources: resource bundles or configurations
5. The corporate entrepreneurship nexus

We discuss each of the five themes in the order presented. For each research theme, we draw upon existing theoretical and empirical research to substantiate the theme and its underlying research question(s) and hypotheses. Whenever appropriate, this is further graphically illustrated by means of a theme-specific research model. Following, we elaborate on the measures and tool(s) used to analyze the research question(s) at hand (as far as these measures and/or tools have not yet been discussed previously). And finally, we present the results.

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## **THEME 1: THE RELATEDNESS OF INNOVATION, VENTURING AND RENEWAL AS DRIVERS OF NEW VALUE CREATED**

### **Content**

Earlier, we defined innovation, venturing and renewal as operational drivers of new value created (see chapter 2). In this first research theme we focus on these performance drivers. Two topics claim a central position. First of all, the three drivers of newly created value should be seen as distinct from each other as this is a mandatory definitional condition (Zahra, 1993a). However, theoretical literature also recognizes that innovation, venturing and renewal are related to each other, besides being distinct (Ucbasaran et al., 2001; Zahra, 1993b). The bulk of empirical corporate entrepreneurship research, though, seems to have neglected this relatedness, often in spite of highly significant correlations between the three constructs. In view of the above, we want to find out if our innovation, venturing and renewal constructs are related to each other. And doing so, we also want to model the direction of the relationship. Further, once the relatedness of innovation, venturing and renewal has been established, we want to validate their newly created value propelling ability. Determining whether or not innovation, venturing and renewal actually affect financial new value created forms this theme's second research topic.

### **Model and hypotheses**

#### *Theoretical background and focus*

Before we delineate the specifics of the innovation, renewal and venturing constructs and relate them to each other in view of the resource-based research developed in this dissertation, we first sketch the three constructs.

Innovation (even in the stricter sense, i.e. distinguishable from venturing and renewal) covers a wide range of forms. It includes new products (goods or services) and processes (Damanpour, 1991; Edquist et al., 2001). The "newness" demands that changes take place with respect to the situation existing before the

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product or process innovation. Taking product innovation as an example, these changes can vary from 'no precedent' (e.g. the introduction of the MP3 music player or the development of the Airbus A380) over 'major changes' (e.g. the development of the Boeing 737 Next Generation) to minor changes (e.g. developing a strawberry waffle). According to the pervasiveness of the change, the innovation can be categorized as 'radical' (major changes at least) to 'incremental' (minor, sometimes cosmetic changes) (Damanpour, 1991).

A similar line of reasoning applies to renewal. In general terms, renewal refers to the transformation of a firm through revitalizing its productive operations, by changing the scope of its business and/or of its competitive approach and business concept (Guth & Ginsberg, 1990). As with innovation, this transformation can take many forms in practice. On the whole, though, it can be pervasive (radical) or superficial (incremental). Renewal viewed in terms of radical shifts in the firm's productive core (e.g. ceasing to produce a complete product line) or in terms of experimental projects to test new product ideas demands major implementing operations (Volberda et al., 2001). In contrast, renewal in the form of an administrative reorganization (Zahra, 1993b) (e.g. splitting up the firm in different product units whereby the mature product unit will be quoted on the stock exchange) can be executed with much less demanding operations.

Venturing refers to diverse expressions of new business created by the firm (Sharma & Chrisman, 1999). Some examples of the wide range of guises venturing can take are entering new geographical markets, establishing a corporate subsidiary firm (start-up) (possibly in a joint venture with one or more other firms), opening a new shop (e.g. through franchising) or many other forms of market development. Some of these forms may implicate a structural differentiation from the firm, while other do not.

All in all, innovation, renewal as well as venturing are characterized by considerable diversity in forms. In order to be able to include the concepts in a model and formulate specific research hypotheses, they need to be delineated to

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some extent. Doing so, we have to take into account the resource-based lens used in our research. Also the distinction between firm exploration and exploitation activities is important to bear in mind.

Exploration is most closely associated with the firm's learning motive to gain knowledge on and experiment with new product or process opportunities. It implies operations beyond the scope of what a firm currently knows or has (Covin et al., 2003). The precursor to exploration is simply the desire to discover or turn to something new (Rothaermel & Deeds, 2004). Through exploitation firms then seek to further appropriate value from their current knowledge base (Covin et al., 2003).

Most explorative activities will have an exploitative component, and vice versa. Building on March's (1991) discussion of the need to make trade-offs between the exploration of new possibilities and the exploitation of old certainties, it is argued that the explorative and exploitative motives for activities cannot be simultaneously high (Covin et al., 2003). In other words, all firm motives can be considered *primarily* (as opposed to *uniquely*) explorative *or* exploitative. Categorizing firms' motives or drivers (such as innovation, venturing or renewal) for new value creation as either (primarily) explorative or exploitative is likely to create some perspective on the relatedness of innovation, venturing and renewal. After all, it is recognized that exploitation depends on and is preceded by exploration (March, 1991; Rothaermel & Deeds, 2004).

Keeping the exploitation/exploration distinction in mind, we now delineate the three NVC drivers in view of our study's setup. As far as innovation and renewal are concerned, we focus on their more radical guises. Our choice for radical innovation and renewal can be justified as follows. First, in their corporate entrepreneurship efforts, firms are more likely to pursue fundamentally (i.e. radical instead of incremental) new opportunities or strategies, either to disrupt an industry's existing competitive conditions or to create new market spaces (Eliasson, 2003; Ireland et al., 2003b). Incremental innovations and renewal operations do not have this potential. Second and following, it is clear that major

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changes imply much more knowledge gathering and experimenting (exploration) than minor changes (He & Wong, 2004; Ravasi & Lojcono, 2005; Volberda et al., 2001). For instance, developing completely new or radically altered products or processes will be much more explorative than making incremental changes to existing ones (Ireland et al., 2003b). A similar line of reasoning holds for radical renewal. Radical changes affecting the firm's productive core and business concept require a lot of organizational learning. The reverse holds for incremental renewal since the knowledge needed here to execute the operation has little or nothing to do with the firm's productive core. Incremental renewal is thus more exploitative, set up to increase shareholder value building on its current productive knowledge base.

Stated in terms of resources and capabilities, radical changes require much more pervasive resource gathering, combination and transformation compared to their incremental counterparts (Dewar & Dutton, 1986; Eliasson, 2003). In fact, in view of their non-routine nature, they always imply fundamental resource transformation, building the technologies and capabilities needed to cope with the change (Danneels, 2002; Mezas & Glynn, 1993). As a result, radical changes are more interesting to study from the resource-based perspective (which focuses on resources and their combination, transformation, etc.). In view of their high degree of exploration, radical innovation and renewal can also give rise to newly developed or combined resources and capabilities that are valuable, rare, inimitable and sustainable (characteristics taking center stage within the resource-based perspective). Put differently, in view of their high degree of cumulative learning, they can raise barriers for competitors, resulting in sustainable competitive advantage (Hewitt-Dundas, 2006). Third, in view of the resulting radical resource transformations, radical innovation and renewal lead to many new resources and capabilities. The resource creating effect of incremental innovation and renewal is deemed much lower. As a result, radical innovation and change also create promising path dependencies (resources that can be combined, transformed, etc.) for future radical changes. In other words, radical innovation and renewal as current drivers of new value created already provide

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the firm with a solid foundation for possible future entrepreneurial activities. They can set the wheel of continuous rejuvenation in motion.

Firms can set up a venture for purely commercial, exploitative reasons (e.g. as the result of an administrative reorganization). On the other hand, companies can also establish a subsidiary (either alone or in a joint venture with one or more other firms) to explore and experiment with completely new types of technology. Although theory thus recognizes that firms seldom define their venturing activities as either explorative or exploitative on an a priori basis (Covin et al., 2003), the same resource-based lens that pushes us towards studying radical innovation and renewal as explorative activities suggests looking upon venturing as an exploitative vehicle, situated at the end of the value chain. As indicated earlier, our resource-based perspective focuses on building new value (innovation, venturing and renewal) based on the firm's resources and capabilities. A focus on explorative instead of exploitative venturing would generate a shift from the inside toward the outside of the firm and would imply a different role for venturing. After all, an important goal of explorative venturing is acquiring resources (including information) currently not in possession of the firm (Covin et al., 2003; Teng, 2003). Although this view on venturing as a resource gathering mechanism is in se an interesting avenue for research, it lies outside this dissertation's focus which looks upon venturing as new value created.

#### *Hypothesis development*

All in all, we thus study an adaptive system of value creation that engages in exploration without excluding exploitation, thus increasing the odds that the firms not only suffer the costs of experimentation (exploration) but also reap its benefits (exploitation) (March, 1991). Our delineation of innovation, renewal and venturing as explorative/exploitative already draws specific relationships between the three constructs: radical innovation and renewal (both explorative) will precede venturing (exploitative). This is consistent with previous research. For instance, (exploitative) venturing may follow from innovations offering new



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products (Sharma & Chrisman, 1999). Renewal activities enhance a firm's ability to compete and relate to its business approach (Miller, 1983; Zahra, 1993c). Thus, although renewal efforts are not new business activities in se, it is expected that they stimulate new business development (exploitative venturing). Hence the following propositions:

*H1: Innovation is positively associated with and precedes venturing.*

*H2v: Renewal is positively associated with and precedes venturing.*

In order to get a full picture of the relatedness of innovation, venturing and renewal we now need to determine the innovation - renewal connection. At this point, two directed models reflecting the innovation, venturing and renewal relatedness remain possible, depending on whether we assume the innovation → renewal or the renewal → innovation direction. In view of our choice for radical renewal and innovation, we will hypothesize the renewal → innovation link for three reasons. First, in relation to radical renewal, radical innovation is expected to be somewhat less explorative. Rothaermel and Deeds (2004) recognize this point of view and argue that *successful* exploration (such as new product development or, in view of our measures, innovation) generates the discovery of new opportunities *and*, at the same time, the potential for exploitation. The exploitation potential of renewal is less outspoken. Renewal connects to exploration and experimenting activities which may lead to future successful new product introductions (innovation) (Ravasi & Lojcono, 2005; Volberda et al., 2001; Zahra, 1993b). Second, Hamel (2000) has pointed to the narrower, less change demanding nature of product or process innovation (even radical innovation). Innovation is limited to one or more business model components, whereas renewal is systemic and multi-dimensional because it affects the very business concept. As such, in terms of exploration efforts, Hamel (2000) labels renewal as meta-innovation, as going beyond (even radically) new products and processes. Third, it is recognized that renewal is more strategic in nature, referring to planned actions in order to alter the firm's path dependency and get it

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more in line with the changing environment (Crossan & Berdrow, 2003; Volberda et al., 2001). Renewal can therefore serve as an adaptive, direction-setting basis for actions taking place within the company, including actions directed at developing new products or processes. For instance, the strategic decision to cease producing a good can trigger the development of new replacing goods that are more in line with current or future customer requirements. Also, changing the business concept is likely to result in developing new products and/or processes fitting that concept. The reverse is far less likely since new products, developed as a linear interpretation of the current business model, will rarely trigger the firm to abandon or put at risk the business model on which its (often successful) products are based (Hamel, 2000). The above arguments suggest the renewal → innovation path rather than innovation → renewal. Taking the above and our measures of innovation, renewal and venturing into consideration, we can formulate the following research hypothesis.

*H2i: Renewal is positively associated with and precedes innovation.*

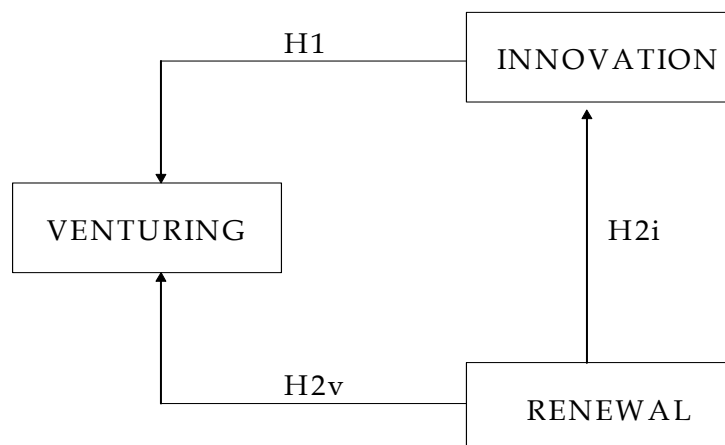


Figure 8. Expected relatedness of the NVC-drivers (model 1).

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Figure 8 graphically reflects the proposed hypotheses. Once these links have been empirically tested, we will - taking the relatedness into account - execute a complementary analysis that allows us to find out whether or not innovation, venturing and renewal affect financial new value created. Past corporate entrepreneurship research (although scarce) has demonstrated the positive effect of corporate entrepreneurship activities on firm financial performance (thus creating shareholder value) (Zahra, 1991; Zahra & Covin, 1995). However, due to a variety of corporate entrepreneurship and performance measures used, this evidence remains anecdotal in nature. As recognized by Zahra and Covin (1995) in their discussion, further empirical verification is needed since one cannot exclude the possibility that different measures produce different findings. As such, rather than just claiming that also our measures of innovation, venturing and renewal (entrepreneurial new value types) engender shareholder value, we want to empirically verify the assertion that they do. If confirmed, this would imply that our measures of innovation, venturing and renewal deserve to be labelled “NVC drivers” in a validated manner. In other words, the complementary analysis will focus on the following hypothesis:

*H3: Innovation, venturing and renewal are positively associated with firm financial performance.*

## **Measures**

*Innovation.* In view of our search for drivers of new value created, we build on a radical innovation measure that deviates from the (market-based) measures typically used in innovation research (e.g. the percentage of revenue that can be attributed to newly developed or radically altered products or services). Since market-based indicators are very adequate to measure the commercial success resulting from adopted innovations (Burgelman & Sayles, 1986; Matsuno et al., 2002; Vazquez et al., 2001) they incline more toward financial indicators instead of operational drivers of new value created (Smith, 1992).

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Radical innovation is measured by means of an index reflecting three specific types of innovation listed by Schumpeter (1961): (1) the development of a new good not familiar to customers, (2) the development of a new quality of a good and (3) the introduction of a new method of production not yet tested by experience. Our index (range 0-11) consists of the weighted sum of the following four dichotomous variables adhering to these specific innovation types: (1) the introduction of a new method of production not yet tested by experience (weight: 1), (2) the development of a new quality (radically altered) of a good (weight: 2), (3) the development of a new good in a new quality without bringing it on the market as yet (weight: 4), and (4) the introduction on the market of a good new to the market and the firm (weight: 4). Thus operationalized, the innovation measure reflects the Oslo Manual's (OECD, 2005) definition of technological product and process innovation. The index weights express the depth of the specific exploration activities. It can be argued that, for instance, product innovations are more important than process innovations in many respects (Edquist et al., 2001), also for exploitative actions such as venturing. We transformed the index by taking the natural logarithm in order to obtain a normal distribution.

*Venturing.* Venturing is measured using an index, composed of variables referring to diverse efforts made by companies that lead to the creation of new business within the corporate organization (in the period 2001-2003). The index comprises the following series of dummy-coded variables: (1) setting up a subsidiary by means of joint venturing, (2) setting up a subsidiary without joint venturing, (3) stimulating demand for current products/services in the currently operated market by means of strong publicity, (4) entering new markets with current products/services, (5) introducing improved (not radically altered) products/services in the currently operated market, (6) entering new markets with improved (not radically altered) products/services, (7) adding a new country to the export market and (8) expanding the product/service range. The venturing index ranges from 0 to 8, and was afterwards transformed by taking the natural logarithm. It is operationalized in a broad sense to reflect the diverse guises venturing can take without assuming that one form of venturing is more

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profound than another. Therefore no weights are assigned. We believe this index to capture a substantial part of the range of efforts a company can make to create new business (distinct from radical innovation and renewal). Similar measures of venturing (although not based on factual data) have been used before (Zahra, 1993b).

Renewal. Building on Guth and Ginsberg (1990), Stopford and Baden-Fuller (1994) and Zahra (1996b), in our study renewal efforts refer to major changes in the scope of the firm's business and/or its business concept. To distinguish renewal from venturing and innovation, renewal efforts can not include new business. We developed an index reflecting the following sides of the renewal process (in the period 2001-2003): writing off fading or less promising business and laying the foundations for new business. Eight dichotomous variables compose the renewal index: (1) selling not yet fully developed business ideas, (2) selling (a) part(s) of the firm, (3) closing down (a) part(s) of the firm, (4) purchasing not yet fully developed business ideas, (5) openness for innovation project proposals outside the current core business, (6) openness for innovation project proposals that could lead to an expansion of the current core business, (7) openness for innovation project proposals that can undermine the current core business and (8) openness for innovation project proposals that could lead to a complete shift of the firm's core business in the long run. The renewal index ranges from 0 to 8, and was afterwards transformed by taking the natural logarithm. As with venturing, it is operationalized in a broad manner to reflect the diversity of renewal efforts.

*Financial performance.* Financial performance is represented by means of the evolution in value added. Two measures were used to be able to accurately account for inter-industry and inter-company differences while reducing the impact of the limited time lag on our conclusions. First, financial performance was measured as the difference of value added/firm earnings in 2004 compared to 2003. Additionally and similarly, we also looked at the difference in EBITDA (earnings before interests, taxes, depreciations and amortizations). Both measures thus reflect the growth or evolution of value added in the firm since the corporate

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entrepreneurship activities took place (2001-2003). Value added reflects how effectively a firm utilizes its resources and added value to its raw materials to turn them into saleable goods or services (Elliott & Elliott, 2006). This financial performance measure is therefore also linked with the firm's resources.

In accordance with the analytical procedure (path analysis) used here, in all analyses we have controlled for industry, company age (number of years) and size (number of employees) to rule out rival hypotheses. Industry was measured by means of six sector dummies (manufacturing and energy; construction; wholesale and retail; catering; transport and communication; finance, real estate and services to companies). The last sector will serve as our point of reference. In order to obtain a normal distribution we have transformed the company size and age measures by taking the natural logarithm. These control variables will also be used in all subsequent research themes.

## **Results**

Based on hypotheses 1 and 2, we developed a path model (including the control variables) and tested it by means of the CALIS procedure (SAS) discussed earlier (see chapter 3). The goodness-of-fit indexes reflect a perfect match between the theoretical model (Figure 7) and the actual relationships (data): Goodness of Fit Index (GFI) (1.00), Bentler's Comparative Fit Index (1.00) and Bentler and Bonett's Normed Fit Index (NFI) (1.00). The chi-square and Bentler and Bonett's Non-normed Index could not be computed here because of the limited model scale. The bivariate correlation coefficients between this study's variables are depicted in Annex 1.

The results of the analysis are depicted in Table 11 (innovation and venturing columns). It provides full support for the hypotheses H1, H2i and H2v, and points to the strong, positive links between innovation and renewal on one hand and venturing on the other and between renewal and innovation. Our results empirically corroborate our propositions and confirm the previously mostly theoretically assumed relatedness of innovation, venturing and renewal.

Table 11. NVC relatedness and link with financial performance

Path from ... to ...	Innovation	Venturing	Financial performance: value added/firm earnings	Financial performance: EBITDA
Venturing	/	/	-0.27 <sup>****</sup>	-0.04
Innovation	/	0.30 <sup>****</sup>	0.19 <sup>***</sup>	0.09
Renewal	0.27 <sup>****</sup>	0.29 <sup>****</sup>	0.16 <sup>**</sup>	0.17 <sup>**</sup>
Company size	0.08	0.01	-0.07	-0.13
Company age	-0.12 <sup>*</sup>	-0.07	0.06	0.09
Manufacturing and energy	0.18 <sup>*</sup>	-0.09	0.47 <sup>****</sup>	0.08
Construction	-0.19 <sup>**</sup>	-0.14 <sup>*</sup>	0.21 <sup>***</sup>	-0.01
Wholesale and retail	0.17 <sup>*</sup>	0.05	0.61 <sup>****</sup>	-0.04
Catering	0.00	-0.17 <sup>**</sup>	0.04	-0.03
Transport and communication	-0.01	-0.12	0.30 <sup>****</sup>	0.00

\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001

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This confirmed relatedness between innovation, venturing and renewal will be taken into account in all subsequent models containing the NVC types. It must be noted, though, that the empirical test of the relatedness of the operational NVC drivers is somewhat hit by the cross-sectional nature of the data. This makes it difficult to make strong causal attributions on a stable basis.

Further, it should be recognized that based on the fit statistics the alternative model with the innovation → renewal path is equivalent to the one reported in Table 11. In other words, although we have a preference for the model with the renewal → innovation connection based on theory, the data do not allow putting one model above the other at this point in time. Only by means of the final analyses of theme 5 including the creator and creating process antecedents of NVC (cfr. *infra*) we will be able to determine whether or not the model preferred here is also superior from the data point of view. Until then we build further on our theoretically preferred model.

Table 11 also demonstrates that renewal not only affects venturing in a direct way but also in an indirect manner. After all, renewal is also associated with innovation, which is directly related to venturing. The total effect of renewal on venturing (i.e. the sum of the direct and the indirect effect) amounts to 0.37 (0.29 (direct) + (0.27 × 0.30) (indirect)). This insight has very important consequences for the remainder of this study, as we will demonstrate.

When it comes to the results of the complementary analysis on the link between innovation, venturing and renewal on one hand and financial performance on the other, we turn to the last column of Table 11. It must be noted that – as opposed to all other analyses reported in this chapter – the analysis here is based on a somewhat lower number of cases (N=192) due to the inclusion of the financial performance variable, causing cases to be dropped (missing values).

Taking the demonstrated relatedness of innovation, venturing and renewal into account (and the resulting direct, indirect and total effects on financial performance), the results provide moderate support for hypothesis 3 that innovation, venturing and renewal stimulate financial performance and thus



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create shareholder value. As far as the first performance measure is concerned, innovation has a direct effect of 0.19, of which a negative indirect effect of -0.07 (via venturing:  $0.27 * (-0.27)$ ) has to be subtracted. This gives us a positive total effect of 0.12 for innovation. Similarly, renewal shows a positive total effect of 0.05. Venturing, however, affects financial performance (value added) in a negative way (-0.27). The results for the second performance measure (EBITDA) follow these trends, albeit that only the renewal → performance link is statistically significant (0.10 level or stronger).

The reported negative effect of venturing on financial performance could be attributed to the limited time lag between the corporate entrepreneurship activities and financial performance. The venturing – performance link is likely to be very sensitive to this time lag as Von Hippel (1977) and Block and Subbanarasimha (1989) concluded that the mean time for venturing activities to become financially successful lies within a three to five year period. Unfortunately, such extendedly lagged financial data are not (yet) available to us at this point in time. Using a time lag of less than three years, it is likely that the venturing costs dominate, resulting in a negative effect on value added. The (short-term) costs associated with corporate entrepreneurship should not be underestimated as they can affect financial performance in a detrimental way (Fast, 1981; Zahra & Covin, 1995). All in all, in view of the results presented we believe we do not force the issue by typifying innovation, renewal and venturing as drivers of new value created.

## **Conclusion**

In this theme we explored if and how innovation, venturing and renewal are related to each other. The main conclusion is that this is an important, yet difficult exercise that has been largely neglected in past empirical research. If we are to arrive at an accurate estimation of the contribution of various resources to innovation, renewal and venturing, we are bound to face this challenge. In modeling the direction of the relatedness of the operational NVC drivers, it is recognized that exploitation builds on and is preceded by exploration activities.

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Based on this categorization, we modeled venturing (exploitative) to be preceded by innovation and renewal (both explorative). Further theoretical arguments led us to model renewal as an antecedent of innovation. These three theoretical links between innovation, venturing and renewal received strong empirical support. However, it was noted that – at this point of the analyses – we were not able to determine the superiority of this model over its main equivalent (the variant with the innovation → renewal path) from a data point of view. Later on in this chapter we shall therefore reconsider this issue (see Theme 5).

Further, a complementary analysis including parameters of financial performance (value added) revealed that innovation, renewal and (probably also) venturing deserve to be labeled newly created value drivers, securing their position in the NVC model block.

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## **THEME 2: CREATING PROCESS ELEMENTS AS DETERMINANTS OF NEW VALUE CREATED**

### **Content**

The resource-based perspective of the firm emphasizes firm resources (stocks) and capabilities (flows) as key determinants of variations in new value created by firms (Galunic & Rodan, 1998; Teece et al., 1997; Wernerfelt, 1984). In the second research theme we investigate the rather simple research questions: (1) to what extent creating process elements act as actual determinants or enablers of innovation, venturing and/or renewal, and (2) which category of creating process elements (resources (stocks) or capabilities (flows)) explains most of the variability in the NVC drivers. Doing so, we want to improve the application of the resource-based perspective by simultaneously adjusting the following three faults burdening earlier resource-based contributions to corporate entrepreneurship research.

A first fault in empirical corporate entrepreneurship research can be attributed to the fact that earlier applications of the resource-based perspective to corporate entrepreneurship have considered only a very limited set of resources or capabilities. A second gap has to do with the types of resources studied. Most research has concentrated on either tangible resources or (more recently) intangible resources. As illustrated earlier, both these options show significant drawbacks (see Chapter 2). A similar remark can be made with regard to the distinction between resource stocks and flows. A mix of tangible and intangible resources and/or of stocks and flows has rarely been studied. Third, a considerable amount of tested resource-based corporate entrepreneurship models focuses on only one type of newly created value driver (in most cases: innovation), or (in case of multiple types) disregarded their relatedness.

Most empirical resource-based corporate entrepreneurship research contributions seem to be hit by one or more of these faults. For example, Laursen and Foss (2003) model the effect of human resource management practices on innovation. Doing so, they study one type of element (an (intangible) flow) on one

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type of newly created value driver. The same can be said of Keil (2004), who investigated the role of organizational learning on corporate venturing. Dakhli and De Clercq (2004) for instance, studied the effect of human and social capital on innovation. As such, they considered the innovation effects (thus: one NVC driver) of two types of resource stocks, albeit both intangibles. Rogers (2004) searched for innovation effects of networking, R&D and training. He thus considered three elements (one stock and two flows; one tangible and two intangibles), but only one type of NVC-driver. Still other studies (e.g. Antoncic & Hisrich (2001), Barrett & Weinstein (1998)) model the effects of multiple elements (stocks and flows; tangibles and intangibles) on corporate entrepreneurship measured as one index or scale. Zahra (1991) made a similar exercise, but in this case corporate entrepreneurship was represented by means of multiple indicators. Renewal, though, was not included.

All in all, these exemplary studies show that our research, considering the effects of a portfolio of seven tangible and intangible creating process elements (three stocks and four flows; cfr. *infra*) on innovation, venturing and renewal (taking into account their relatedness demonstrated earlier), has a strong potential in furthering resource-based corporate entrepreneurship research. Adjusting the earlier mentioned faults is a major concern of the research developed here. It could lead to the discovery of promising creating process elements that are able to simultaneously stimulate innovation, venturing and renewal. It has several strengths. First, this approach will allow us to estimate the actual contribution of diverse resources (stocks) and capabilities (flows) (tangible as well as intangible) to all three types of newly created value drivers thoroughly, increasing the degree of detail in resource-based research. Second, it opens the possibility to find out whether or not the benefits of a resource investment on one type of NVC driver are at the expense of one or both other types. As such, we not only look upon resources/capabilities as enablers of NVC, but also as possible disablers. Resources and capabilities are thus considered as key determinants of positive *and* negative variations in NVC. Third, it allows us to compare the contribution of

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resources to NVC with that of the capabilities. Consequently, the research here can enrich the resource-based perspective of the firm by demonstrating the importance of (under-investigated) flows for the NVC drivers.

### **Model and hypotheses**

In operationalizing the creating process building on resource-based theory we recognize the resource heterogeneity by incorporating a range of tangible and intangible elements. Additionally, we consider resources (stocks) as well as capabilities (flows). As explained in Chapter 2, the following seven knowledge-related resources and capabilities will be considered: patents and commercial secrets, research and development (R&D) activities, employee human capital, human resource management, networking, intelligence generation and intelligence dissemination. Three elements are considered resources (stocks) (employee human capital, R&D and patents and commercial secrets), the other are seen as capabilities (flows). Within the context of this research theme, we link each of these elements to the NVC drivers and develop the corresponding research hypotheses. The numbering of the research hypotheses continues from the previous research theme.

*Patents and commercial secrets.* Intellectual property rights such as patents can provide the firm with a (temporary) technological lead, securing legal monopolies over key technologies, substances and so forth, facilitating the firm's subsequent experimenting and exploration efforts and successes (i.e. innovation) (Markman et al., 2004; Reitzig, 2004; Van Dijk et al., 1997). Intellectual property rights are linked to a firm's absorptive capacity. Absorptive capacity is an internal capability that colors the firm's ability to create and deploy the knowledge necessary to build other capabilities and resources for purposes of value creation (Zahra & George, 2002). As an externalization of realized absorptive capacity, patents and commercial secrets allow a firm to internally harvest and incorporate knowledge into its operations, producing a dynamic capability and leading to outcomes such as the development of new goods, processes and insights (Spender, 1996; Van den

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Bosch et al., 1999; Zahra & George, 2002). Additionally, patents and commercial secrets function as a powerful business weapon for taking an original idea to the market and pushing it towards commercial success, thus protecting the competitive advantage derived from new products or services and optimizing their exploitation (Colson, 2001; Sattler, 2003). Moreover, the ability to create business-method patents (e.g. Amazon's "one click order on the internet" patent) also affects firms' business development and competitive approach (Colson, 2001). Patents and commercial secrets may also lead firms to resource leveraging behavior by creating new business (i.e. venturing) through horizontal and vertical differentiation (Covin et al., 2003, Reitzig, 2004; Tiessen, 1997) and/or reconsidering their business scope and/or business concept (i.e. renewal). These effects can be amplified as patents and commercial secrets also are important signaling mechanisms (Baum & Silverman, 2004) facilitating access to input and fortifying the firm's reputation on output markets (Reitzig, 2004). Hence the following research hypothesis:

*H4: Patents and commercial secrets are positively associated with the NVC drivers (innovation (H4i), venturing (H4v) and renewal (H4r))*

*Research & development (R&D) investment.* R&D investments are expected to be positively associated with new product development (innovation), as demonstrated by past research (Dierickx & Cool, 1989; Greve, 2003). As explorative and experimenting activities, R&D can also bring out certain process needs that must be fulfilled in order to successfully complete the product development process (Urban & Hauser, 1993). These process needs can inspire innovation in terms of experimenting with and introducing new methods of production. R&D thus creates an internal capacity to acquire, assimilate and exploit diverse types of new knowledge, making it a key representative element of firm absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002). Additionally, R&D creates knowledge and discovers opportunities that are (at a certain point in time) not yet commercially viable. This type of knowledge cannot

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(yet) be considered innovation as it has not yet substantiated through a newly developed product or production method. It may, though, lay the foundations for future marketable products or services or even for an entire new business concept. Thus R&D also stimulates renewal to some extent. As such, renewal is, at many times unintentionally, underpinned by research and development projects that create new product and process knowledge (Ravasi & Lojacono, 2005). This knowledge can thereafter engender changes in the business concept or scope. Our fifth research hypothesis summarizes:

*H5: Investments in R&D activities are positively associated with the NVC drivers (innovation (H5i) and renewal (H5r))*

In contrast to innovation and renewal which are primarily explorative, venturing is categorized as exploitative in this study, due to its operationalization (cfr. *infra*) and to the confirmed links with innovation and renewal. We therefore believe R&D investment to be positively connected to innovation and renewal, but not *directly* to the firm's efforts to develop new business (venturing).

*Employee human capital.* Human capital begins with human resources in the form of knowledge and skills embodied in people. A company's human resources act as a surrogate indicator of its competence and credibility, affecting the ability to attract and develop other types of resources and capabilities needed in the innovation, development and growth process (Bartel & Lichtenberg, 1987; Florin et al., 2003; Leonard-Barton, 1992; Pennings et al. 1998; Shadur & Snell, 2002). One such capability strongly affected by human capital is the firm's absorptive capacity (Keller, 1996; Luo, 1997). The human resource base comprises the upper echelon as well as the employees (Hewitt-Dundas, 2006). As far as this research theme is concerned, we only consider employee human capital. Better educated human resources are likely to result in more productive human capital (Hatch & Dyer, 2004; Hitt et al., 2001a). Firms that are endowed with better educated employees should be more able to effectively plan, troubleshoot and problem-

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solve, revamp their knowledge stock, adapt to environmental contingencies, renew, detect new ways to develop new business and to innovate (Kor & Leblebici, 2005; Lengnick-Hall, 1992; Snell & Dean, 1992; Youndt et al., 1996). After all, the acquisition and transformation of new knowledge remains a human process (Laursen & Foss, 2003). Earlier research has pointed to the importance of employee human capital for knowledge-intensive NVC drivers such as innovation, venturing and renewal. For instance, Souitaris (2002) found that employee human capital to be strongly and positively associated with technological innovation. Thornhill (2006) came to a similar conclusion, although the association found here was significantly weaker. Still, in his opinion the effect was strong enough to attach the label 'innovative firepower' to the employee knowledge stock. Barney (2002) and McGrath and MacMillan (2000) posited that knowledge bases such as employee human capital represent much of what firms know about innovating and seeking new ways (innovation and renewal) and about exploiting opportunities (e.g. venturing). In view of the above we develop the following research hypothesis:

*H6: A highly educated employee human resource pool (employee human capital) is positively associated with the NVC drivers (innovation (H6i), venturing (H6v) and renewal (H6r)).*

*Knowledge creating and sharing HRM.* A firm's HR system can provide a source of sustainable competitive advantage (Colbert, 2004; Lado & Wilson, 1994; Ray et al., 2004). Conversely, faulty HR practices such as poorly designed compensation and performance appraisal systems for instance constrain entrepreneurial behavior in established firms (Balkin & Logan, 1988). Moreover, HR practices can help entrepreneurs to build a viable business model and secure their organic development (Chandler & McEvoy, 2000; Sels et al., 2006a). Therefore, the acquisition and management of the human resources is a very important domain in the discovery and exploitation of entrepreneurial opportunities. A firm's ability to develop new products is inextricably linked to the way in which it organizes its



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human resources (Laursen, 2002). HR practices assist firms to implement their knowledge strategies to generate innovations and enhance the development of the firm's absorptive capacity (Michie & Sheehan, 1999; Shadur & Snell, 2002; Spender, 1996; Zahra & George, 2002). The role of human resources in creating competitive advantage is amplified by their intertwined relationship with tacit knowledge (Hatch & Dyer, 2004). HR practices directed at creating and sharing knowledge throughout the firm can therefore be seminal for firm new value creation (Jansen et al., 2005; Mahoney, 1995). Thus, knowledge creating and sharing HR practices can further deploy employee human capital as a source of knowledge. In this way firms can also *make* additional human capital based on the human capital they bought by employing valuable employees (Lepak & Snell, 1999). We therefore expect that the more intensely the knowledge creating and sharing management of employee human resources is developed within the firm, the stronger its effect on firm new value creation (innovation and renewal) will be. We do not expect knowledge creating and sharing HRM to be *directly* positively connected to the firm's efforts to develop new business (venturing). Indirect effects (via innovation and/or renewal), however, are possible. Hence the following research hypothesis:

*H7: The intensity of the knowledge creating and sharing human resource management is positively associated with the NVC drivers (innovation (H7i) and renewal (H7r)).*

*Networking.* Defined in terms of network intensity, networks are generally considered as a valuable intangible capability (Camelo-Ordaz et al., 2003; Hall, 1993; Teece et al., 1997). Networking can increase the firm's absorptive capacity through acquiring external knowledge that can further be assimilated, transformed and exploited internally (Jansen et al., 2005; Zahra & George, 2002). It also facilitates the discovery of opportunities and enables the identification, acquisition, allocation and accumulation of knowledge and other resources (Davidsson & Honig, 2003; Greene & Brown, 1997; Hitt et al., 2001b; Honig, 1998; Uzzi, 1999; Vanhaverbeke et al., 2002). It can therefore be considered a capability

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or 'flow'. As such, it is part of and supports the entrepreneurial creating process, by providing and diffusing information, knowledge and various other important resources. The creating process is characterized by uncertainty and information asymmetry (Jones & Butler, 1992; Shane & Venkataraman, 2000). Social networks may act as a safeguard mechanism to reduce uncertainty and enhance the flow of information (Davidsson & Honig, 2003; Shi et al., 2003). To summarize, a firm's configuration of social networks can generate sets of valuable, rare, inimitable and non-substitutable resource bundles (Florin et al., 2003). Social networks can result in so-called entrepreneurial recombination (Eliasson, 2003; Schumpeter, 1934) or, put differently, in new value creation.

