Over the last decade, small and medium-sized enterprises (SMEs) have increased their international presence along a broad range of value-chain activities such as sales, marketing, purchasing, R&D, and production. The engagement in these cross-border activities has important growth implications. At a macro level there is evidence that SMEs with international activities tend to show higher growth rates and to be more productive and profitable than domestic SMEs. Though significant progress has been made in explaining SME growth through internationalization, much remains unanswered. This dissertation adds to the existing body of knowledge by investigating how SMEs benefit from current international activities to continue growing in international as well as domestic markets.

Using longitudinal survey data from a sample of 885 Swedish SMEs, the empirical study indicates that internationalization promotes the acquisition of new market knowledge and new technological knowledge, which in turn contribute to the growth of SMEs, especially in international markets. Thus, this dissertation provides novel and useful insights into the development of SMEs in today’s global marketplace.
Over the last decade, small and medium-sized enterprises (SMEs) have increased their international presence along a broad range of value-chain activities such as sales, marketing, purchasing, R&D, and production. The engagement in these cross-border activities has important growth implications. At a macro level there is evidence that SMEs with international activities tend to show higher growth rates and to be more productive and profitable than domestic SMEs.

Though significant progress has been made in explaining SME growth through internationalization, much remains unanswered. This dissertation adds to the existing body of knowledge by investigating how SMEs benefit from current international activities to continue growing in international as well as domestic markets.

Using longitudinal survey data from a sample of 885 Swedish SMEs, the empirical study indicates that internationalization promotes the acquisition of new market knowledge and new technological knowledge, which in turn contribute to the growth of SMEs, especially in international markets. Thus, this dissertation provides novel and useful insights into the development of SMEs in today’s global marketplace.
LUCIA NALDI

Growth through Internationalization

a Knowledge Perspective on SMEs

JÖNKÖPING INTERNATIONAL BUSINESS SCHOOL
JÖNKÖPING UNIVERSITY
Looking back at the crafting of this dissertation, I realize that it has been a lifelong process and a group effort. It has been a lifelong process because my life to this point has influenced my research interests in internationalization and growth of small firms. I have always believed in the potential of small things. As my grandfather used to remind me, ‘good wine comes in small casks’. In addition, learning from internationalization has been a very important aspect of my personal development. The first year I spent abroad, as an international student in Spain, had profound influence on me, changing the path of my professional and private life.

This dissertation has been a group effort because there are many people who have been crucial for its development. I would like to take this opportunity to thank them. First, I wish to thank my main advisor, Professor Leif Melin, for guiding, encouraging, and inspiring my efforts over the years. Leif has believed in my work, has given me intellectual freedom, and has steered me judiciously through critical moments, always doing so with a light and tactful hand. It has been inspiring and fun to be surrounded by his intellectual energy and enthusiasm. I am especially grateful that he invited me to be part of the research project, *The Process of Growth–Organizing, Strategizing and Entrepreneurial Activities*, which has been a great learning forum and has provided me with the financial resources needed to complete my study.

I am also deeply indebted to Professor Per Davidsson, my co-advisor, who is a great source of inspiration and a role model. Per’s PhD courses triggered my interests in entrepreneurship and were most important to the development of my research skills. Per has also been a tremendous support, providing guidance and feedback throughout my work with this dissertation. His constant faith in my abilities helped me to overcome many moments of frustration and despair, and his timely responses meant the world to me, especially during the final stages of the dissertation.

I also wish to thank my third thesis advisor, Professor Shaker Zahra, who has been invaluable in inspiring and guiding my work. From the first time I met Shaker, he has fed and encouraged my research interests in firms’ internationalization. Over the years, he has patiently followed my professional development and has always taken time to help me. Shaker not only welcomed me at the Carlson School of Management for visiting periods, but also made me feel at home in Minneapolis. Spending Thanksgiving at Shaker’s and his wife Patricia’s house is one of those times that I look back on with nostalgia.

At JIBS I have had the opportunity to interact with and learn from many colleagues. I would like to give special acknowledgment to Leona Achtenhagen for providing me with invaluable mentorship in research and teaching, great laughs and, more importantly, for her ever-present support. The countless hours she spent reading the numerous drafts of this dissertation (once even
when she was in the maternity ward), is just one of the many facets of her friendship. I am very grateful for the ideas, help, and cooperation I received from Olof Brunnin, Mona Ericson, and Jenny Helin, who work with Leif, Leona, and me in the research project on growth. I would also like to thank Johan Wiklund for first recruiting me to JIBS and for being a constant source of inspiration. His work, and especially his insightful dissertation, has had an immeasurable effect on my research.

Beside her professional help and the generous feedback on the dissertation, I want to express my gratitude to Ethel Brundin for being a great friend and office neighbor whose door is always open. I am also indebted to Susanne Hertz for her valuable support, and to Ghazi Shukur and Thomas Holgersson for their precious statistical advice and for answering my silly questions on statistics.

Further I would like to extend my thanks to the many friends, former and current colleagues at JIBS: Agostino Manduchi, Alexander McKelvie, Anders Melander, Anna Blombäck, Benedikte Borgström, Caroline Wigren, Elena Raviola, Eric Hunter, Helén Anderson, Helgi Valur Fridriksson, Henrik Agndal, Jean-Charles Languilaire, Jens Hultman, Jonas Dahlqvist, Kajsa Haag, Karin Hellerstedt, Katarina Blåman, Lars-Olof Nilsson, Leticia Lövkvist, Robert Picard, Rolf Lundin, Susanne Hansson, Tomas Karlsson, Stefan Nylander, and Tomas Müllern. In different ways, their support has been crucial for the completion of the dissertation, and their humor and friendship have made working at JIBS very enjoyable.

The help, comments, and discussions with colleagues at other universities and institutions helped shaping this dissertation as well. I would like to acknowledge and thank Rögnvaldur Sæmundsson, whose insightful comments and feedback at the final seminar have helped me to improve the manuscript. Special thanks go to Professors Andrew Van de Ven and Harry Sapienza, who were kind enough to welcome me to their PhD courses and seminars at the Carlson School of Management, and to Professor Carin Holmquist for providing me with valuable feedback on the research proposal. I also wish to thank my academic sisters, Barbara Larrañeta and Els Van de Velde, who inspired me with insights, humor, and love. Further, I consider myself lucky to have worked with Salvatore Sciascia, a colleague and friend, and to have made many friends at the Carlson School of Management, who have provided me with ideas, advice, and fun discussions.

I am particularly grateful to all those managers of small and medium-sized firms who took time to participate in the study, completing several telephone interviews and mail questionnaires. In addition, I want to express my gratitude to Handelsbanken, whose Jan Wallander and Tom Hedelius Foundation financed my visits to the Carlson School of Management.

I would never have completed this dissertation without the support, encouragement, and unconditioned love from my family. This dissertation is entirely dedicated to them. Grazie mamma and babbo, you are everything
parents should be and more. Grazie Giovanni, you are the best gift I ever received from my parents. Tack Britta and Bosse, your support and love over these years have been invaluable. Above all, my deepest thanks go to my husband Mattias. Tack Amore for believing in me, letting me cry, listening to my worries and complaints, reading my stuff, and giving me great advice. You are my inspiration, my voice of reason, my best friend!

Jönköping, May 2008

Lucia Naldi
Abstract

Drawing on Penrose’s theory of the growth of the firm, the international business literature, the literature on the knowledge-based view, organizational learning, and absorptive capacity, this dissertation addresses four research questions: 1) What are the effects of downstream international activities (sales and marketing completed abroad) and upstream international activities (purchasing, production, and R&D completed abroad) on the acquisition of market knowledge and technological knowledge? 2) What is the role of prior knowledge in these relationships? 3) What are the effects of the newly acquired knowledge on different growth outcomes? 4) What is the role of processes of knowledge transformation and exploitation in these relationships?

Addressing these issues has practical relevance for the development of small and medium-sized enterprises (SMEs). On the one hand, international expansion might provide small and medium-sized firms with additional knowledge, enriching their limited resource base. On the other hand, internationalization might spread the limited resource base of SMEs too thin and create internal coordination problems.

Longitudinal survey data from 885 Swedish international SMEs yielded the following results. First, downstream internationalization and upstream internationalization are important sources of new market and technological knowledge for SMEs. Second, while downstream internationalization directly brings new market and technological knowledge, the acquisition of new knowledge from upstream internationalization is enhanced by the firm’s prior endowment of knowledge. Third, knowledge acquired from internationalization contributes to a firm’s growth advantage in international markets and to its further internationalization, and it provides the basis for entrepreneurial actions such as venturing into new markets and reaching new international customers. However, the new knowledge base has no, or very little, effect on SMEs’ growth in domestic markets. Fourth, the relationships between knowledge acquired from internationalization and different growth outcomes are not accentuated by a firm’s knowledge management processes. These processes have only a direct effect on a firm’s growth advantage in international markets, its continued internationalization, and its entrepreneurial growth through the development and commercialization of new products/services in international markets.

Overall, the study suggests that internationalization promotes the acquisition of new market knowledge and new technological knowledge, which in turn contribute to the growth of SMEs, especially in international markets.
 CONTENT

1 INTRODUCTION ......................................................... 17
  1.1 INTRODUCTION ......................................................... 17
  1.2 SME GROWTH IN THE AGE OF GLOBALIZATION ................ 17
  1.3 A KNOWLEDGE-BASED COMPETITION ....................... 19
  1.4 CURRENT RESEARCH ON SME GROWTH AND SME
      INTERNATIONALIZATION ........................................ 22
  1.5 PURPOSE AND CLARIFICATION OF THE KEY CONCEPTS .... 25
  1.6 OUTLINE OF THE DISSERTATION .......................... 26

2 BUILDING A KNOWLEDGE-BASED MODEL OF FIRM
   GROWTH THROUGH INTERNATIONALIZATION .......... 29
  2.1 INTRODUCTION ......................................................... 29
  2.2 PENROSE’S THEORY OF THE GROWTH OF THE FIRM ........ 30
  2.3 PENROSIAN GROWTH AS A SELF-REINFORCING PROCESS OF
      KNOWLEDGE INTEGRATION ....................................... 33
  2.4 INTERNATIONAL EXPANSION OF SMEs: A TERRITORY FOR APPLYING
      PENROSE’S THEORY ........................................... 35
  2.5 THE THEORY OF THE GROWTH OF THE FIRM AND
      INTERNATIONALIZATION THEORIES ....................... 37
    2.5.1 The ‘why’ literature: Internationalization as entry mode of
         multinational enterprises ....................................... 38
    2.5.2 The ‘how’ literature: Internationalization stage models and
         network models .................................................. 46
    2.5.3 The ‘when’ literature on internationalization: International
         entrepreneurship ............................................... 50
  2.6 A KNOWLEDGE-BASED CONCEPTUALIZATION OF THE
      INTERNATIONALIZATION PROCESS ......................... 55
    2.6.1 The knowledge-based view .................................... 56
    2.6.2 Literature on organizational learning ..................... 58
    2.6.3 Literature on absorptive capacity ........................ 61
  2.7 INTEGRATING THE PERSPECTIVES INTO A KNOWLEDGE-BASED MODEL OF
      FIRM GROWTH THROUGH INTERNATIONALIZATION ...... 62
    2.7.1 A knowledge-based model of firm growth through
         internationalization ............................................ 62
    2.7.2 Specification of the components of the model ............ 64
    2.7.3 Research questions ........................................... 66