Social networks have been found to facilitate the development of innovative and self-renewing organization, information gathering, idea generation and testing, product innovation, entrepreneurship and the creation of new companies (Adler & Kwon, 2002; Cooke & Wills, 1999; Gabbay & Zuckerman, 1998; Lee et al., 2001; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Walker et al., 1997). Thus, network intensity is assumed to positively affect the introduction of new products/services (innovation), new business creation (venturing) and the revitalization and renewal of the firm's operations (renewal). Hence our eighth research hypothesis:

*H8: Network intensity is positively associated with the NVC drivers (innovation (H8i), venturing (H8v) and renewal (H8r)).*

*Market orientation.* Market intelligence generation and dissemination can be seen as intangible capabilities (Ray et al., 2004). Creating and sharing knowledge are important prerequisites in order to facilitate organizational learning and create dynamic organizational capabilities such as firm (potential) absorptive capacity (Jansen et al., 2005). This holds even stronger when market knowledge is concerned since market orientation serves as the direct linkage between marketing and corporate entrepreneurship (Barrett & Weinstein, 1998; Bhuian et al., 2005; Hult & Ketchen, 2001). It helps firms to align themselves with the output

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part of their commercial environment (Manu & Sriram, 1996). Following, market intelligence generation and dissemination might be imperative for the commercial success of innovations and for the firm's efforts to develop new business (venturing) and to renew its business concept. The ultimate goal of entrepreneurial efforts lies in creating new value through business success, which can only be fulfilled when the firm's offer meets the (present and/or future) market needs (Burns, 2005; Matsuno et al., 2002; Rogers, 2004; Vazquez et al., 2001). Moreover, the idea that information gathering and analysis are critical to the successful development of innovation and renewal strategies claims a central position in entrepreneurship literature (Barringer & Bluedorn, 1999; Covin, 1991; Matsuno et al., 2002). The ability to profile market intelligence will also reduce the risk associated with product development, joint venturing, acquisitions and so forth (Dobni & Luffman, 2003). As such, it increases the likelihood of *successful* innovation, venturing and renewal. In addition, Hurley and Hult (1998) have raised the idea that market intelligence generation and dissemination are antecedents of a firm's willingness or receptivity towards new idea and/or business development. Past research has empirically confirmed the latter (Han et al., 1998; Verhees & Meulenbergh, 2004).

All these arguments clearly point to the positive link between intelligence generation/dissemination and new value created. Intelligence generation is expected to stimulate innovation, venturing and renewal as drivers of newly created value. As an exploitative vehicle, venturing is less in direct need of market intelligence seeping through all sections of the firm. We therefore believe intelligence dissemination to be positively connected to innovation and renewal, but not *directly* to the firm's efforts to develop new business (venturing). Hence:

*H9: Intelligence generation is positively associated with the NVC drivers (innovation (H9i), venturing (H9v) and renewal (H9r)).*

*H10: Intelligence dissemination is positively associated with the NVC drivers (innovation (H10i) and renewal (H10r)).*

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Figure 9 reflects the expected relationships between the creating process elements and the NVC drivers, as formulated in the hypotheses 4 through 10. It also shows the earlier confirmed relationships between innovation, venturing and renewal (as materialized in theme 1). Detailed research hypotheses are summarized in Annex 2.

## Measures

*Patents and commercial secrets.* To measure the strength of the firm's intellectual property base we added up (1) the company's number of patents (product as well as process patents) in 2003 and (2) whether or not the company possesses (in 2003) commercial secrets (0-1).

*Research and development (R&D) investment.* R&D investment was measured by means of a dichotomous variable looking into whether the company did invest in R&D in the period 2001-2003. The investment amount itself could not be used in view of a very high item non-response.

*Employee human capital (human resource pool).* The human capital of employees is measured by the percentage of highly skilled employees (i.e. having a degree of formal, higher education of at least bachelor level). This measure is believed to be a good proxy for the amount and level of employee knowledge (DeCarolis & Deeds, 1999; Hatch & Dyer, 2004; Thornhill, 2006).

*Knowledge creating and sharing HRM.* The intensity of knowledge creating and sharing HRM is measured by means of an index, as suggested by Sels et al. (2006a). This index consists in the sum of 20 dichotomous variables referring to knowledge creating (10 items) and knowledge sharing (10 items) HRM practices. The list with these practices was developed departing from the work of Shadur and Snell (2002). The HRM practices concerned are listed in Annex 3. The index score ranges from 0 to 20 and gives an indication of the extent to which the firm engages in knowledge creating and knowledge sharing HRM.

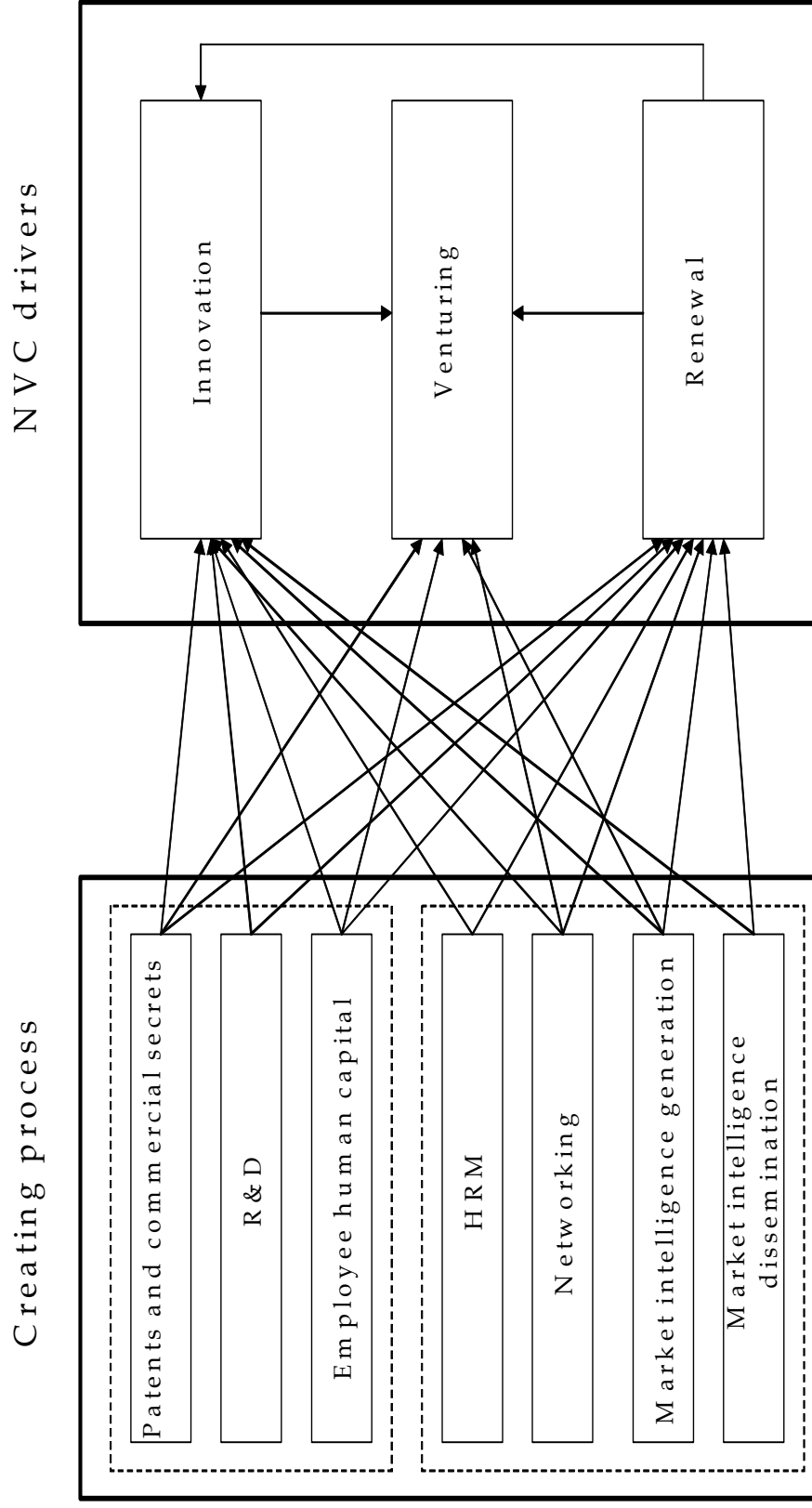


Figure 9. Expected creating process - NVC links (model 2).

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*Networking.* Networking intensity was measured by the number of partners the company worked with to develop or improve new products, services or processes. Respondents were offered a list of 12 types of partners, such as suppliers, customers, subcontractors, universities, commercial laboratories and so forth.

*Market intelligence generation and dissemination.* The measures for market intelligence generation and dissemination are both based on the MARKOR-scale (Kohli et al., 1993). This scale measures the intensity of the market intelligence process (Bhuiyan et al., 2005). The Cronbach's alphas are 0.65 for the market intelligence generation scale (range 0-10) and 0.60 for the market intelligence dissemination scale (0-10). Annex 4 reflects the items of these scales.

We refer to theme 1 for the measures for innovation, venturing and renewal and for the control variables.

## **Results**

The model presented in Figure 9 has again been tested as a path model by means of the CALIS procedure. Hypotheses 4 through 10 have been tested in three consecutive steps. First, we have modeled the stocks (employee human capital, R&D and patents and commercial secrets) – NVC driver links. Following, we tested the flows (networking, market intelligence generation and dissemination and HRM) – NVC associations. And finally, we considered the links between both stocks and flows and the NVC drivers. The results obtained in the last step will be used to determine whether to adopt or reject the research hypotheses 4-10. The whole three-step approach has the advantage of giving us insights in the explanatory power of the stocks (as a block) versus the flows studied.

Table 12. Creating process – NVC: path coefficients

Path from ... to ...	Renewal	Innovation	Venturing
Renewal	/	0.17**	0.19***
Innovation	/	/	0.30****
Patents and commercial secrets	0.18**	0.12	0.18**
R&D	0.27****	0.21***	/
Employee human capital	0.03	0.01	0.11
HRM	0.07	-0.04	/
Networking	0.16**	0.11	-0.03
Market intelligence generation	0.06	-0.05	0.18***
Market intelligence dissemination	0.02	-0.11	/
Company size	0.09	0.03	-0.06
Company age	-0.02	-0.10	-0.04
Manufacturing and energy	-0.08	0.13	0.02
Construction	-0.04	-0.02	-0.03
Wholesale and retail	0.02	0.21*	0.12
Catering	0.05	0.02	-0.09
Transport and communication	-0.07	-0.00	-0.02

\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001

All goodness-of-fit indexes support the model. We report the fit indexes of the third step: chi-square (p-value 0.84), Goodness of Fit Index (GFI) (0.99), Bentler's Comparative Fit Index (1.00), Bentler and Bonett's Non-normed Index (1.11) and Bentler and Bonett's Normed Fit Index (NFI) (1.00). These indicate that the model with the paths presented in Table 12 is supported by the data (Hatcher, 1994). This model accounts for 22% of the variation in innovation, 33% in renewal and 40% in venturing (cfr. infra).

Table 12 shows that creating process elements (e.g. R&D, networking) have direct effects on drivers of new value creation (innovation, venturing or renewal). However, given the conclusion with regard to the NVC-types relatedness (cfr. supra), it is seminal to look at the *total* effects of the creating process elements on new value created when reviewing whether or not a corresponding research hypothesis should be accepted. A review of these based on Table 12 (path coefficients; direct effects) would underestimate the contribution of the elements.

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For example, networking does not yield a direct effect on innovation. Since networking is significantly associated with renewal, though, and renewal is connected to innovation, networking will have an indirect effect on innovation (and, following, also a total effect). We present all direct, indirect and total effects in Table 13. As discussed earlier in Chapter 3, only significant paths are taken into account in order to calculate the indirect and total effects.

Hypothesis 4 predicted a positive effect of patents and commercial secrets on new value created. This hypothesis receives full support. Patents and commercial secrets stimulate renewal, innovation and venturing. In the case of innovation, the total effect is purely indirect (via renewal). Hypothesis 5 assumed a positive relationship between firm R&D investment and innovation and renewal. Our results provide strong support for this hypothesis. There are indeed very strong positive and direct effects of R&D investment on renewal and innovation. As far as venturing is concerned, the total effect is due to a positive indirect effect (via renewal and innovation). All things considered, we are bound to conclude that R&D is an important renewal and innovation enabler, from which venturing as a newly created value driver may arise in a secondary order. Hypothesis 6 is not confirmed by the results. As such, the stock of employee human capital (the human resource pool) in se does not propel the creation of new entrepreneurial value.

Hypothesis 7 also receives no support from the results. The intensity of knowledge creating and sharing HRM does not affect the NVC drivers. Network intensity was expected to affect the NVC drivers positively, as expressed in hypothesis 8. The results fully support this hypothesis: network intensity has a strong, positive effect on innovation, renewal and venturing. Consequently, it is an important corporate entrepreneurial capability. In the case of renewal, its effect is direct. For innovation and venturing the positive total effect can be fully attributed to an indirect effect. Hypothesis 9, predicting a positive link between market intelligence generation and new value created, receives partial support. Intelligence generation indeed stimulates venturing (directly).



Table 13. Creating process – NVC: direct, indirect and total effects

Effects of ... on ...	Renewal			Innovation			Venturing		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Renewal	/	/	/	0.17	/	0.17	0.19	0.05	0.24
Innovation	/	/	/	/	/	/	0.30	/	0.30
Patents and commercial secrets	0.18	/	0.18	/	0.03	0.03	0.18	0.05	0.23
R&D	0.27	/	0.27	0.21	0.05	0.26	/	0.14	0.14
Employee human capital	/	/	/	/	/	/	/	/	/
HRM	/	/	/	/	/	/	/	/	/
Networking	0.16	/	0.16	/	0.03	0.03	/	0.05	0.05
Market intelligence generation	/	/	/	/	/	/	0.18	/	0.18
Market intelligence dissemination	/	/	/	/	/	/	/	/	/
Company size	/	/	/	/	/	/	/	/	/
Company age	/	/	/	/	/	/	/	/	/
Manufacturing and energy	/	/	/	/	/	/	/	/	/
Construction	/	/	/	/	/	/	/	/	/
Wholesale and retail	/	/	/	0.21	/	0.21	/	0.06	0.06
Catering	/	/	/	/	/	/	/	/	/
Transport and communication	/	/	/	/	/	/	/	/	/

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Hypothesis 10, assuming a positive link between market intelligence dissemination on one hand and innovation and renewal on the other, is not supported.

Although these findings could seem disappointing at first sight, we must refrain ourselves from jumping to far-reaching conclusions at this point in time. It must be noted that – corresponding to the model setup in this theme – all creating process resources were treated as exogenous variables. It is our expectation that relationships among the resources will emerge as soon as they are modeled as endogenous variables (i.e. variables that are not only independent). This would be in line with theory, as Dierickx and Cool (1989) raised the idea of the interconnectedness of resources. Reciprocal effects among the creating process resources are likely to give rise to additional (indirect and total) effects of the resources on the newly created value drivers, thus demanding a second review of the hypotheses proposed here. At this point in time, though, all of this remains highly speculative. Research themes 4 and 5 (cfr. *infra*) will help us to determine whether or not this speculation can be transformed into confirmation.

Let us now turn to the explanatory power of the creating process resources (stocks) (as a block) versus that of the capabilities (flows). As mentioned, the three step approach used in this theme enables this discussion. As we recall, in the first step (model 2a) we modeled the effects of the stocks to new value created (in the presence of the NVC-relationships and of the control variables). The second step (model 2b) consisted of an analogous exercise for the flows, whereas the third step (model 2c) included the stocks and the flows. A comparison of the squared multiple correlations (the equivalent of the R-squared in linear regression) shows us what additional proportion of the variance is explained by adding the stocks, flows, or both. Points of reference are the squared multiple correlations of model 1 (see theme 1), containing the relations among the NVC-driver types and the control variables.

Table 14 lists the squared multiple correlations. Adding the stocks to model 1 (i.e. model 2a) leads to an increase of the explained variance in renewal, innovation and venturing. Adding the flows to model 1 (i.e. model 2b) leads to a similar observation: the explained variance increases for renewal, innovation and venturing.

Table 14. Squared multiple correlations of model 1 and 2

	<b>Renewal</b>	<b>Innovation</b>	<b>Venturing</b>
Model 1	0.13	0.16	0.33
Model 2a (stocks)	0.29	0.20	0.38
Model 2b (flows)	0.23	0.18	0.38
Model 2c (stocks and flows)	0.33	0.22	0.40

However, as far as renewal and innovation are concerned, the increase is smaller compared to that of adding the stocks. When it comes to venturing, the explanatory power of the stocks is equal to that of the flows. This leads us to the conclusion that the stocks might be more important to explain renewal and innovation compared to the flows. Finally, model 2c includes the stocks and the flows, and comprises the changes in explained variation of the models 2a and 2b. As already indicated, the creating process elements together with the control variables and the NVC-links explain 33% of the variation in renewal, 40% in venturing and 22% in innovation. The latter is slightly disappointing, but perhaps the upper echelon resources can adjust this. This will be investigated in research theme 3.

## **Conclusion**

The analyses performed here have illustrated that creating process elements can be valuable enablers of newly created value through innovation, venturing and renewal. This is in line with the resource-based perspective of the firm, seeing firm internal elements as determinants of performance and value creation. The results particularly place patents and commercial secrets, R&D, and networking

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in the picture as important determinants. These three elements affect all three NVC drivers. Trade-offs were not detected. It must be noted, though, that the conclusions drawn here with regard to the elements' contribution to new value created remain preliminary. Based on complementary analyses later on in the chapter we will review and recalculate the various effects.

Further, the findings of this section focus our attention on the importance of the capabilities or flows. As mentioned, these have remained somewhat under-researched in the past. Most research was directed towards the stocks. As far as innovation and renewal are concerned, this can be justified to a certain extent (stocks are more important here than flows). But for venturing, flows demonstrate the same explanatory as the stocks. Either way, the combination of stocks and flows looks the most promising.

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## **THEME 3: CREATOR ELEMENTS AS DETERMINANTS OF NEW VALUE CREATED**

### **Content**

Congruous with upper echelon theory, managers and other creator or upper echelon constituents (e.g. ownership) have been recognized as important elements within the heterogeneous constellation of resources and capabilities (Daily et al., 2000; Dimov & Shepherd, 2005; Flood et al., 1997; Hoskisson et al., 2002; Zahra et al., 2000). As the resource-based perspective of the firm emphasizes resources and capabilities as key determinants of variations in new value created by firms, we investigate in this third research theme to what extent creator elements act as determinants of innovation, venturing and/or renewal. Thus, we are interested here in the creator (and only the creator). Consequently, we treat the creator here purely as a direct determinant of NVC, not as a catalyst propelling the creating process.

As explained earlier, we have developed a context-specific demarcation of the upper echelon, including the top management team and ownership as indicators of its composition and entrepreneurial strategic orientation, intended strategy type and management's perception of the remote environment as elements referring to managerial postures or learning and selection mechanisms. Having an eye for both the composition or demographic side of the upper echelon and its learning and selection mechanisms is important in exploring the creator side of corporate entrepreneurship. After all, the upper echelon can be considered as the aggregate knowledge and decisional center through which competitive moves are made and value creation activities are initiated (Hambrick et al., 1996). Demographics serve as observable proxies for the human capital and knowledge stocks embodied in the upper echelon. And team postures, intentions and perceptions refer to dispositions or action propensities, decision-making styles and learning and selection mechanisms (Atuahene-Gima & Ko, 2001; Dess & Lumpkin, 2005; Eliasson, 2003; Hayton, 2005; Lumpkin & Dess, 1996). As such, the postures lean more towards the flow side of the upper echelon. Considering the

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upper echelon composition as well as its learning and selection mechanisms leads us to distinguish two types of creator elements. This can help us to portray two (complementary) sides of the upper echelon coin. In the third research theme we investigate the rather simple research questions: (1) to what extent creator elements act as actual determinants or enablers/disablers of innovation, venturing and/or renewal, and (2) which category of creator elements (composition elements or learning and selection mechanisms) explains most of the variability in the NVC drivers.

This theme's set-up allows us to further upper echelon or creator-focused corporate entrepreneurship research on four fronts. First, next to having an eye for the composition of the upper echelon, the study also includes complementary indicators of managerial behavior such as learning and selection mechanisms. Such a mix of management's composition and decision-making aspects has rarely been studied. Many studies have only displayed regard for one type of creator resources. For example, Flood et al. (1997) and Hoffman and Hegarty (1993) looked into the upper echelon demographics. An impressive body of research took the opposite point of view, focusing solely on firm or creator attitudes and postures such as entrepreneurial orientation in explaining firm new value creation (e.g. Covin & Slevin, 1989; Dess & Lumpkin, 2005; Lumpkin & Dess, 1996). The study of Srivastava and Lee (2005) can be considered a go-between, acknowledging the importance of both top management team demography and of attitudes or postures for explaining innovation. The latter, although recognized as complementary to the demographics, served as hypothetical, unmeasured constructs in their study. Second, as far as the top management team is concerned, this study considers the composition of the entire team. A substantial amount of previous upper echelon research has focused exclusively on the chief executive officer (Carpenter et al., 2004; Hambrick & Mason, 1984), thus neglecting the contribution of other top management team members to firm new value creation. Looking at the team composition allows inquiry into dispersion characteristics that are highly relevant in terms of management team task relatedness. Third, the

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study stretches the composition of the upper echelon by including a pivotal actor residing outside the traditional management team boundaries: ownership. Ownership can be considered an important creator resource in the context of corporate entrepreneurship (Hoskisson et al., 2002; Zahra, 1996b; Zahra et al., 2000). Its constituency can have a pronounced preference (or aversion) for (risky) corporate entrepreneurial objectives. Fourth, analogous to theme 2, considering innovation, renewal and venturing and their relatedness we can more accurately map the actual contribution of the creator elements to new value created. Furthering the corporate entrepreneurship research on these four fronts holds the potential of discovering promising creator elements that are able to simultaneously stimulate innovation, venturing and renewal.

### **Model and hypotheses**

As explained in Chapter 2, we consider the following series of creator elements: top management team size, team industry experience and education heterogeneity, the presence of institutional owners, the presence of private third-party owners, foreign ownership, ownership concentration, management's perception of the remote environment, technology strategy, innovative differentiation strategy, aggressiveness and futurity. Within the context of this research theme, we link each of these elements to the NVC-drivers (innovation, venturing and renewal) and develop the corresponding research hypotheses. The numbering of the research hypotheses continues from the previous research theme. Figure 10 graphically depicts this theme's model and its expected relationships between the creator elements and the NVC drivers. We now develop and discuss this model's set-up.

All three top management team composition elements represent a unique (intangible) organizational resource stock or 'position' as they can be seen as representative for its human capital and knowledge base (Camelo-Ordaz et al., 2003; Daily et al., 2000; Hitt et al., 2001b).

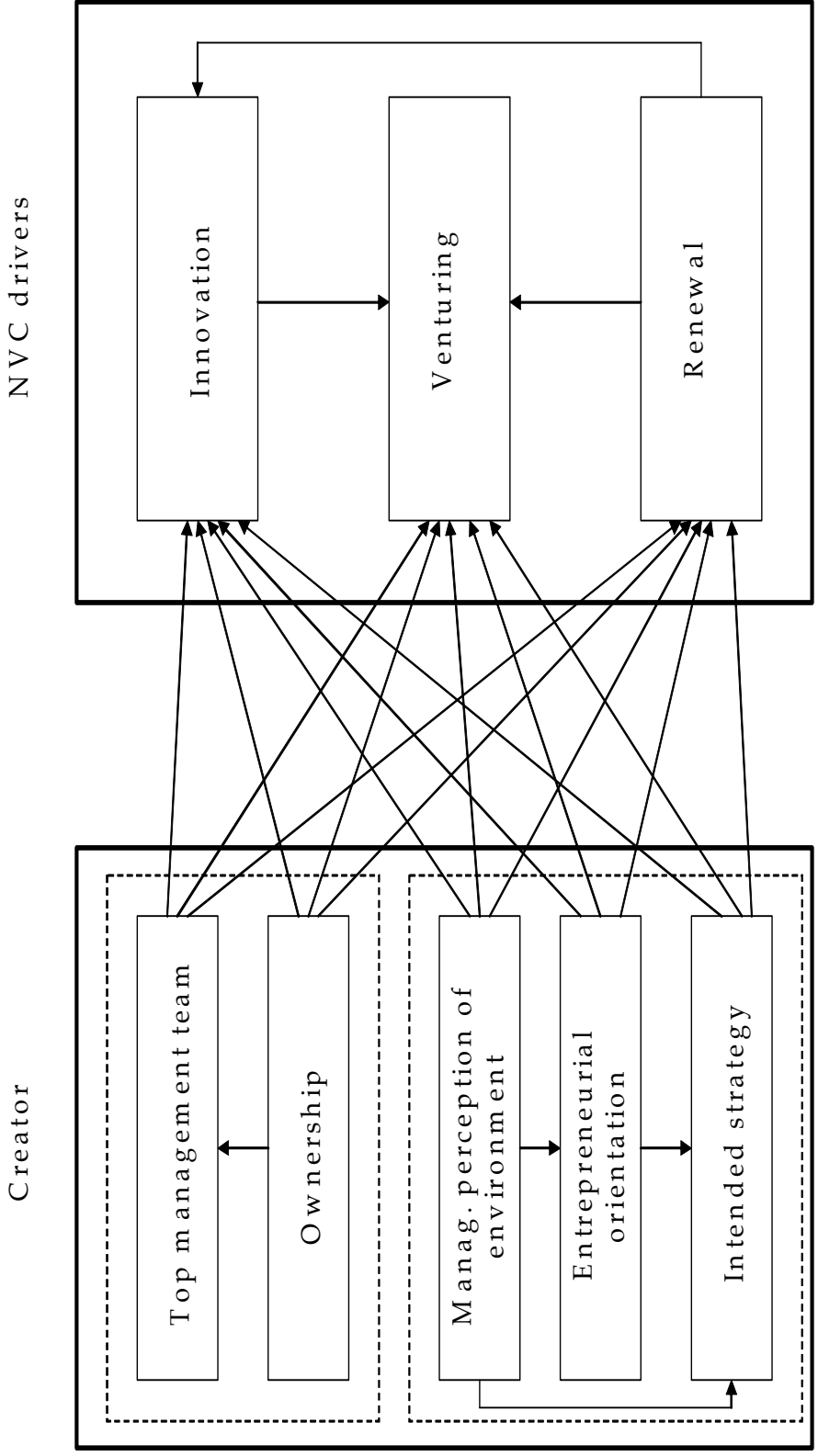


Figure 10. Expected creator - NVC links (model 3).



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As mentioned earlier, upper echelon theory links upper echelon variables to organizational outcomes, such as innovation. On the whole, though, upper echelon studies are fragmented and inconclusive. They have led to mixed findings with regard to specific relationships, such as the 'top management team industry heterogeneity - business success' relationship (Davidsson & Honig, 2003; Dimov & Shepherd, 2005; Reuber & Fisher, 1999; Vyakarnam & Handelberg, 2005). However, it is generally put forward that the upper echelon represents - through its composition - a unique organizational resource 'position' affecting performance and value created directly (Daily et al., 2000; Lynskey, 2004). Some notable upper echelon studies have found evidence for this expected management team - innovation link. For instance, Hoffman and Hegarty (1993) found that executive characteristics such as management expertise influence both product/market and administrative innovations. Bantel and Jackson (1989) showed that top management team education level heterogeneity was positively associated with innovativeness. Flood et al. (1997) noted that top management team age and education have an effect on product pioneering. Shrivastava and Lee (2005) found top management team organizational tenure and educational background heterogeneity to be positively related to new product introduction. Past research thus has found top management team composition to be important in the context of innovation or other NVC drivers. Hence the following research hypothesis on the relationship between the composition of the top management team and the NVC drivers:

*H11: The top management team size, industry and educational background heterogeneity (TMT demographic or composition elements) are positively associated with the NVC drivers (innovation (H11i), venturing (H11v) and renewal (H11r)).*

Likewise, ownership structure aspects can be considered important resource in order to create new value (Borch et al., 1999; Certo et al., 2001). Large and/or powerful owners often promote long-term value creation activities (Hansen & Hill, 1991; Zahra et al., 2000). Ownership concentration has been identified as an

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important mechanism to stimulate management's propensity to pursue value creating strategies (Hoskisson et al., 2002). Owner types such as institutional and private owners are very concerned with the firm's earnings and value creation (Graves & Waddock, 1990). Such owners usually have a diversified portfolio of ownership stakes in multiple firms. In order to reach their desired performance objectives (for the portfolio as a whole as well as for the specific firm investment) they may push firms' management to undertake focused projects, including innovation and other new value creation (Hansen & Hill, 1991; Kochhar & David, 1996). A similar line of reasoning holds as far as foreign ownership is concerned. Due to the international dimension of their investment (resulting in additional risks), foreign owners are expected to increase firm monitoring and are likely to steer the firms in which they invest toward value creation (Douma et al., 2006). This holds even stronger when their shareholding is rather high. So foreign firms (i.e. of which a considerable shareholding (e.g. at least 10 %) is in hands of foreign owners) are very likely to be subject to the steering mechanisms described. Further, firms with a (considerable) foreign ownership stake (e.g. by a multinational firm) can also reap benefits through knowledge, technology, expertise and so on percolating through in the firms operations (Conyon et al., 2002).

The promotion of new value creation by ownership works its way through two channels: through ownership monitoring the top management team and through the governance structure (Hoskisson et al., 2002; Zahra, 1996b; Zahra et al., 2000). The board of directors (including owners, managers and in some cases also independent representatives) serves as an additional primary governing mechanism to discuss, plan, supervise and police managerial behavior. It forms an additional lever through which ownership can make its preferences and concerns felt. The ownership - top management team link will be taken into account (cfr. *infra*). The hypothesized ownership - NVC association builds on the governance mechanism, which remains a (unmeasured) black box in this study.

As a component of the upper echelon, ownership is seen as a unique organizational resource 'position' with a positive direct effect on the NVC drivers

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(Daily et al., 2000; Lynskey, 2004). We follow this direction for all upper echelon composition elements, except for ownership concentration. Whereas it has been recognized that ownership concentration can be an important instrument to influence management in pursuing higher-risk strategies (Hoskisson et al., 2002), this mechanism specifically pertains to large outside owners (Gamble, 2000; Hill & Snell, 1988). Inversely, a high inside ownership concentration could very well result in management becoming more risk-averse. Taking into account the specificities of our sample (cfr. supra), we can expect high ownership concentration to represent mainly high *inside* ownership concentration. Following, we link high ownership concentration with lower risk tolerance. As new value creation usually is linked to higher risk (Zahra & Covin, 1995), we hypothesize ownership concentration to be negatively associated with the NVC drivers. Hence the following research hypotheses reflecting the relationship between the upper echelon composition variables included here and the NVC drivers:

*H12: The presence of institutional owners, the presence of private third-party owners, the firm being a foreign company and ownership concentration (ownership elements) are positively (ownership concentration: negatively) associated with the NVC drivers (innovation (H12i), venturing (H12v) and renewal (H12r)).*

As already suggested, ownership structure elements can be attributed an additional role in our model. They can be considered as shaping the composition of the top management team (Zahra, 1996b; Zahra et al., 2000). Thus, these elements affect the human capital of the top management team as a whole. Next to the paths already hypothesized we therefore also incorporate model links between the ownership elements and the top management team composition variables. Building on the discussion above regarding their preferences, we expect the ownership variables considered to stimulate the magnitude of the top management team's human capital base (size and heterogeneity). Hence:

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*H13: The presence of institutional owners, the presence of private owners, the firm being a foreign company and ownership concentration (ownership elements) are positively (ownership concentration: negatively) associated with the top management team composition elements (team size (H13ts), industry heterogeneity (H13id) and educational background heterogeneity (H13ed)).*

The remote environment in general and the way it is perceived in particular are generally considered antecedents of new value created (Huse et al., 2005). There is strong consensus that the perceived characteristics of the remote environment play an important role in firms' pursuits of corporate entrepreneurship (Guth & Ginsberg, 1990; Katila & Shane, 2005; Sathe, 2003). For instance, innovation is positively correlated to environmental uncertainty (Russell & Russell, 1992). Antoncic and Hisrich (2001) found environmental dimensions such as the demand for new products and technological opportunities to stimulate corporate entrepreneurship. Miller and Friesen (1982) concluded that environmental dynamism, hostility and heterogeneity can be positively related to innovation. Though the nature of the relationship between the (remote) environment and company performance (including corporate entrepreneurship) has been the subject of a fierce discussion in the literature (Boyd et al., 1993; Zahra & Bogner, 2000), there is agreement that managers' perception of their firm's environment significantly influences the firm's corporate entrepreneurship success (Grant, 2005; Zahra, 1993b).

As indicated earlier, we include management's perception of the environment's technological opportunities, demand for new products and rivalry in our model. Based on past research, it is our expectation that more munificent environments, perceived rich in technological opportunities and/or showing a high demand for new products or services will act as stimuli for firms to pursue new value creation. Such environments prompt firms to exploit opportunities in current and/or new markets and pressure companies to renew themselves (Zahra, 1993b). The same goes for hostile or rivalrous environments. When rivalry

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is outspoken, companies feel compelled to innovate, explore new markets and renew themselves (Fombrun & Ginsberg, 1990; Zahra, 1993b). Hence:

*H14: Munificent and/or hostile environments are positively associated with the NVC drivers (innovation (H14i), venturing (H14v) and renewal (H14r)).*

Entrepreneurial strategic orientations or postures and intended strategy reflecting managerial choices can also be linked to the NVC drivers. Entrepreneurial strategies such as a technology strategy or an innovative differentiation strategy are likely to enhance firm new value creation (Zahra, 1993c). As new value can equally be created through unplanned, infrequent or even single efforts, firms pursuing new value creation based on well-developed entrepreneurial strategies and persistent postures can reach higher levels of new value created (Russell & Russell, 1992). This link between strategy or entrepreneurial posture and new value has been presumed before. For instance, Zahra (1993c) considered strategy and innovation to be related. Lumpkin and Dess (1996) departed from the view that an entrepreneurial orientation affects firm performance (which can include corporate entrepreneurship success). Although entrepreneurial postures or orientations and entrepreneurial strategy are serving the same purpose here, they can be seen as conceptually distinct from each other (Covin & Slevin, 1991; Ireland et al., 2003a; Meyer & Heppard, 2000). We consider it thus appropriate to connect both separately to new value created. Hence:

*H15: Entrepreneurial strategy (technology strategy and innovative differentiation) is positively associated with the NVC drivers (innovation (H15i), venturing (H15v) and renewal (H15r)).*

*H16: Entrepreneurial strategic orientation (aggressiveness and futurity) is positively associated with the NVC drivers (innovation (H16i), venturing (H16v) and renewal (H16r)).*

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Entrepreneurial orientation can be attributed an additional role in this model, affecting intended strategy. Entrepreneurial orientation is a specific type of strategic orientation, involving a willingness to rejuvenate and innovate (Covin & Slevin, 1989; Wiklund & Shepherd, 2005). A strategic orientation appeals to a behavioral culture that dictates how a firm's employees should think and act (Dobni & Luffman, 2003). Literature recognizes that the firm's upper echelon holds a high stake in developing this culture (Auh & Menguc, 2005; Jeong et al., 2006). Strategic orientations serve as the guiding principles that influence firms' strategy-making activities (Noble et al., 2002). *Futurity*, for instance, reflects a proactive, forward-looking characteristic of a firm that has the willingness to seize opportunities in anticipation of future demand. *Aggressiveness* represents a combative posture aimed at improving the firm's competitive position or at overcoming a threat (Dess & Lumpkin, 2005; Venkatraman, 1989a).