3 INTERNATIONALIZATION, PRIOR AND NEW
   KNOWLEDGE .......................................................... 67
  3.1 INTRODUCTION ......................................................... 67
  3.2 DIFFERENT FORMS OF LEARNING FROM INTERNATIONALIZATION .... 68
3.3 Learning by doing from internationalization ........................................ 71
  3.3.1 Downstream internationalization and the acquisition of market knowledge ......................................................... 71
  3.3.2 Upstream internationalization and the acquisition of technological knowledge ...................................................... 72
3.4 Other forms of learning from internationalization ............................ 73
  3.4.1 Downstream internationalization and the acquisition of technological knowledge ...................................................... 74
  3.4.2 Upstream internationalization and the acquisition of market knowledge ................................................................. 75
3.5 The role of prior knowledge .............................................................. 77
  3.5.1 Prior knowledge and learning by doing from internationalization .................................................................................. 78
  3.5.2 Prior knowledge and other forms of learning from internationalization ........................................................................ 79

4 New knowledge, knowledge processes and firm growth .................... 81
4.1 Introduction ...................................................................................... 81
4.2 Knowledge acquired from internationalization and firm growth .......... 82
  4.2.1 New knowledge and firm growth relative to competitors .......... 85
  4.2.2 New knowledge and international growth .............................. 86
  4.2.3 New knowledge and entrepreneurial growth .......................... 87
4.3 The moderating role of processes of knowledge transformation and exploitation ......................................................... 89
  4.3.1 New knowledge, knowledge processes and firm growth relative to competitors ....................................................... 89
  4.3.2 New knowledge, knowledge processes and international growth .............................................................. 90
  4.3.3 New knowledge, knowledge processes and entrepreneurial growth .............................................................. 91

5 Method: research design ................................................................. 93
5.1 Introduction ...................................................................................... 93
5.2 My view on reality and knowledge ................................................ 93
5.3 Research design ............................................................................ 95
5.4 Sample design and data collection ............................................... 97
  5.4.1 The construction of the original sample .................................. 99
  5.4.2 Sample development and data collection ............................... 99
  5.4.4 Response rate ........................................................................ 102
  5.4.5 Pre-testing of survey instruments .......................................... 103
5.5 A short introduction to the choice of analysis ............................... 103

6 Method: measurement of the constructs ...... 105
6.1 Introduction ................................................................................... 105
6.2 Some basics on measuring constructs ......................................... 105
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.1</td>
<td>Operationalization</td>
<td>105</td>
</tr>
<tr>
<td>6.2.2</td>
<td>Validity and reliability</td>
<td>106</td>
</tr>
<tr>
<td>6.3</td>
<td>OPERATIONALIZING AND VALIDATING THE KEY CONSTRUCTS</td>
<td>109</td>
</tr>
<tr>
<td>6.3.1</td>
<td>Upstream and downstream internationalization</td>
<td>109</td>
</tr>
<tr>
<td>6.3.2</td>
<td>Organizational knowledge: prior knowledge and acquisition of new market knowledge and technological knowledge</td>
<td>112</td>
</tr>
<tr>
<td>6.3.3</td>
<td>Processes of knowledge transformation and exploitation</td>
<td>119</td>
</tr>
<tr>
<td>6.3.4</td>
<td>Firm growth: Growth relative to competitors, growth relative to competitors in international markets, and entrepreneurial growth in domestic and international markets</td>
<td>123</td>
</tr>
<tr>
<td>6.4</td>
<td>OTHER VARIABLES IN THE ANALYSIS</td>
<td>128</td>
</tr>
<tr>
<td>7</td>
<td>ANALYSIS AND RESULTS: INTERNATIONALIZATION, PRIOR AND NEW KNOWLEDGE</td>
<td>131</td>
</tr>
<tr>
<td>7.1</td>
<td>INTRODUCTION</td>
<td>131</td>
</tr>
<tr>
<td>7.2</td>
<td>SAMPLE SELECTION AND ATTENTION BIAS</td>
<td>131</td>
</tr>
<tr>
<td>7.2.1</td>
<td>Sample selection bias</td>
<td>131</td>
</tr>
<tr>
<td>7.2.2</td>
<td>Sample attrition bias</td>
<td>133</td>
</tr>
<tr>
<td>7.3</td>
<td>CHOICES FOR DATA ANALYSIS</td>
<td>134</td>
</tr>
<tr>
<td>7.3.1</td>
<td>Heckit first step: Probit analysis and Inverse Mills Ratio (IMR)</td>
<td>135</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Multivariate multiple regression analysis</td>
<td>137</td>
</tr>
<tr>
<td>7.4</td>
<td>MEASUREMENTS: A SUMMARY OF THE VARIABLES USED IN THE ANALYSES</td>
<td>139</td>
</tr>
<tr>
<td>7.5</td>
<td>RESULTS</td>
<td>142</td>
</tr>
<tr>
<td>7.5.1</td>
<td>Correlation analysis</td>
<td>142</td>
</tr>
<tr>
<td>7.5.2</td>
<td>Probit model for sample selection bias</td>
<td>144</td>
</tr>
<tr>
<td>7.5.3</td>
<td>Probit model for sample attrition bias</td>
<td>147</td>
</tr>
<tr>
<td>7.5.4</td>
<td>Multivariate multiple regression estimating knowledge acquisition from internationalization</td>
<td>150</td>
</tr>
<tr>
<td>7.6</td>
<td>SUMMARY OF THE RESULTS</td>
<td>156</td>
</tr>
<tr>
<td>8</td>
<td>ANALYSIS AND RESULTS: NEW KNOWLEDGE, KNOWLEDGE PROCESSES, AND FIRM GROWTH</td>
<td>159</td>
</tr>
<tr>
<td>8.1</td>
<td>INTRODUCTION</td>
<td>159</td>
</tr>
<tr>
<td>8.2</td>
<td>SAMPLE SELECTION BIAS, ATTENTION BIAS, AND NON-RESPONSE ANALYSIS</td>
<td>159</td>
</tr>
<tr>
<td>8.2.1</td>
<td>Sample selection bias</td>
<td>159</td>
</tr>
<tr>
<td>8.2.2</td>
<td>Sample attrition bias</td>
<td>160</td>
</tr>
<tr>
<td>8.3</td>
<td>CHOICES FOR DATA ANALYSIS</td>
<td>161</td>
</tr>
<tr>
<td>8.3.1</td>
<td>Multiple regression analysis</td>
<td>161</td>
</tr>
<tr>
<td>8.3.2</td>
<td>Fractional logit regression analysis</td>
<td>163</td>
</tr>
<tr>
<td>8.4</td>
<td>MEASUREMENTS: A SUMMARY OF THE VARIABLES USED IN THE ANALYSES</td>
<td>164</td>
</tr>
<tr>
<td>8.5</td>
<td>RESULTS</td>
<td>167</td>
</tr>
<tr>
<td>8.5.1</td>
<td>Correlation analysis</td>
<td>168</td>
</tr>
</tbody>
</table>
8.5.2 Probit model for sample selection bias .................................................... 172
8.5.3 Probit model for sample attrition bias in 2006 ..................................... 173
8.5.4 Multiple regression, multivariate multiple regression, and fractional logit regression analysis............................................................. 174
8.6 SUMMARY OF THE RESULTS ................................................................. 194