Both *futurity* and *aggressiveness* are likely to be positively associated with aiming to develop technological capabilities (technology strategy) and an innovative differentiation strategy. Both these strategies can function as reflections of management's philosophy (postures) and as mechanisms to explore opportunities and improve the competitive position. For instance, the firm's propensity to use technology in positioning itself can be a substantiation of its combative posture (*aggressiveness*) (Zahra & Covin, 1993) and/or its proactive, forward-looking perspective (*futurity*). It can therefore be argued that *aggressiveness* and *futurity* postures are likely to go hand in hand with pursuing a technology strategy. Previous studies have also pointed to the positive association between *aggressiveness* and technology strategy, e.g. by using the label *aggressive technological posture* (Oster, 1990). A similar line of reasoning holds as far as the connection between *aggressiveness/futurity* and innovative differentiation is concerned. Firms portraying a combative, aggressive posture often rely on non-traditional ways of competing (e.g. innovative differentiation) (Porter, 1985; Lumpkin & Dess, 1996). A firm's *futurity* posture also relates positively to its planned introduction of new products or services as a way of competing (Lumpkin & Dess, 1996; Venkatraman, 1989a). In view of the above,

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the following relationship between entrepreneurial orientation and intended strategy is proposed:

*H17: Entrepreneurial strategic orientations such as aggressiveness and futurity are positively associated with intended strategy (technology strategy (H17t) and innovative differentiation (H17i)).*

Further, it can be argued that management's perception of the remote environment serves as a basis for adaptive or anticipative managerial choices, postures and planned actions (Huse et al. 2005; Manu & Sriram, 1996; Tsai et al., 1991; Zahra, 1993a; Zahra & Pearce, 1989). The exact nature of this relationship, though, remains unclear (Wiklund & Shepherd, 2005; Zahra & Bogner, 2000). Previous research supports the argument made with regard to management's perception of the remote environment. For instance, innovation differentiation strategies are likely to be found in more dynamic, munificent, rich environments (Miller, 1987; 1988). Dynamic, hostile and heterogeneous environments are positively associated with the pursuit of radical product technology (Zahra, 1996a). And Russell and Russell (1992) linked environmental uncertainty to the development and pursuit of an entrepreneurial strategy. Miller and Friesen (1983) saw a connection between futurity and the remote environment. Munificent, rich environments are likely to favor firms with an entrepreneurial strategic orientation because of the good fit between their posture and the environment (Wiklund & Shepherd, 2005). Building on these findings, we expect more munificent environments to relate positively to entrepreneurial managerial choices and postures, such as an intended technology and innovative differentiation strategy, aggressiveness and futurity. This leads us to the following propositions:

*H18: Munificent, opportunity-rich and/or hostile environments are positively associated with intended strategy (technology strategy (H18t) and innovative differentiation (H18i)).*

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*H19: Munificent, opportunity-rich and/or hostile environments are positively associated with entrepreneurial postures (aggressiveness (H19a) and futurity (H19f)).*

Figure 10 (cfr. supra) reflects the formulated hypotheses 11 through 19. It also shows the earlier confirmed relationships between innovation, venturing and renewal (see theme 1). In view of the measures used (cfr. infra), no links were foreseen between the upper echelon composition and the creator learning and selection variables. Detailed research hypotheses are summarized in Annex 2.

## **Measures**

*Top management team.* The following variables were used to operationalize the top management team composition: (1) the top management team size (number of members), (2) top management team industry experience heterogeneity (0-2) and (3) top management team educational background heterogeneity (0-2). As far as the heterogeneity measures are concerned: '0' stands for complete homogeneity, '1' for moderate heterogeneity (nearly all have the same industry/educational background) and '2' for high heterogeneity (all or nearly all have a different industry/educational background).

*Ownership.* Ownership is measured by means of (1) the presence of institutional owners (0-1), (2) the presence of private (corporate or individual) third party owners (0-1), (3) whether or not the company can be considered as a foreign company (at least 10% of the total shares is in hands of a foreign person or company (Vandenhove, 2001)), and (4) ownership concentration (% of shares in the hands of the most significant shareholder).

*Management's perception of the environment.* The following environment dimensions are considered: (1) technological opportunities, (2) importance of new products and (3) competitive rivalry. The first two dimensions were separately measured by means of scales (range 0-10). The Cronbach's alpha is 0.84 for the technological opportunities scale and 0.83 for the importance of new products scale. Competitive rivalry was measured by means of an index (0-10) reflecting the competitive pressure experienced of domestic start-ups, domestic incumbents,



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foreign start-ups and foreign incumbent firms. All environment measures are based on Zahra (1993b).

*Entrepreneurial orientation.* Two entrepreneurial strategic orientation dimensions are included: (1) competitive aggressiveness and (2) futurity. The measures for both are scales (range 0-10) based on Venkatraman (1989a). The Cronbach's alpha is 0.74 for the aggressiveness scale and 0.60 for the futurity scale.

*Intended strategy.* The following strategy types refer to intended business strategy: (1) technology strategy and (2) innovative differentiation. Each was measured by means of a scale for which we drew inspiration from Carter et al. (1997) and Durand and Coeurderoy (2001). The Cronbach's alpha is 0.83 for technology strategy and 0.78 for innovative differentiation.

We refer to Theme 1 for the measures for innovation, venturing and renewal and for the control variables. We refer to Annex 4 for an overview of the items composing the scales.

## **Environmental settings**

Before turning towards presenting and discussing the results of the analyses, we first go into the topic of how we have distinguished environmental settings. As indicated earlier, there is a need to use multiple dimensions to capture a firm's perception of its environment (Zahra, 1993b; Zahra & Pearce, 1989). Tied to this study's set-up, we selected three such dimensions: technological opportunities, importance of new products/services and competitive rivalry. These dimensions are interrelated. All bivariate correlation coefficients are significant at the .01 level and vary from 0.15 (technological opportunities - competitive rivalry) to 0.66 (technological opportunities - importance of new products), confirming the independent yet interconnected nature of these dimensions (Hair et al., 1998). This interconnectedness suggests the need for a taxonomic approach, i.e. creating discrete and homogeneous environmental settings. We follow the approach set out by Zahra (1993b) to obtain such settings.

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Adjusting the data for inter-industry variations in the perceived characteristics of the environment is a required first step in this approach because environmental conditions vary significantly from one industry to another (Dess & Beard, 1984; Zahra & Bogner, 2000). For all environment measures, the mean industry score was subtracted from the company score and then divided by the mean industry score. These “industry corrected” measures were then used in a cluster analysis to create discrete environmental settings.

The cluster analysis was executed in two consecutive steps. First, a hierarchical cluster analysis (Ward’s method) was performed in order to guide the selection of the final number of clusters. The analysis suggested four clusters. Following, this initial cluster solution served as the input for a non-hierarchical cluster analysis (K-means procedure) to obtain the final cluster centers and means. To evaluate the stability and meaningfulness of the four clusters, we conducted analysis of variance (ANOVA) and Bonferroni tests of differences in group means. Table 15 summarizes the results of these tests and contains the standardized means of the four clusters on the three environmental dimensions. The Bonferroni tests mark the discerning qualities of the four clusters. All F-values are significant at the .001 level.

We can summarize the four cluster profiles as follows. The first environmental cluster (N=47) is deemed very rich in technological opportunities and the importance of new products or services is estimated as high. Yet rivalry is low. We label this cluster as a *hospitable and promising environment*. Firms in the second cluster (N=46) look upon their environment as hospitable yet low in technological opportunities and in importance of new products. As with Zahra (1993b), we label this cluster as a *static and impoverished environment*. Companies belonging to the third cluster (N=71) view their environment as intensely rivalrous but low in technological opportunities and in importance of new products or services. We can label this environmental setting as a *rivalrous and low growth environment*. The fourth cluster (N=49) obtains high scores on technological opportunities and importance of new products or services. Rivalry is considered fierce. This cluster is labeled as a *competitive growth environment*.

Table 15. Environmental clusters: results of ANOVA

<b>Dimension</b>	<b>CL1</b> (hospitable and promising environment)	<b>CL2</b> (static and impooverished environment)	<b>CL3</b> (rivalrous low growth environment)	<b>CL4</b> (competitive growth environment)	<b>Bonferroni</b>	<b>F</b>
Technological opportunities	1.04	-86	-55	.61	1>2; 1>3; 1>4; 4>3; 4>2; 3>2	100.9
Importance of new products	.76	-62	-61	.74	1>2; 1>3; 1>4; 4>3; 4>2; 3>2	59.6
Competitive rivalry	-.78	-.98	.52	.92	4>3; 4>2; 4>1; 3>1; 3>2; 1>2	118.7

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Based on their properties, clusters one and four can be considered munificent, opportunity-rich clusters. Clusters three and four can be typified as rivalrous, hostile clusters. Cluster three thus also portrays an environmental feature that can stimulate NVC: although it is not munificent, it reflects a high degree of rivalry. From this point on, we will use these four clusters whenever we aim to account for management's perception of the environment in our analyses. These clusters will be included by means of environment dummies. The static and impoverished environment (cluster 2) will constitute our point of reference as it is neither munificent nor rivalrous. Following, we can now reformulate and specify hypotheses 14a/b, 18a/b and 19a/b:

*H14a: The hospitable and promising environment, the competitive growth environment and the rivalrous low growth environment are positively associated with the NVC drivers (innovation (H14ai), venturing (H14av) and renewal (H14ar)).*

*H18a: The hospitable and promising environment, the competitive growth environment and the rivalrous low growth environment are positively associated with intended strategy (technology strategy (H18at) and innovative differentiation (H18ai)).*

*H19a: The hospitable and promising environment, the competitive growth environment and the rivalrous low growth environment are positively associated with entrepreneurial postures (aggressiveness (H19aa) and futurity (H19af)).*

Based on the munificence and rivalry dimensions we now attempt to rank the environmental clusters with regard to their effects on the NVC drivers, intended strategy and entrepreneurial postures.

Munificence and rivalry are both considered conducive to new value creation. Yet, caution is needed in the case of propositions regarding rivalry (Zahra, 1993b). Fierce rivalry could drive firms toward exit behavior instead of undertaking risky corporate entrepreneurial activities. Additionally, the relationship between rivalry and new value creation may be nonlinear. As such,

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rivalry is expected to be linked in a somewhat weaker way to new value created vis-à-vis munificence. Taking these insights into account we expect the following ranking with regard to the strength of the association of the environmental clusters with new value created (in descending order): (1) competitive growth environment (strong on munificence and rivalry), (2) hospitable and promising environment (strong on munificence, weak on rivalry), (3) rivalrous low growth environment (strong on rivalry, weak on munificence) and (4) static and impoverished environment (weak on munificence and rivalry). The static and impoverished environment is ranked last and serves as out point of reference. Hence:

*H14b: The competitive growth environment displays the strongest association with the NVC drivers, followed by the hospitable and promising environment, which is followed by the rivalrous low growth environment.*

We expect the same order as far the strength of the association between the environmental clusters and technology strategy, innovative differentiation (both intended strategies) and futurity (entrepreneurial posture) is concerned. Munificence and rivalry are again both conducive to these strategies and this posture. And again, caution is necessary when it comes to rivalry. For this reason, we rank the hospitable and promising environment (strong on munificence, weak on rivalry) higher than the rivalrous low growth environment (strong on rivalry, weak on munificence). The reverse of the latter holds when it comes to aggressiveness (entrepreneurial posture). Although both munificence and rivalry are conducive to aggressiveness, the link between rivalry and aggressiveness is expectedly more straightforward than the link between munificence and aggressiveness. In all instances, the static and impoverished environment is ranked last and serves as out point of reference. Hence:

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*H18b: The competitive growth environment displays the strongest association with technology strategy and innovative differentiation, followed by the hospitable and promising environment, which is followed by the rivalrous low growth environment.*

*H19b: The competitive growth environment displays the strongest association with the futurity posture, followed by the hospitable and promising environment, which is followed by the rivalrous low growth environment. As far as aggressiveness is concerned, the competitive growth environment displays the strongest association, followed by the rivalrous low growth environment, which is followed by the hospitable and promising environment.*

## **Results**

A path model by means of the CALIS procedure was used to test the model presented in Figure 10. The analyses were executed in three main steps, analogous to the approach applied in theme 2. First, we modeled the upper echelon composition – NVC links. Following, we tested the management learning and selection mechanisms – NVC associations. And finally, we considered the links between the upper echelon composition and learning and selection mechanisms and NVC. The results obtained in the last step will be used to determine whether to adopt or reject the research hypotheses 11 to 19. The whole three-step approach has the advantage of giving us insights in the explanatory power of the diverse blocks studied.

### *Effects of creator elements on the NVC drivers*

We now turn to the results of the analyses with regard to model 3, as presented in Figure 10. Based on the third analytical step (including the upper echelon composition as well as learning and selection mechanisms) we will now review whether or not the hypotheses 11 to 19 receive empirical support.

All goodness-of-fit indexes support the models tested in the three-step approach. We report the fit indexes of the third model: chi-square (p-value 0.32), Goodness

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of Fit Index (GFI) (0.98), Bentler's Comparative Fit Index (1.00), Bentler and Bonett's Non-normed Index (0.98) and Bentler and Bonett's Normed Fit Index (NFI) (0.97). These indicate that the model with the paths presented in Table 16 (a and b) is supported by the data (Hatcher, 1994). Note that a few paths had to be added compared to the theoretical model (Figure 10) in order to eliminate significant residuals. A first such path refers to an industry heterogeneity → educational heterogeneity link (Table 16b). It suggests that the team's educational background heterogeneity depends on its industry heterogeneity. In other words, just by composing management teams of which the members have diverse industry backgrounds firms also induce educational background diversity, suggesting that educational background and industry background go hand in hand to a certain extent. Two other added paths link technology strategy to innovative differentiation and aggressiveness to futurity (Table 16c). These suggest that adopting a technology strategy works as a vehicle for firms to differentiate themselves from their competitors and that assuming a combative posture (aggressiveness) also stimulates firms to adopt a more long term perspective (futurity). All in all, the creator resources together with the control variables and the NVC-links explain 32% of the variation in renewal, 47% in venturing and 24% in innovation.

Table 16a shows that some creator elements have direct effects on innovation, venturing or renewal. This goes for both categories of creator elements, i.e. upper echelon composition variables (TMT and ownership elements) and learning selection and selection mechanisms (management's perception of the environment, entrepreneurial strategic orientation and intended strategy). The tables 16b and 16c contain information that allows us to review hypotheses 13, 17, 18 and 19. Hypothesis 13 proposed that the ownership variables were positively (ownership concentration: negatively) associated with the top management team composition elements.

Table 16a. Model 3: NVC path coefficients

Path from ... to ...	Renewal	Innovation	Venturing
Renewal	/	0.19***	0.14**
Innovation	/	/	0.26****
TMT size	-0.05	0.06	-0.11*
TMT industry heterogeneity	-0.03	0.01	0.03
TMT educational heterogeneity	0.03	-0.03	0.08
Presence of institutional owners	0.04	0.06	0.08
Presence of private owners	-0.09	-0.07	-0.02
Foreign company	0.06	0.12	0.00
Ownership concentration	-0.03	-0.07	-0.09*
Technology strategy	0.29****	0.21**	0.19**
Innovative differentiation	-0.00	0.02	0.03
Aggressiveness	0.01	-0.01	0.12**
Futurity	0.22***	-0.09	0.14**
Rivalrous low growth environment	0.01	0.10	0.06
Hospitable promising environment	0.08	0.17**	0.08
Competitive growth environment	0.06	0.02	0.15**
Company size	0.20**	0.05	-0.04
Company age	0.01	-0.09	0.00
Manufacturing and energy	-0.12	0.14	-0.09
Construction	-0.10	-0.05	-0.07
Wholesale and retail	-0.05	0.16	0.07
Catering	0.06	0.03	-0.10
Transport and communication	-0.12	-0.02	-0.07

\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001



Table 16b. Model 3: TMT path coefficients

Path from ... to ...	TMT size	TMT industry heterogeneity	TMT educational heterogeneity
TMT size	/	/	/
TMT industry heterogeneity	/	/	0.40***
TMT educational heterogeneity	/	/	/
Presence of institutional owners	-0.08	-0.02	0.01
Presence of private owners	-0.19**	-0.02	0.03
Foreign company	-0.05	0.05	0.02
Ownership concentration	0.09	0.02	0.09
Company size	0.38***	0.24***	0.18**
Company age	0.04	-0.08	-0.01
Manufacturing and energy	0.27***	0.05	0.12
Construction	0.18**	-0.05	0.02
Wholesale and retail	0.23**	0.06	0.18*
Catering	0.06	-0.01	0.01
Transport and communication	0.12	-0.01	0.10

Table 16c. Model 3: Strategy and entrepreneurial orientation path coefficients

Path from ... to ...	Technology strategy	Innovative differentiation	Aggressiveness	Futurity
Technology strategy	/	0.51 <sup>***</sup>	/	/
Innovative differentiation	/	/	/	/
Aggressiveness	0.04	-0.17 <sup>***</sup>	/	0.20 <sup>***</sup>
Futurity	0.35 <sup>***</sup>	-0.04	/	/
Rivalrous low growth environment	-0.12	-0.10	0.16 <sup>*</sup>	0.02
Hospitable promising environment	0.21 <sup>***</sup>	-0.01	0.12	0.19 <sup>**</sup>
Competitive growth environment	0.08	0.07	0.18 <sup>**</sup>	0.22 <sup>***</sup>
Company size	-0.00	-0.02	-0.01	0.25 <sup>****</sup>
Company age	-0.04	-0.07	-0.03	-0.10
Manufacturing and energy	0.07	-0.04	0.20 <sup>*</sup>	-0.01
Construction	-0.06	-0.07	0.07	-0.19 <sup>**</sup>
Wholesale and retail	-0.03	0.06	0.32 <sup>***</sup>	-0.09
Catering	-0.20 <sup>***</sup>	0.12 <sup>*</sup>	0.10	-0.07
Transport and communication	-0.09	-0.04	-0.00	-0.09

\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001

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This hypothesis receives little support from the data (Table 16b). Only one link is significant. The presence of private owners affects top management team size, albeit negatively. As such, the presence of private owners leads to smaller top management teams (controlled of firm size). All in all, the ownership elements studied here leave little or no marks on the composition of the top management team.

Hypothesis 17 stated that entrepreneurial postures such as aggressiveness and futurity are positively linked to intended strategy (technology strategy and innovative differentiation). In other words, it suggests that the pursuit of a technology or an innovative differentiation strategy is an outlet of management's aggressive and future-minded orientation. Hypothesis 17 is supported by the data in Table 16c.

Note that this table only reflects the direct effects of the entrepreneurial postures on intended strategy. The indirect (and total) effects have to be calculated as follows. Futurity directly affects technology strategy. Here there are no indirect effects. There is no direct effect of futurity on innovative differentiation. However, due to the (significant) technology strategy - innovative differentiation path that had to be added, there is an indirect (and total) effect of 0.18 ( $= 0.35 \times 0.51$ ) of futurity on innovative differentiation. Similarly, aggressiveness has an indirect (and total) effect of 0.07 ( $= 0.20 \times 0.35$ ) on technology strategy. In addition to the direct effect (-0.17) of aggressiveness on innovative differentiation, there is also an indirect effect of 0.07, partly via futurity ( $0.20 \times 0.18$ ) and via technology strategy ( $0.07 \times 0.51$ ). In sum, this gives us a total effect of -0.10 of aggressiveness on innovative differentiation. The sign of this particular effect runs opposite to what was hypothesized.

Table 17 summarizes the thus calculated (total) effects as they are important to bear in mind when calculating the effects on the NVC drivers (cfr. *infra*). It shows that futurity has a strong and positive association with both a technology and an innovative differentiation strategy.

Table 17. Total effects of entrepreneurial orientation on intended strategy

<b>Effects of ... on ...</b>	<b>Technology strategy</b>	<b>Innovative differentiation</b>
Aggressiveness	0.07	-0.10
Futurity	0.35	0.18

As far as aggressiveness is concerned, the associations are somewhat weaker and (in the case of innovative differentiation) even negative. As such, a technology strategy is indeed a channel through which management's competitive aggressiveness substantiates, but innovative differentiation is not. Futurity, however, is reflected through both.

Table 18. Effects of environment on entrepreneurial orientation and strategy

<b>Effect on ... of ...</b>		<b>Rivalrous low growth environment</b>	<b>Hospitable and promising environment</b>	<b>Competitive growth environment</b>
Aggressiveness	Direct	0.16	/	0.18
	Indirect	/	/	/
	Total	0.16	/	0.18
Futurity	Direct	/	0.19	0.22
	Indirect	0.03	/	0.04
	Total	0.03	0.19	0.26
Technology strategy	Direct	/	0.21	/
	Indirect	0.01	0.07	0.10
	Total	0.01	0.28	0.10
Innovative differentiation	Direct	/	/	/
	Indirect	-0.02	0.18	0.08
	Total	-0.02	0.18	0.08

Hypotheses 18 and 19 stated that munificent and/or hostile environments are expected to be positively associated with entrepreneurial postures and intended entrepreneurial strategies. Earlier we discerned three such environmental settings: the hospitable and promising environment, the competitive growth

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environment and the rivalrous low growth environment. In view of Table 17 and of the paths added in Table 16c (e.g. aggressiveness – futurity), it is necessary to calculate the indirect and total effects of the environmental clusters on entrepreneurial postures and intended strategies before being able to review hypotheses 18 and 19 properly. Table 18 reveals the results of these calculations. We recall that our point of reference is the static and impoverished environment.

The total effects presented in Table 18 provide considerably strong support hypotheses 18a and 19a. We notice that both distinguished types of munificent, opportunity rich environments are indeed positively associated with both intended strategies and with both entrepreneurial postures. Only one expected association concerned is not confirmed: the link between the hospitable and promising environment and aggressiveness (absent). Table 18 also reveals that the non-munificent, opportunity-poor yet hostile environment included here (rivalrous low growth environment) is strongly positively associated with aggressiveness. This particular environment is also positively (yet weakly) connected with futurity and technology strategy and (weakly negatively) with innovative differentiation. All in all, firms perceiving their environment as munificent and rich in opportunities show a more profound technology and innovative differentiation strategy and a stronger expression of a future-oriented and/or aggressive strategic posture compared to firms considering their environment as static and impoverished.

It is also clear that firms experiencing strong competitive pressure or hostility (e.g. rivalrous low growth or competitive growth environment) adapt an aggressive posture, whereas companies in a hospitable environment do not. All of this points to the fact that management's entrepreneurial posture and intended strategy is indeed colored or even propelled by its perception of the firm's competitive environment. For instance, if the environment is perceived to be munificent, management will react and plan accordingly.

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When it comes to hypotheses 18b and 19b (ranking the environmental clusters in terms of their effects), the results of Table 18 also allow for considerable support. As far as aggressiveness and futurity are concerned, the results display the expected ranking whereby the competitive growth environment has the strongest effect, followed by the hospitable and promising environment (for futurity) and the rivalrous low growth environment (for aggressiveness). As far as technology strategy and innovative differentiation are concerned, the expected first and second positions in the ranking are reversed in practice, indicating that the hospitable and promising environment displays the strongest effect. All of this illustrates that the influence of the perceived environment on elements such as strategy is not always easy to capture. They may influence each other over time (Zahra, 1993b). This longitudinal interplay should be the research subject of future studies.

Given the review of hypotheses 13, 17, 18a and 19a and in view of the relatedness of the NVC-drivers (cfr. *supra*), it is again necessary that our review of the hypotheses with regard to the effects of the creator elements on new value created (hypotheses 11, 12, 14, 15 and 16) should be based on the total effects. At least if we are not to underestimate the contribution of the creator elements. The direct, indirect and total effects of all creator elements on new value created are presented in Table 19.

Hypotheses 11, 12, 14, 15 and 16 departed from the view that the creator (by means of its upper echelon composition/human capital elements and its learning and selection mechanisms) is an important resource in se. Top management team human capital characteristics (H11) and ownership elements (H12) were predicted to be positively related to innovation, renewal and venturing. The results of Table 19 provide weak support for these two general hypotheses. The majority of composition elements considered do not have an effect, and one shows an effect with a sign opposite to what was expected.

Table 19. Creator – NVC: direct, indirect and total effects

Effect of ... on ...	Renewal			Innovation			Venturing		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Renewal	/	/	/	0.19	/	0.19	0.14	0.05	0.19
Innovation	/	/	/	/	/	/	0.26	/	0.26
TMT size	/	/	/	/	/	/	-0.11	/	-0.11
TMT industry heterogeneity	/	/	/	/	/	/	/	/	/
TMT educational heterogeneity	/	/	/	/	/	/	/	/	/
Presence of institutional owners	/	/	/	/	/	/	/	/	/
Presence of private owners	/	/	/	/	/	/	/	0.02	0.02
Foreign company	/	/	/	/	/	/	/	/	/
Ownership concentration	/	/	/	/	/	/	-0.09	/	-0.09
Technology strategy	0.29	/	0.29	0.21	0.06	0.27	0.19	0.13	0.32
Innovative differentiation	/	/	/	/	/	/	/	/	/
Aggressiveness	/	0.08	0.08	/	0.07	0.07	0.12	0.13	0.25
Futurity	0.22	0.10	0.32	/	0.16	0.16	0.14	0.21	0.35
Rivalrous low growth environment	/	0.03	0.03	/	0.02	0.02	/	0.07	0.07
Hospitable promising environment	/	0.14	0.14	0.17	0.13	0.30	/	0.26	0.26
Competitive growth environment	/	0.13	0.13	/	0.11	0.11	0.15	0.22	0.37
Company size	0.20	0.08	0.28	/	0.09	0.09	/	0.12	0.12
Company age	/	/	/	/	/	/	/	/	/
Manufacturing and energy	/	0.02	0.02	/	0.02	0.02	/	0.03	0.03
Construction	/	-0.06	-0.06	/	-0.04	-0.04	/	-0.11	-0.11
Wholesale and retail	/	0.03	0.03	/	0.03	0.03	/	0.07	0.07
Catering	/	-0.06	-0.06	/	-0.07	-0.07	/	-0.09	-0.09
Transport and communication	/	/	/	/	/	/	/	/	/

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For example, the heterogeneity measures have no effect at all. And the sign of the top management team size – venturing link runs opposite to what was hypothesized. Based on these results, a heterogeneous top management team is not to be automatically considered a promising resource propelling NVC. And a larger team size curbs the firm’s venturing activities. Only two upper echelon composition characteristics are significantly associated with new value created in the way they were hypothesized (and all of them only with venturing): the presence of private owners and ownership concentration. Based on these results we cannot distinguish creator composition elements affecting all three types of NVC drivers.

As far as the upper echelon learning and selection mechanisms are concerned, things look brighter. Hypotheses 14a to 16 receive strong support. Only one element shows no effect on new value created: the innovative differentiation strategy. All other learning and selection mechanisms are positively and rather strongly associated with renewal, innovation and venturing. Very often these effects are direct effects on one or two NVC drivers.

When it comes to ranking the effects of the environmental clusters on the NVC drivers (hypothesis 14b), the results provide considerable support for our hypotheses. However, at the same time we observe that reality is not that straightforward as hypothesized. We expected the strongest effects on all NVC drivers to be reserved for the competitive growth environment, as it displays both munificence and rivalry. The hospitable and promising environment and the rivalrous low growth environment were expected to be second and third in line as far as the strength of their effects are concerned. The third position of the rivalrous low growth environment is confirmed by the results for all NVC drivers. But surprisingly, the competitive growth environment is only second in line as far as innovation and renewal are concerned, i.e. after the hospitable and promising environment (although the difference is negligible in the case of renewal). These deviations from what was expected may have to do with the fact that we do not consider the creating process catalyst effect of the creator elements in this study. Theme 5 (cfr. *infra*) should be able to reveal us more on this matter.



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All in all, pursuing a technology strategy, displaying a futurity and/or aggressive entrepreneurial posture and perceiving the environment as munificent or hostile prove to be important and promising upper echelon learning and selection mechanisms affecting the NVC drivers. The control variables we included in the analysis also prove to be of importance. Company size is positively related to innovation, renewal and venturing. The association of industry sector with new value created presents mixed findings: positive in the case of manufacturing and energy and wholesale and retail, negative otherwise. Interesting to note is that all control variable effects on the NVC drivers are purely indirect (via the composition and/or the learning and selection mechanisms).

*Explanatory power of upper echelon composition versus learning and selection mechanisms*

Having considered two sides of the upper echelon coin (its composition as well as learning and selection mechanisms), we are interested in their relative importance for the NVC drivers (in terms of explanatory power). Is it the upper echelon composition that makes the strongest contribution in explaining new value created, or are the learning and selection mechanisms more important? Answering this question could be of great practical relevance for firms in order to prepare or optimize their upper echelon resources to build new entrepreneurial value. In order to discuss the explanatory power of the upper echelon composition elements (as a block) versus that of the learning and selection mechanisms we turn to the three step approach mentioned earlier. In the first step (model 3a) we modeled the effects of the composition elements (top management team and ownership) to new value created (in the presence of the NVC-relationships and of the control variables). The second step (model 3b) took an analogous approach for the learning and selection mechanisms, whereas the third step (model 3c) included both.

Earlier we presented the goodness-of-fit indexes of model 3c. It is noteworthy that also the fit indexes of the models 3a and 3b all suggest that these theoretical models are supported by the data. Further, it is worth mentioning too that model

3c (paths presented in the Tables 16a to 16c) has been developed taking the lessons of the preceding steps (models 3a and 3b) into account. For instance, the path between TMT industry heterogeneity and TMT educational background heterogeneity (one of the paths added compared to the model depicted in Figure 9) stems from the learning experience of model 3a, where this residual was originally discovered. Similarly, the path between aggressiveness and futurity stems from model 3b. In other words, model 3c is neither more nor less than the mere combination of the models 3a and 3b.

As in theme 2, a comparison of the squared multiple correlations reveals what additional proportion of the variance is explained by adding the composition elements, learning and selection mechanisms, or both. Points of reference are the squared multiple correlations of model 1 (see theme 1), containing the relations among the NVC-types and the control variables. Table 20 lists the squared multiple correlations. Adding the upper echelon composition elements to model 1 (i.e. model 3a) increases the explained variance of all three types of NVC drivers. Adding the learning and selection mechanisms to model 1 (i.e. model 3b) also raises the explained variance for renewal, innovation and venturing. For all three types of new value created, the increase is substantially larger compared to that of adding the composition elements. This compels us to conclude that the learning and selection mechanisms of the upper echelon might be more important to explain the variance in the NVC drivers compared with the demographic side of the upper echelon (composition). In other words, the importance of the way in which management learns and decides excels that of its composition.

Table 20. Squared multiple correlations of model 1 and 3

	<b>Renewal</b>	<b>Innovation</b>	<b>Venturing</b>
Model 1	0.13	0.16	0.33
Model 3a (composition)	0.14	0.18	0.36
Model 3b (learning and selection)	0.30	0.21	0.42
Model 3c (both)	0.32	0.24	0.47

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Finally, model 3c includes the compositions elements and the learning and selection mechanisms, and comprises the changes in explained variation of the models 3a and 3b. As indicated earlier, the creator elements together with the control variables and the NVC-links explain 32% of the variation in renewal, 47% in venturing and 24% in innovation. Compared with the explanatory power of creating process elements (model 2c; Table 14) the creator elements show more explanatory power as far as venturing (47% versus 40%) is concerned. For innovation (24% versus 22%) renewal (32% versus 33%) the explanatory power of both blocks is more or less in balance. This suggests that exploratory efforts such as innovation and renewal require strong creator and creating process elements. When it comes to exploitation (venturing) the propelling (selling?) force of the creator becomes somewhat more important compared with the creating process elements, although the difference is not very striking.

## **Conclusion**

In line with the upper echelon perspective of the firm, we have illustrated in this research theme that creator elements too can be valuable enablers of NVC. Doing so, we have stretched the traditional boundaries of the upper echelon. Traditional upper echelon studies focus on the demographics of the top management team (or even the CEO) in the narrow sense. We have also included ownership composition variables and even top management postures, intentions and perceptions that guide the learning and decision-making on the highest level in the firm.

We thus discerned two types of creator elements: demographic or composition indicators (top management team and ownership composition) and learning and selection mechanisms. As far as the top management demographics are concerned, we focused on the team level. Only the team size turned out to be relevant. Heterogeneity measures such as industry and educational background heterogeneity stayed behind, showing no association with the NVC drivers. The same can be said about two ownership demographics, namely the presence of institutional owners and foreign ownership. Two other ownership elements (the

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presence of private owners and ownership concentration) did show effects. The negative effect of team size on venturing was somewhat surprising. Further developing the model (combining creator and creating process resources) can perhaps provide us with clearer insights into the what's and why's of this effect. We will deal with this in research theme 5. In this theme we will also be able to demonstrate whether or not the direct ('resource') effects of the creator elements found here will last or will prove to be (in theme 3) unmeasured catalyst effects running via the creating process. The results strongly supported our propositions with regard to the links between NVC and the learning and selection mechanisms. Only the innovative differentiation strategy turned out to be irrelevant for new value creation.

To summarize, whereas both the upper echelon demographics and the learning and selection mechanisms display explanatory power with regard to the NVC drivers, the latter seem more powerful. Although we must again be careful not to draw far-reaching conclusions at this point in time since we only looked at the 'resource' effect of the creator here, this very 'resource' impact of the upper echelon composition is on the whole rather disappointing. The results of Theme 5 will be more adequate to draw more in-depth conclusions. Still, our findings here suggest that its composition does not really offer a strong human capital or knowledge base of direct use for new value creation. This could be explained by means of the combination of the measures used (e.g. educational background heterogeneity measures instead of educational level measures) and the diverse sample of firms studied. Using the same sample, other measures could lead to revealing interesting tendencies. Or still, applying the same measures to a more homogeneous industry and/or size setting could also be worthwhile exploring. All in all, given our measures and the sample, we are bound to conclude at this point in time that the upper echelon composition is not that important as it is sometimes suggested. Much more can be expected from the upper echelon's learning and selection mechanisms. This need not be bad news. On the contrary, it offers interesting perspectives for firms of diverse upper echelon composition. It

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is perhaps easier to adjust the lens used to look at and learn about things than to alter the upper echelon composition.

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## **THEME 4: CREATING PROCESS ELEMENTS' RELATEDNESS**

### **Content**

In theme 2 we expressed the expectation that relationships exist among the creating process variables. This expectation is based on theory, as Dierickx and Cool (1989) pointed to the interconnectedness and accumulation (bundling) of asset stocks in order to build competitive advantage. Connections among creating process elements would result in important implications for our exploration of resources stimulating new value creation in firms. Reciprocal effects among the creating process resources and capabilities are likely to give rise to additional (indirect and total) effects of these and other stocks and flows on the NVC drivers, thus demanding a second review of the hypotheses proposed earlier. In the light of this concern, in this research theme we set out to confirm (and map) or dismiss such relationships among the creating process elements.

### **Hypothesis**

Our research hypothesis is deceptively simple: we assume that the creating process elements are related. The set-up of this research theme is explorative. As such, in contrast with the other research themes, here we do not depart from a specific research model. We try to capture the relatedness in order to take it into account in our further search for resources and capabilities that are valuable for innovation, venturing and renewal.

The hypothesis of the relatedness of resources and capabilities is built on the premise raised by Dierickx and Cool (1989) who saw the interconnectedness of the asset stocks as a characteristic of the resource accumulation process, affecting the imitability of the resources or capabilities thus obtained. In their view, accumulating increments in an existing asset stock not only depends on the level of that particular stock, but also on the level of other asset stocks. It is our contention that the supposed relatedness not only pertains to assets or resource stocks, but also to flows. For instance, Afuah (2002) argues that firms' competitive

resources often stem from weaving unique combinations of newly acquired or developed resources and capabilities with existing ones. As the sustainability of the firm's privileged resource profile hinges on how easily it can be replicated by competitors (Dierickx & Cool, 1989), such promising, valuable and/or rare resources or capabilities need to be truly inimitable and non-substitutable. Many such firm-specific and/or non-tradeable and often intangible resource stocks (e.g. human capital, customer loyalty, know-how etc.) and capabilities are built rather than bought. They are built by means of flows. We thus expect stocks to be connected with flows. However, this need not be a one-on-one relationship. Building a particular stock can perhaps demand a consistent pattern of several flows. Also, a particular flow can be valuable in accumulating different stocks and flows. This is to suggest that firms can exhibit diverse yet consistent patterns or configurations of often causally ambiguous stocks and/or flows. In this research theme we set out to detect such patterns. Doing so, we work with the creating process resource measures discussed earlier.

Until now we departed from the assumption that the resources are related. An immediate question now arising is whether or not the elements actually are connected. An analysis that can shed light on this question is calculating the bivariate correlation coefficients. Table 21 displays these correlations.

Table 21. Creating process elements: bivariate correlations

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Patents and commercial secrets	1.00					
(2) R&D	0.29	1.00				
(3) Employee human capital	0.25	0.18	1.00			
(4) HRM	0.49	0.28	0.34	1.00		
(5) Networking	0.47	0.24	0.17	0.53	1.00	
(6) Market intelligence generation	0.30	0.21	0.19	0.41	0.36	1.00
(7) Market intelligence dissemination	0.37	0.18	0.26	0.45	0.28	0.66

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Correlations greater than or equal to 0.14 are significant at the .05 level (2-tailed). Table 21 therefore reveals that all bivariate associations are significant and positive. This suggests that (make or buy) accumulations of one type of resources/capabilities are likely to go hand in hand with accumulations of other types.