9 DISCUSSION AND CONCLUSIONS .......................................................... 199

9.1 INTRODUCTION ..................................................................................... 199
9.2 FINDINGS IN RELATION TO THE RESEARCH QUESTIONS ..................... 200
  9.2.1 What are the effects of downstream and upstream internationalization on the acquisition of new market knowledge? 200
  9.2.2 What is the role of prior knowledge in the relationships between downstream/upstream internationalization and the acquisition of market knowledge? ........................................................................ 201
  9.2.3 What are the effects of downstream and upstream internationalization on the acquisition of new technological knowledge? ........................................................................................................ 204
  9.2.4 What is the role of prior knowledge in the relationships between downstream/upstream internationalization and the acquisition of technological knowledge? ......................................................... 205
  9.2.5 What are the effects of knowledge acquired from internationalization on growth outcomes? ................................................................. 208
  9.2.6 What role do the processes of knowledge transformation and exploitation play in the relationships between knowledge acquired from internationalization and different growth outcomes? .... 214

9.3 KEY FINDINGS AND THEORETICAL IMPLICATIONS ................................... 219
  9.3.1 Knowledge acquisition from internationalization ................................ 219
  9.3.2 Prior knowledge .................................................................................. 220
  9.3.3 New knowledge and firm growth .......................................................... 221
  9.3.4 Processes of knowledge transformation and exploitation .................. 223

9.4 REVISION AND EXTENSION OF THE RESEARCH MODEL ....................... 225

9.5 STRENGTHS AND WEAKNESSES OF THE STUDY .................................. 228

9.6 SUGGESTIONS FOR FUTURE RESEARCH ............................................. 230

9.7 IMPLICATIONS FOR SME MANAGERS .................................................. 232

9.8 IMPLICATIONS FOR POLICY MAKERS ................................................... 233

REFERENCES ........................................................................................................ 237

APPENDIX 1: NON-RESPONSE ANALYSIS RELATIVE TO THE SAMPLE
USED IN CHAPTER 7 ......................................................................................... 263

APPENDIX 2: NON-RESPONSE CASE ANALYSIS RELATIVE TO
THE SAMPLE USED IN CHAPTER 8 ..................................................................... 268
List of Tables

TABLE 2.1 A COMPARISON OF DIFFERENT INTERNATIONALIZATION THEORIES AND INSIGHTS FROM PENROSE’S FRAMEWORK. SOURCE: COMPILED BY THE AUTHOR.....54

TABLE 2.2 AREAS OF OVERLAP BETWEEN THE DIFFERENT INTERNATIONALIZATION THEORIES. SOURCE: COMPILED BY THE AUTHOR.........................................................56

TABLE 4.1 VIEWS ON THE ROLE OF KNOWLEDGE RESOURCES AND THEIR GROWTH IMPLICATIONS. SOURCE: THE AUTHOR, INSPIRED BY PRASHANThAM (2005)..........83

TABLE 5.1 RESPONSE RATE (RR) FOR THE SCREENING SAMPLE AND FOR THE SELECTED SAMPLE ...........................................................................................................................102

TABLE 6.1 PCA RESULTS AND CFA RESULTS FOR DOWNSTREAM INTERNATIONALIZATION AND UPSTREAM INTERNATIONALIZATION ......................111

TABLE 6.2 PCA RESULTS AND CFA RESULTS FOR PRIOR KNOWLEDGE.................................................................116

TABLE 6.3 PCA RESULTS AND CFA RESULTS FOR ACQUISITION OF MARKET AND TECHNOLOGICAL KNOWLEDGE ..................................................................................119

TABLE 6.4 PCA RESULTS AND CFA RESULTS FOR PROCESSES OF KNOWLEDGE TRANSFORMATION AND EXPLOITATION .................................................................122

TABLE 6.5 PCA RESULTS AND CFA RESULTS FOR GROWTH RELATIVE TO COMPETITORS, GROWTH RELATIVE TO COMPETITORS IN INTERNATIONAL MARKETS, AND INTERNATIONAL GROWTH...........................................................................................................................126

TABLE 7.1 SUMMARY OF THE CONTROL VARIABLES TO BE USED IN THE PROBIT ANALYSES AND MULTIVARIATE MULTIPLE REGRESSION ANALYSIS ......................140

TABLE 7.2 SUMMARY OF THE INDEPENDENT AND DEPENDENT VARIABLES TO BE USED IN THE PROBIT ANALYSES AND MULTIVARIATE MULTIPLE REGRESSION ANALYSIS ....141

TABLE 7.3 MEANS, STANDARD DEVIATIONS, AND CORRELATIONS AMONG THE STUDY’S VARIABLES AND THE CONTROL VARIABLES ..................................................143

TABLE 7.4 INTERCORRELATIONS AMONG THE STUDY’S INDEPENDENT AND DEPENDENT VARIABLES ..................................................................................................................144

TABLE 7.5. PROBIT MODEL FOR SELECTION BIAS MODEL .................................................................145

TABLE 7.6. PROBIT MODEL FOR ATTTRITION BIAS MODEL .................................................................................148

TABLE 7.7 MULTIVARIATE MULTIPLE REGRESSION ANALYSIS .............................................................................153

TABLE 7.8 SUMMARY OF HYPOTHESES AND RESULTS..........................................................................................157

TABLE 8.1 SUMMARY OF THE CONTROL VARIABLES TO BE USED IN THE PROBIT ANALYSES AND MULTIVARIATE MULTIPLE REGRESSION ANALYSIS ......................165

TABLE 8.2 SUMMARY OF THE INDEPENDENT AND DEPENDENT VARIABLES TO BE USED IN THE PROBIT ANALYSES AND IN THE MULTIVARIATE MULTIPLE REGRESSION ANALYSIS .................................................................................................166

TABLE 8.3 MEANS, STANDARD DEVIATIONS OF ALL VARIABLES AND CORRELATIONS BETWEEN CONTROL VARIABLES AND ALL VARIABLES..............................169
TABLE 8.4 INTERCORRELATIONS AMONG INDEPENDENT VARIABLES AND DEPENDENT VARIABLES ......................................................................................................................170
TABLE 8.5 PROBIT MODEL FOR SELECTION BIAS MODEL .................................................172
TABLE 8.6 PROBIT MODEL FOR SELECTION BIAS MODEL .................................................174
TABLE 8.7 HYPOTHESES AND STATISTICAL ANALYSES .................................................175
TABLE 8.8 MULTIPLE REGRESSION ANALYSIS FOR OVERALL GROWTH RELATIVE TO COMPETITORS AND INTERNATIONAL GROWTH RELATIVE TO COMPETITORS ..........177
TABLE 8.9 MULTIPLE REGRESSION ANALYSIS FOR INTERNATIONAL GROWTH ...............178
TABLE 8.10 MULTIVARIATE MULTIPLE REGRESSION AND FRACTIONAL LOGIT REGRESSION FOR ENTREPRENEURIAL GROWTH: SALES FROM NEW CUSTOMERS .................181
TABLE 8.11 MULTIVARIATE MULTIPLE REGRESSION AND FRACTIONAL LOGIT REGRESSION FOR ENTREPRENEURIAL GROWTH: SALES FROM NEW PRODUCTS ......................182
TABLE 8.12 MULTIVARIATE MULTIPLE REGRESSION AND FRACTIONAL LOGIT REGRESSION FOR ENTREPRENEURIAL GROWTH: SALES FROM NEW MARKETS .........................183
TABLE 8.13 SINGLE SLOPE OF KNOWLEDGE ACQUIRED FROM INTERNATIONALIZATION ON INTERNATIONAL GROWTH RELATIVE TO COMPETITORS AT DIFFERENT LEVELS OF KNOWLEDGE PROCESSES .................................................................190
TABLE 8.14 SINGLE SLOPE OF KNOWLEDGE ACQUIRED FROM INTERNATIONALIZATION ON SALES FROM NEW CUSTOMERS IN SWEDEN AT DIFFERENT LEVELS OF KNOWLEDGE PROCESSES .................................................................192
TABLE 8.15 SINGLE SLOPE OF KNOWLEDGE ACQUIRED FROM INTERNATIONALIZATION ON SALES FROM NEW CUSTOMERS IN INTERNATIONAL MARKETS AT DIFFERENT LEVELS OF KNOWLEDGE PROCESSES .................................................................193
TABLE 8.16 SUMMARY OF HYPOTHESES AND RESULTS ................................................195
TABLE A1 SUMMARY STATISTICS OF MISSING DATA FOR ORIGINAL METRIC VARIABLES AND SCALES ........................................................................................................265
TABLE A2 SUMMARY STATISTICS OF MISSING DATA FOR ORIGINAL NON-METRIC VARIABLES ........................................................................................................266
TABLE A3 SUMMARY STATISTICS OF MISSING DATA FOR METRIC VARIABLES AND SCALES ........................................................................................................269
TABLE A4 SUMMARY STATISTICS OF MISSING DATA FOR ORIGINAL NON-METRIC VARIABLES ........................................................................................................271
# List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIGURE 1.1</td>
<td>Structure of the Dissertation</td>
<td>27</td>
</tr>
<tr>
<td>FIGURE 2.1</td>
<td>The Penrosian Model of Firm Growth</td>
<td>34</td>
</tr>
<tr>
<td>FIGURE 2.2</td>
<td>Model of the Internalization Perspective</td>
<td>41</td>
</tr>
<tr>
<td>FIGURE 2.3</td>
<td>Model of the Organizational Capabilities Perspective</td>
<td>44</td>
</tr>
<tr>
<td>FIGURE 2.4</td>
<td>The Internationalization Process Model</td>
<td>47</td>
</tr>
<tr>
<td>FIGURE 2.5</td>
<td>Model of the IE Perspective</td>
<td>52</td>
</tr>
<tr>
<td>FIGURE 2.6</td>
<td>A Knowledge-based Model of Growth through Internationalization</td>
<td>63</td>
</tr>
<tr>
<td>FIGURE 3.1</td>
<td>Expected relationships in the first part of the research model</td>
<td>68</td>
</tr>
<tr>
<td>FIGURE 3.2</td>
<td>Learning Continuum</td>
<td>70</td>
</tr>
<tr>
<td>FIGURE 4.1</td>
<td>Expected relationships in the second part of the research model</td>
<td>82</td>
</tr>
<tr>
<td>FIGURE 5.1</td>
<td>Identification of the eligible sample and its development</td>
<td>98</td>
</tr>
<tr>
<td>FIGURE 7.1</td>
<td>Interaction plot illustrating the slope of upstream internationalization on the acquisition of technological knowledge at low, medium, and high values of prior knowledge</td>
<td>155</td>
</tr>
<tr>
<td>FIGURE 7.2</td>
<td>Interaction plot illustrating the slope of acquisition of market knowledge on upstream internationalization at low, medium, and high levels of prior knowledge</td>
<td>156</td>
</tr>
<tr>
<td>FIGURE 9.1</td>
<td>Illustration of the effects of downstream/upstream internationalization on the acquisition of new market knowledge</td>
<td>201</td>
</tr>
<tr>
<td>FIGURE 9.2</td>
<td>Illustration of the role of prior knowledge in the relationship between downstream/upstream internationalization in the acquisition of new market knowledge</td>
<td>203</td>
</tr>
<tr>
<td>FIGURE 9.3</td>
<td>Illustration of the effect of downstream and upstream internationalization on the acquisition of new technological knowledge</td>
<td>205</td>
</tr>
<tr>
<td>FIGURE 9.4</td>
<td>Illustration of the role of prior knowledge in the relationship between downstream/upstream internationalization and the acquisition of new technological knowledge</td>
<td>207</td>
</tr>
<tr>
<td>FIGURE 9.5</td>
<td>Illustration of the effects of knowledge acquired from internationalization on different growth</td>
<td>213</td>
</tr>
<tr>
<td>FIGURE 9.6</td>
<td>Illustration of the effects of knowledge processes on the different growth outcomes</td>
<td>217</td>
</tr>
<tr>
<td>FIGURE 9.7</td>
<td>Overview of the results</td>
<td>218</td>
</tr>
<tr>
<td>FIGURE 9.8</td>
<td>Revised and extended knowledge-based model of growth through internationalization</td>
<td>227</td>
</tr>
</tbody>
</table>
I Introduction