### **Element relatedness: patterns or configurations**

Now that the correlations have empirically corroborated the formerly assumed element relatedness, we turn towards capturing their relatedness into internally consistent (“fitting”) patterns or configurations. In order to obtain such patterns we draw upon the seminal work of Venkatraman (1989b). Venkatraman (1989b) distinguished between six types of fit in a classificatory framework: fit as moderation, fit as mediation, fit as profile deviation, fit as gestalts, fit as matching and fit as covariation. This framework can guide our selection of the adequate type(s) of fit to be pursued here and of the appropriate analytical tool.

The exploratory set-up of this research theme comprises no criterion variable (i.e. a dependent variable we are trying to explain, e.g. innovation). As such, according to Venkatraman’s (1989b) framework, the three criterion-free perspectives remain in the running: fit as gestalts, fit as matching and fit as covariation. Since we are dealing here with more than two variables in the specification of fit, fit as matching is no longer an option. It thus boils down to conceptualize fit either as gestalts or as covariation. For the purpose of illustration we will cover both, beginning with covariation.

#### *Fit as covariation*

Following Venkatraman (1989b), fit as covariation can be modeled by means of confirmatory factor analysis (in the case of interval measures) or by means of path models, which we have been using until now. To illustrate this type of fit, we depart from the model presented in theme 2 (model 2c). As we recall, in model 2c relationships among the creating process elements did not emerge because we



treated all stocks and flows as exogenous (i.e. strictly independent; see Chapter 3) variables. Therefore, if we would treat them as endogenous variables, the CALIS procedure would soon point to the existence of significant residuals (non-modeled paths) between creating process elements. After all, correlations between certain variables are strong (Table 21). If residuals exist, the CALIS procedure always suggests from which variable to which variable a path should be foreseen in order to eliminate the residual concerned. Turning the formerly exogenous creating process variables into endogenous variables can be accomplished by explaining them by means of the control variables. The rest of the model specification remains identical to that of model 2c. So the only exogenous variables left in the model are then the control variables.

Table 22. Creating process elements: path coefficients

<b>From ... to ...</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
(1) Patents and commercial secrets	-	0.20	-	-	-	-	-
(2) R&D	-	-	-	-	-	-	-
(3) Employee human capital	-	0.17	-	0.26	-	-	-
(4) HRM	0.27	-	-	-	0.39	0.37	0.21
(5) Networking	0.29	-	-	-	-	-	-
(6) Market intelligence generation	-	-	-	-	-	-	0.60
(7) Market intelligence dissemination	-	-	-	-	-	-	-

In Table 22 we present the results of this illustrative exercise. We only depict the coefficients of the paths among the creating process resources, as this is our point of interest here. As expected, all these paths had to be added during model respecification in order to eliminate residuals. We strictly followed the suggestions of the software in modeling these paths. All paths are significant at the 0.10 level (at least).

According to the results presented in Table 22, stocks can be related to stocks (e.g. patents and commercial secrets - R&D) and to flows (e.g. networking - patents and commercial secrets or employee human capital - HRM). And flows

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also connect to flows (e.g. HRM – networking). More specifically, the empirical findings suggest among others that a strong patents and commercial secrets base goes hand in hand with research and development (R&D) investments. Further, employee human capital is strongly related to R&D and HRM, indicating that it may serve as a platform for R&D investment and for developing knowledge creating and sharing HRM. Networking with other firms and/or organizations such as universities and research institutes can enlarge the firm's patents and commercial secrets portfolio. And market intelligence generation seems to stimulate the dissemination of this type of knowledge. Finally, knowledge creating and sharing HRM seems to propel the number of patents and commercial secrets, networking, market intelligence generation and dissemination.

Closely interpreting these relationships reveals the main shortcoming of fit as covariation in this setting. Venkatraman (1989b) rightly pointed attention to the theoretical relatedness of variables to be fitted in a pattern of covariation. However, problems can arise when theory recognizes bidirectional relationships. This can be best described through an example based on Table 22.

As mentioned, we followed the suggestions of the software in modeling the paths (e.g. HRM → networking instead of networking → HRM). This data-driven approach does not exclude reverse causation on the theoretical level. For instance, it is possible that intense knowledge creating and sharing HRM stimulates firms to network (to create and share knowledge beyond the firm's boundaries). But the reverse cannot be ruled out. For instance, knowledge networks among firms can engender the awareness within firms that building knowledge networks among employees by means of knowledge creating and sharing HRM practices might be valuable too. In other words, the model specification forces us to choose among two alternatives that might both be practically valuable and theoretically acceptable. This choice, though, has consequences for researchers when calculating the direct, indirect and total contributions of the resources on the NVC drivers. For instance, choosing the HRM → networking path will increase the total effect of HRM on new value created. Opting for the networking → HRM

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path will do the same for networking. Although this covariation type of exercise has its advantages and is by no means wrong, we have to be very conscious of the consequences of the path choices that have been made, especially when formulating managerial implications.

### *Fit as gestalts*

Fit as gestalts makes way with this drawback of modeling fit as covariation. Fit as gestalts refers to a multivariate perspective of fit, searching for internally coherent sets of attributes of variables. Compared to other fit perspectives, the degree of precision in the functional form (e.g. interaction, mediation etc.) of the variable relationship can be relaxed as more than two variables are involved (Venkatraman, 1989b). The direction of the relationship between the variables is no longer a concern (e.g. HRM → networking versus networking → HRM). In other words, fit as gestalts aims at detecting distinguishable yet internally homogeneous patterns or configurations of creating process elements.

Cluster analysis is an analytical tool available for discovering gestalts. As with the environmental settings, the cluster analysis was executed in two consecutive steps. First, a hierarchical cluster analysis (Ward's method) guided the selection of the final number of clusters. The analysis suggested four clusters, which is within the reliable N/30 to N/50 cluster range (in our sample: N = 213) according to Lehman (1979). Second, based on this initial number of clusters we performed a non-hierarchical cluster analysis (K-means procedure) to obtain the final cluster centers and means. To evaluate the stability and meaningfulness of the four clusters, we conducted analysis of variance (ANOVA) and Bonferroni tests of differences in group means.

Table 23 summarizes the results of these tests and contains the standardized means of the four clusters on the seven creating process resources. The data have been adjusted for inter-industry variations. The Bonferroni tests mark the discerning qualities of the four clusters. All F-values are significant at the .001 level.

Table 23. Creating process element clusters: results of ANOVA

<b>Creating process element</b>	<b>CL1</b> (weak profile)	<b>CL2</b> (balanced profile)	<b>CL3</b> (flow profile)	<b>CL4</b> (human capital profile)	<b>Bonferroni</b>	<b>F</b>
Patents and commercial secrets	-0.51	1.59	0.67	0.01	2>1, 2>3, 2>4, 3>1, 3>4, 4>1	35.4
R&D	-0.28	4.13	-0.30	-0.01	2>1, 2>3, 2>4, 4>1, 4>3	423.2
Employee human capital	-0.48	0.13	-0.32	0.99	4>1, 4>2, 4>3	46.8
HRM	-0.68	1.03	0.73	0.33	2>1, 3>1, 4>1	48.5
Networking	-0.58	0.73	1.14	-0.12	3>1, 3>4, 2>1, 2>4, 3>1	62.6
Market intelligence generation	-0.64	0.59	0.67	0.38	2>1, 3>1, 4>1	35.9
Market intelligence dissemination	-0.64	0.80	0.52	0.47	2>1, 3>1, 4>1	35.3

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Based on the Bonferroni tests we can profile the four creating process gestalts or clusters as follows. The first cluster (N = 95) displays the lowest scores for all seven resources or capabilities. As a result, we can label it as *the weak profile* cluster. The second cluster (N = 10) holds an overall strong position as far as the resource stocks (patents and commercial secrets, R&D, employee human capital) are concerned. On the flow front its scores are moderate (higher than the weak profile and (as far as networking is concerned) than the fourth cluster). We label this cluster as *the balanced profile*. In the third cluster the flows are also moderately well developed, but the stocks (except patents and commercial secrets) fall behind. We call it the *flow profile*. The fourth and last cluster (N = 60) excels in employee human capital (highest score of all clusters). Its score on HRM is moderate (higher than that of the weak profile), combined with also moderate scores on market intelligence generation and dissemination. Its score on networking is lower than that of the balanced and flow profiles. We label this last cluster the *human capital profile*.

The cluster profiling reveals that the distinction between resource stocks and flows is also useful to some extent in discerning resource gestalts. Three of the four clusters can be mapped by means of this distinction. Cluster one disappoints on both dimensions. Cluster two on the other hand offers interesting perspectives on both. The third cluster specializes in developing flows.

## **Conclusion**

In this research theme we explored the existence and nature of relationships among the creating process elements. Our expectation has been confirmed: they are indeed related. In capturing the relatedness we followed two approaches: fit as covariation and fit as gestalt. The first approach leads us to conclude that many of the creating process stocks and flows studied positively affect other stocks and/or flows. As such, investing in one type of resource or capability (e.g. HRM) can facilitate or leverage other resource or capability development or deployment (e.g. networking). One type of stock or capability can serve as a platform to launch the development of others. Whereas fit as covariation is highly dependent

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on choices made by the researcher when theory recognizes bidirectional relationships between specific elements, the second approach to capture resource relatedness (fit as gestalt) can easily overcome this. It looks for patterns or configurations of creating process elements. Four such patterns have been detected: a weak profile and three other profiles indicating some kind of resource strength (balanced profile, flow profile and human capital profile). Fit as gestalt, though, cannot be used to calculate individual elements' contributions to new value created since it departs from sets or patterns of stocks and flows. The existence of these profiles demonstrates that firms portray patterns or configurations of resources and capabilities. Both fit approaches will be used in research theme 5 to investigate the contribution of the elements (individual or as configurations) to the NVC drivers.

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## **THEME 5: THE CORPORATE ENTREPRENEURSHIP NEXUS**

### **Content**

This fifth and final research theme concludes the study's empirical section. It brings together and builds upon the previous four themes. As such, in this theme we investigate the contribution of the full resource portfolio on the NVC drivers. The portfolio contains the creating process elements (stocks and flows; as separate variables or by means of the distinguished element profiles) as well as the creator elements (top management team and ownership composition demographics and learning and selection mechanisms) discussed earlier.

We can summarize the value added of this research theme vis-à-vis the previous themes as follows. First, as far as the creating process elements are concerned, we will be able to demonstrate the consequences of their relatedness for the NVC drivers. This relatedness will be taken into account in two separate analyses. In one analysis we will model the creating process elements separately (just as in Theme 2) and in another analysis we will depart from the resource profiles discovered in Theme 4. Second, combining the creating process with the creator allows us to test both roles of the creator. Next to the earlier studied resource role of the creator (Theme 3) we can now also evaluate its catalyst function, i.e. directing the creating process elements.

All things considered, this research theme tests the corporate entrepreneurship nexus in its full complexity. The model extensions of this theme will demand that the majority of the research hypotheses proposed earlier be reviewed for a second time as the further development of the model can engender additional resource contributions to the NVC drivers. After all, catalyst effects of the creator as well as reciprocal effects among the creating process elements are likely to give rise to additional (indirect and total) effects of these and other elements on innovation, venturing and/or renewal.

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## Model and hypotheses

The hypotheses developed in Theme 1 through 4 also apply to this theme. However, compared with the previous research themes, we have to develop two additional sets of hypotheses. One set runs parallel with the hypotheses linking the creating process elements to the NVC drivers, whereas the second reflects the catalyst function of the creator.

### *Hypotheses with regard to the creating process element profiles*

Instead of proposing linkages between the individual resources/capabilities and new value created, the first additional set of hypotheses departs from the resource profiles or clusters distinguished in Theme 4. These profiles must now be linked to the NVC drivers. Four profiles have been discerned: the weak resource profile, the balanced resource profile, the flow profile and the human capital profile. From an analytical point of view, one profile has to serve as the point of reference. For this purpose we choose the weak resource profile. As the other three resource clusters are endowed with more stocks and/or flows vis-à-vis the weak profile, we develop the following proposition with regard to the NVC drivers:

*H20: The balanced, flow and human capital profiles are positively associated with new value created (innovation (H20i), venturing (H20v) and renewal (H20r)).*

Further, as the balanced profile exhibits a broader, overall resource and capability base compared with the other two profiles studied, it is our assumption that this profile will give rise to more substantial effects on the NVC drivers compared with the flow and human capital profiles. Hence the following general hypothesis:

*H21: The balanced resource profile is stronger (positively) associated with new value created than the flow and human capital profiles.*



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*Hypotheses linking the creator to the creating process*

The second additional set of hypotheses links the individual creator elements to the creating process. All creator or upper echelon elements have the ability to influence other elements (i.e. creating process elements) and their management (Bates, 1990; Roth, 1995), such as the nature and the management of employee human resources. Studying these (indirect) catalyst effects of the creator on new value created is likely to improve our understanding of the mechanisms and processes by which upper echelon elements shape firm outcomes (Carpenter et al., 2004). After all, the role of management is not only direct, but also more influential, shaping managerial processes and resource deployments (Hoffman & Hegarty, 1993; Maes et al., 2005). As such, the upper echelon can also affect managerial processes and resource accumulation. Its human capital and its learning and selection mechanisms are sources of knowledge and insight needed to effectively build and use the firm's resources and capabilities, such as R&D and HRM (Dutta et al., 2002; Lynskey, 2004).

As Borch et al. (1999) noted that certain resource combinations may attract other resources, we can also expect that certain upper echelon elements may lead to other (creating process) resource positions and managerial processes. This does not only hold for the top management team demographics, but applies equally to all other upper echelon elements studied here, such as ownership and the diverse learning and selection mechanisms. For instance, Zahra (1996a) demonstrated that management's perception of the environment as being dynamic and rich stimulates R&D spending. This suggests that an environment perceived as munificent (or hostile) in some way pushes companies towards investing in resource stocks (e.g. R&D) and capabilities (flows) that allow firms to appropriate value from the perceived opportunities. The creating process elements studied in this dissertation belong to this category of resources (cfr. supra). In the context of the environment - creating process elements link we can build on the environmental settings detected earlier (see Theme 3). Further, we expect that also entrepreneurial orientation and intended entrepreneurial strategy are likely to affect investment in and deployment of resources and capabilities that can create

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new value (such as the ones constituting the creating process). This hypothesis builds on Noble et al. (2002) who showed that strategic orientation influences organizational learning capabilities. Still further, the association of ownership and the creating process elements builds on the (unmeasured) governance mechanism discussed earlier (see Theme 3). Specific ownership characteristics such as shareholdings by private or institutional owners, foreign owners and ownership concentration affect resource endowments (Douma et al., 2006). Since institutional, private and foreign owners are expected to pursue new value creation (cfr. supra), we assume that they also push resource and capability endowments (such as R&D, networking, etc.) in that direction. The reverse holds for ownership concentration. In view of the above we propose the following hypotheses:

*H22: The top management team size, industry and educational background heterogeneity are positively associated with the creating process elements (patents and commercial secrets (H22p), R&D (H22rd), employee human capital (H22e), knowledge creating and sharing HRM (H22h), networking intensity (H22n), intelligence generation (H22ig) and intelligence dissemination (H22id)).*

*H23: The presence of institutional owners, the presence of private owners, the firm being a foreign company and ownership concentration (ownership elements) are positively (ownership concentration: negatively) associated with the creating process elements (patents and commercial secrets (H23p), R&D (H23rd), employee human capital (H23e), knowledge creating and sharing HRM (H23h), networking intensity (H23n), intelligence generation (H23ig) and intelligence dissemination (H23id)).*

*H24: The hospitable and promising environment, the competitive growth environment and the rivalrous low growth environment are positively associated with the creating process elements (patents and commercial secrets (H24p), R&D (H24rd), employee human capital (H24e), knowledge creating and sharing HRM (H24h), networking intensity (H24n), intelligence generation (H24ig) and intelligence dissemination (H24id)).*

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*H25: Entrepreneurial strategy (technology strategy and innovative differentiation) is positively associated with the creating process elements (patents and commercial secrets (H25p), R&D (H25rd), employee human capital (H25e), knowledge creating and sharing HRM (H25h), networking intensity (H25n), intelligence generation (H25ig) and intelligence dissemination (H25id)).*

*H26: Entrepreneurial strategic orientation (aggressiveness and futurity) is positively associated with the creating process elements (patents and commercial secrets (H26p), R&D (H26rd), employee human capital (H26e), knowledge creating and sharing HRM (H26h), networking intensity (H26n), intelligence generation (H26ig) and intelligence dissemination (H26id)).*

Detailed research hypotheses are summarized in Annex 2, which shows the expected association of all paths modeled. Figure 11 depicts the full corporate entrepreneurship nexus modeled here. The model with the resource profiles is analogous.

## **Measures**

All measures necessary to test this theme's research models have been clarified in the previous research themes.

## **Results**

As revealed earlier, two models - differing in the operationalization of the creating process - will be tested: one with the individual creating process elements and another with the four clusters or profiles. Both will be analyzed as path models. We begin with the model containing the individual creating process elements, which will be used to assess the hypotheses 4 to 19 and 22 to 26.

However, before discussing the test results and coefficients of the model depicted in Figure 11, we first determine whether or not the proposed relatedness of innovation, venturing and renewal in this model is not only theoretically superior to its alternative (cfr. Theme 1), but also data wise.

*NEXUS*

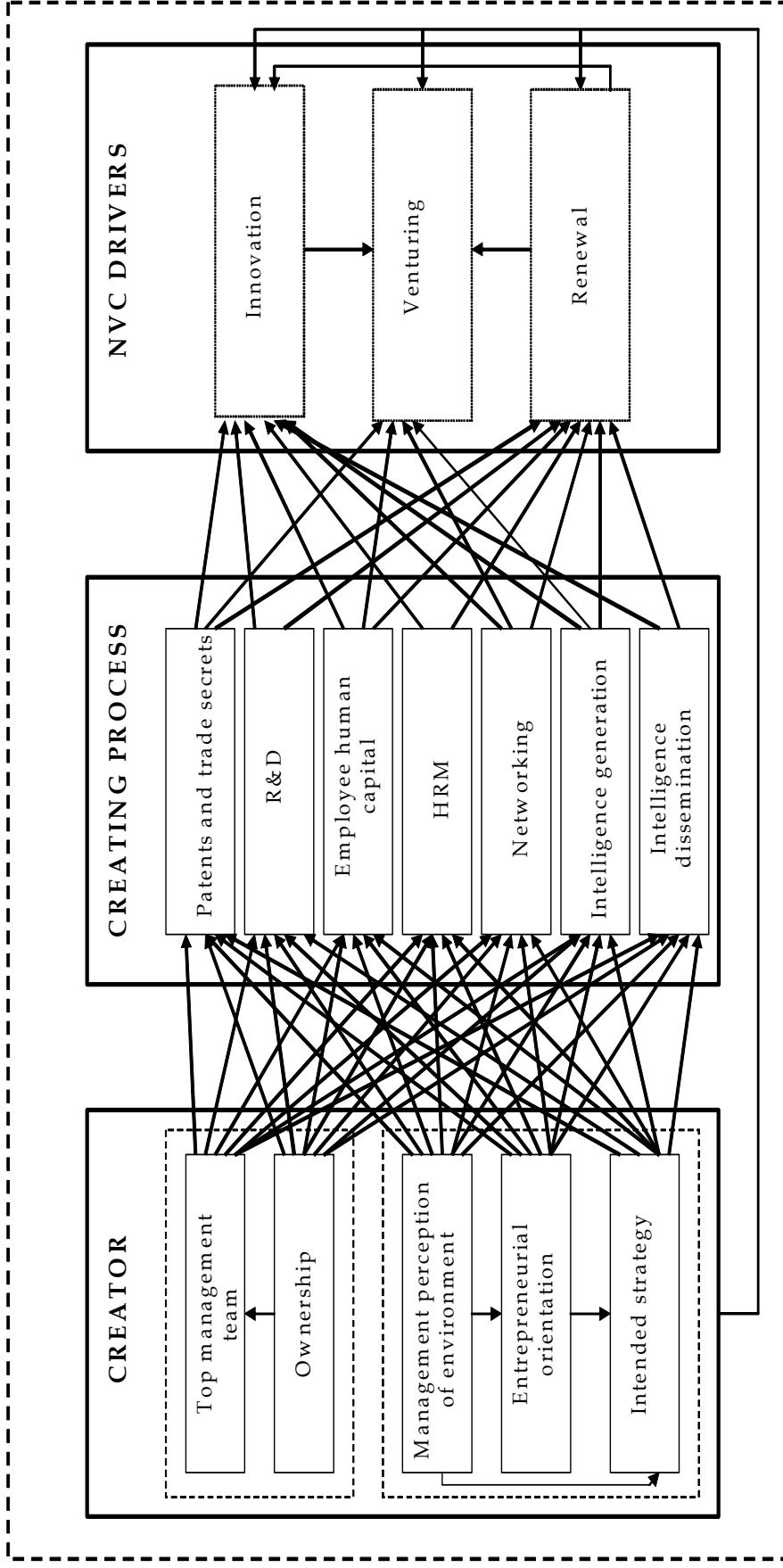


Figure 11. Corporate entrepreneurship nexus: expected links (model 5).

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As we recall from Theme 1, the discussion concerns the renewal → innovation versus the innovation → renewal path. We revealed our theoretical preference for the model with the NVC driver relatedness depicted in Figure 11. However, in Theme 1 both competing models were found to be equivalent when confronted with the data.

Since we are now testing the full model in Theme 5 (including the creator and creating process elements), we are better equipped to retest the possible equivalence or superiority of the competing models. The creator and creating process elements serve as a so-called preceding block (Henley et al., 2006), allowing us to look for variations in the fit statistics by means of the replacement rule (Lee & Hershberger, 1990). Using this rule, we replace the renewal → innovation path by the innovation → renewal linkage (all else remaining equal) and rerun the model to obtain the corresponding fit statistics. If these fit measures are equal, then both models are equivalent from a data point of view. If not, the model with the best fit is regarded superior data wise. Note that – compared to the theoretical model presented in Figure 11 – several paths had to be added to account for the creating process resources’ relatedness. Doing so, the suggestions of the software have been closely followed.

The resemblance with the corresponding paths of Table 22 is striking. Model respecification did not include introducing non-hypothesized paths such as the ones between certain creating process elements (e.g. R&D or HRM) and venturing (cfr. Theme 2). These paths thus actually proved to be redundant. Note that paths with 0.00 as coefficient were actually modeled and tested, but proved to be completely redundant, as suggested by the Wald test statistics. These paths were deleted in order to obtain the full list with the variable equations and paths coefficients. Otherwise only a part of that particular output is retrievable due to a limited capacity of the CALIS output generator. We used the replacement rule only after these paths were added. The preceding block of the competing models is therefore identical. The goodness-of-fit measures of both competing models are reported in Table 24.

Table 24. Goodness-of fit comparison of the competing models

<b>Goodness-of-fit measure</b>	<b>REN → INNO</b>	<b>INNO → REN</b>
Chi-square (p-value)	1.0000	1.0000
Goodness of Fit Index (GFI)	0.9782	0.9776
Bentler's Comparative Fit Index	1.0000	1.0000
Bentler and Bonett's Non-normed Index	1.1470	1.1451
Bentler and Bonett's Normed Fit Index (NFI)	0.9651	0.9641

The goodness-of-fit measures indicate that the model containing the renewal → innovation link is (slightly) better in fit with the data on three out of five fit measures (Hatcher, 1994). Its scores are equal on both other fit measures. On the whole, its fit is excellent. As such, we can conclude that the modeled relatedness of the NVC drivers we have been using throughout this dissertation's empirical section is not only theoretically preferable (cfr. Theme 1) but is also superior from the data point of view.

We can therefore proceed with the discussion of the tests of the model presented in Figure 11. The standardized path coefficients of this model are depicted in Table 25.

A quick scan of Table 25 already reveals some interesting findings that point to the necessity of the earlier indicated reassessment of most research hypotheses. First, it shows that creator elements (TMT, ownership and so forth) affect creating process elements (R&D, networking and so on). As such, creator elements also have indirect effects (via creating process elements) on the NVC drivers. Second, it points to the earlier discussed interconnectedness of diverse creating process elements (see Theme 4). So within the focus of this fifth research theme, creating process elements too can generate indirect effects (via other creating process elements having a direct effect) on innovation, venturing and/or renewal. Given these general conclusions confirming the usefulness of partial mediation, it is seminal to look at the *total* effects of creator and creating process elements on the NVC drivers when reassessing whether or not a corresponding research hypothesis should be accepted.

Table 25. Corporate entrepreneurship nexus: standardized path coefficients (\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001)

Path from ... to ...	REN	INNO	VENT	PCS	R&D	EHC	HRM	NTW	MIG	MID
Innovation	/	/	0.26****	/	/	/	/	/	/	/
Renewal	/	0.13*	0.12*	/	/	/	/	/	/	/
Intellectual property	0.12*	0.00	0.16**	/	0.16**	/	/	/	/	/
R&D	0.23****	0.22**	/	/	/	/	/	/	/	/
Employee human capital	0.00	0.00	0.06	/	0.19***	/	0.12*	/	/	/
HRM	0.00	0.00	/	0.16**	/	/	/	0.31****	0.23****	0.19***
Networking	0.19**	0.15**	-0.07	0.31****	/	/	/	/	/	/
Market orientation	0.00	0.00	0.13**	/	/	/	/	/	/	0.53****
Intelligence dissemination (MID)	0.00	-0.17**	/	/	/	/	/	/	/	/
TMT size	-0.05	0.00	-0.14**	0.09	-0.12*	0.00	0.09	-0.05	0.00	0.07
TMT industr. heter. (TMT IH)	0.00	0.00	0.04	0.00	-0.05	0.00	-0.04	0.06	-0.10	-0.04
TMT educ. heter. (TMT EH)	0.00	0.00	0.07	-0.11*	0.11*	0.09	0.13*	0.15**	0.13**	0.03
Presence of institutional owners	0.00	0.00	0.07	0.05	0.07	0.00	0.10*	0.03	-0.08	0.00
Presence of private owners	-0.13*	0.00	-0.05	0.07	-0.06	0.19***	0.11	0.11*	-0.14**	0.03
Foreign company	0.07	0.00	0.00	0.05	-0.16**	0.04	0.07	0.00	0.12*	0.00
Ownership concentration	0.00	0.00	-0.09*	0.00	-0.12**	0.04	-0.04	-0.06	-0.06	-0.05
Rivalrous low growth	0.00	0.00	0.06	-0.04	0.00	0.08	-0.08	0.11	0.07	0.08
Hospitable and promising of environment	0.05	0.00	0.07	0.00	0.00	0.08	0.00	0.09	0.00	0.00
Competitive growth	0.00	0.00	0.14**	-0.08	0.00	0.17**	0.07	0.20***	0.13**	-0.05
Aggressiveness (AGG)	0.04	0.00	0.12**	0.00	-0.12**	0.00	0.00	0.00	-0.04	0.00
Futurity (FUT)	0.14**	0.00	0.05	0.11	0.17**	0.08	0.19***	0.00	0.44****	0.13**
Technology strategy (TEC)	0.21**	0.22**	0.16**	0.12*	0.12*	0.12	0.19**	0.08	0.00	0.05
Innovative differentiation (DIF)	0.00	0.00	0.04	0.07	0.00	-0.05	-0.04	-0.09	-0.05	0.00

Table 25 (continued)

	REN	INNO	VENT	PCS	R&D	EHC	HRM	NTW	MIG	MID
Company age	0.00	0.00	0.00	0.00	0.00	-0.14*	-0.05	0.04	0.05	0.02
Company size	0.10	0.00	-0.04	0.05	0.15**	-0.10	0.09	0.21***	0.00	-0.04
Manufacturing and energy	-0.13**	0.00	0.00	-0.09	0.33***	-0.78***	-0.16*	0.12	-0.07	-0.18**
Construction	-0.05	0.00	0.00	-0.09	0.06	-0.43***	-0.09	0.00	-0.13**	-0.09
Wholesale and retail	0.00	0.18***	0.12**	0.07	0.00	-0.57***	-0.15*	0.05	-0.10	0.11
Catering	0.06	0.00	-0.06	-0.11	0.09	-0.40***	0.00	0.16**	0.00	-0.05
Transport and communication	0.07	0.00	0.00	-0.10	0.00	-0.45***	-0.10	0.04	-0.12*	-0.06

Table 25 (continued)

	Path from ... to ...	TMT size	TMT IH	TMT EH
TMT	TMT size	/	/	/
	TMT industry heterogeneity	/	/	0.40***
	TMT educational heterogeneity	/	/	/
	Presence of institutional owners	-0.08	0.00	0.00
Ownership	Presence of private owners	-0.19**	0.00	0.00
	Foreign company	-0.05	0.04	0.04
	Ownership concentration	0.09	0.00	0.09
	Company age	0.04	-0.08	0.00
	Company size	0.38***	0.24***	0.18***
	Manufacturing and energy	0.27***	0.06	0.11
Control variables	Construction	0.18**	-0.04	0.00
	Wholesale and retail	0.23**	0.07	0.17**
	Catering	0.06	0.00	0.00
	Transport and communication	0.12	0.00	0.09



Table 25 (continued)

	<b>Path from ... to ...</b>	<b>AGG</b>	<b>FUT</b>	<b>TEC</b>	<b>DIF</b>
Management perception of environment	Rivalrous low growth	0.16*	0.00	-0.13	-0.10
	Hospitable and promising	0.12	0.19***	0.21***	0.00
	Competitive growth	0.18**	0.21**	0.09	0.07
Entrepreneurial orientation	Aggressiveness	/	0.20***	0.04	-0.17***
	Futurity	/	/	0.35***	-0.05
Intended strategy	Technology strategy	/	/	/	0.51***
	Innovative differentiation	/	/	/	/
Control variables	Company age	-0.03	-0.10	-0.04	-0.07
	Company size	0.00	0.25***	0.00	0.00
	Manufacturing and energy	0.20**	0.00	0.09	-0.04
	Construction	0.07	-0.18***	-0.05	-0.07
	Wholesale and retail	0.32***	-0.08	0.00	0.06
	Catering	0.11	-0.07	-0.18***	0.12*
	Transport and communication	0.00	-0.08	-0.07	-0.05

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In what follows we therefore first return to the issue of the links within the creator covered in Theme 3 to ensure that the corresponding conclusions still hold. Afterwards we discuss the interconnectedness of the creating process elements, followed by a discussion of the effects of the creator on the creating process elements. Once these mechanisms have been revealed, we move on to the focal point of this theme, i.e. examining the (total) effects of creator and creating process elements on innovation, venturing and renewal.

#### *Relationships within the creator*

Hypotheses 13 and 17 to 19 (see Theme 3) covered connections within the creator. As we recall, hypothesis 13 proposed that the ownership variables were positively (ownership concentration: negatively) associated with the top management team composition. In Theme 3, this hypothesis received little support. Based on the paths presented in Table 25 depicting the full corporate entrepreneurship nexus, our review with regard to hypothesis 13 remains unchanged. As only one link is significant (the presence of private third-party owners - TMT size) (albeit negatively), the data do not support the proposition that the ownership elements affect the composition of the top management team. As will be discussed later on, sample-specific characteristics could account for these non-effects (cfr. *infra*). Returning to the topic of hypothesis 13, though, it is clear that both the TMT and ownership have to be considered as (almost) separate upper echelon entities as far as their composition is concerned. Perhaps, as put forward by Zahra (1996b) and Zahra et al. (2000) the behavior, priorities and propensities of the management team could be influenced by the ownership profile. But this has not been investigated here. Additionally, it must be noted that this does also not imply that ownership is not an important resource or catalyst for the NVC drivers. We review the latter effects of ownership later on.

Hypotheses 17 assumed that entrepreneurial strategic orientations connect to intended strategy in a positive way. Just as in Theme 3, the data provide strong support for this hypothesis. The total effects slightly changed and are presented in Table 26. The conclusions drawn from this table remain identical to the

corresponding ones in Theme 3. It shows that futurity has a strong and positive association with both a technology and an innovative differentiation strategy. As far as aggressiveness is concerned, the associations are somewhat weaker and (in the case of innovative differentiation) even negative. The latter could be attributed to the measures used, as we discuss later on (cfr. *infra*).

Table 26. Total effects of entrepreneurial orientation on intended strategy (review)

<b>Effects of ... on ...</b>	<b>Technology strategy</b>	<b>Innovative differentiation</b>
Aggressiveness	0.07	-0.10
Futurity	0.35	0.18

All things considered, a technology strategy is a channel through which management's competitive aggressive posture substantiates, but innovative differentiation is not. Futurity, however, is reflected through both. Building on Noble et al. (2002), we can therefore conclude that (in general) firm's strategy-making activities are actually shaped by management's entrepreneurial strategic orientations.

By confirming the hypotheses 18 and 19 (a and b) earlier, we showed that the hospitable and promising and the competitive growth environments are positively associated with intended strategies (technology strategy and innovative differentiation) and with entrepreneurial strategic orientations (aggressiveness and futurity). We also demonstrated that a ranking of the environments (based on the munificence and rivalry dimensions) in terms of the strength of their effects on intended strategy and entrepreneurial postures is considerably stable. The direct, indirect and total effects listed in Table 27 make a perfect match to what has been discussed and concluded hereon in Theme 3. The findings indicate that management's entrepreneurial posture and intended strategy are indeed colored or even propelled by its munificent and/or hostile perception of the firm's competitive environment.

For instance, if the environment is perceived to be munificent or rich in opportunities (i.e. the hospitable and promising or competitive growth environment), management will react and plan accordingly (through futurity, technology strategy and innovative differentiation). A similar mechanism applies if the environment is sensed to be hostile (competitive growth or rivalrous low growth environment) (e.g. through aggressiveness).

Table 27. Effects of environment on entrepreneurial orientation and strategy (review)

Effect on ... of ...		Rivalrous low growth environment	Hospitable and promising environment	Competitive growth environment
Aggressiveness	Direct	0.16	/	0.18
	Indirect	/	/	/
	Total	0.16	/	0.18
Futurity	Direct	/	0.19	0.21
	Indirect	0.03	/	0.04
	Total	0.03	0.19	0.25
Technology strategy	Direct	/	0.21	/
	Indirect	0.01	0.07	0.10
	Total	0.01	0.28	0.10
Innovative differentiation	Direct	/	/	/
	Indirect	-0.02	0.18	0.08
	Total	-0.02	0.18	0.08

We explicitly list these recalculated effects (and those of Table 26) because we will have to use them in the calculations of the indirect and total effects on innovation, venturing and renewal. If we are not to underestimate the contribution of aggressiveness, futurity and both dynamic, opportunity-rich environments to new value created, we will have to focus on these total effects and not on the (direct) path coefficients of Table 25.

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To conclude the reporting of the findings with regard to the relationships within the creator, we can summarize by stating that in particular the detected links between management's perception of the environment, entrepreneurial strategic orientation and intended strategy must be kept in mind in the remainder of this theme.

#### *Creating process elements: reciprocal effects*

Following the covariation approach of Theme 4, several paths among creating process elements had to be added during model respecification. As illustrated in Table 25, all of these relationships generate reinforcing (positive) effects, indicating that some resources or capabilities serve as a supporting platform for the development or deployment of others. Among other, there is a mutual positive relationship between knowledge creating and sharing HRM on one hand and networking intensity, intelligence generation and dissemination. Further, a highly educated human resource pool seems to stimulate R&D investments and the intensity of knowledge creating and sharing HRM. The main lesson that must be drawn from this important finding is that creating process elements can also have indirect effects (i.e. via other creating process resources) on innovation, venturing and renewal. Again, in assessing their contribution we will have to focus on their total effects.

#### *Effects of creator on creating process elements*

As upper echelon theory assumes that everything that goes on inside an organization is a reflection of its top management team, so should the creating process depend on the creator. Hypotheses 22 to 26 departed from this view and stated that the creator demographics and learning and selection mechanisms are positively (ownership concentration: negatively) associated with the creating process elements. The results (building on Table 25 but taking into account the *total* effects of the creator elements on the creating process) provide partial support for these hypotheses. Only one (out of fourteen creator elements studied) does not affect the creating process elements considered. This element (innovative

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differentiation strategy) does not leave a mark on the deployment of the resources and capabilities studied. This could be attributed to the measure used (cfr. *infra*). On the whole, the resource catalyst function of the creator thus receives considerably strong empirical support.

As far as the creator composition variables are concerned, two elements studied have only positive (significant) total effects on creating process elements: TMT educational heterogeneity and the presence of institutional owners. One element affects the creating process in a strictly negative sense (as hypothesized): ownership concentration. All other composition elements present mixed effects (both positive and negative). When it comes to the learning and selection mechanisms, four elements generate only positive effects: a technology strategy, futurity and management's perception of the environment as a competitive growth environment or as a hospitable and promising environment. The creating process is thus actually positively directed by these creator elements. The other learning and selection mechanisms display mixed effects. Although the findings with regard to the hypotheses 22 to 26 may be interesting in themselves, they are particularly important to bear in mind when determining the indirect and total effects of the creator elements on the NVC drivers in the subsequent section.