1.1 Introduction

This dissertation is about growth through internationalization of small and medium-sized enterprises (SMEs). I propose that international activities are sources of new market and technological knowledge which SMEs can leverage for further growth, especially in international markets. Contributing to this positive spiral are also the firms’ prior endowment of knowledge and their knowledge management processes.

The dissertation is positioned at the interface of, and contributes to the literature on entrepreneurship, international business, and knowledge management. I hope the findings of the study will prove valuable for small business managers who are struggling to grow their businesses in today’s global marketplace and to policymakers who are striving to make it happen.

This chapter is organized into five sections. The first two sections present the background of the study—that is, what ‘real-life’ problems and questions attracted my attention and why these are of general interest. The third section turns to what has been done and said by relevant prior studies. A brief literature review reveals that the questions which attracted my attention have not been fully addressed, leaving a number of issues open for research. Building on these unresolved issues, the purpose of the study is presented in the fourth section, along with a clarification of the dissertation’s key concepts. The chapter ends with an overview of the dissertation.

1.2 SME growth in the age of globalization

In most national economies SMEs make up more than 95% of all firms and account for 60-70% of employment (OECD, 2004). The OECD report *SMEs: Employment, innovation and growth* (1996) shows that the SME sector contributes substantially to job creation and economic growth. The report indicates, for instance, that an increase in small firm sales, compared to large firms, leads to more growth in the national GNP; and that SMEs are the major source of new jobs in OECD countries. In addition, there is increasing evidence that SMEs play an important role in the production of innovation (Acs & Preston, 1997).
A decisive change at the turn of the twenty-first century is the globalization of economic activities. Indeed, the shift of economic activities from a local or national sphere to an international or global orientation has been identified as the most dramatic change shaping the current economic landscape (Audretsch, 2003). As for most grand concepts, the definition of globalization is difficult and open to criticism. At the macro level, globalization "refers to the increasing integration of economies around the world, particularly through trade and financial flows. The term sometimes refers to the movement of people (labor) and knowledge (technology) across international borders" (Kohler, 2000, p. 36). Thus, globalization can be explained by a more rigorous application of the broader scope of the World Trade Organization’s (WTO) rules and by the creation and strengthening of free trade zones (Julien, 2001). Globalization has also been accelerated by the reduction of transportation and communication costs, making interaction between people possible at low costs (Audretsch, 2003). All in all, the accelerated trend towards market globalization has altered the meaning of national borders and geographic distance and led to a considerable internationalization of the world economy.

Globalization affects SMEs and their growth in different ways. First, it favors the establishment of transactional activities by SMEs and thereby it increases the possibility for these firms to grow beyond their national borders. Deregulation of markets and technological advances have put an end to the logic that firms need to be big in order to compete internationally (Bloodgood, Sapienza, & Almeida, 1996). About 25 % of manufacturing SMEs compete in international markets and about one-fifth of manufacturing SMEs draw between 10 % and 40 % of their turnover from cross-border activities (OECD, 2004). Access to international markets offers several business opportunities, such as new niche markets, possibilities to exploit economies of scope, and technological advantages (OECD, 2004). This is especially true for small market countries, such as Sweden, which compete against large economies such as the United States and Japan (Julien & Ramangalahy, 2003). Furthermore, in a global economy, the international activities of SMEs can also be motivated by other factors, such as a company’s customers going abroad and requiring international services (Kjellman, Sundnäs, Ramström, & Elo, 2004).

Second, globalization also poses challenges to SMEs and their development. The gradual disappearance of tariff barriers and the increasing variety of products and services available to customers increase competition in international as well as domestic markets and speed up product (and service) volatility (Julien, 2001). SMEs are believed to be less equipped than larger firms to deal with these difficulties (OECD, 2004). Compared to traditional multinational enterprises, SMEs tend to possess limited resources (Benito & Welch, 1997; Knight & Liesch, 2002). In addition, internationalization might spread the limited resources of SMEs too thinly, causing internal coordination problems (Manolova, Brush, Edelman, & Greene, 2002). The following activities might pose significant challenges to resource-constrained SMEs:
I. Introduction

researching foreign markets, adapting products and services to international customers, finding and contracting international buyers and suppliers, moving goods and services across large distances, and making sure that products are managed properly on the way to their users (Knight & Liesch, 2002). Furthermore, SMEs are more vulnerable to fluctuating conditions in the environment and can ill afford to carry out international projects which may end in failure (Knight & Liesch, 2002). As explained by Buckley (1997), it is likely that the proportion of resources committed to foreign investments is greater in small firms than in large firms. Thus, failure is more costly.