#### *Effects on the NVC drivers*

The model tested here accounts for 24% of the variance in innovation, 50% in venturing and 41% in renewal. This section will expose the actual contribution of the various elements (creator as well as creating process) to innovation, venturing and renewal. Taking the previous results sections of this theme into account, we will now review whether or not hypotheses 4 to 12 and 14 to 16 receive empirical support.

Table 28. Direct, indirect and total effects on the NVC drivers

Effects of ... on ...	RENEWAL			INNOVATION			VENTURING		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Innovation	/	/	/	/	/	/	0.26	/	0.26
Renewal	/	/	/	0.13	/	0.13	0.12	0.03	0.15
Patents and commercial secrets	0.12	0.04	0.16	/	0.06	0.06	0.16	0.06	0.22
R&D investments	0.23	/	0.23	0.22	0.03	0.25	/	0.10	0.10
Employee human capital	/	0.06	0.06	/	0.06	0.06	/	0.06	0.06
HRM	/	0.10	0.10	/	0.03	0.03	/	0.12	0.12
Networking	0.19	0.05	0.24	0.15	0.05	0.20	/	0.16	0.16
Intelligence generation	/	/	/	/	-0.09	-0.09	0.13	-0.05	0.08
Intelligence dissemination	/	/	/	-0.17	/	-0.17	/	-0.04	-0.04
TMT size	/	-0.03	-0.03	/	-0.03	-0.03	-0.14	-0.02	-0.16
TMT industry heterogeneity	/	0.02	0.02	/	0.02	0.02	/	0.03	0.03
TMT educational heterogeneity	/	0.06	0.06	/	0.05	0.05	/	0.06	0.06
Presence of institutional owners	/	0.01	0.01	/	0.00	0.00	/	0.01	0.01
Presence of private owners	-0.13	0.04	-0.09	/	0.04	0.04	/	0.05	0.05
Foreign company	/	-0.04	-0.04	/	-0.06	-0.06	/	-0.03	-0.03
Ownership concentration	/	-0.03	-0.03	/	-0.03	-0.03	-0.09	-0.02	-0.11
Rivalrous low growth environment	/	0.02	0.02	/	0.01	0.01	/	0.05	0.05
Hospitable and promising environment	/	0.14	0.14	/	0.13	0.13	/	0.20	0.20
Competitive growth environment	/	0.17	0.17	/	0.13	0.13	0.14	0.25	0.39
Aggressiveness	/	0.05	0.05	/	0.02	0.02	0.12	0.08	0.20
Futurity	0.14	0.16	0.30	/	0.13	0.13	/	0.27	0.27
Technology strategy	0.21	0.07	0.28	0.22	0.08	0.30	0.16	0.18	0.34
Innovative differentiation	/	/	/	/	/	/	/	/	/

Table 28 (continued)

Effects of ... on ...	RENEWAL			INNOVATION			VENTURING		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Company age	/	-0.01	-0.01	/	-0.01	-0.01	/	-0.01	-0.01
Company size	/	0.16	0.16	/	0.16	0.16	/	0.14	0.14
Manufacturing and energy	-0.13	0.02	-0.11	/	0.04	0.04	/	-0.04	-0.04
Construction	/	-0.09	-0.09	/	-0.06	-0.06	/	-0.14	-0.14
Wholesale and retail	/	-0.03	-0.03	0.18	-0.04	0.14	0.12	0.02	0.14
Catering	/	-0.04	-0.04	/	-0.05	-0.05	/	-0.08	-0.08
Transport and communication	/	-0.03	-0.03	/	-0.02	-0.02	/	-0.05	-0.05



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Previous sections have made it abundantly clear that - if we are to fully grasp the effects of creator and creating process elements on new value creation - we must map both direct and indirect effects and thus calculate *total* effects of all these elements. Table 28 presents the results of this exercise based on the significant paths in Table 25 and on the total effects listed in Table 26 and 27.

Hypothesis 4 predicted a positive effect of patents and commercial secrets on new value created. This hypothesis is supported for all three NVC drivers. While assumed important to secure the value of knowledge embedded in innovations, products and processes, patents and commercial secrets also stimulate corporate entrepreneurial new value creation through innovation, renewal and venturing. In the case of innovation, the purely indirect effect is due to the strong and positive link between patents and commercial secrets and R&D investments (0.16; significant at the .01 level). This leads us to conclude that current patents and commercial secrets are likely to enhance new R&D investments. It demonstrates that patents and commercial secrets are valuable for exploration (innovation (via R&D) and renewal) as well as for exploitation (venturing), protecting the commercial value of the firm's operations.

Hypothesis 5 assumed a positive relationship between firm R&D investment and innovation and renewal. Our results provide support for this hypothesis. There are indeed very strong positive and direct effects of R&D investment on renewal and innovation. So, these findings not only confirm past research on the positive R&D → innovation linkage (Dierickx & Cool, 1989; Greve, 2003). They also demonstrate that renewal is stimulated by R&D, as recently suggested by Ravasi and Lojacono (2005). As far as innovation is concerned, the direct effect of R&D is supplemented by a small indirect effect (via renewal). We also note a positive total effect of R&D on venturing. The latter is also purely indirect (via renewal and innovation). All things considered, we are bound to conclude that R&D investment is an important enabler of renewal and innovation, from which venturing as a NVC driver may arise in a secondary order.

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Hypothesis 6 is also confirmed by the results. As such, employee human capital (the human resource pool) supports the creation of new entrepreneurial value. In all instances, the effect of employee human capital is indirect and rather small. This indirect effect manifests itself through R&D and HRM. Following Kor and Leblebici (2005) and Youndt et al. (1996) (among others), we can conclude that better educated human resources lead their employing firms to renew, detect new ways to develop new business and innovate.

The results in Table 28 lead to the confirmation of hypothesis 7. The intensity of knowledge creating and sharing HRM strongly supports the creation of venturing, renewal and (to a lesser extent) innovation. In all three cases, the effect is completely indirect. It can be noted that knowledge creating and sharing HRM is a strong contributing creating process element, in particular through its positive link with networking and patents and commercial secrets. It serves as a knowledge platform for these resources and capabilities. And through its platform function it stimulates innovation, venturing and renewal. The (positive) connections of HRM with in particular market intelligence generation and dissemination also account for the small (positive) effect of HRM on innovation. Both market intelligence generation and dissemination are to a considerable extent negatively associated with innovation. And these negative effects resound within the small total effect of HRM on innovation.

Network intensity was expected to affect the NVC drivers positively, as expressed in hypothesis 8. The results fully support this hypothesis: network intensity has a strong, positive effect on renewal, innovation and venturing. As such, it is an important capability. In the case of renewal and innovation, its effect is mostly direct. For venturing the total effect is purely indirect. In other words, it directly stimulates exploration (renewal and innovation): increasing their networking intensity is an excellent way for firms to achieve renewal and innovation success. And doing so, it indirectly affects exploitation.

Hypothesis 9, predicting a positive link between market intelligence generation and the NVC drivers, receives little support. Intelligence generation indeed stimulates venturing. In the case of innovation we notice a negative total

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effect. This indirect effect can mainly be attributed to the intelligence generation → intelligence dissemination linkage (cfr. *infra*). No effect can be found when it comes to renewal. All in all, we are bound to side with Christensen (1997) and conclude that market intelligence generation stimulates exploitation (venturing), but not exploration (renewal and innovation). We discuss this further on.

Hypothesis 10, assuming a positive link between market intelligence dissemination on one hand and innovation and renewal on the other, is not supported. In the case of renewal, there is no effect whereas in both other cases it is negative. In the case of venturing the effect is indirect (via innovation) since a direct connection between market intelligence dissemination and venturing was not foreseen in the model. As far as innovation is concerned, the negative effect is purely direct, meaning that market intelligence dissemination curbs innovation, as predicted by Christensen (1997) (cfr. *supra/infra*).

Hypotheses 11, 12 and 14 to 16 departed from the view that the upper echelon or creator is an important resource in se. Top management team demographics (proxies for its human capital) (H11), ownership elements (H12) and learning and selection mechanisms (H14 to H16) were predicted to be positively related to new value created. The results of Table 28 provide partial support for these general hypotheses.

Hypothesis 11 stated that the top management team is valuable for NVC through its human capital base, be it directly or by means of its creating process propelling ability. Table 28 provides partial support for this hypothesis. It demonstrates that the heterogeneity of the team actually affects the NVC drivers in a positive sense, albeit purely indirectly (i.e. through its catalyst effect (via for example networking, R&D and HRM) and/or via linkages among creator elements). The team size though, curbs renewal, innovation, and (even more) venturing. This negative effect could be attributed to a higher degree of conflicts when team size increases (cfr. *infra*). On the whole, though, our findings only point to the positive role of team industry and educational background

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heterogeneity. The latter findings confirm the earlier results of Bantel and Jackson (1989) and Srivastava and Lee (2005).

Following a similar line of reasoning, hypothesis 12 connected the presence of institutional and private owners, the firm being a foreign company and ownership concentration positively (ownership concentration: negatively) to the NVC drivers. Hypothesis 12 receives only partial support. The results reveal that ownership concentration affects the NVC drivers indeed purely negatively (as hypothesized). The presence of institutional owners has a very small positive effect on renewal and venturing. Private owners yield a positive effect on innovation and venturing, yet a negative effect on renewal. This could have to do with the fact that private owners often invest in firms that pursue a specific plan or operate from a particular philosophy that has been made clear at the time of the investment decision. Any (unexpected) deviation from that plan is not likely to be appreciated by the private owner. Threatening with a shareholding exit from the firm is not unusual in such equity alliances (Pekar & Margulis, 2003). This could curb firm's renewal ("changing the plan") efforts. Foreign owned companies are also (weakly) negatively associated with the NVC drivers. This effect, however, is purely indirect and attributable to a negative effect of foreign firms on R&D investment. Although foreign firms often spend huge sums on R&D in the Flemish economy, it has been recognized that these investments are highly concentrated in a small number of firms in a limited range of industries (Peeters et al., 2004). Detecting a negative effect in a broadly conceived study as this one (considering many firms in very diverse industries) is therefore not that surprising. All in all, strong NVC enabling ownership elements have not been detected. Only one is a strong disabler: ownership concentration.

When it comes to the positively assumed effect of management's perception of the remote environment on the NVC drivers (as reflected in hypothesis 14), the findings generate strong supporting evidence. Seeing the environment as munificent (rich in opportunities) and/or hostile apparently is a strong selection mechanism for firms to set the new value creation wheel in motion. Almost all

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effects here are purely indirect, going through other learning and selection mechanisms or through the creating process elements. Further, the predicted ranking of the environments in terms of the strength of their effects on the NVC drivers (hypothesis 14b) now receives full support (as opposed to the findings of Theme 3). The competitive growth environment (strong on munificence and on rivalry) displays the strongest effect on renewal, innovation and venturing. Second in line comes the hospitable and promising environment (strong on munificence, weak on rivalry), followed by the rivalrous low growth environment (strong on rivalry, weak on munificence). In fact, the hospitable and promising environment shares the first place with the competitive growth environment as far as innovation is concerned. These findings demonstrate that both munificence and rivalry are conducive to new value creation (compared with the static and impoverished environment, which is neither munificent nor rivalrous). Their combined appearance generates the strongest effects. However, in general terms the effect of munificence is somewhat stronger, as expressed by the ranking. Considering the NVC drivers separately illustrates that for innovation and renewal munificence is most wanted. If (departing from the competitive growth environment) the perception of fierce rivalry diminishes (resulting in the hospitable and promising environment), the effect of the environment concerned changes very little (renewal) or not at all (innovation). However, if munificence diminishes (rivalrous low growth environment), the effect drops considerably. It demonstrates the dominant effect of munificence versus rivalry in the case of innovation and renewal. In the case of venturing, the environmental effect drops noticeably once either munificence or rivalry is no longer perceived. The latter suggests that neither munificence nor rivalry is dominant in this case.

A similar line of reasoning applies to management's entrepreneurial strategic postures studied, i.e. aggressiveness and futurity. Hypothesis 15 foresaw positive effects of these on the NVC drivers. This hypothesis is strongly supported by the data in Table 28. Futurity is strongly and positively associated with all three NVC drivers. Aggressiveness is also positively connected to all drivers, yet the association is rather weak for innovation and renewal. This suggests that futurity

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is beneficial for exploitation as well as exploration purposes, whereas aggressiveness is more directed at exploitation (venturing).

Finally, the expected positive effect of an intended technology and innovative differentiation strategy (hypothesis 16) could only be confirmed for technology strategy. This type of intended strategy is directly and indirectly associated (in a strong sense) with innovation, renewal and venturing. According to our findings, it is one of the strongest propellers of the NVC drivers. As far as innovative differentiation is concerned, no effect could be detected. This could be attributable to the measure concerned (cfr. *infra*).

All in all, we can fully confirm the important effect of the creator in terms of the learning and selection mechanisms (management's perception of the environment, intended strategy and entrepreneurial strategic orientation). As indicated earlier, hypotheses 14 to 16 thus receive very strong support. Less support can be found as far as the demographics/composition side of the creator coin is concerned (hypotheses 11 and 12). Our findings with regard to both these hypotheses thus add to the typical mixed effects found in most of the upper echelon research. Combining our findings here with those of Theme 3 lets us conclude that – in general – the catalyst effect of the creator exceeds its resource effect. After all, most upper echelon effects just discussed in this section are indirect effects, due to effects of the creator elements on creating process resources. Although there are a few direct ('resource') effects of the upper echelon on NVC (as detected in Theme 3 and also in this theme), these are much smaller in number (and sometimes also in magnitude) than the indirect (catalyst) effects.

The control variables we included in the analysis also prove to be of importance. Company size is positively related to innovation, renewal and venturing. The reverse holds for company age. The association of industry with new value created presents mixed findings: positive in the case of venturing and innovation for the wholesale and retail sector and in the case of innovation for manufacturing and energy, negative in all other instances. We recall that the sector of finance, real estate and services to companies serves as our point of reference. Interesting

to note is that the majority of the control variable effects on NVC are indirect, originating from associations between the controls and creator or creating process elements.

*Element profiles and the NVC drivers*

By means of a second analysis we want to review the hypotheses 20 and 21. The value added of the second analysis lies in the fact that it focuses on the association between the creating process element profiles or clusters (instead of on the individual creating process elements) and the NVC drivers. The creator is left out of this analysis because the link between the creator elements and the individual creating process elements (hypotheses 22 to 26; cfr. supra) can provide us with more detailed insights on this matter than the analysis here could. The purpose of the exercise here is to determine whether or not some creating process bundles or profiles are more able to affect the NVC drivers vis-à-vis other ones. Our point of reference is the weak profile. The control variables are included.

Table 29. Resource profiles – NVC drivers: path coefficients

Path from ... to ...	Renewal	Innovation	Venturing
Renewal	/	0.24****	0.26****
Innovation	/	/	0.31****
Balanced profile	0.25****	0.21***	0.01
Flow profile	0.27****	-0.05	0.12*
Human capital profile	0.15**	-0.03	0.16**
Company size	0.19***	0.08	-0.03
Company age	-0.04	-0.09	-0.06
Manufacturing and energy	-0.12	0.18*	-0.08
Construction	-0.21***	-0.08	-0.12*
Wholesale and retail	-0.16	0.12	0.06
Catering	-0.06	-0.02	-0.17**
Transport and communication	-0.22***	-0.05	-0.10

\* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01 \*\*\*\* p < 0.001

Table 30. Element profiles – NVC drivers: direct, indirect and total effects

Effect of ... on ...	Renewal			Innovation			Venturing		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Renewal	/	/	/	0.24	/	0.24	0.26	0.07	0.33
Innovation	/	/	/	/	/	/	0.31	/	0.31
Balanced profile	0.25	/	0.25	0.21	0.06	0.27	/	0.17	0.17
Flow profile	0.27	/	0.27	/	0.07	0.07	0.12	0.11	0.23
Human capital profile	0.15	/	0.15	/	0.04	0.04	0.16	0.06	0.22
Company age	/	/	/	/	/	/	/	/	/
Company size	0.19	/	0.19	/	0.05	0.05	/	0.08	0.08
Manufacturing and energy	/	/	/	0.18	/	0.18	/	0.06	0.06
Construction	-0.21	/	-0.21	/	-0.05	-0.05	-0.12	-0.09	-0.21
Wholesale and retail	/	/	/	/	/	/	/	/	/
Catering	/	/	/	/	/	/	-0.17	/	-0.17
Transport and communication	-0.22	/	-0.22	/	-0.05	-0.05	/	-0.09	-0.09



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Table 29 lists the standardized path coefficients. As indicated by the goodness-of-fit measures (Goodness of Fit Index (GFI) (1.00), Bentler's Comparative Fit Index (1.00), Bentler and Bonett's Normed Fit Index (1.00)), the data support the model with the paths presented in Table 22 (Hatcher, 1994). The chi-square and Bentler and Bonett's Non-normed Index could not be computed here because of the limited model scale.

Again, we look at the total effects of the creating process profiles on the NVC drivers when reviewing whether or not a corresponding research hypothesis should be accepted. Table 30 depicts these total effects.

Hypothesis 20 stated that the balanced profile, the flow and the human capital profiles are positively associated with new value created vis-à-vis the weak profile. Based on Table 30, we can confirm this hypothesis. All three profiles generate (often strong) positive total effects on innovation, venturing and renewal. Congruous with the resource-based perspective of the firm, any of the three profiles (indicating a particular element strength) is better suited to pursue new value created in comparison with the weak profile.

When it comes to comparing the contribution of the three investigated profiles to the NVC drivers, hypothesis 21 assumed that the balanced profile would yield a larger contribution than the flow and human capital profiles. The findings of Table 30 only enable to confirm this assumption as far as innovation is concerned. Here the difference is substantial. In the case of renewal, though, we notice that the contribution of the flow profile slightly exceeds that of the balanced profile. And on the venturing front the balanced profile is ranked last, although its contribution to new value created remains substantial. All in all, this somehow suggests that the balanced profile is very adequate for exploration purposes (innovation and renewal), whereas other profiles can bring more benefits for exploitation objectives. We put these and the other findings in perspective in the subsequent conclusion.

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## Conclusion

The fifth and final theme of this chapter combined the basic assumptions of the four previous themes to study the corporate entrepreneurship nexus in its full complexity. As such, this theme recognized the relatedness of the NVC drivers, the relatedness (including the profiles or clusters) and the resource effect of the creating process elements, the resource effect of and the linkages within the creator. The value added of the fifth theme lies in bringing together all these insights and in adding further model developments (e.g. the catalyst role of the creator) to estimate the effects of the creator and creating process elements as accurately as possible.

In view of the combination of knowledge gathered in the previous themes, we began with reassessing some of the earlier reviewed hypotheses, such as the proposed linkages within the creator and the reciprocal connections between certain creating process elements. As far the relationships within the creator are concerned, our findings on the earlier discussed hypotheses (see Theme 3) could be reconfirmed. For instance, the association between the ownership variables and the composition of the top management team (size and heterogeneity) is very weak. This could be attributed to strong presence of family firms in the Flemish economy (and in our sample). In family firms management and ownership are bundled. This undermines the basic agency theory assumption on which the ownership → top management team link builds: the distinction between agents (management) and principals (owners). As a result, the relative power of ownership as a distinct entity decreases (Kroll et al., 1997), which can explain the weakness of the ownership → TMT link in our findings. It is therefore not surprising that the ownership → TMT path that was found to be significant (negative relationship between ownership by private third-party owners and TMT size) is a link that expresses an increase in the relative power of ownership. Private owners can be associated with a smaller management team, which (at least in terms of magnitude) strengthens the influence of that particular owner. To wind up this issue, the current factual weakness of the association between ownership and the composition of the top management team may also somehow

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suggest that the awareness of the entrepreneurial potential of this theoretical monitoring and steering mechanism is underestimated by owners to date.

Still within the creator, we found strong associations of entrepreneurial strategic orientations (aggressiveness and futurity) and intended strategy. Futurity for example is positively associated with a technology and an innovative differentiation strategy. The same goes for aggressiveness and technology strategy. We can therefore side with Noble et al. (2002) who saw strategic orientations as guiding principles influencing the firm's strategy-making. The negative association of aggressiveness with innovative differentiation can be attributed to the measurement of aggressiveness: it was mainly operationalized in terms of price rivalry. And past research has demonstrated that price rivalry is negatively linked with frequent new product introduction (Zahra, 1993c), which is a feature of firms pursuing to differentiate themselves from their competitors by means of contemporary products or services (Carter et al., 1994; Durand & Coeurderoy, 2001).

All in all, management's perception of the environment serves as a very strong base for managerial choices, postures and planned actions. Although literature proclaims that the exact nature of this relationship remains unclear (Wiklund & Shepherd, 2005; Zahra & Bogner, 2000), we believe our results can bring some clarity on this matter. Our expectations are confirmed up to a considerable degree. And the deviation of the findings from what was proposed can be accounted for as follows. Let us first focus on the negative link we found between management's perception of the environment as a rivalrous low growth environment and innovative differentiation. A low growth environment offers little or no opportunity for new product introduction (and thus also to differentiate oneself in such a manner) (Zahra, 1993b), which undermines the utility of an innovative differentiation strategy. The reverse holds for both growth environments, as demonstrated through the results. Further, in a low growth environment aggressiveness is likely to be exteriorized through price-based rivalry. As aggressiveness was measured accordingly, a positive link between a perceived rivalrous low growth environment and aggressiveness is evident. In

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general, it is striking that both hostile environments (rivalrous low growth and competitive growth environment) are positively connected to aggressiveness, whereas this association is absent in case of the hospitable environment. Based on these explanations, we would also expect non-price based aggressiveness to be positively associated with a competitive growth environment (and negatively or not associated with the rivalrous low growth environment). But this is an item for future research as our analyses cannot account for this. Finally, our results also indicate that any environment perceived as non-static and impoverished is positively associated with futurity and with a technology strategy. So the forces of rivalry (hostility) and growth opportunities (munificence) - separately or in conjunction - drive companies to adopt a technology strategy and a futurity posture.

Creator elements cannot only serve as important resources in se to pursue new value, but they also act as catalysts propelling the creating process. Evidence for the latter role is abundantly present in our findings. However, it is much stronger for the creator learning and selection mechanisms than for the demographics. Management's perception of the environment as a competitive growth environment for instance is positively connected to networking, market intelligence generation and employee human capital. A technology strategy and a futurity posture also have a positive relationship with various creating process elements. Important demographics seem to be the top management team education heterogeneity and the presence of private owners. Depending on what the ultimate effect of these learning and selection mechanisms on the NVC drivers are, their dominance on influencing the creating process could be good news for firms. Altering the overall composition of the upper echelon is more difficult than adjusting the lens used to look at and learn about things.

As earlier, reciprocal links among creating process elements were also present. These links are identical to the ones discussed earlier in Theme 4: stocks are connected to stocks and flows, and flows are also linked with other flows. Together with the relatedness of the NVC drivers demonstrated earlier, these

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reassessed and reconfirmed relationships pointed towards the necessity of looking at the total effects (within the full corporate entrepreneurship nexus) of creator and creating process elements on new value created in assessing their respective contribution.

When it comes to the contribution of the creating process elements to the NVC drivers, our hypotheses received strong support. All proposed associations were corroborated with two exceptions only: the link between market intelligence generation and dissemination and NVC. In particular, these associations appeared to be negative for innovation and absent in the case of renewal. As both these NVC drivers refer to exploration, we could state that market orientation (e.g. market intelligence generation) can be beneficial for exploitation (venturing), but detrimental to exploration. As we recall from Chapter 2, Christensen (1997) argued that market orientation can curb corporate entrepreneurship in general and innovation in particular through a too narrow focus on the markets known by the firm. Based on our findings, we have to agree with him to some extent, although he saw no benefits at all of a market orientation for the entrepreneurial proclivity of the firm. All five other creating process elements are positively associated with renewal, innovation and venturing. As such, they are enablers of all three NVC drivers. The benefits of investing in these elements are not at the expense of one or both other NVC drivers.

As far as the creator elements are concerned, their effects are the combined result of their resource and their catalyst effects. Our findings have made it clear that the catalyst effects of creator elements are in general more prominent than their resource effects. The learning and selection mechanism effects are all positive, and in many cases they are substantial (0.10 or higher). A technology strategy, a futurity posture and a perception of the firm environment as hostile and rich in opportunities (munificent) all seem to be important propellers of innovation, venturing and renewal. The absence of an effect of an innovative differentiation strategy is somewhat surprising, but is likely to be linked with an imperfect match of the measure and the context in which it is used. The

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innovative differentiation measure takes the pulse of the firm's desire to distinguish itself from its competitors in the marketplace by providing unique, distinguishable products or services (Carter et al., 1997). Firms use innovative differentiation to lure customers (Durand & Coeurderoy, 2001). Although such a strategy is not without value for established firms as well, it has been argued that the measure used to grasp it is particularly appropriate for new ventures or start-ups (Carter et al., 1994; Chaganti et al., 1989). The measure operationalizes the uniqueness of the products/services specifically in terms of being unique for the market. As we have discussed in Chapter 1, this conceptualization of innovation is perfect for independent entrepreneurship, but might be too strict for corporate entrepreneurship. As such, the measure used might not match the context it is used in here. This could explain the absence of an effect, indicating that innovative differentiation (as measured here) is neither good nor bad for new value created. The fact that the measure could be more adequate for young instead of established firms is somehow reflected through its negative correlation (-0.17; see Annex 1) with company age.

When it comes to the composition elements we notice that the effects are rather small. But in general the majority of the effects are in line with what has been proposed. A major exception (deviating effect of at least 0.10 in absolute value) to this general pattern is the top management team size, which is negatively related to all three NVC drivers. For innovation and renewal this effect is purely indirect (due to a negative link between team size and R&D). A direct effect of team size is absent here. In the case of venturing, however, team size has a strong direct negative effect. This is not surprising since team size has led to mixed findings throughout upper echelons research (Dimov & Shepherd, 2005). Building on a more recent discourse, though, can possibly explain our findings with regard to team size. This discourse refers to the positive relationship between team size and (cognitive and affective) conflict. Cognitive conflict arises from differences in perspective and facilitates the exchange of information among TMT members. Affective conflict produces distrust, hostility and suspicion among team members

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(Amason & Sapienza, 1997). As such, cognitive conflict can stimulate exploration (renewal and venturing), while affective conflict will curb it, producing a zero effect in total. For exploitation purposes, though, consensus is needed and conflicts are unproductive. Team size (via its positive link with affective and cognitive conflict) could make it more difficult to reach a consensus, leading to a negative effect of team size on venturing.

In a final step we modeled the effect of the creating process element profiles instead of the individual creating process elements on the NVC drivers. Here we could draw the conclusion that the balanced profile and the flow and human capital profiles are all three positively associated with new value created (vis-à-vis the weak resource profile). As such, the basic resource-based perspective premise that resource strengths (whatever their nature) enhance firm performance was demonstrated. Finally, a comparison of the contribution of the three profiles modeled revealed that the balanced profile (with regard to innovation and renewal) and the flow profile (with regard to renewal and venturing) are the most promising. As far as innovation is concerned, the balanced profile is the most promising whereas in the case of venturing the flow profile clearly dominates. Put differently, the balanced profile is the most interesting profile for exploration (innovation and renewal) purposes since it comprises stocks as well as flows that can further develop these and other stocks. The flow profile assumes this role when it comes to exploitation (venturing), demonstrating that for exploitative purposes routines and capabilities that enable resource leveraging and gathering excel.

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## CONCLUDING OVERVIEW OF THE CHAPTER

In this chapter we have presented the empirical findings of our research, structured around five themes. The first four themes each have a particular focus. The fifth and final theme combines the lessons learned in the previous themes to build and test a comprehensive model of corporate entrepreneurship.

In the first research theme we explored how innovation, venturing and renewal are related to each other. We came to the conclusion that capturing this relatedness is not an easy exercise. In either case, it is highly dependent on the definition and operationalization of the constructs. The distinction between explorative and exploitative activities helped us to shape the connections between the NVC types. It is recognized that exploitation builds on and is preceded by exploration activities. Based on this categorization, we modeled venturing (exploitative) to be preceded by innovation and renewal (both explorative). Further, the specific measures used led us to model renewal as an antecedent of innovation. These three links between innovation, venturing and renewal received strong empirical support and needed to be taken into account in the remainder of this chapter.

Building upon the resource-based perspective of the firm, the second theme set out to illustrate that creating process elements can be valuable enablers of newly created value. Having an eye for the heterogeneity of elements, we considered seven elements (three stocks and four flows) as possible determinants of innovation, renewal and/or venturing. The empirical results corroborated our expectations and pointed towards the importance of studying flows as well as stocks.

In the third theme we focused on creator or upper echelon elements as determinants of new value created. We developed a context-specific demarcation of the upper echelon, including indicators of its composition (top management team and ownership) and of its learning and selection mechanisms (management's perception of the environment, entrepreneurial strategic orientation and intended strategy). We modeled two types of paths here: linkages



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among creator elements (e.g. between entrepreneurial strategic orientation and intended strategy) and associations between the creator elements and new value created. The findings suggest considerable support for both categories of paths.

In the fourth theme we dug into the expected relatedness of creating process elements. Following two approaches, our expectation was confirmed: creating process resources are related. The first approach took the covariation view and detected connections between specific creating process elements (e.g. HRM and networking intensity). This approach has the advantage of allowing the calculation of individual elements' contributions to new value created. The second approach looked for patterns, bundles or clusters of resources. It identified four distinguishable element profiles. Its advantage lies in reducing the intervening power of the researcher as it does not demand specific directions in the relationships between elements. Both these approaches make way with each other's drawbacks and offer a valuable perspective on the exploration of resources' contribution to innovation, venturing and renewal.

Combining the insights of the previous themes, the fifth and final theme aimed at discovering the contribution of the upper echelon and creating process elements to innovation, venturing and renewal. Doing so, it modeled an additional catalyst role for the creator, propelling the creating process. The results pointed towards several creator and creating process elements that stimulate renewal, innovation and venturing. The findings also demonstrated that - at times - trade-offs are at hand, meaning that certain a certain element can stimulate one type of newly created value while curbing one or both others. All in all, the fifth research theme advanced our knowledge of how innovation, venturing and renewal as drivers of new value created come into existence. In the following section on the general conclusions we will discuss the findings in detail and in the epilogue we will develop a corporate entrepreneurship agenda for researchers, managers and policy makers.

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## **GENERAL CONCLUSIONS**

This dissertation set out with the intent to address two gaps in corporate entrepreneurship research. First, we wanted to clarify the construct of corporate entrepreneurship. Although the interest in corporate entrepreneurship is high and increasing, its conceptual demarcation is burdened by fuzziness and divergence, impeding the evolution of the field and of practice. Second, through empirical research we aimed at increasing our understanding of the effective conduct of building entrepreneurial firms. In particular, we were interested in detecting firm resources and capabilities that can stimulate corporate entrepreneurial performance or new value created.

To deal with these objectives we first clarified the corporate entrepreneurship construct based on a thorough review of its 'source field' entrepreneurship. Following, we developed a research model building on the resource-based perspective of the firm. This model was then tested in consecutive steps in order to be able to accurately map the contribution of resources to new value created. Doing so, we had to start the empirical journey with testing the relatedness of the new value drivers and of the resources and capabilities, resulting in five specific research themes (see Chapter 4). The analyses built on a realized sample of over 200 firms of diverse sectors. In this concluding chapter, we first summarize the main concerns and findings of this dissertation. Next, we focus on this study's most prominent theoretical and methodological contributions and its limitations.

### **SUMMARY OF THE MAIN CONCERNS AND FINDINGS**

Driven by a changing business environment and by the constantly altering guises of change, established firms increasingly feel compelled to evoke the entrepreneurial spirit that characterizes their young entrepreneurial counterparts. Firms think of corporate entrepreneurship because their value creation rate or

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their change coping vigor lags behind (Hamel, 1999; Thornberry, 2001). However, its utility as an occasional drug administered to promptly boost the firm's competitive power is limited. Rather, it demands an architectural approach, building entrepreneurial firms by concentrating on internalizing some of the capabilities and competences of entrepreneurially performing companies. Given the promising nature of corporate entrepreneurship for established firms, researchers are eager to identify those capabilities, competences, resources or practices that can support firms in their efforts to accomplish their entrepreneurial rebirth.

Existing research on this topic is burdened by two major flaws. Theoretically, it is built on unstable (patches of) conceptual ground. And empirically, it is dominated by research favoring opinion-like and intention-directed measures, diverting the attention away from measures reflecting true entrepreneurial successes (which is what the firms long to accomplish after all). In an attempt to get corporate entrepreneurship research deliverables more in line with the surging enthusiasm for the practice, this dissertation tried to delineate an appropriate theoretical base for understanding and describing the multi-facet corporate entrepreneurship phenomenon. Subsequently, it developed and tested a resource-based model in an integrative way. All of this with the intent of detecting resources or capabilities that prove to make a difference in scoring corporate entrepreneurial successes. Before summarizing our findings on this front, we will first turn to the essence of the conceptual base on which the results are grounded.

### **Conceptual base and model**

Corporate entrepreneurship is generally considered to be ill-defined (Burns, 2005; Sharma & Chrisman, 1999). The origin of the definitional malaise can be traced back to the definitional frailness of its source field of research, i.e. entrepreneurship. Since the entrepreneurship field remains in a fermentation stage (Busenitz et al., 2003; Gartner, 2001), the issues of establishing the boundaries of and of identifying streams within the entrepreneurship research

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domain have still not been resolved (Bruyat & Julien, 2001; Schildt et al., 2006; Shane, 2003). As a result, the label 'entrepreneurship' is very broad and fuzzy and houses a hodgepodge of research (Shane & Venkataraman, 2000). In the absence of a generally accepted definition within the field, it is the responsibility of every author to clarify his view on the delineation of the concept. Since we are interested in corporate entrepreneurship and since we strive to maximize the degree of definitional consensus hereon, we adopted the approach suggested by Hoy and Verser (1994) to tackle the construct issue. These authors raise the idea that - instead of formulating an additional, research context-based definition - describing the research field can be a promising avenue in bridging a conceptual gap. We took up this challenge and first described the entrepreneurship field by determining its conceptual dimensions before translating these to the corporate entrepreneurship context.

In describing the entrepreneurship domain we pointed toward the benefits of the behavioral approach. This approach takes the entrepreneurial object being created as the primary level of analysis and interest. The project is seen as the outcome of a complex process with many influences. As a result, entrepreneurship is typified as a multidimensional construct. After reviewing a substantial number of existing, behavior-directed entrepreneurship definitions, we opted for a framework comprising five dimensions: creator, creating process, new value created, close and remote environment. By considering these five dimensions, the diversity of entrepreneurship research (including as-yet-unspecified forms of entrepreneurial behavior) is recognized to a considerable extent. The last two dimensions are of a more contextual nature, while the first three (creator, creating process and new value created) form a tight nexus. Whereas entrepreneurship as a research field encompasses all five dimensions, the actual research object or conceptual core of this field is represented by the nexus. A focus on this nexus has provided us with an implicit, descriptive definition of entrepreneurship. Narrowing the focus to corporate entrepreneurship requires the object-dimensions concerned to be interpreted in a context-specific way. As far as the creator is concerned, an individual or a group

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of individuals acting within the logic of one or more existing organizations initiates and propels all aspects of the creating process. This creating process can be described as the complex of activities and resources through which entrepreneurial opportunities are pursued and accomplished. Accomplishing these opportunities can lead to new value being created. Three operational drivers of new value created claim a central position: introducing new products or processes (innovation), new business development (venturing) and renewing the business concept (renewal). Although the descriptive approach applied here did not yield an explicit (corporate) entrepreneurship definition in the strictest sense, it does bridge the definitional gap to a considerable extent by pointing towards the dimensions we must focus on in setting up our empirical research and by elucidating our position hereon.

The focal point of this dissertation is to detect resources, capabilities or configurations that prove to make a difference for firms in their attempts to rekindle the entrepreneurial spirit. In line with this focus, we looked upon the corporate entrepreneurship nexus from a resource-based point of view. This perspective focuses on what happens inside the firm and stresses firm-specific assets and capabilities as enablers of value creation. We used the resource-based perspective of the firm as a lens to delineate the creating process and creator in detail in order to gain understanding of how new entrepreneurial value is created through innovation, venturing and renewal. In doing so, we furthered resource-inspired corporate entrepreneurship research through having an eye for management or managerial processes (flows) next to resource stocks. This bi-focal resource-based lens shaped the operationalization of the creating process. The latter comprises a heterogeneous mix of tangible and intangible knowledge-related resource stocks (patents and commercial secrets, R&D investments and employee human capital) and flows accumulating these stocks (HRM, networking, and market intelligence generation and dissemination).

When it comes to the creator we directed our attention on top management, inspired by upper echelon theory and in line with this study's set-up. However,

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the upper echelon was studied not only as a valuable resource, but also as the catalyst for the resource-based perspective developed here. Demographic variables reflecting its composition on the team level (size, industry and education heterogeneity) and on the ownership level (presence of institutional and private owners, foreign ownership and ownership concentration) served as proxies for the upper echelon's human capital stock. And upper echelon's learning and selection mechanisms were represented by management's perception of the remote environment, entrepreneurial strategic orientation and intended strategy. We also studied links within the creator: links related to its composition elements (top management team and ownership) and with regard to its learning and selection mechanisms (perception of the environment, entrepreneurial strategic orientation and intended strategy).

Our model's set-up was then compared to that of other models that appeared in major publication or dissemination channels and that are frequently cited in literature. Through this comparison we were able to demonstrate that the set-up of our study offers considerable value-added vis-à-vis the existing major corporate entrepreneurship research models. It (1) considers all (corporate) entrepreneurship object dimensions (nexus model), (2) it integrates the remote environment and business strategy, and (3) it focuses on measurable outcomes of overt and demonstrable firm behavior and actions.

## **Findings**

Our main empirical focal point in this dissertation was to detect resources (stocks) and capabilities (flows) (or configurations of them) that enable innovation, venturing and renewal as drivers of new value. In order to explore and assess elements' contribution to new value created, we have focused on three major objectives that have been covered in five research themes: (1) the relatedness of innovation, venturing and renewal, (2) the relatedness of the resources and capabilities studied and (3) the contribution of the resources and capabilities studied to innovation, venturing and renewal. We will discuss our findings with regard to these three research objectives separately and consecutively.

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***Research objective 1: the relatedness of innovation, venturing and renewal***

From an operational outcome or value point of view, corporate entrepreneurial activity is seen as the complex of innovation, venturing and renewal (Guth & Ginsberg, 1990; Zahra, 1995). These three operational NVC drivers are not only distinct from each other, they are also considered related. If we are to assess the contribution of diverse resources to new value created, we need a better understanding of this 'complex' and of its relationship with economic value. In an adhering first research theme we therefore focused (1) on the topic of the relatedness of innovation, venturing and renewal and (2) their newly created value propelling ability. We briefly summarize our main findings with regard to both topics.

**Relatedness of innovation, venturing and renewal.** Gaining insight into the linkages among innovation, venturing and renewal is not easy. However, the distinction between a company's exploration and its exploitation activities can help us to find our way. Exploration implies operations beyond the scope of what the firm currently knows or has (Covin et al., 2003). Exploring something new related to the firm's productive core forces the firm toward intensive learning, experimenting and knowledge gathering (Rothaermel & Deeds, 2004). Exploitation allows the firm to distil value from its current (productive) knowledge base (Covin et al., 2003). Although most activities have an explorative as well as an exploitative side, all firm motives or activities can be considered *primarily* explorative or exploitative. As March (1991) made clear, both motives cannot be simultaneously high. Exploitation builds on and is preceded by exploration (March, 1991; Rothaermel & Deeds, 2004).

Keeping the exploration/exploitation distinction in mind, we delineated innovation, renewal and venturing taking this dissertation's resource-based lens into account. As far as innovation and renewal are concerned, we focused on their more radical guises. In their corporate entrepreneurship efforts, firms are more likely to pursue fundamentally new (i.e. radical) opportunities or strategies. And radical changes are more interesting to study from the resource-based perspective since they require much more pervasive resource gathering, combination and



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transformation. The same resource-based lens that pushed us to study radical innovation and renewal suggested looking upon venturing as an exploitative vehicle, situated at the end of the value chain. Studying venturing as an explorative vehicle would have generated a shift away from the inside of the firm (which is the main focus of the resource-based perspective) and would have implied a different role for venturing than the one investigated here.

This classification of innovation and renewal (both explorative) and of venturing (exploitative) gives a sense of direction to the renewal → venturing and the innovation → venturing linkages: renewal and innovation will precede venturing. Further, although renewal and innovation both belong to the explorative category, it is in fact their relative degree of exploitation/exploration that matters in drawing the linkage between both. And as we have argued, renewal can be considered as relatively more explorative than innovation in view of its more strategic and in-depth nature. Following, we assumed the renewal → innovation linkage instead of the opposite.

The results provided strong support for the assumed relationships among innovation, venturing and renewal. Although one model containing the innovation → renewal path was equivalent (in terms of Theme 1 in Chapter 4) data wise, further analyses (in Theme 5 of Chapter 4) revealed the superiority of the model comprising the linkages we assumed. A major lesson can be drawn from these results: innovation, venturing and renewal are not only distinct, but also related. Neglecting this relatedness - as has been done in previous research on an empirical level - would jeopardize the correct assessment of the contribution of the diverse resources and capabilities to (taking into account the specific relatedness) innovation and venturing in particular.

**Innovation, venturing and renewal as new value drivers.** The topic of interest here was whether or not the assertion that innovation, renewal and venturing propel new value can be confirmed. Although past research (however scarce) has demonstrated the beneficial effects of corporate entrepreneurship for firm financial performance, this evidence remains anecdotal in nature (Zahra & Covin, 1995). As a result, we wanted to make sure whether or not our measures of

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innovation, venturing and renewal actually engender economic or shareholder value, measured here in terms of the growth in the firm's value added in the period 2003-2004 (i.e. after the corporate entrepreneurial activities measured took place).

Our findings considerably demonstrate that innovation and renewal actually propel firm economic value. In the case of venturing a negative effect was found, but this is likely to be caused by the fact that a one-year time lag between the substantiation of the venturing activities and financial performance might be too limited (Von Hippel, 1997; Block and Subbanarasimha, 1989). Using a time lag of less than three years, it becomes likely that the venturing costs dominate, resulting in a negative effect on value added. All things considered, though, the findings strongly suggest that we can typify innovation, renewal and venturing as drivers of new value created.

**Conclusion.** Examining the value-creating ability and the relatedness of innovation, venturing and renewal, our findings allowed us to label them as drivers of new value created. However, it would be too strong an assertion to label them as a financial miracle drug. Further, we were able to map specific linkages among these NVC drivers. We found renewal and innovation to stimulate venturing, and renewal to reinforce innovation. In view of the focal point of this dissertation (i.e. detecting resources, capabilities or configurations that contribute to innovation, venturing and renewal in order to create new value for the firm) it is imperative to take this relatedness into account.

However, an important, refining remark is needed with regard to the specific sense of direction of the relations between renewal, innovation and venturing. Although we remain confident in our assumptions and in the resulting findings, we believe that further empirical verification is needed since we expect different views on the nature of innovation, venturing and renewal (e.g. explorative instead of exploitative venturing) to demand different assumptions and to produce different findings. Future research using various operationalizations of venturing, innovation and renewal (all of them broad constructs) would therefore be welcome in order to obtain a more fine-grained understanding of the

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innovation, venturing and renewal complex. The cross-sectional nature of the data used here also suggests the need for further testing. Our findings also suggest future research to use a stretched time lag (of 3 years or preferably more) in order to accurately map the financial effects of innovation, renewal and venturing.

Our results also contain an important warning for firms embarking on a financially motivated corporate entrepreneurship journey. Not all corporate entrepreneurial outcomes (e.g. exploitative venturing) are able to offer a return on investment in the short run. At first, the costs of some operations may very well largely exceed the revenues. The firms considered should therefore have some financial reserve at their disposal. And their managers must be armed with courage and vigorousness against impatient shareholders demanding high-speed returns on their investments. Firms and their boards should therefore evaluate their managers on various milestones during corporate entrepreneurial operations, and not (only) on financial results in the shorter run. In fact, the managers best suited to guide firms through the rough waters of corporate entrepreneurship may be the ones following a carefully outweighed yet visionary path, even if this means that the firm's results will suffer dearly in the short run.

***Research objective 2: the relatedness of the resources and capabilities studied***

Resources and capabilities are also expected to be related. They can be bundled and/or they can be part of resource configurations (Ireland et al., 2003b). This recombination and transformation stimulates their value, rareness, inimitability and non-substitutability. Considering the diversity of resources and capabilities studied in this dissertation, other linkages are equally possible and have been foreseen. For instance, we expect the creator elements to shape the creating process resources (i.e. the catalyst role of the creator). Or, we linked management's perception of the environment to its entrepreneurial postures and its intended strategy (all of these are creator learning and selection mechanisms). Getting a clear understanding of these and other linkages among the resources

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and capabilities studied is essential. Only by modeling the resource and capability linkages we can accurately estimate the contribution of the resources and capabilities to the NVC drivers. The topic of the resource and capability relatedness was - each from a particular point of view - covered in three separate research themes. We use the insights emerging from these themes to briefly discuss major features of the linkages among (1) creating process elements, (2) creator elements and (3) the creator and the creating process.

**Linkages among creating process elements.** We operationalized the creating process by means of a portfolio of tangible and intangible knowledge-related resources. We distinguished between resource stocks (patents and commercial secrets, R&D investments and employee human capital) and flows (HRM, networking and market intelligence generation and dissemination). The flows represent managerial processes and capabilities through which resources can be gathered, recombined and leveraged. Flows can thus create or maintain resource stocks (Thornhill, 2006), although the flows studied here can generate stocks other than the ones (explicitly) included in this study. Compared to stocks (in particular the asset stocks), flows have received less attention in resource-based corporate entrepreneurship research due to their more intangible nature.

The challenge was then to capture the relatedness into meaningful and interpretable “fitting” patterns. We followed two approaches to obtain such patterns. Both approaches have their (dis)advantages. As a first approach, we turned to fit as covariation. This type of fit revealed several, reinforcing linkages among creating process elements. For instance, the number of patents and commercial secrets seems to stimulate R&D investment. Or, knowledge creating and sharing HRM may increase networking intensity. Some of these linkages are self-evident (e.g. between market intelligence generation and dissemination). All in all, HRM and employee human capital are the creating process elements that are most related to other elements (these elements are involved in 6 out of 9 paths detected).

The possibility of using the linkages between individual elements in further calculations (e.g. with regard to new value created) is a strong advantage of fit as

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covariation. However, in linking two resources or capabilities two each other, we must choose a direction (from ... to ...), and this choice has its implications for the (total calculated) contribution of the elements concerned to the NVC drivers. In our case, we followed the software in making these choices. Problems arise, though, when theory recognizes bidirectional relationships, as is often the case with resources (causal ambiguity). In other words, the impact of the researcher's discretion within the covariation approach is not to be underestimated. All in all, though, this impact is somewhat comparable to that of the manager of a firm having to make resource investment choices. The manager too is faced with the causal ambiguous character of resources and capabilities.

The second approach looks for 'gestalts' or internally consistent sets of resources and capabilities. In this approach, the direction of the linkages among elements is no longer a concern. However, we do not obtain information with regard to linkages between two individual elements. Information we no longer can use when calculating individual elements' contribution to the NVC drivers. Our findings revealed the existence of four distinct profiles: the overall weak profile (weak scores on all resources stocks and capabilities (flows)), the balanced profile (moderate to strong scores on all stocks and flows), the flow profile (strong on the flow front, weaker on the stocks) and the human capital profile (excelling in employee human capital and HRM). Just as in the pattern of linkages detected by means of the covariation approach, HRM and employee human capital also play an important role within the profiles as one profile builds on both these elements. The distinction between stocks and flows is therefore also useful in profiling the resource gestalts as three out of four profiles can be mapped building on this distinction. Future research can perhaps advance our knowledge of the creating process elements' relatedness even more by using more fine-grained typologies of resources and capabilities, for example by building on the recent work of Zahra et al. (2006) (resources/skills/substantive capabilities/dynamic capabilities).

**Linkages among creator elements.** Creator elements comprise upper echelon composition variables (TMT demographics and ownership characteristics) and

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learning and selection mechanisms (management's perception of the remote environment, entrepreneurial strategic orientation and intended strategy). As opposed to the creating process where we used a purely exploratory approach to detect the existence of resource linkages, we formulated specific research propositions as far as the relationships between certain groups of creator elements are concerned. The creator elements considered allow for such hypotheses to be formulated.

One such hypothesis was the expected influence of ownership on the top management team composition (size and heterogeneity). Our findings provided only weak support for this proposition. The creator composition elements are therefore not (or only very weakly) linked. Sample specifics (e.g. the pronounced presence of family businesses) could be at the base of this weak effect. As far as the relationships among the learning and selection mechanisms are concerned, evidence was much stronger. For instance, a futurity entrepreneurial orientation connects positively to a technology strategy and to an innovative differentiation strategy. An aggressive posture is positively associated with technology strategy and negatively with an innovative differentiation strategy. As we hypothesized based on earlier research (Noble et al., 2002), entrepreneurial strategic orientations actually function as guiding principles influencing the firm's strategy-making. They represent in a certain sense a state of mind of the top management that colors its behavior. And in this respect, a futurity orientation looks the most powerful of both orientations investigated.

The entrepreneurial strategic orientations are themselves influenced by management's perception of the remote environment. The same goes for intended strategy. As far as management's perception of the remote environment is concerned, we detected four discrete environmental settings indicating that the various environmental dimensions (such as rivalry or demand for new products) also form internally coherent patterns. The environmental profiles discovered are: the static and impoverished environment, the rivalrous low growth environment, the hospitable and promising environment and the competitive growth environment. The four settings can be distinguished from each other based on

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their scores on the opportunity or munificence dimension (technological opportunities and demand for new products) and on the rivalry dimension. Our results (taking the static and impoverished environment as the point of reference) revealed that management's perception of the remote environment serves as a very strong base for managerial postures (e.g. entrepreneurial strategic orientation) and choices (e.g. intended strategy). Whereas previous research warned for the lack of clarity of these linkages, our results have contributed to the clarification of these relationships. For instance, when management perceives the environment as rivalrous, it is likely to adopt an aggressiveness posture. And perceiving the environment as rich in opportunities triggers the adoption of a technology strategy and of a futurity entrepreneurial posture. The competitive growth environment has the broadest effect on management's entrepreneurial posture and intended strategy: it sparks aggressiveness and futurity postures as well as a technology and an innovative differentiation strategy. An environment perceived as rivalrous and low in growth opportunities only evokes an aggressiveness posture.

Ranked in terms of effect strength, the competitive growth environment leads as far as aggressiveness and futurity are concerned. Second in line is the rivalrous low growth environment (for aggressiveness), and the hospitable and promising environment (for futurity). This ranking is in line with our expectations. Somewhat surprising, though, is that the hospitable and promising environment heads the ranking when it comes to the intended strategies (technology strategy and innovative differentiation), preceding the competitive growth environment. On the whole these findings suggest that both munificence and rivalry are conducive to adopt entrepreneurial postures and strategies. An environment perceived as munificent and/or rivalrous pushes firms to develop aggressiveness and futurity postures and technology and innovative differentiation strategies compared with an environment that is perceived as neither of both (i.e. the static and impoverished environment). However, as far as the intended strategies are concerned, a purely munificent environment (with very low rivalry) is the most stimulating. All things considered, management's perception of the environment

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is likely to influence its state of mind (entrepreneurial posture) and its planned actions (intended strategy). This finding points to the importance of environmental scanning and of interpreting the forthcoming results for a firm wishing to feel the change and cope with it.

It must be noted that the few deviations of the findings from what was hypothesized could be accounted for by considering (especially) the operationalization of the aggressiveness posture (as being price based rivalry). Future research distinguishing between price based and non-price based rivalry would therefore be very valuable in bringing even more clarity on the linkages among management's perception of the remote environment, its entrepreneurial posture and its intended strategy.

**Creator - creating process connections.** Building on upper echelon theory, we expected the creating process to be a reflection of the upper echelon, i.e. the creator. As such, we modeled all creating process elements as being dependent on all creator elements (composition as well as learning and selection mechanisms). These linkages represented the catalyst function of the creator. All but one creator elements studied actually assume a catalyst role (in view of their total effects, i.e. taking their reciprocal linkages (e.g. TMT industry heterogeneity - TMT educational background heterogeneity) into account). The non-catalyst element is an innovative differentiation strategy. The non-effect here could be attributed to the imperfect match between the measure and the context in which it is used (cfr. supra). On the whole, the catalyst effects of the creator elements vary considerably, though. Some catalysts have only positive effects, others only negative and still others give rise to mixed effects. The creating process elements most affected (positively and negatively) by creator elements are R&D investment and market intelligence generation. R&D investment for instance is positively affected by a futurity posture, a technology strategy and TMT educational background heterogeneity. It is curbed by TMT size, ownership concentration, the foreign character of the company and an aggressiveness posture. All in all, evidence for the creator's catalyst role is much stronger for the learning and selection mechanisms than for the composition variables. And this is in se good



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news for firms as learning and selection mechanisms can be easier to adopt and/or adjust than ownership and top management team composition. Future research could target the catalyst role of the composition variables in deeper detail by considering more precise relationships (e.g. curvilinear relationships between (for instance) team size or foreign ownership and creating process elements).

**Conclusion.** Our answer to the deceptively simple question “are the resources and capabilities studied related to each other?” is short and without hesitation: yes. In order to explore how they are related, we tested several propositions developed in this dissertation. On the whole, these hypotheses received considerable support. The linkages discovered are threefold: linkages within the creating process, linkages within the creator and connections between the creator and the creating process (the catalyst role of the creator). In view of the linkages detected, it is therefore imperative to take these into account if we are not to underestimate resources’ contribution to the NVC drivers.

The research described here is cross-sectional in nature, which makes it difficult to make strong causal attributions concerning the resources and capabilities’ linkages. Additional research is therefore needed, for instance sector studies in order to detect industry-specific resource paths and profiles. Or still, we could compare the value creating elements and their relatedness (paths) within small firms with those within medium-sized and large firms, or family firms with non-family firms and so on. Finally, as we departed here from the assumption that the creator shapes the creating process, we might also consider the reversed relationship in future research. For example, the assessment by management of a creating process element being valuable, rare and so on can also trigger the creator (management) to adopt a futurity posture, a technology strategy (which can subsequently trigger new resource accumulation, recombination et cetera). To summarize, our view on the creator – creating process connection is likely to be an interesting, yet simplified perspective on an in fact complex reality. Much remains to be researched on this matter.

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The findings with regard to our second research objective already suggest some interesting management avenues for firms interested in developing specific resources and/or capabilities. First, the results point to the importance of keen, responsible managers who keep in touch with the various layers of their firms' environment. The managerial perception of the environment is an energetic spark that can light the firm's entrepreneurial fire and colors its resources, management practices and capabilities. Firm owners and board members should therefore pay a lot of attention to the skills and competencies of the managers they attract and to the way they deal with them (e.g. rewards, incentives). Specific HR practices directed at (top) management (selection, rewards, etc.) might be an option. Second, our results reveal the contours of an architectural approach in developing capabilities and building resources. The findings suggest a path-dependent, stepping stone approach whereby firms gradually build their entrepreneurial force. As already discussed, a keen and environmental sensitive management team is such a basic stepping stone that will affect other learning mechanisms (e.g. strategy), resources and capabilities within the firm. Employee human capital and knowledge creating and sharing HRM are such building blocks on the creating process level. Both propel multiple other creating process elements. All in all, the findings discussed here clearly shed light on the importance of the human factor as a basic layer within the firm: management's learning and selection mechanisms, employee human capital and HR practices further creating knowledge from this human capital base.

*Research objective 3: the contribution of the resources and capabilities studied to innovation, venturing and renewal*

The issue of estimating the contribution of the various creator and creating process elements to innovation, venturing and renewal formed the focal point of this dissertation. Only after we obtained clarity on the relatedness of innovation, venturing and renewal (research objective 1) and of the resources and capabilities studied (research objective 2), we could turn to this third and final research

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objective. Theme 5 of Chapter 4 gave us the final results on this particular topic by modeling all creator and creating process elements (including their linkages) to innovation, venturing and renewal (recognizing their confirmed relatedness).

In general, the results provided strong support for the developed propositions with regard to resources and capabilities' association with innovation, venturing and renewal. The results (including the unexpected ones) with regard to the hypotheses have been discussed in detail in Chapter 4. It must be noted that the support would not have been that convincing if the resource relatedness would not have been taken into account. This is reflected through the fact that many total effects (the effects expressing the actual contribution to innovation, venturing and renewal) are composed of purely indirect effects.

Let us now turn to the issue of detecting promising resources and capabilities that enable new value creation through innovation, venturing or renewal. Building on Table 28, we discerned several resources that are positively associated with renewal, innovation and venturing. The benefits of investing in these resources and capabilities for one type of NVC driver (e.g. renewal) do therefore not go at the expense of the effects on one or both other drivers. When reviewing the heterogeneous series of elements studied, it became clear that the most promising elements of this type (generating strong (0.10 or higher in absolute value) total effects) either belong to the creating process or to the creator learning and selection mechanisms. Examples are R&D investments, networking intensity, patents and commercial secrets, management's perception of the environment as a competitive growth environment, futurity and technology strategy. The creator composition elements generated smaller effects, some of which run contrary to what has been proposed. As a result, when formulating recommendations to firms in order to increase their value creation, we would first of all point to creating process elements and to creator learning and selection mechanisms. The overall strongest effect can be attributed to technology strategy. It did not come as a surprise that this honor could be awarded to a creator element (learning and selection mechanism). After all, creator elements perform two roles in our model:

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a resource and a catalyst role. And each role can give rise to effects on new value created. The results also revealed several elements that are not interesting in order to achieve a higher degree of new value creation. Among such elements are ownership concentration and market intelligence dissemination. It is noteworthy that not all creator elements give rise to catalyst effects propelling the creating process. For instance, the total effect of a rivalrous low growth and a hospitable and promising environment on the NVC drivers is attributable to effects of those environments on entrepreneurial postures and intended strategies. The creating process elements are not (directly) affected by both these environments. A competitive growth environment on the other hand does display catalyst effects, suggesting that perceived munificence *and* rivalry are needed in order to generate catalyst effects. When it comes to the entrepreneurial postures, the results also elucidate that futurity has a much more profound catalyst role than aggressiveness. As such, a futurity postures not only affects other learning and selection mechanisms, but also colors and (positively) leverages creating process elements, making it an important and interesting posture.

Our findings have indicated that resources (stocks) as well as capabilities (flows) can be interesting elements for new value creation. Neither of both types can be considered as dominant in their effects. However, we have been able to demonstrate the importance of flows. And this can add to resource-based corporate entrepreneurship research which seems to have been dominated by resource stocks. As far as the creator elements are concerned, learning and selection mechanisms clearly excel in their effects on new value created in comparison with the composition variables. As such, here we can say that what the upper echelon does (learning and selection mechanisms; flows) matters more than what its composition is (its human capital stock).

Our analyses with regard to the creating process profiles have demonstrated the basic premise of the resource-based perspective: resource strengths (whatever their nature) enhance new value creation. After all, all profiles expressing some kind of resource strength were able to positively affect innovation, venturing or renewal compared with the weak resource profile (which has no resource

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strengths). The findings further suggested that the balanced and the flow profiles hold the most promising cards for new value creation. The balanced profile is the most promising for exploration purposes while the flow profile takes up this role on the exploitation (venturing) front.

This evidence suggests that exploration activities demand a somewhat different (creating process) resource profile than exploitation actions. We notice similar tendencies when focusing on the direct effects of the individual creator and creating process elements. Elements characterized by a direct effect on exploration (innovation and/or renewal) most often remain without direct effect when it comes to exploitation (venturing). Examples of such elements are networking, R&D investment and a futurity posture. The same can be said of elements portraying a direct effect on venturing (exploitation), such as aggressiveness, a competitive growth environment and market intelligence generation. A direct effect of these elements on exploration is absent. All in all, exploration and exploitation may require different resource and capability accents to be established. There are, however, rather exceptional elements that directly affect exploitation and exploration: a technology strategy and patents and commercial secrets. As such, these elements serve an ambidextrous use.

Based on our findings, we point to the importance of an architectural or stepping stone approach in developing the firm's resource portfolio. This particular approach stresses the path dependency of the creating process and creator elements. As broad or overall resource and capability strengths rarely (or never) can be accomplished all at once, firms will have to make choices and focus on a limited number of specific elements with priority. In targeting these specific elements, their relatedness is crucial. Some can be considered as basic in terms of their potential of propelling the development or acquisition of other. In other words, whereas some elements may display lower direct and even total effects than other (e.g. knowledge creating and sharing HRM), they may be interesting to commence the portfolio development with, in view of their linkages with other, even more desired elements (e.g. patents and commercial secrets, networking).

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The message behind all of this is that the total effects of the resources and capabilities not necessarily reflect the temporal (path dependent; 'where to begin') priority of the elements concerned. The resource linkages may be more important to map the full element chains or paths (including where to begin) of elements in order achieve new value creation.

As has been discussed earlier, the linkages among the elements are large in numbers, resulting in important indirect (and total) effects of many resources and capabilities on the NVC drivers. Knowledge creating and sharing HRM, for instance, connects positively to networking, patents and commercial secrets and market intelligence generation and dissemination. As such, networking builds (at least partly) on HRM. Negative linkages are equally important to consider. For instance, top management team size is negatively linked with R&D investment. This implies that firms trying to maximize the return of their R&D input also should be aware of the role of other 'intervening' factors lying outside the R&D arena (here: top management team size). The same goes for many other elements, as Table 25 illustrates. More generally, particular resource investments or deployments often build on and can be leveraged by other. All resource linkages (creator and creating process elements) should therefore be carefully studied and taken into account when making resource decisions. This also suggests the existence of general corporate entrepreneurship paths (cfr. *infra*).

**Conclusion.** Based on our findings it is possible to suggest to management and policy a series of resources and capabilities they should focus on in their efforts to increase firm new value creation. There are stocks and flows that can simultaneously stimulate innovation, venturing and renewal (e.g. R&D investment, networking, etc.). Correctly estimating the contribution of the resources and capabilities, however, demands that their relatedness is taken into account. If not, their contribution to the NVC drivers can be seriously underestimated. In addition, the relatedness of the elements is also important to be considered when firms make this resource investment decisions and determine their (temporal) priorities. It points to the need for firms to manage their resources very considerably, both in time as at a given moment of time. In view

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of the resource leveraging mechanisms detected, government policy aiming to increase firms' innovation, venturing and renewal rates should also be directed at other factors or elements, besides the 'usual suspects' such as R&D and patents and commercial secrets. We will discuss this issue further in the epilogue.

This very strength of our study, though, also points to the need for carefulness in response and for future research. After all, we already mentioned the need for further research on the relatedness of the resources and capabilities. And we have also demonstrated that the contribution of the stocks and flows depends on this relatedness. As such, if future research could generate more fine-grained results with regard to the relatedness, this would also have its consequences for the assessment of resources and capabilities' contribution. The results of this study should therefore be interpreted with this important caveat in mind. As already suggested, a more detailed typology of resources and capabilities could also add to our insights on the contribution of the various types to new value created.

## **THE STUDY'S CONTRIBUTIONS AND LIMITATIONS**

This dissertation offers contributions on two fronts: the theoretical and methodological front. We list and discuss the main contributions on each front.

### **Contributions to theory**

The theoretical contributions of this dissertation are fivefold. First, our model illustrates the nexus nature of corporate entrepreneurship. Second, we have clarified the position of the corporate entrepreneurship field of research vis-à-vis that of independent entrepreneurship. Third, our data expands the existing conceptualization of the upper echelon. Fourth, the approach developed in this dissertation offers an enriched resource-based view of corporate entrepreneurship. And fifth, the study clarifies the role of entrepreneurial orientation within the corporate entrepreneurship domain. In what follows, we elaborate in detail on these contributions.

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### *The corporate entrepreneurship nexus*

Given the fact that corporate entrepreneurship was ill-defined (Burns, 2005; Sharma & Chrisman, 1999), we have developed a descriptive framework to make way with the construct issue. Instead of formulating yet another context-specific research definition of corporate entrepreneurship, we described its conceptual dimensions. Three such dimensions were identified as being able – in combination – to describe the object of corporate entrepreneurship research: the creator, the creating process and new value created. These three form a tight nexus.

The framework or model thus obtained is very generic and applicable to various kinds of corporate entrepreneurship research. Its value added stretches beyond this study's objectives. One of the strengths of the nexus model is its generic nature. It applies to general conceptualizations of corporate entrepreneurship (e.g. renewal as an economy-wide rejuvenation tool) as well as to very specific forms in very specific circumstances (e.g. a bottom-up approach of innovation in a pharmaceutical company). As such, various interpretations of the label corporate entrepreneurship allow for an application of the model. It can therefore stimulate dialogue within a field burdened by disagreement. The model clarifies which dimensions (at least) must be taken into account in corporate entrepreneurship research and why they are relevant. Every corporate entrepreneurship study should then elaborate on how the nexus components have been examined and why. Finally, the model shows that enablers or disablers of corporate entrepreneurial performance can be situated on various fronts (creator, creating process and/or NVC drivers).

### *Corporate entrepreneurship versus independent entrepreneurship*

Building on an extensive literature review, this dissertation has launched an attempt to clarify the theoretical notions of corporate and independent entrepreneurship by specifying their interpretation of the three nexus components. We have demonstrated that the difference between both is mainly situated in two of the three nexus components: the creator and new value created.



As far as the creator is concerned, the difference between both boils down to whether or not the creative individual(s) is (are) acting within the logic of an existing organization. In the case of independent entrepreneurship, this is not the case.

When it comes to new value created, independent entrepreneurship is intrinsically linked to the creation of a new organization. This new organization may or may not involve innovation. If it does, it is subject to a more strict delineation of 'innovation' than in the case of corporate entrepreneurship: innovation comprises the introduction of a product, process or business idea that is new for the market. New value created in terms of corporate entrepreneurship does not imply the creation of a new organization. Another type of innovation suffices. Only one of both is mandatory: a new organization or innovation. Further, innovation in terms of corporate entrepreneurship is much more broadly conceived than in terms of independent entrepreneurship. It refers to developing or introducing a product, process, business or idea that is new to the market or to the firm.

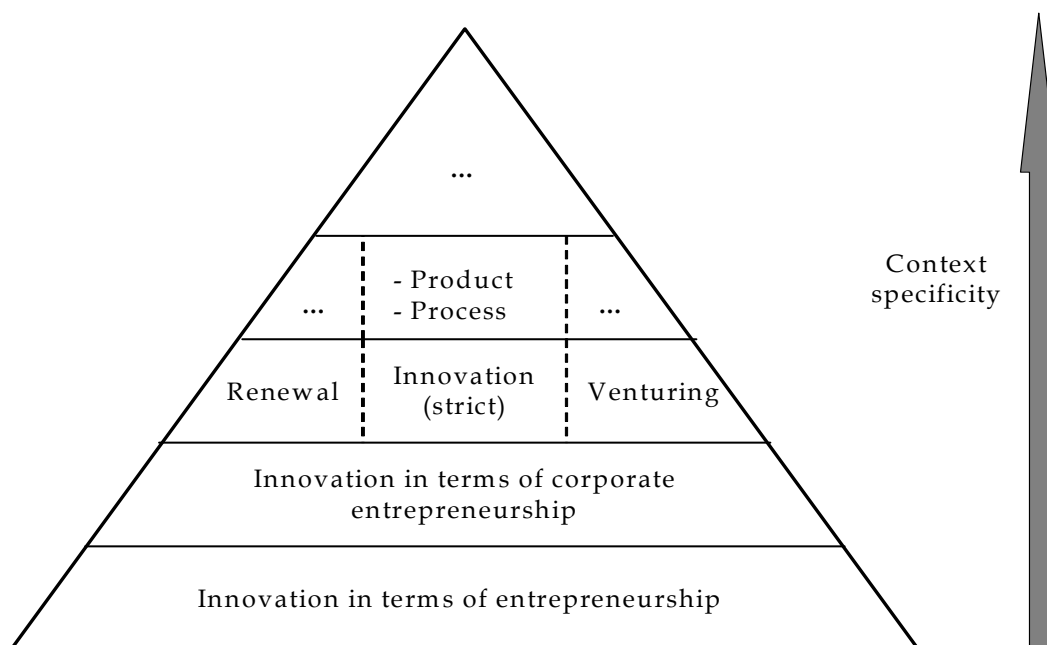


Figure 12. Innovation as a multi-layered construct.

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As such, we have followed the allusion raised by Sharma and Chrisman (1999) and have demonstrated that the setting (independent or corporate entrepreneurship) determines what can be considered an innovation. In fact, innovation can be seen as a multi-layered construct when looked upon from a scientific point of view, as illustrated in Figure 12. Its first layer is the most general: innovation in terms of entrepreneurship (Figure 2; cfr. supra). Its second layer already is context-specific (independent versus corporate entrepreneurship; cfr. supra). Its third layer (within corporate entrepreneurship) distinguishes between various types of 'innovation' that resort under the general second layer of corporate entrepreneurship. It separates venturing (multiple forms of new business) from renewal (new business concept, etc.) and from innovation in a stricter sense (new product or process). All of these could then further be disentangled (e.g. process innovation versus product innovation). Seminal, however, is the context-specific nature of what can resort under the innovation umbrella.

*Towards an enriched conceptualization of the upper echelon*

Building on upper echelon theory (Hambrick & Mason, 1984), the firm's senior management level can be considered a key actor for creating new firm value (Daily et al., 2000; Dimov & Shepherd, 2005). Many studies have found evidence for the value creating effects of the CEO and other top management team members (e.g. Flood et al., 1997; Hoffman & Hegarty, 1993; Lynskey, 2004; Srivastava & Lee, 2005). Although this view on the constitution of the upper echelon holds a dominant position within corporate entrepreneurship research, more recent work revisiting upper echelon theory (Carpenter et al., 2004) has emphasized that the upper echelon is not a universally apt unit of analysis composed solely of the company's top management. Other parties might be of equal importance.

A context-specific demarcation of the upper echelon is therefore highly commendable. Specifically in high-risk activities such as corporate entrepreneurship, other creating actors are likely to have a finger in the pie as

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well. One such important player of which the effect on corporate entrepreneurial outcomes has been demonstrated is ownership (Hoskisson et al., 2002; Zahra, 1996b; Zahra et al., 2000). However, empirical research that has demarcated the upper echelon in a corporate entrepreneurship setting as consisting of the top management and ownership has remained very scarce. In our opinion, this dissertation contributes to an enriched demarcation of the upper echelon by (1) considering top management team members and ownership structure as parties constituting the upper echelon and (2) by suggesting that ownership influences top management's composition (thus having an eye for relationships among the upper echelon constituents). However, sample-specific issues may have led to only weak support for the latter. If not, our findings may indicate that an important role for the owners of Flemish firms remains unfulfilled at this point in time. Ownership taking up the TMT composition shaping role could then increase its effect on the NVC drivers.

When it comes to modeling the effect on new value creation of the thus demarcated upper echelon, this dissertation also adds value. In its origin, upper echelon theory stresses the composition side (through observable demographics such as age, education, tenure, and so on) of the upper echelon (Carpenter et al., 2004; Hambrick & Mason, 1984). Although this view has dominated the research strand on upper echelon theory, a few studies have taken another approach by focusing on upper echelon perceptions, management styles, attitudes, postures or behavior (e.g. Dess & Lumpkin, 2005; Lumpkin & Dess, 1996). This grew out of the idea that this side of the upper echelon coin might be more closely related to the upper echelon's managerial tasks and behaviors. In addition, whereas studies focusing on the composition side have – on the whole – only been able to produce fragmented and inconclusive results (Davidsson & Honig, 2003; Dimov & Shepherd, 2005; Vyakarnam & Handelberg, 2005), research on perceptions and postures seem to portray a more consistent results' record. After all, research has demonstrated that postures such as aggressiveness, futurity, proactiveness and so

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forth affect firm performance rather consistently (e.g. Dess & Lumpkin, 2005; Wiklund & Shepherd, 2005).

In an attempt to enrich the application of upper echelon theory, in this dissertation we have opted to consider both the composition side and learning and selection mechanisms. After all, recent studies have recognized both these sides of the creator coin as complementary (Srivastava & Lee, 2005), enriching our understanding of the role of the upper echelon. However, empirical research that has measured and studied both is very rare. Whereas the composition side serves as an observable proxy for the upper echelons' human capital and knowledge stock, the learning and selection mechanisms refer to action propensities (Atuahene-Gima & Ko, 2001; Hayton, 2005). Having an eye for the learning and selection mechanisms seems in fact to be important. In Chapter 4 (Theme 3) we have been able to reveal that – although both the composition side and the learning and selection mechanisms have explanatory power with regard to the NVC drivers, the latter excels that of the first. Also in terms of individual elements and their contribution to NVC, it is clear that the learning and selection mechanisms deserve the bulk of our attention.