Whereas on an aggregate level SMEs are a vital part of our economy as important generators of jobs, innovation, and economic growth, the macro trends towards market globalization have created specific opportunities and threats to the development of these firms. On the one hand, internationalization is regarded as an essential prerequisite for SME growth. On the other hand, SMEs are believed to be less equipped than larger firms to compete and develop in international markets. This paradox seems to have been resolved by those firms that are able to benefit from their international operations. At an aggregate level, there is evidence that SMEs with international activities experience higher growth rates than domestic SMEs and that internationally active SMEs tend to be more productive and profitable than those confined to domestic markets (Buckley, 1997; OECD, 1997). The fact that SME involvement in international activities increases their growth prospects raises some interesting questions: Why and how do some international SMEs continue to grow? How do international SMEs benefit from conducting different types of international activities?

1.3 A knowledge-based competition

To address the above questions, another feature of today’s competition needs to be taken into account. As pointed out by Audretsch and Thurik (2001), globalization has shifted the competitive advantage in the OECD countries away from traditional input-output production towards knowledge (Audretsch, 2003; Audretsch & Thurik, 2001). Similarly, Johannessen, Olaisen and Olsen (2001) argue that the increasing focus on knowledge as the most important resource for companies characterizes today’s society, which is a result of globalization. In the words of Nonaka (1991, p. 96) “in an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge.”

Consequently, firm internationalization can be seen as a way of gaining access to knowledge which resides in other parts of the globe (Zahra, Neck, & Kelley, 2004). And, in the specific case of resource-constrained SMEs, this knowledge might provide an indispensable platform for enhancing future
growth (Sapienza, Autio, & Zahra, 2003). For instance, by entering international markets, SME managers increase their knowledge of the market (Johanson & Vahlne, 1990); the firm expands its customer base and its number of business partners, and improves its reputation (Cheng, Blankson, Wu, & Chen, 2005) and technological know-how (Zahra, Ireland, & Hitt, 2000; Zahra, Matherne, & Carleton, 2003). A study on the internationalization of SMEs conducted by the Observatory of European SMEs (2003) finds that access to know-how and technology is a frequent motive for going abroad and that 48% of SMEs export, at least partly, in order to acquire knowledge.

An example of how a small firm can gain relevant knowledge by being involved in international activities is provided by the story of Polarbröd (see box 1.1). Though Polarbröd’s export operations faced several difficulties due to the company’s limited experience, the firm continued to participate in international trade fairs and to interact with foreign distributors and trade organizations. By doing so, Polarbröd gained important insights into how to choose the ‘right’ distributor(s) and how to leverage foreign distributors’ knowledge and competences. In addition, the strong relationship that Polarbröd established with the French distributor helped the company to refine its international marketing strategy—that is, to develop differentiated offerings and to target niche markets overseas.

Access to knowledge, however, does not necessarily entail its acquisition and subsequent use. First, current knowledge reflects past knowledge. Prior knowledge is essential for recognizing the value of, making sense of and integrating the information obtained from foreign operations (Zahra et al., 2004). Second, the knowledge emerging from international markets needs to be recombined with the existing knowledge and applied to commercial ends. This is usually accomplished through a set of organizational routines and processes, e.g. by intensifying interaction among organizational members (Kim, 1998), creating ad hoc teams of individual specialists to solve problems (Kazanjian, Drazin, & Glynn, 2002) and rewarding people for learning more jobs (Moss Kanter, 2000). All of this might pose significant challenges to SMEs with a limited knowledge base and geographically dispersed operations.

Furthermore, the world-wide flow of information, knowledge, and technology has triggered a continual quest for knowledge superiority (Etemad, 2004). Especially in developed countries, firms are specialized in skill-intensive operations and pressed into competing at the cutting-edge level of quality (Andersson & Friberg, 2005). In this competitive context, SME survival and growth depend not only on acquiring new competences, but also on what competences are acquired. Thus, additional questions arise: What knowledge do SMEs acquire from their international activities? To what extent does this knowledge contribute to SME growth? What role, if any, is played by the firms’ current knowledge base and knowledge management routines and processes?
Polarbröd is a family business with five generations’ experience of baking bread. The company is located in the far north of Sweden and owns one of the country’s most recognized brands. The beginning of the company can be found around the turn of the last century in the bakery of John Nilsson and his wife. Through the years the company has developed into one of Sweden’s largest bread producers, employing approximately 400 people. Polarbröd’s formula for success is very simple: the bread is frozen right after baking; it remains frozen while shipped and transported; and it is defrosted and re-heated once it reaches the grocery stores. In this way, the customers always get bread which tastes freshly baked.

Polarbröd has a strong position in Sweden, holding 14.5 percent of the Swedish bread market. The company’s formula makes its products suitable for export. Compared with other perishable food products, Polarbröd’s frozen bread can handle long shipping and storage times. The company showed some interest in exporting as early as the late 70s, when it tried to sell its bread to Denmark and Germany. These attempts did not turn out well due to the company’s lack of experience. The bread shipment never made it to Denmark: it was stopped at the customs as it lacked the proper accompanying documents. In Germany an unfortunate translation made the bread little appealing to German-speaking people. Despite this unlucky outset, the company continued to take part in international trade fairs and maintained relationships with trade organizations. These were important channels for learning. Polarbröd gained, for instance, knowledge on how to identify and value new partners. In the words of Polarbröd’s former export manager:

“One should not sell to anybody who is willing to distribute [the products]. Instead one must be active in choosing the right partner […] or finding the right person. This person must be in the business, the product must match other products [he/she] is already selling or distributing and [he/she] must be willing to commit and grow with the product”.