*Towards an enriched resource-based view of the firm*

Taking the resource-based perspective of the firm (Barney, 1991; Teece et al., 1997; Wernerfelt, 1984) as a lens to explore the entrepreneurial performance of firms, this dissertation has focused on the inside of the firm, stressing its resources, assets and capabilities as determinants of performance. However, through a too narrow focus on a limited set of assets (balance sheet items) or other (tangible) resource stocks, past resource-based corporate entrepreneurship research has been unable to discover much on how resources contribute to corporate entrepreneurial performance (Camelo-Ordaz et al., 2003; Teng, 2003). Key was then to empirically recognize the element heterogeneity in a more pronounced way if we were to increase our understanding of how resources and capabilities affect innovation, venturing and renewal. This has been accomplished by (1)

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considering flows next to stocks and by (2) paying attention to intangible resources next to tangible ones.

Considering flows next to stocks draws attention to the management of resources. Inspired by the dynamic capability view of the firm (Eisenhardt & Martin, 2000; Makadok, 2001; Teece et al., 1997), it was argued that firm capabilities must specifically be more understood in terms of managerial processes (flows) that support productive activity. As such, both resources in se (stocks) as well as capabilities (flows) have been awarded a prominent role in the study of firm new value creation. The management side of resources was accounted for not only by considering creating process flows, but also by the creator (upper echelon) (e.g. its learning and selection mechanisms).

More recent studies on resources and their impact on firm performance point to the growing importance of intangible, knowledge-related or competence-based resources (Daum, 2003; Dess et al., 2003). These types of invisible or intangible resources are becoming ever more salient for firms in emerging and/or rapidly changing industries. In this dissertation we have therefore studied a portfolio of tangible and intangible creating process elements, and we have demonstrated the importance of both. And the previously discussed enriched conceptualization of the creator also adds to the heterogeneity of the total resource package examined here.

*Towards a clarification of the entrepreneurial orientation – corporate entrepreneurship relationship*

As noted earlier, corporate entrepreneurship is an ill-defined construct. Consequently, diverse measures have been used throughout corporate entrepreneurship research in order to capture the phenomenon. Some authors have considered entrepreneurial orientation as a synonym of established corporate entrepreneurship (e.g. Barrett et al., 2000; Messeghem, 2003; Morris & Sexton, 1996; Stremersch & Tindemans, 2003). Entrepreneurial orientation represents an entrepreneurial state of mind percolating a firm's ongoing processes

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(Dess & Lumpkin, 2005). It has five dimensions: aggressiveness, risk-taking, proactiveness (futuraity), autonomy and innovativeness, although the majority of studies do not operationalize all five dimensions. Morris and Sexton (1996) consider any firm event reflecting a certain degree of aggressiveness, futurity and so on to be a demonstration of corporate entrepreneurial behavior. Building on more recent studies (Dess & Lumpkin, 2005; Eliasson, 2003; Wiklund & Shepherd, 2005) we have attributed a different role to entrepreneurial orientation in the corporate entrepreneurship context. We saw in it an indication of a firm's disposition toward rather than engagement in actual entrepreneurial activities. As such, it reflects an antecedent of new value created. As far as the measurement of corporate entrepreneurship is concerned, we turned to different, tangible measures of demonstrable corporate entrepreneurial behavior.

In modeling entrepreneurial orientation as an antecedent of new value creation, we considered it as a state of mind or posture of the creator. Put differently, we modeled it as a creator learning and selection mechanism. The results offered us interesting insights on entrepreneurial orientation's actual role with regard to new value creation. For instance, we were able to confirm earlier research pointing toward the positive effect of an entrepreneurial orientation for firm performance (here: new value creation) (Wiklund, 1999; Zahra, 1991; Zahra & Covin, 1995). Further, we have been able to demonstrate that the two investigated dimensions of an entrepreneurial orientation are able to show different effects on new value created and/or on creating process elements and intended strategy. In other words, their total effect on the NVC drivers may differ as well as the number and nature of the paths that lead to the effect. For instance, while the verdict is unanimously positive for futurity, the prospects are of a less promising nature as far as aggressiveness is concerned. Aggressiveness is weakly (positively) associated with renewal and innovation (exploration), and strongly positively with venturing (exploitation). Aggressiveness is also positively associated with a technology strategy, while it is strongly negatively connected to an innovative differentiation strategy and to R&D. All in all, although further research modeling more entrepreneurial orientation dimensions is required, our

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findings enable a clearer understanding of the entrepreneurial orientation – corporate entrepreneurship relationship through its conceptualization as a learning and selection mechanism.

### **Methodological contributions**

By stating that sound theoretical and empirical knowledge regarding the effective conduct of building successful entrepreneurial firms is lacking, several scholars (e.g. Burns, 2005; Miles & Covin, 2002; Zahra et al., 1999) pointed to the need for additional empirical research directed at isolating factors that lead to corporate entrepreneurial success. This dissertation took up this challenge and built a resource-based model of corporate entrepreneurship mainly based on survey data of a large sample of Flemish enterprises. Next to the theoretical contributions already discussed, this study also offers a series of methodological contributions. We discuss five such contributions.

A first methodological contribution is our use of factual data for the operationalization of the majority of the variables in this study. For instance, contrary to studies turning to opinion-like measures of corporate entrepreneurial outcomes (e.g. Antoncic & Hisrich, 2001; Zahra, 1993b), this dissertation has chosen to develop measures of overt and demonstrable firm entrepreneurial behavior. The bulk of the study's other variables have been operationalized in a similar fashion. Our findings thus reflect the contributions of actual firm behavior to true-type entrepreneurial outcomes. Future research could build on these or similar measures in view of validating the results.

A second contribution lies in the data sources used. We combined a primary data source (survey) with a secondary source (certified financial statements; Bel-First database by Bureau Van Dijk). Only five percent of all entrepreneurship research (including corporate entrepreneurship) builds on such a combination (Chandler & Lyon, 2001). Moreover, in view of our focus on factual measures resulting from the primary data source, it is likely that our specific combination of a factual primary and a factual secondary source is unique at this point in time. The coupling of secondary data source to the primary source allowed verifying

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the value creating ability of innovation, venturing and renewal. This point has received very little attention in previous corporate entrepreneurship research (Dess et al., 2003; Zahra et al., 1999a). The added financial statements referred to the years 2003 and 2004, namely the years of and just after the survey were administered. As extendedly lagged financial data were not available to us at the time of completing the study, future research focusing on the actual value creating effect of (in particular) venturing should therefore consider using such data. Additionally, in studying the link between innovation, venturing and renewal and value creation it would also be of great interest to model the effect of past performance on the firm's subsequent rejuvenation efforts. This past performance can include financial performance as well as past innovation, renewal and venturing. In this way we could advance our knowledge on the performance drivers of corporate entrepreneurial activities and find out, for instance, whether or not strongly performing firms find it less difficult to practice corporate entrepreneurship compared to firms performing weakly on the financial front. Or still, we could verify whether corporate entrepreneurship really works as a rejuvenation effort, increasing the innovation, renewal and/or venturing rates of firms performing poorly as far as new value created is concerned.

Closely related to the preceding contribution, our primary data source (PASO 2004 database) allows us to focus on all economic sectors. Compared to previous research in which 85% of the companies researched were manufacturing firms (Zahra et al., 1999a), this approach generates a greater diversity in industry scope and allows inter-industry comparisons, including the worldwide surging service sectors. The PASO 2004 database also opens the door to consider different types of companies, such as young versus mature businesses and large firms versus small and medium sized enterprises. The need for such comparisons or controls has been frequently expressed (Ucbasaran et al., 2001; Zahra et al., 1999a).

This research project focuses on corporate entrepreneurship in Flanders. As such, it complies with the call for greater diversity in the geographic scope of corporate entrepreneurship research. After all, the vast majority of research on



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firm-level entrepreneurship has been conducted in the United States or by researchers working in U.S.-based universities (Zahra et al., 1999a). Research on corporate entrepreneurship in Flanders (or Belgium) is very scarce. In fact, to date only one other, explorative research project on corporate entrepreneurship (or rather: entrepreneurial orientation) in Flanders has been carried out (Stremersch & Tindemans, 2003).

We have used structural equation modeling with manifest variables (path analysis) as a multivariate statistical tool. This technique in particular has very rarely been used in entrepreneurship and corporate entrepreneurship research (in only 1% of all cases) (Chandler & Lyon, 2001). Nevertheless, this technique is very appropriate (if not necessary) for testing more complex relationships. Taking into account the partial mediation approach (cfr. supra), the relatedness of the NVC drivers and of the diverse resources and capabilities (resulting in direct, indirect and total effects) would not have been possible without this particular tool. In this respect, a substantial part of the empirical value added of this dissertation builds on the use of path analysis.

## **Limitations**

Aside from the contributions mentioned, we point to three important limitations of the study. First, although the conceptual model in se is applicable to all types of corporate entrepreneurship (including top-down as well as bottom-up initiatives), it has mainly been approached from the top-down perspective, leading to the current operationalization of the creator. The main driver behind this decision was the nature of the PASO 2004 survey. Targeted respondent of the survey was the chief executive officer (CEO) of the firm. And the targeted firm population was very diverse, including small firms as well as very large companies. The CEO was therefore a useful respondent for the diverse types of firms. And in view of this, it would have been unsound to use the CEO to probe for the nature of entrepreneurial initiatives originating from all levels within the firm. Senior executives may not be fully aware of autonomous initiatives undertaken by lower-level employees (Zahra et al., 1999a).

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We therefore stress the need for additional research based on the nexus model that does target bottom-up initiatives. Several research avenues can be followed to accomplish this objective. First, we could think of a 'mirror' survey of the PASO 2004 survey, directed at the firm's employees (at all non-senior management levels). Such a survey would be particularly well-placed to gain information on idea generation and 'selling' practices the firm uses to involve the employees in the firm rejuvenation process. Put different, this would allow us to gain insights in what employees need (in terms of creator and creating process support) in order to be able to contribute to the firm's entrepreneurship pursuits. This type of survey would form an interesting complement to the existing PASO 2004 database. Second, when developing a completely new survey independent from the PASO survey, we could opt for survey research using the middle manager as the targeted respondent. Middle managers are expected to be well informed about how formal and informal entrepreneurial activities unfold and are better placed to evaluate the success or failure of these efforts (Kanter, 1985; Zahra et al., 1999a). This would, however, imply an adjustment of the survey target population to ensure the presence of middle managers.

A second, related limitation of our survey methodology has to do with the nature of the data obtained. Reliance on a survey has well-known side-effects, such as the overemphasis on the content of entrepreneurial activities (rather than their process) (Zahra et al., 1999a). The use of survey data can also lead to an overemphasis on the formal aspects of entrepreneurial activities, overlooking informal actions and their contributions to the firm's performance. As a remediation effort, field studies and case-study research could be more adequate to reveal the role of autonomous entrepreneurial activities (Burgelman, 1983). In particular, we would opt for case study research, using a design whereby each case (an entrepreneurial project from its origin to its finish (whether successful or not)) is researched from various levels and/or angles within the firm. Several interviewees or parties would be invited to participate. Doing so, we would be able to collect very rich data on a number of specific cases, giving us insights in the process of (formal and/or informal) corporate entrepreneurship and enabling

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strong causal attributions (useful for future quantitative analyses using a covariation fit approach). This approach could be combined with a multi-level design (interviewing different levels within the firm: lower-level employees, line management, middle management and senior management) in order to obtain multi-level process data (top-down and bottom-up). However, one should keep in mind that gaining access to this type of information about firm's entrepreneurial activities is exceedingly difficult.

A third limitation emerging from comparing this study's set-up with that of existing research concerns the level of analysis. About 90% of all corporate entrepreneurship studies is limited to a single level or unit of analysis (the firm (53%), an industry (9%), etc.) (Chandler & Lyon, 2001). Admittedly, so is this study. It focuses on the firm level. Research would therefore benefit from including various levels of analysis (Zahra et al., 1999a). One could, for instance, include the establishment/division and the concern levels next to the firm level in one study following rejuvenation efforts from A to Z.

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## **EPILOGUE**

### **SUGGESTIONS FOR A CORPORATE ENTREPRE- NEURSHIP AGENDA**

In this concluding section of the dissertation we focus on a number of suggestions that can allow a deeper understanding and a better practice of corporate entrepreneurship in Flanders. We list recommendations and points in need of attention on three avenues: research, practice and government policy. In what follows, we discuss these domains consecutively.

### **IMPLICATIONS FOR A CORPORATE ENTREPRENEURSHIP RESEARCH AGENDA**

Based on our insights and experience with regard to this study, we formulate a number of additional suggestions that could be useful for future research in order to advance our knowledge on new value creating firm-internal capabilities and resources.

*Delineation of constructs and development of detailed typologies.* Additional research is needed when it comes to the delineation of and relationships among many constructs. This particularly applies to the NVC drivers innovation, venturing and renewal as all three remain broad constructs. Further, as suggested by our results, elements can often stimulate one type of NVC driver while inhibiting another (see e.g. the effects of market intelligence generation), resulting in more complex, less straightforward implications for managers and advisors. A large part of past corporate entrepreneurship research has neglected this important issue by building recommendations to practice on a study incorporating only one outcome type. Further, when innovation, venturing and renewal are contemporarily

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studied, it is important to treat them not only as distinct, but also as related. Only then one can get a clear view of the actual contribution resources and capabilities are able to render to new value created through innovation, venturing and renewal. This also points to the importance of paying attention to the consequences of using different operationalizations and more strict delineations of the NVC drivers for their specific connections. For instance, conceptualizing venturing as exploratory instead of exploitative is likely to give rise to a different pattern of interrelatedness than the one proposed and confirmed in this study. It is therefore advised that corporate entrepreneurship research aiming at detecting determinants of NVC focuses on all three NVC drivers and their relatedness. But the directions of the relationships should be carefully modeled in view of the specific constructs, their delineation and operationalization. Similarly, more fine-grained typologies of resources, capabilities, environments and so on are welcome to advance our knowledge of their relatedness and their connections with the NVC drivers.

*Context-sensitive measures.* Building on the previous point, future research could contribute to our understanding of the corporate entrepreneurship phenomenon by using more fine-grained measures for some of the constructs. For instance, studying two types of venturing (explorative and exploitative) next to renewal and innovation could be an interesting way to refine the insights coming from this study. The same goes for distinguishing between price based and non-price based rivalry or aggressiveness. Such a refinement could lead to a better understanding of how aggressiveness as an entrepreneurial posture affects intended strategy, creating process resources and (ultimately) new value created. The measures used for R&D and networking intensity can also be refined. We focused on R&D investment in this dissertation. Future research could turn to specific R&D activities. Networking intensity could be further disentangled considering types of networking partners (e.g. networking with clients/suppliers and networking with research institutes, universities, etc.). All of these (and other) measure

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refinements would be useful in order to be able to more fully grasp how innovation, venturing and renewal can be stimulated.

The suggestive measure refinements mentioned somehow reflect the underlying need for context-sensitive measures. Corporate entrepreneurship is a very broad construct and many research strands can carry the corporate entrepreneurship flag. It is therefore imperative that the measures and constructs used in each research project are in line with the study's intent, design and setting. For example, cross-sectional research covering a wide variety of sectors requires a delineation and operationalization of (for instance) product innovation that is different from the one of a specific sector study (e.g. product innovation in banking and insurance). Although this may seem trivial, research practice demonstrates that all too often measures and constructs are used in settings for which they are more or less inadequate. This blocks clear insights into the complex nature of corporate entrepreneurship. Measure fetishes are therefore not wanted in corporate entrepreneurship research because it is highly unlikely that any measure suits all research settings and designs. What we need are study-by-study rigorous construct and measure development and thorough accountability of their operationalization and use.

*Complementary research designs and settings.* Having studied corporate entrepreneurship in all economic (for-profit) sectors, this study has expanded the industry scope of corporate entrepreneurship research. All companies, though, were studied as one sample, using the same measures. It could therefore be interesting for future research projects to study the same corporate entrepreneurship nexus model separately in diverse sectors, allowing the possible discovery of sector-specific resource deploying mechanisms and effects (using context-sensitive measures). Doing so, the distinction between industry and service firms would count as the minimum. But further, more detailed sector studies should also be seriously considered. All of this can imply using sector-specific measures to gauge new value created (e.g. innovation in manufacturing

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versus innovation in wholesale and retail) and sector-tailored accents to operationalize the creator and the creating process.

As discussed earlier in the section on the limitations of this dissertation, complementary research designs are highly desirable in order to obtain rich data on content and process aspects of corporate entrepreneurship actions. In addition, such designs would enable researchers to make strong causal attributions on the relationships and linkages detected, accurately depicting the paths and steps in the new value creation chain. Future research projects would therefore also benefit from regular contact moments with stakeholders from practice in order to discuss the research objectives, designs and findings and put them into perspective. Such practical feedback could be invaluable in developing appropriate, context-specific measures.

*Recognizing firm heterogeneity.* Besides stressing sector or industry differences in resources important for and paths leading to new value created, future research could also focus on other comparisons. For example, research could compare value creating resources and paths of small firms with those of medium-sized and large firms. This could also be combined with the distinction between family and non-family firms. Doing so, research should be able to pinpoint more accurately which elements work best in certain contexts, as well as how and why their effects on the NVC drivers come into existence.

*Maintaining an open view on the creating process and the creator.* In view of enriching our view of resource-based theory, this study has gone great lengths in obtaining an elaborated portfolio, including flows next to stocks and intangible next to tangible resources. Future research should feel intrigued to study portfolios containing other resources and their linkages. A similar line of reasoning applies to the position held with regard to the creator in view of advancing upper echelon theory. We expanded the boundaries of its composition to include ownership and we pointed towards the importance of its learning and selection mechanisms next to its demographic or composition side.



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Future research could advance upper echelon research further in three ways. First, research could turn to more fine-grained ownership measures to account for various types of institutional (e.g. pressure sensitive and pressure resistant; cfr. Zahra et al., 2000) and private owners. It is not unlikely that the use of such refined measures (compared to the more general categories used in this study) generates deeper insights into the role and effects of ownership with regard to corporate entrepreneurship. Second, it could stretch its boundaries even further by also having an eye for the governance side of the upper echelon. The board of directors or, more in general, the governance system could in fact be a pivotal actor residing outside of traditional management team boundaries. Particularly in those cases where the governance system assigns a number of important tasks affecting firm management and performance to the board, one could argue that the board falls within the boundaries of the upper echelon. Whereas we only considered the governance issue to a minor (and unmeasured) extent, future research should include governance as a measured element of the upper echelon. Doing so, it could turn towards measures reflecting its composition (e.g. the number of independent board members) and its authority (e.g. number of tasks specifically assigned to the board). Third, future research could also refine our view on the upper echelon by linking its composition side with its learning and selection mechanisms. At least if the measures used allow for such a link (which was not the case in this study).

*Research based corporate entrepreneurship indicators.* As a last suggestion to list an agenda for future corporate entrepreneurship research, we would like to recall and stress the main objective of corporate entrepreneurship research. This boils down to listing practically valuable and interpretable determinants and indicators (what and how) of successful corporate entrepreneurship. Evidently, these determinants should be research based, meaning that they follow from rigorous empirical research that builds on thorough conceptual work. Without such deliverables it will become even more difficult than it already is for the research field to safeguard its position within the interdisciplinary management domain.

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## PUTTING CORPORATE ENTREPRENEURSHIP ON THE AGENDA IN PRACTICE

The findings and conclusions of this dissertation provide us with the opportunity to address firms and transfer a few major lessons and general directions in order to enhance the practice of corporate entrepreneurship.

*The findings put into perspective.* When it comes to managerial practice, this study offers various valuable insights that can guide management in their efforts and actions of pursuing corporate entrepreneurship. From a content point of view ('what'), the earlier discussed findings point to diverse resources and capabilities that are able to stimulate all three types of NVC drivers simultaneously (e.g. R&D, networking, technology strategy, etc.). And it also identifies elements that curb corporate entrepreneurial activities (e.g. ownership concentration). Table 28 contains the details on the total effects of all elements studied (cfr. supra).

In an attempt to look upon corporate entrepreneurship from a process point of view ('how'), our findings can be depicted in the flow model of Figure 13 (however imperfect and suggestive). This figure provides us with a raw sketch of the strength of the linkages among the main nexus blocks of the model studied in this dissertation. It represents flows rather than (total) effects. As such, it portrays in general terms how the effects come into existence. We distinguish between strong, moderate, and weak linkages. The figure reveals several interesting phenomena. Evidently, it shows that the linkage between the creating process elements and the NVC drivers is strong. The same goes for the connection between the creator and the creating process, at least in general terms. The direct tie between the creator and the NVC drivers is almost absent. Only the top management team composition displays a weak linkage. As such, the figure generally suggests in terms of flows that the creator affects the creating process and that the latter leads to new value created.

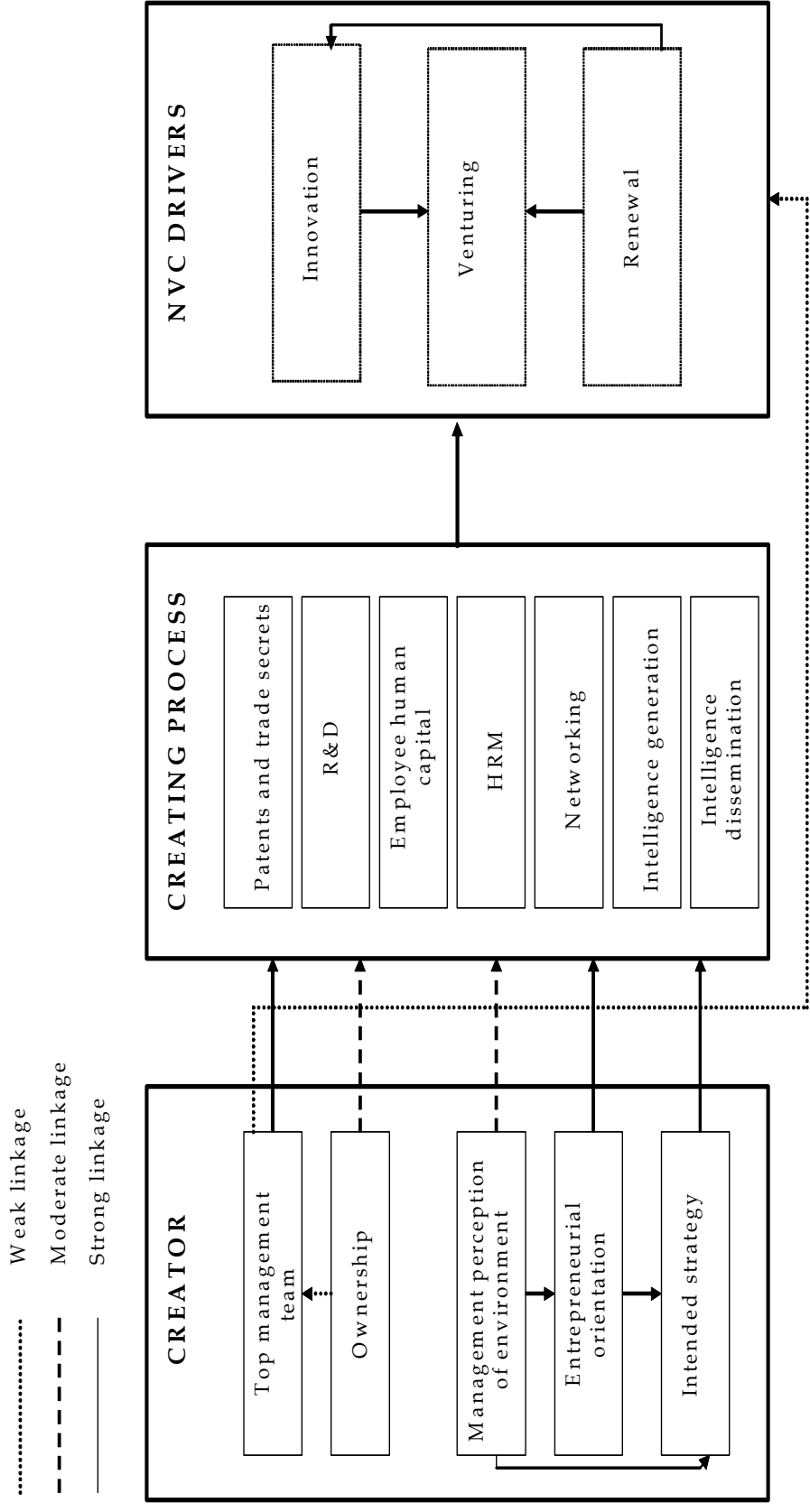


Figure 13. General path strengths.

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A closer look on the creator - creating process flows teaches us that the creating process is tied to ownership in a weak way, to the top management team and the perception of the environment in a moderate way and to the entrepreneurial posture and the intended strategy in a strong way. As far as the creator learning and selection mechanisms are concerned, we also notice the strong paths between the perception of the environment and both entrepreneurial postures and intended strategy. The latter is also strongly tied to the entrepreneurial postures.

All things considered, Figure 13 suggests three main flows or paths through which new value creation is instigated within firms: (1) the top management team's human capital, (2) its learning and selection mechanisms and (3) creating process resources and capabilities. And it also demonstrates that the first two evoke new value creation via the creating process. All things considered, the information on the total effects (Table 28) reveals which elements are of importance for firm new value creation.

Figure 13 complements this information by revealing how these effects come into existence and by pointing to general paths or chains that can be useful in determining firms' priorities in order to build or acquire the elements. It suggests where firms can start and which connections they should take into account when acting. In other words, the paths depicted function as feed-forward and feed-backward mechanism. They indicate the main paths to follow towards NVC from a certain point onwards (feed-forward) (e.g. which step(s) to take next once knowledge creating and sharing HRM has been developed: networking, market intelligence generation and so on). And they also suggest which elements should be kept in close supervision in "rear view" and/or should be taken into account when following the creator - creating process - NVC logic from a certain point onwards (here: HRM) (feed-backward; e.g. developing knowledge creating and sharing HRM is affected by management team educational background heterogeneity).

*The all-round nature of corporate entrepreneurship.* A major message lying underneath the findings is that firm-internal resources, capabilities and features of diverse nature explain a considerable part of the firm's innovation, venturing and

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renewal successes. Put differently, there is no single class or group of elements ('miracle drug') that on its own excels in its value creation potential. Further, the findings illustrate that in order to reach success with a particular resource or capability (e.g. R&D), other elements (and especially their effects on the resource or capability concerned (e.g. R&D)) are crucial to be considered as well (e.g. HRM, employee human capital, team size). In other words, instead of betting on a single horse (e.g. R&D), firms need to develop an integrated management approach, whereby all capabilities and resources concerned jointly work in the same (desired) direction. The results of this dissertation may help firms to develop such an approach. A crucial caveat for firms is therefore that creating new value by means of corporate entrepreneurship may require much more profound actions than one would expect at first sight.

*A long term vision is necessary.* In view of the profound, transforming actions that are often needed to get the firm on the corporate entrepreneurship track, it becomes clear that short term results (in terms of new value created pay-offs) are highly unlikely. The actions needed take time and include considerable risk. And once new value has been created in operational terms (innovation, venturing and/or renewal), it may again take time to see this positively reflected in financial terms. Firms therefore need a long term vision that is consistently implemented throughout all segments of the firm. However, the road to a long term vision may be hindered by several practical impediments, such as impatient shareholders and managers focusing on the short term in view of their personal career paths (jobhopping) and financial gains. Again, thorough and at times difficult structural adjustments (in fit with the other actions) (e.g. transforming the reward structure for management) may be at hand for many firms if they are to overcome or avoid such impediments.

*Change is not a burden, it can be a blessing.* The perceived degree of change (in terms of opportunities and rivalry) in firms' environment seems to force a discipline on firms to (re)act. Rivalrous environments push firms to act entrepreneurially,

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whereas opportunity-rich environments functions more as a pull mechanism. Environmental change is therefore not bad in its essence. But it does keep firms on their toes and demands action from their part. Action that may render success if handled properly. For instance, an environment perceived as rivalrous and low in growth demands an aggressiveness posture to trigger the entrepreneurial value creation chain (see Table 25; cfr. supra). The opportunities offered by a hospitable and promising environment can be deployed beginning with a futurity posture and/or a technology strategy. The mechanisms to exploit a perceived competitive growth environment are more diverse, comprising an aggressiveness and/or futurity posture and creating process elements (e.g. employee human capital or networking). In other words, different perceptions of the environment (and the change it reflects) can all lead to new value created, but the actions ('chain') needed to reach success may require different (first) steps to be taken.

*Resource management is the key to success.* Our findings have made it clear that companies have a high degree of control over their entrepreneurial behavior. If things go bad or change is at order, they can undertake corrective measures. And if things are prosperous, they can be proactive in order to safeguard the prosperity. Moreover, these corrective measures and proactive actions relate to the firm's resource portfolio. This dissertation has stressed that firm's should keep a broad view on the constitution of their resource portfolio. The portfolio does not only contain 'traditional' resource stocks (such as patents and commercial secrets or R&D) but also flows (capabilities such as networking). Key is also the human side of the portfolio, pointing towards the impact of the human capital stocks and flows (HRM) which generate indirect effects on new value created through supporting the development or deployment of other stocks and/or flows. All of this suggests the need for an all-round resource management, whereby resource investments (and divestments) are carefully planned and outweighed, taking into account the demonstrated reciprocal effects of resources and capabilities. Resource profiles will need to evolve continuously since changes in the

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environment and/or in the firms' objectives (exploitation/exploration) will demand updates of the resource profile.

Independent from the specific resources and capabilities on which the corporate entrepreneurial efforts could be based, we suggest management to adopt one or both of the following general resource-based perspectives on corporate entrepreneurship. We label them the "emergent" and the "strategic" perspective on corporate entrepreneurship. Figure 14 reflects both perspectives.

In the emergent perspective, management's role boils down to evaluating its current resource base, deploying it to the utmost and enabling bottom-up initiatives in order to achieve corporate entrepreneurial successes such as innovation, venturing or renewal. It does not give a specific predetermined direction to the initiatives. Management only masters the playground without dictating the game or its outcomes. It determines which elements it gives the opportunity to demonstrate their value creating ability. Key trigger here is management's perception of valuable resources and capabilities (indicated in grey in Figure 14).

In the strategic perspective, management's insights or expectations play a steering role. Management itself sees opportunities it wants to explore and/or exploit through specific actions leading to the desired objectives. These insights drive management to invest or accentuate targeted resources and capabilities needed to enable the exploration or exploitation. Main trigger here is management's recognition of an opportunity to create new value (through its perception of the environment and/or an entrepreneurial posture and strategy), as indicated in grey in Figure 14.

Both perspectives are of course related and can mutually influence each other. Key difference is the primary trigger that sets the wheel in motion. Both perspectives point to two key activities for management: continuous resource management and valuation at all levels and environmental scanning in order to recognize value creation opportunities.

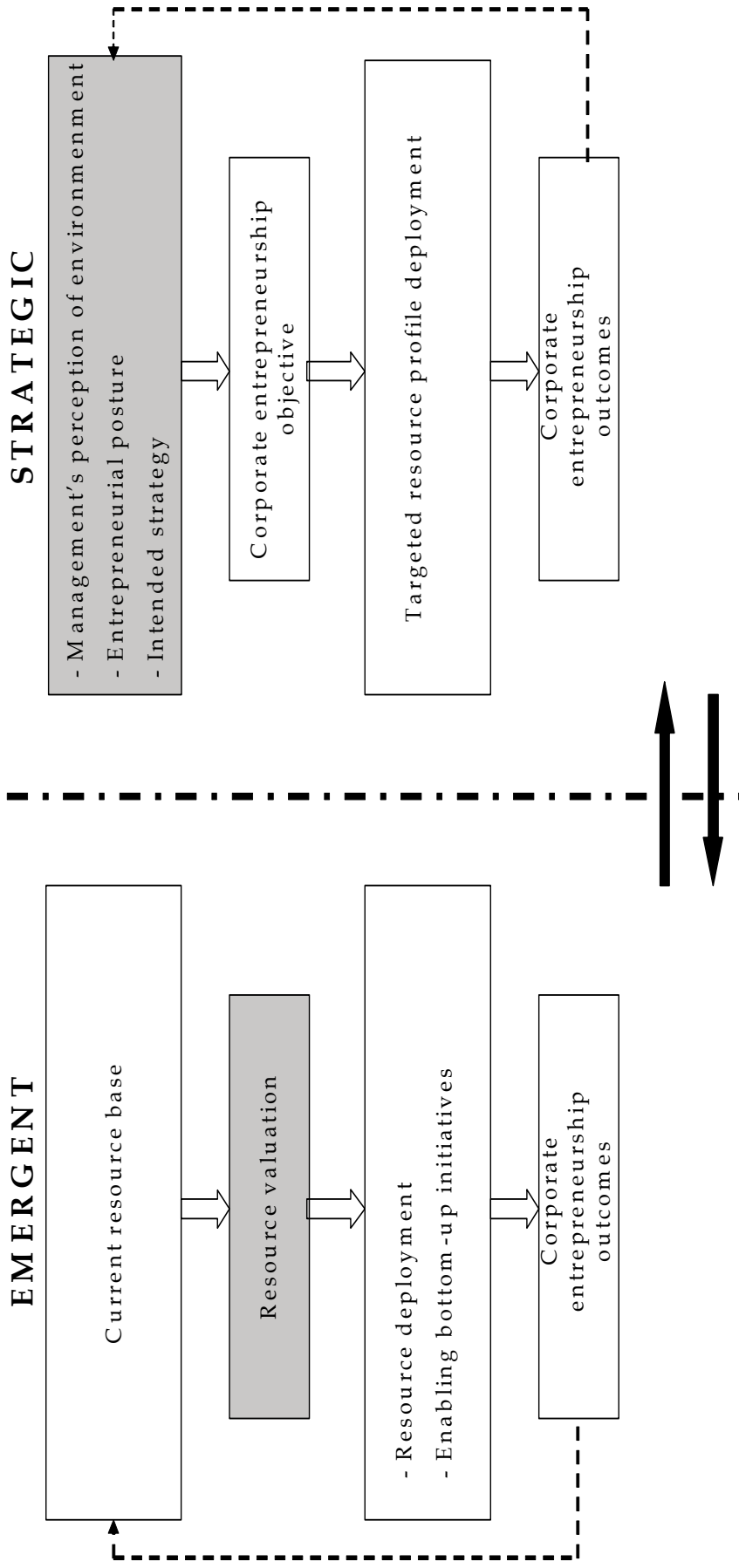


Figure 14. General resource-based perspectives on corporate entrepreneurship.



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*Element profiles: an architectural approach.* For firms starting to compose their resource portfolio, the (creating process) profiles detected in this dissertation can serve as a guideline, as does the earlier discussed Figure 13. Our findings with regard to the resource profiles illustrated that the balanced, flow and human capital profiles all are positively associated with the NVC drivers (vis-à-vis the weak profile), suggesting that any strength is to be preferred over an overall resource weakness. When it comes to start to build resource and capability strengths, it is unlikely that firms can accomplish an overall strength (balanced profile) at once. Choices will have to be made, working towards a balanced profile in the future. In making such choices, we suggest - based on the findings with regard to the resource profiles' NVC effects - that firms start with building a human capital profile (stressing human capital and knowledge creating and sharing HRM) which will provide a platform for future resource investments and developments. Of course, building this human capital profile will also demand that actions are made on other levels, such as the creator (cfr. supra). For instance, developing knowledge creating and sharing HRM can be affected by the educational background heterogeneity of the firm's top management team, by a futurity posture, and so on (see Table 25). In other words, developing such HRM may require that also these elements are valuated, and if necessary adjusted. An integrated approach is therefore always a must (cfr. supra). And the earlier discussed Figure 13 has revealed the main chains of actions.

Once the human capital base is realized, firms can pass to a second phase in which they stress the development of a flow profile (while maintaining the human capital base), e.g. stressing networking and inter-organizational cooperation. In a third and last phase, the companies should stress the development of stocks based on their flows and their human capital base and make additional investments to obtain such stocks.

The actual decisions on how to develop the portfolio remain off course firm-specific. Still, these suggestive guidelines provide a framework that can guide the decisions. As already indicated, management should also have an eye for the composition and the learning and selection mechanisms of the upper echelon of

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which it is part. Especially the latter have a profound effect on new value created. Management's perception of the environment, a futurity posture and a technology strategy strongly propel and color the development and deployment of the creating process. In this respect, management should take its environmental evaluation and its strategic response to it (entrepreneurial posture and intended strategy) very seriously. And in doing so, it also has to carefully take into account the larger setting (including ownership) it has to operate within, developing an integrated resource management.

*Human capital is a basic firm resource.* Our findings have made it clear that human capital is of the utmost importance for firms choosing the corporate entrepreneurship track. Employee human capital and the way in which it is further deployed (knowledge creating and sharing HRM) display important effects on the NVC drivers. In terms of profiles, the human capital seems to compose a basic layer. Moreover, if we also consider the major flows or chains of resources (Figure 13), it becomes obvious that also managerial or upper echelon human capital leaves its mark on the creating process. All in all, this suggests that firms must assign high priority to the management of their full human capital base. This implies the awareness of the need for powerful HRM on the employee level and for targeted HR practices on the managerial level, including the top of the firm. Such focused HR practices for the upper echelon should in particular target the selection, rewarding and evaluation of managers. If managers are to instigate and/or support corporate entrepreneurship throughout the firm, specific selection (e.g. managers expression a long term vision an able to cope with resistance), reward (e.g. long term oriented reward practices) and evaluation practices (e.g. evaluation on corporate entrepreneurship milestones instead of on short term financial results) are needed. As this can complicate the role and position of the HR department within the firm (e.g. HR manager being a manager and having to manage the other managers), firms could consider the upper echelon HRM as a major task of its board or governance structure.

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*Openness as a basic philosophy.* An attitude that can support firms in their corporate entrepreneurship efforts is openness. It has several dimensions. First of all, it calls on companies to keep a very open view of what is happening in society at large. It means getting in touch with societal trends as well as to technological and economic evolutions. This can trigger their sensitivity to change and strengthens their ability to push their resource transformation in an environment fitting direction.

Second and following, openness also implies opening the firm's gates or doors for academic researchers to enter the firm and for firm employees to get involved in research. Through their function, researchers mostly are in touch with current and future evolutions in their research area. As such, researchers and employees involved in research can be a tremendously rich source of timely and cutting-edge information and knowledge on various fronts for the firm. Going through research results and participating in research (e.g. by filling in a questionnaire) also can transfer valuable knowledge to firms. Additionally, opening the firm's doors is also beneficial for researchers, enabling them to feel the practical vibes within the firms and incorporate this knowledge within their work.

Third, openness also points to actively pursuing cooperation with other parties than academic researchers. It implies co-development of products, processes and resources with other firms, government institutions, experts, and so on. It invites firms to maintain an open attitude on all fronts, including equity, financing, product development, and so on. However, openness should not be confused with naiveté. Proper governing mechanisms (e.g. contracts) paralleling the cooperation must be installed whenever appropriate (see for instance Faems (2006) for governing mechanisms in the case of R&D alliances). But the need for such mechanisms should not deter firms from opening up.

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## DIRECTIONS FOR A CORPORATE ENTREPRENEURSHIP POLICY AGENDA

To conclude the epilogue we discuss a number of concerns and tracks that may direct corporate entrepreneurship policy.

*The multi-faceted nature of corporate entrepreneurship.* As discussed on several instances in this dissertation, stimulating corporate entrepreneurship requires an architectural approach. This comprises resource and capability development and deployment on many diverse levels and in multiple areas. It includes (and even requires) actions in areas that lay outside the R&D and intellectual property spheres ('the usual suspects'). Both the latter remain of course very important resources for corporate entrepreneurship (as demonstrated in this dissertation).

However, policy should feel advised to be open and above board in stimulating and supporting firms in their entrepreneurial efforts and in developing corporate entrepreneurship targets. For instance, in many policy instruments innovation targets are defined in terms of amounts of R&D investments or in terms of the number of patents or other intellectual property rights obtained. While this is by no means wrong, this dissertation has demonstrated that corporate entrepreneurship actions can often originate from other actions, attitudes or resources. A futurity posture and networking serve as such powerful examples. As such, other areas outside R&D and intellectual property rights should also stand high on the corporate entrepreneurship policy agenda in terms of targets or objectives.

Additionally, even when policy focuses on (e.g.) R&D it must be clear that the resource of R&D often is dependent on or leveraged by other resources and capabilities on the creating process (e.g. employee human capital) and on the creator front (e.g. futurity posture). Put differently, even when R&D support from policy to a firm remains equal, more return from this investment can be obtained if other resources and capabilities (e.g. employee human capital) are also pushed toward a higher level of development. A first major lesson for policy is therefore

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to consider a whole spectrum of corporate entrepreneurship stimulating resources and capabilities because they can be equally interesting in se in terms of corporate entrepreneurship and because they can leverage existing policy mechanisms on the R&D and intellectual property fronts.

*The need for policy integration.* Building on the previous issue, it becomes clear that policy initiatives and measures often belonging to separate departments should be tuned to each other. Corporate entrepreneurship involves so many different resources that it is obvious that no single government department can be held accountable and responsible for a corporate entrepreneurship stimulating policy. As a result, diverse departments should be involved in a policy building a corporate entrepreneurship infrastructure. For example, besides the entrepreneurship and innovation department, also the employment and education department could participate (e.g. in helping to ensure the presence of sufficient human capital). The same goes, for instance, for the foreign trade department (and even embassies) in order to get in touch with market developments in specific countries or regions. Additionally, the input delivered by these departments should be integrated in a coherent way so that various policy measures do not conflict with each other.

This call for policy integration is also an appeal against disconnected, scattered initiatives which may prove useful on their own small patch yet unproductive when the larger picture is considered. It is, however, not an appeal against small-scale and/or focused initiatives. Such initiatives can be useful and at times even necessary (e.g. in very specific industry contexts). They should, though, always grow as a case-specific adaptation of an integrated policy.

Developing an integrated yet also evidence-based corporate entrepreneurship policy also points to the need for interdisciplinary research and cooperation. Focused research groups involving diverse disciplines and operating within a matrix structure (in order to ensure the transfer and integration of knowledge) could support the policy levels in building an integrated corporate entrepreneurship policy infrastructure. Within such frameworks, the policy level

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functions as a sensor (indicating the topic to study), manager (controlling the targets and costs), moderator (enforcing and explicating consultation among the research groups) and knowledge broker (VIWTA, 2004).

*Which firms to target?* Not all firms can build on a resource portfolio of the same strength and potential and that not all firms have the ability to acquire such a portfolio in some other way. We also accept that the firm-supporting policy budget cannot be scattered too much at that often better results can be obtained if by recognizing economies of scale. Additionally, we also understand that policy at times targets specific sectors or industry segments, in view of the larger economic and political structure and functioning of Flanders as a region.

Nevertheless, evidence-based insights compel us to start from an economy-wide point of view in determining which firms to support and which not in terms of value creation. For instance, recent research on Flemish companies has demonstrated that the fastest growing (and financially healthy) firms can be found in all sectors of the private economy (Sels et al., 2006b). This is to say that focusing on a limited number of sectors from a corporate entrepreneurship policy point of view (as opposed to a strictly budgetary point of view) is not recommended. In its very essence, the corporate entrepreneurship policy framework should target firms from all industries and try to push and/or pull them towards the maximum of value creation they can support and sustain.

If and when focusing on specific firms is at order from a corporate entrepreneurship policy point of view, we suggest that firms can count on government support in some form once they have a certain (to be determined) corporate entrepreneurship potential. Such scouting or scanning for potential could be accomplished by means of the research-based corporate entrepreneurship indicators corporate entrepreneurship research should be able to provide in due time, if necessary followed by a more in-depth case by case assessment. Government should pursue a very active policy in tracking companies that have certain entrepreneurial competencies ('potential') and convince and support them in deploying and exploiting this potential.

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In concluding the discussion on the selection of firms targeted in a corporate entrepreneurship policy, we would like to point to the relative importance of medium-sized and/or young firms as interesting firm populations for actual government support (once the firms' entrepreneurial potential has been determined). Of course, corporate entrepreneurship policy should first and foremost be directed at revitalizing large and/or incumbent firms. But large firms are small in numbers in Flanders. And they usually possess the resources and means to take the necessary steps towards revitalization in a more or less autonomous way.

When it comes to actual government support, medium-sized and/or young firms should not be forgotten. After all, Flanders remains a region that is economically dominated by small and medium-sized companies that come and go. Next to and on top of this numeric argument in favor of smaller firms, we believe the need for government support among this population may be greater than among large firms. As mentioned earlier, all firms can display corporate entrepreneurship competencies. Yet, large firms often have an advantage in terms of resources and resource acquiring capabilities (attracting employee human capital, slack resources, financial reserves, and etcetera) compared to their younger and/or smaller counterparts. Our results also confirmed this to some extent (see Tables 25 and 28). Further, the success rate of active corporate entrepreneurship support may be somewhat higher with medium-sized and/or young firms. As indicated earlier, corporate entrepreneurship often demands intensive resource transformation, environmental scanning, an alert firm state of mind and so on. These practices may be easier to introduce and embed within small and (even more) young firms as they generally display a lower degree of formalization and a higher degree of flexibility.

Consequently, if government support – in terms of resources – is at hand we would suggest that a larger part of the available support is reserved for medium-sized and/or young firms. However, the support should not be awarded unconditionally. The firms concerned displaying an entrepreneurial potential should be willing to make the necessary (to be determined) internal adjustments

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parallel to the government resource support (e.g. diminishing ownership concentration, opening up for institutional or third-party private owners, management team adjustments, and so on).

*How to support the targeted firms?* In determining how to support firms in their entrepreneurial efforts, government can choose various tracks. As mentioned earlier in the context of the need for policy integration, government can play an important role as sensor, manager, moderator and knowledge broker. We believe some of these roles also to be of importance in the government - firm relationships, the particular the sensor and knowledge broker roles. The sensor role refers here to the entrepreneurial competency scanning of firms, actively pointing firms to the potential they possess. The knowledge broker role then stands for government as an intermediary between the firm concerned and experts (academic, government or private) that might be able to guide the firm on its entrepreneurial journey. The actual decision on which particular expert(s) to call upon, though, remains of course to be made by the firm.

One element that concerns all policy measures, though, is the high need for legal security. The global economy and the more local environments firm operate within are subject to enough change already. When policy measures (and certainly the support measures) are introduced, government should be able to guarantee their applicability during longer period of time. The policy-induced corporate entrepreneurship framework should therefore be a solid and robust one.



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**ANNEX 1**

**DESCRIPTIVE STATISTICS OF AND BIVARIATE CORRELATIONS BETWEEN THE  
STUDY'S VARIABLES**

Variable	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Innovation (ln) <sup>1</sup>	-0.86	1.83											
2. Venturing (ln)	1.65	0.35	0.43										
3. Renewal (ln)	-0.49	1.18	0.33	0.41									
4. Patents and commercial secrets	1.46	1.16	0.27	0.42	0.41								
5. R&D investments	0.26	0.44	0.31	0.28	0.40	0.29							
6. Human resource pool	24.04	27.14	0.04	0.27	0.21	0.25	0.18						
7. Networking intensity (ln)	0.81	0.85	0.25	0.23	0.43	0.47	0.24	0.17					
8. Intelligence generation	4.49	2.09	0.03	0.29	0.27	0.30	0.21	0.19	0.36				
9. Intelligence dissemination	5.29	1.98	0.04	0.27	0.26	0.37	0.18	0.26	0.28	0.66			
10. HRM	7.21	5.68	0.14	0.28	0.38	0.49	0.28	0.34	0.53	0.41	0.45		
11. TMT size	5.10	3.02	0.10	0.03	0.10	0.17	0.04	0.03	0.15	0.14	0.16	0.16	
12. TMT ind. heterogeneity	0.75	0.77	0.07	0.13	0.11	0.12	0.11	0.17	0.24	0.07	0.04	0.18	0.14
13. TMT educ. heterogeneity	1.45	0.76	0.02	0.10	0.07	0.06	0.12	0.16	0.26	0.15	0.14	0.19	0.14
14. Presence of institutional owners	0.05	0.21	0.14	0.15	0.09	0.11	0.12	0.06	0.12	0.00	-0.02	0.14	-0.09
15. Presence of private owners	0.37	0.48	0.08	0.10	0.12	0.29	0.09	0.30	0.32	0.08	0.10	0.30	-0.10
16. Foreign company	0.31	0.47	0.15	0.13	0.17	0.23	-0.01	0.21	0.32	0.18	0.14	0.28	-0.01
17. Ownership concentration	76.20	28.90	-0.06	-0.09	-0.04	-0.03	-0.17	0.03	-0.04	-0.05	-0.07	-0.05	0.06
18. Technology strategy	5.07	2.49	0.35	0.42	0.44	0.40	0.32	0.27	0.26	0.23	0.24	0.40	0.21
19. Innovative differentiation strategy	4.97	1.93	0.16	0.19	0.19	0.22	0.16	0.16	0.06	0.02	0.09	0.16	0.04
20. Aggressiveness	2.93	1.82	0.09	0.24	0.11	0.10	-0.08	0.05	0.09	0.11	0.13	0.06	0.07
21. Futurity	4.95	2.00	0.19	0.39	0.41	0.40	0.32	0.25	0.31	0.51	0.47	0.46	0.18
22. Hospitable promising environment	0.22	0.42	0.23	0.16	0.19	0.15	0.10	0.06	0.10	0.03	-0.01	0.16	0.02
23. Static impoverished environment	0.22	0.41	-0.15	-0.20	-0.12	-0.10	-0.10	-0.17	-0.22	-0.17	-0.13	-0.14	-0.14
24. Rivalrous low growth environment	0.33	0.47	-0.09	-0.16	-0.19	-0.18	-0.10	-0.13	-0.09	-0.07	-0.03	-0.22	0.02
25. Competitive growth environment	0.23	0.42	0.02	0.22	0.15	0.15	0.11	0.25	0.22	0.22	0.17	0.23	0.10

Correlations greater than or equal to 0.14 are significant ( $p < 0.05$ )

<sup>1</sup> 'ln' means that the natural logarithm was taken

Variable	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
13. TMT educ. heterogeneity	0.45												
14. Presence of institutional owners	0.01	0.01											
15. Presence of private owners	0.12	0.13	-0.03										
16. Foreign company	0.14	0.15	0.18	0.53									
17. Ownership concentration	-0.04	0.09	-0.17	0.00	0.11								
18. Technology strategy	0.08	-0.01	0.03	0.18	0.08	-0.02							
19. Innovative differentiation strategy	0.07	-0.02	-0.05	0.14	-0.07	0.00	0.46						
20. Aggressiveness	-0.01	0.01	0.02	-0.00	0.14	0.02	0.11	-0.09					
21. Futurity	0.23	0.13	0.04	0.21	0.24	-0.03	0.49	0.19	0.15				
22. Hospitable promising environment	0.04	0.07	0.04	0.14	0.10	0.07	0.29	0.15	0.01	0.17			
23. Static impoverished environment	-0.01	-0.10	-0.01	-0.12	-0.09	-0.05	-0.15	0.01	-0.17	-0.18	-0.28		
24. Rivalrous low growth environment	-0.09	0.09	-0.02	-0.08	-0.05	0.01	-0.29	-0.30	0.07	-0.18	-0.38	-0.37	
25. Competitive growth environment	0.06	-0.08	-0.02	0.07	0.04	-0.04	0.18	0.18	0.08	0.22	-0.29	-0.29	-0.39

Variable	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
26. Company size (ln)	3.48	1.20	0.14	0.13	0.27	0.30	0.31	0.17	0.45	0.26	0.19	0.38	0.29
27. Company age (ln)	2.62	0.93	-0.09	-0.07	-0.03	-0.06	-0.01	-0.09	-0.05	-0.01	-0.05	-0.15	0.13
28. Manufacturing and energy	0.37	0.48	0.14	0.02	0.08	0.07	0.33	-0.08	0.17	0.12	-0.05	0.06	0.15
29. Construction	0.09	0.29	-0.14	-0.19	-0.13	-0.17	-0.12	-0.11	-0.15	-0.17	-0.18	-0.12	0.09
30. Wholesale and retail	0.26	0.44	0.07	0.19	-0.02	0.09	-0.23	0.03	-0.10	-0.05	0.19	-0.08	-0.02
31. Catering	0.05	0.22	-0.05	-0.15	-0.00	-0.16	-0.09	-0.19	-0.02	-0.01	-0.07	-0.07	-0.10
32. Transport and communication	0.10	0.31	-0.11	-0.13	-0.11	-0.08	-0.13	-0.10	0.02	-0.00	-0.08	-0.00	-0.04
33. Finance, real estate and services	0.12	0.33	-0.04	0.09	0.13	0.11	0.11	0.38	0.01	0.12	0.14	0.18	-0.17
34. Evolution in firm earnings	-0.30	5.84	0.13	-0.10	0.01	0.01	-0.27	-0.20	-0.07	-0.20	-0.22	-0.34	-0.02
35. Evolution in EBITDA	1.57	14.41	0.18	0.16	0.13	0.01	0.05	-0.06	0.12	0.04	-0.06	-0.02	-0.03

Variable	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
26. Company size (ln)	0.28	0.27	0.06	0.36	0.32	-0.07	0.22	0.05	-0.03	0.35	0.10	-0.15	-0.11
27. Company age (ln)	-0.07	0.01	-0.04	-0.12	-0.08	-0.01	-0.13	-0.17	-0.02	-0.10	-0.18	0.07	0.18
28. Manufacturing and energy	0.10	0.06	0.02	0.05	0.07	-0.03	0.20	0.01	0.04	0.16	-0.01	-0.09	0.06
29. Construction	-0.10	-0.08	-0.07	-0.18	-0.11	-0.04	-0.13	-0.13	-0.06	-0.17	0.02	0.03	0.01
30. Wholesale and retail	-0.00	0.05	-0.08	-0.03	-0.01	0.06	-0.04	0.04	0.21	-0.04	-0.04	0.05	-0.02
31. Catering	-0.07	-0.10	-0.05	-0.09	-0.07	0.04	-0.20	0.04	-0.04	-0.09	0.03	0.03	0.02
32. Transport and communication	-0.01	0.06	0.07	0.13	0.10	0.06	-0.09	-0.08	-0.12	-0.07	0.01	-0.03	0.06
33. Finance, real estate and services	-0.01	-0.08	0.12	0.07	-0.04	-0.08	0.09	0.09	-0.15	0.10	0.01	0.05	-0.14
34. Evolution in firm earnings	0.07	0.01	-0.00	0.01	0.08	0.06	0.02	-0.00	0.09	-0.18	-0.01	0.08	0.03
35. Evolution in EBITDA	-0.09	-0.10	-0.11	0.05	-0.02	-0.02	0.09	0.12	0.02	-0.02	-0.02	0.05	0.06

Variable	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
26. Company size (ln)	0.17									
27. Company age (ln)	-0.10	0.13								
28. Manufacturing and energy	0.02	0.24	0.10							
29. Construction	-0.06	-0.03	0.04	-0.25						
30. Wholesale and retail	0.00	-0.23	0.00	-0.45	-0.19					
31. Catering	-0.08	-0.18	-0.16	-0.18	-0.08	-0.14				
32. Transport and communication	-0.04	0.08	-0.02	-0.26	-0.11	-0.20	-0.08			
33. Finance, real estate and services	0.10	0.03	-0.06	-0.28	-0.12	-0.22	-0.09	-0.13		
34. Evolution in firm earnings	-0.08	-0.11	0.08	0.02	0.02	0.22	-0.07	-0.02	-0.33	
35. Evolution in EBITDA	-0.08	0.02	-0.10	-0.11	-0.05	0.12	0.20	-0.12	0.04	0.25

Variable	mean	SD	(1)	(2)	(3)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
36. Weak resource profile	0.45	0.50	-0.13	-0.28	-0.34	-0.30	0.12	0.02	0.07	-0.04	0.00	0.01	-0.05
37. Balanced resource profile	0.05	0.21	0.27	0.09	0.17	0.05	-0.14	-0.17	0.08	0.12	0.05	0.07	-0.08
38. Flow profile	0.23	0.42	0.03	0.15	0.23	0.20	0.01	0.01	-0.06	0.09	-0.02	0.00	-0.06
39. Human capital profile	0.28	0.45	-0.01	0.13	0.07	0.13	-0.08	0.04	-0.06	-0.09	-0.01	-0.04	0.15

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**ANNEX 2**

**DETAILED RESEARCH HYPOTHESES: EXPECTED SIGN AND ACCEPTANCE**

	Path from ... to ...	Value added	REN	INNO	VENT
Innovation	Innovation (INNO)	H3i (+)			H1 (+)
Renewal	Renewal (REN)	H3r (+)		H2i (+)	H2v (+)
Venturing	Venturing (VENT)	H3v (+)			
Patents etc.	Patents and comm. secrets (PCS)		H4r (+)	H4i (+)	H4v (+)
R&D	R&D investments		H5r (+)	H5i (+)	
Employee human capital	Human resource pool (HRP)		H6r (+)	H6i (+)	H6v (+)
HRM	HRM		H7r (+)	H7i (+)	
Networking	Networking intensity (NTW)		H8r (+)	H8i (+)	H8v (+)
Market orientation	Intelligence generation (IG)		H9r (+)	H9i (+)	H9v (+)
	Intelligence dissemination (ID)		H10r (+)	H10i (+)	
	TMT size		H11r1 (+)	H11i1 (+)	H11v1 (+)
TMT human capital	TMT industry heterogeneity (IH)		H11r2 (+)	H11i2 (+)	H11v2 (+)
	TMT educational heterogeneity (EH)		H11r3 (+)	H11i3 (+)	H11v3 (+)
Ownership	Presence of institutional owners		H12r1 (+)	H12i1 (+)	H12v1 (+)
	Presence of private owners		H12r2 (+)	H12i2 (+)	H12v2 (+)
	Foreign company		H12r3 (+)	H12i3 (+)	H12v3 (+)
	Ownership concentration		H12r4 (-)	H12i4 (-)	H12v4 (-)
Environments	Hospitable promising environment		H14ar1 (+)	H14ai1 (+)	H14av1 (+)
	Competitive growth environment		H14ar2 (+)	H14ai2 (+)	H14av2 (+)
	Rivalrous low growth environment		H14ar3 (+)	H14ai3 (+)	H14av3 (+)
Intended strategy	Technology strategy (TECH)		H15r1 (+)	H15i1 (+)	H15v1 (+)
	Innovative differentiation (DIF)		H15r2 (+)	H15i2 (+)	H15v2 (+)
Strategic orientation	Aggressiveness (AGG)		H16r1 (+)	H16i1 (+)	H16v1 (+)
	Futurity (FUT)		H16r2 (+)	H16i2 (+)	H16v2 (+)
Resource profiles (indicating a strength)	Balanced profile		H20r1 (+)	H20i1 (+)	H20v1 (+)
	Flow profile		H20r2 (+)	H20i2 (+)	H20v2 (+)
	Human capital profile		H20r3 (+)	H20i3 (+)	H20v3 (+)



<b>Path from ... to ...</b>	<b>PTS</b>	<b>R&amp;D</b>	<b>EHC</b>	<b>HRM</b>	<b>NTW</b>	<b>MIG</b>
TMT size	H22p1 (+)	H22rd1 (+)	H22e1 (+)	H22h1 (+)	H22n1 (+)	H22ig1 (+)
TMT human capital	H22p2 (+)	H22rd2 (+)	H22e2 (+)	H22h2 (+)	H22n2 (+)	H22ig2 (+)
TMT educational heterogeneity (EH)	H22p3 (+)	H22rd3 (+)	H22e3 (+)	H22h3 (+)	H22n3 (+)	H22ig3 (+)
Presence of institutional owners	H23p1 (+)	H23rd1 (+)	H23e1 (+)	H23h1 (+)	H23n1 (+)	H23ig1 (+)
Presence of private owners	H23p2 (+)	H23rd2 (+)	H23e2 (+)	H23h2 (+)	H23n2 (+)	H23ig2 (+)
Foreign company	H23p3 (+)	H23rd3 (+)	H23e3 (+)	H23h3 (+)	H23n3 (+)	H23ig3 (+)
Ownership concentration	H23p4 (-)	H23rd4 (-)	H23e4 (-)	H23h4 (-)	H23n4 (-)	H23ig4 (-)
Hospitable promising environment	H24p1 (+)	H24rd1 (+)	H24e1 (+)	H24h1 (+)	H24n1 (+)	H24ig1 (+)
Competitive growth environment	H24p2 (+)	H24rd2 (+)	H24e2 (+)	H24h2 (+)	H24n2 (+)	H24ig2 (+)
Rivalrous low growth environment	H24p3 (+)	H24rd3 (+)	H24e3 (+)	H24h3 (+)	H24n3 (+)	H24ig3 (+)
Technology strategy (TECH)	H25p1 (+)	H25rd1 (+)	H25e1 (+)	H25h1 (+)	H25n1 (+)	H25ig1 (+)
Innovative differentiation (DIF)	H25p2 (+)	H25rd2 (+)	H25e2 (+)	H25h2 (+)	H25n2 (+)	H25ig2 (+)
Aggressiveness (AGG)	H26p1 (+)	H26rd1 (+)	H26e1 (+)	H26h1 (+)	H26n1 (+)	H26ig1 (+)
Futurity (FUT)	H26p2 (+)	H26rd2 (+)	H26e2 (+)	H26h2 (+)	H26n2 (+)	H26ig2 (+)

<b>Path from ... to ...</b>	<b>TMT size</b>	<b>TMT IH</b>	<b>TMT EH</b>	<b>TECH</b>	<b>DIF</b>	<b>AGG</b>	<b>FUT</b>
Presence of institutional owners	H13ts1 (+)	H13ih1 (+)	H13eh1 (+)				
Presence of private owners	H13ts2 (+)	H13ih2 (+)	H13eh2 (+)				
Foreign ownership	H13ts3 (+)	H13ih3 (+)	H13eh3 (+)				
Ownership concentration	H13ts4 (-)	H13ih4 (-)	H13eh4 (-)				
Aggressiveness				H17t1 (+)	H17d1 (+)		
Futurity				H17t2 (+)	H17d2 (+)		
Hospitable promising environment				H18at1 (+)	H18ad1 (+)	H19aa1 (+)	H19af1 (+)
Competitive growth environment				H18at2 (+)	H18ad2 (+)	H19aa2 (+)	H19af2 (+)
Rivalrous low growth environment				H18at3 (+)	H18ad3 (+)	H19aa3 (+)	H19af3 (+)

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+ = positive association expected  
- = negative association expected

A = hypothesis is supported

P = hypothesis is partially supported (significant, but other sign than expected)

R = hypothesis is rejected

	Path from ... to ...	Value added	REN	INNO	VENT
Innovation	Innovation (INNO)	H3i (A)			H1 (A)
Renewal	Renewal (REN)	H3r (A)		H2i (A)	H2v (A)
Venturing	Venturing (VENT)	H3v (P)			
Patents etc.	Patents and comm. secrets (PCS)		H4r (A)	H4i (A)	H4v (A)
R&D	R&D investments		H5r (A)	H5i (A)	
Employee human capital	Human resource pool (HRP)		H6r (A)	H6i (A)	H6v (A)
HRM	HRM		H7r (A)	H7i (A)	
Networking	Networking intensity (NTW)		H8r (A)	H8i (A)	H8v (A)
Market orientation	Intelligence generation (IG)		H9r (R)	H9i (P)	H9v (A)
	Intelligence dissemination (ID)		H10r (R)	H10i (P)	
	TMT size		H11r1 (P)	H11i1 (P)	H11v1 (P)
TMT human capital	TMT industry heterogeneity (IH)		H11r2 (A)	H11i2 (A)	H11v2 (A)
	TMT educational heterogeneity (EH)		H11r3 (A)	H11i3 (A)	H11v3 (A)
Ownership	Presence of institutional owners		H12r1 (A)	H12i1 (R)	H12v1 (A)
	Presence of private owners		H12r2 (P)	H12i2 (A)	H12v2 (A)
	Foreign company		H12r3 (P)	H12i3 (P)	H12v3 (P)
	Ownership concentration		H12r4 (A)	H12i4 (A)	H12v4 (A)
Environments	Hospitable promising environment		H14r1 (A)	H14i1 (A)	H14v1 (A)
	Competitive growth environment		H14r2 (A)	H14i2 (A)	H14v2 (A)
	Rivalrous low growth environment		H14r3 (A)	H14i3 (A)	H14v3 (A)
Intended strategy	Technology strategy (TECH)		H15r1 (A)	H15i1 (A)	H15v1 (A)
	Innovative differentiation (DIF)		H15r2 (R)	H15i2 (R)	H15v2 (R)
Strategic orientation	Aggressiveness (AGG)		H16r1 (A)	H16i1 (A)	H16v1 (A)
	Futurity (FUT)		H16r2 (A)	H16i2 (A)	H16v2 (A)
Resource profiles (indicating a strength)	Balanced profile		H20r1 (A)	H20i1 (A)	H20v1 (A)
	Flow profile		H20r2 (A)	H20i2 (A)	H20v2 (A)
	Human capital profile		H20r3 (A)	H20i3 (A)	H20v3 (A)

	<b>Path from ... to ...</b>	<b>PTS</b>	<b>R&amp;D</b>	<b>EHC</b>	<b>HRM</b>	<b>NTW</b>	<b>MIG</b>
	TMT size	H22p1 (R)	H22rd1 (P)	H22e1 (R)	H22h1 (R)	H22n1 (R)	H22ig1 (R)
TMT human capital	TMT industry heterogeneity (IH)	H22p2 (P)	H22rd2 (A)	H22e2 (R)	H22h2 (A)	H22n2 (A)	H22ig2 (R)
	TMT educational heterogeneity (EH)	H22p3 (P)	H22rd3 (A)	H22e3 (R)	H22h3 (A)	H22n3 (A)	H22ig3 (R)
	Presence of institutional owners	H23p1 (R)	H23rd1 (R)	H23e1 (R)	H23h1 (R)	H23n1 (R)	H23ig1 (R)
	Presence of private owners	H23p2 (R)	H23rd2 (A)	H23e2 (A)	H23h2 (A)	H23n2 (P)	H23ig2 (R)
Ownership	Foreign company	H23p3 (R)	H23rd3 (P)	H23e3 (R)	H23h3 (R)	H23n3 (A)	H23ig3 (R)
	Ownership concentration	H23p4 (R)	H23rd4 (A)	H23e4 (R)	H23h4 (R)	H23n4 (R)	H23ig4 (R)
	Hospitable promising environment	H24p1 (A)	H24rd1 (A)	H24e1 (R)	H24h1 (R)	H24n1 (A)	H24ig1 (A)
Environments	Competitive growth environment	H24p2 (A)	H24rd2 (A)	H24e2 (A)	H24h2 (A)	H24n2 (A)	H24ig2 (A)
	Rivalrous low growth environment	H24p3 (R)	H24rd3 (P)	H24e3 (R)	H24h3 (R)	H24n3 (A)	H24ig3 (R)
	Technology strategy (TECH)	H25p1 (A)	H25rd1 (A)	H25e1 (R)	H25h1 (R)	H25n1 (R)	H25ig1 (R)
Intended strategy	Innovative differentiation (DIF)	H25p2 (R)	H25rd2 (R)	H25e2 (R)	H25h2 (R)	H25n2 (R)	H25ig2 (R)
	Aggressiveness (AGG)	H26p1 (A)	H26rd1 (P)	H26e1 (R)	H26h1 (R)	H26n1 (A)	H26ig1 (A)
Strategic orientation	Futurity (FUT)	H26p2 (A)	H26rd2 (A)	H26e2 (R)	H26h2 (R)	H26n2 (A)	H26ig2 (A)

	<b>Path from ... to ...</b>	<b>TMT size</b>	<b>TMT IH</b>	<b>TMT EH</b>	<b>TECH</b>	<b>DIF</b>	<b>AGG</b>	<b>FUT</b>
	Presence of institutional owners	H13ts1 (R)	H13ih1 (R)	H13eh1 (R)				
	Presence of private owners	H13ts2 (P)	H13ih2 (R)	H13eh2 (R)				
Ownership	Foreign ownership	H13ts3 (R)	H13ih3 (R)	H13eh3 (R)				
	Ownership concentration	H13ts4 (R)	H13ih4 (R)	H13eh4 (R)				
	Aggressiveness				H17t1 (A)	H17d1 (P)		
Strategic orientation	Futurity				H17t2 (A)	H17d2 (A)		
	Hospitable promising environment				H18t1 (R)	H18d1 (A)	H19a1 (A)	H19f1 (A)
Environments	Competitive growth environment				H18t2 (A)	H18d2 (A)	H19a2 (A)	H19f2 (A)
	Rivalrous low growth environment				H18t3 (A)	H18d3 (A)	H19a3 (A)	H19f3 (P)

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## **ANNEX 3**

# **KNOWLEDGE-RELATED HR PRACTICES**

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**Knowledge creating HR practices**

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The use of creativity and/or learning potential as selection criteria

Scheduling time to experiment or to develop new ideas

To reward financially employees who come up with new ideas

To give challenging assignments that sharpen creativity and learning capacity

To give training in creative problem solution techniques

To organize group sessions for process improvement (e.g. brainstorming, quality circles, etc.)

To support networking with externals (e.g. financially or by means of scheduling time)

To measure employee competencies in view of additional training and development

To use a system of competency management for individual career planning

To reward financially the acquisition of new competencies and skills

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### **Knowledge sharing HR practices**

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To use group test for employee selection (e.g. roles game, group discussion, etc.)

To use formal suggestion system in order to gather ideas that can improve work

The meticulous preparation of the replacement or succession of valuable employees ('succession planning')

To assign a mentor or coach to employees upon starting in their new function

To organize systems of job circulation or rotation

To use systems that stimulate knowledge sharing (e.g. intranet platforms, knowledge databases, competency portfolios, memos, etc.)

To dispose of a formal introduction program to initiate new employees

To develop career trajectories beyond the boundaries of various functional domains (e.g. marketing, production, sales, etc.)

To organize training sessions in learning skills and learning willingness

To reward team results and achievements (e.g. group bonus, gain sharing, etc.)

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## **ANNEX 4**

### **FACTOR STRUCTURES**

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<b>Market intelligence generation</b>	<b>Factor loading</b>
At least once a year we invite customers to find out which products/services they think they'll need in the future	0.72
In this company we invest a lot of time and energy in own market research	0.72
We survey the end users at least once a year with regard to our products'/services' quality	0.67
We investigate periodically which impact of changes in our firm's environment will have on our customers' desires and demands	0.70
Cronbach's alpha = 0.65	

<b>Market intelligence dissemination</b>	<b>Factor loading</b>
The sales responsible regularly makes time to discuss expected changes in our customers' needs with the employees	0.80
At least once a quarter we collectively and systematically analyze trends and developments on our market	0.62
Whenever something important occurs with one of our customers or on our market, all employees are quickly informed on that matter	0.63
Data on customer satisfaction are regularly disclosed within our firm	0.65
Cronbach's alpha = 0.60	

<b>Technological opportunities</b>	<b>Factor loading</b>
A lot of chances for technological innovation are present within our industry	0.87
The need for new technology grows within our industry	0.88
Our industry needs new technology in order to grow	0.86
Cronbach's alpha = 0.84	

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<b>Demand for new products</b>	<b>Factor loading</b>
Our industry offers many opportunities to introduce new products or services	0.88
Within our industry customers' demand for new products/services grows ever more	0.82
The market for new products/services within our industry is expanding	0.89
Cronbach's alpha = 0.83	

<b>Aggressiveness</b>	<b>Factor loading</b>
We often lower our sale prices in order to increase our market share	0.73
We often fix our sale prices beneath those of our competitors	0.75
We often aim for reaching a certain market share, notwithstanding the possible negative implications for our cash flow and profitability	0.71
We often sacrifice profits in order to increase our market share	0.81
Cronbach's alpha = 0.74	

<b>Futurity</b>	<b>Factor loading</b>
We are constantly in search for new markets for our current activities	0.57
Investing in research is crucial for our future competitive position	0.66
Forecasting key indicators (revenue, sales, cash flow, etc.) is quite common within our firm	0.76
When faced with critical challenges for our firm we usually turn to "what if" analyses	0.66
Cronbach's alpha = 0.60	

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<b>Technology</b>	<b>Factor loading</b>
Our firm aims at developing new or advanced technology or processes	0.84
Our firm uses new or advanced technology or processes	0.87
Our firm stresses the importance of new or advanced technology or processes	0.90
Cronbach's alpha = 0.83	

<b>Innovative differentiation</b>	<b>Factor loading</b>
It is difficult for our competitors to imitate our products/services	0.78
Our products/services are more contemporary than those of our most prominent competitors	0.78
It is easy for our competitors to imitate our method of production or organization (reverse coded)	0.63
Our products/services are unique compared to those of our most prominent competitors	0.80
Our firm can distinguish itself with ease from our most prominent competitors	0.64
Cronbach's alpha = 0.78	

The formula used to transform the factor items into a single factor scale (10 point) (Maes et al., 2005):

$$F = [ (s - v) / ((v * w) - v) ] * 10$$

s = the sum of the items scores

v = the number of variables

w = the number of scale points (for the items)

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