In the mid 80s the company succeeded in exporting its bread to Finland, where it even established a sale subsidiary, and to Norway. A defining moment in the internationalization of Polarbröd was, however, the entry into the French market in the late 90s. The success in France was boosted by an innovative marketing strategy masterminded by Jean Paul Creuzon, Polarbröd’s distributor. Jaen-Paul, also known as Monsieur Pain Polaire, promoted the bread as gourmet sandwich bread, starting with a tuna fish sandwich. He also provided French customers with a recipe book on how to prepare several deli sandwiches with Pain Polaire. Polarbröd’s relationship with Jean Paul Creuzon was important for learning how to develop an internationalization strategy.
Abroad Polarbröd does not compete with local bread producers to get a share of their market. Rather, it profiles its bread as a high quality, exotic product, tackling the niche of bread connoisseurs. As Polarbröd’s former export manager acknowledges:

“When we enter a foreign market we do not get a share of the bread market. We create the demand for a new product. In the countries we enter, we create a new market”.

The firm’s exports have grown from 6 million SEK in 1997 to 100 million SEK in 2007. In 2007 Thomas Hedberg, Polarbröd’s export manager, received the prize—handed out by the Swedish Trade Council—of Food Exporter of the Year. Nowadays, Polarbröd serves 17 countries and foreign sales account for 14% of total sales, a figure which grows every year.

Box 1.1: An example of how SMEs can acquire knowledge from international markets

1.4 Current research on SME growth and SME internationalization

The current importance attributed to SME growth and SME internationalization is mirrored in the number of academic studies investigating factors driving or limiting firm growth and firm internationalization. These studies, though very valuable, do not provide an answer to the questions raised above.

Much research has focused on firm growth. While initially researchers have mainly investigated growth of large firms, later the research focus has shifted to high growth and rapid growth of smaller firms (e.g. Delmar, Davidsson, & Gartner, 2003; Fombrun & Wally, 1989; Siegel, Siegel, & Macmillan, 1993). Attention has been particularly devoted to the antecedents of such phenomena. Research has, for instance, focused on the contingent relationship between certain individual, organizational, and environmental factors and firm growth (For an extended review see Wiklund, 1998 and 2006).

One alternative to this static view of firm growth is provided by life-cycle and stage models (e.g. Churchill & Lewis, 1983; Greiner, 1972; Kazanjian, 1988; Quinn & Cameron, 1983; Scott & Bruce, 1987). Though these models differ in the number of stages and sub-stages identified, they all illustrate firm growth as an inevitable and gradual process which unfolds following a known trajectory. At a minimum, all models start with an initial stage, which is typically characterized by a simple organizational structure and direct
I. Introduction

supervision, and particular importance is attributed to the founder or entrepreneur. In the following stage, the firm achieves its initial product market success. Here, a first division of managerial tasks occurs, but control is still achieved through personal supervision. The subsequent stages are characterized by an increased bureaucratization of the organizational structure and the separation between management and control. These models have been highly criticized for not leaving room for human motivation or individual differences among firms. In addition, firm growth is understood as a cumulative and fundamentally unidirectional process (Van de Ven & Poole, 1995).

Interestingly, a similar picture results when reviewing the literature on internationalization. While early research has mainly investigated international entry modes of multinational enterprises (MNEs) (Buckley & Casson, 1976; Dunning, 1988; Hymer, 1976/1960), later a number of studies have also investigated factors driving or limiting internationalization in SMEs, e.g., decision-maker characteristics, firm characteristics, inter-firm relationships and networks, and foreign as well as domestic environment (e.g. Andersson & Wictor, 2003; Dimitratos, Lioukas, & Carter, 2004; Karagozoglu & Lindell, 1998). More recently attention has been devoted to international new ventures (INVs). These are defined as business organizations that internationalize from inception (McDougall, Shane, & Oviatt, 1994) and are seen as the counterpart of ‘Mom and Pop’ businesses, which start small and continue small (Bloodgood et al., 1996). Key antecedents to the internationalization of young ventures are the entrepreneurial knowledge of the founder(s) (McDougall, Oviatt, & Shadrer, 2003; Westhead, Wright, & Ucbasaran, 2001) and the technological or knowledge intensity level of the firm (Autio, Sapienza, & Almeida, 2000). Internationalization entails mainly export activities, and export sales as a percentage of total sales is the most commonly used proxy for the degree of internationalization (Sullivan, 1994).

There are also studies which explain internationalization as a gradual, sequential process (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). These studies suggest that firms proceed from no regular exports to exports through independent representatives and the establishment of sales subsidiaries to the establishment of manufacturing facilities abroad. This step-wise process is mainly explained in terms of the firms’ gradual increase of market knowledge (Johanson & Vahlne, 1977). This approach has been criticized for being too deterministic and stressing only the early stages of internationalization (Melin, 1992). Its validity has also been questioned in the light of today’s highly global environment, where knowledge about foreign markets is better distributed across national borders (McDougall, 1989).

To sum up, significant progress has been made in explaining the nature and cause of SME growth and internationalization. Yet, much remains unanswered, leaving room for additional theorizing and empirical research.
1) Recently, attention has been placed on high-growth and instant internationalization of firms operating in ‘glamorous’ industries (high-tech or biotech). However, ventures which start global with high growth aspirations and firms which intentionally remain local and small can be seen as two opposite poles of a continuum, with most SMEs actually falling somewhere in the middle. These international SMEs—that is, SMEs which are not necessarily young and/or in high-growth industries—deserve research attention as well.

2) Past research has focused mainly on the export-related activities of SMEs. As a result, import- and production-related activities have received much less attention (Agndal, 2004; Karlsen, Silseth, Benito, & Welch, 2003). This narrow focus is a limitation, since SMEs tend to be international along a whole range of value chain activities such as sales, marketing, purchasing, R&D, and production (Observatory of European SMEs, 2003).

3) Researchers have addressed the factors that drive SME growth and the factors which drive SME internationalization, but rarely examined the effects of internationalization on SME growth. Also the effect of internationalization on the acquisition of knowledge is often suggested by the literature, but seldom empirically investigated. Recently some studies have taken an important step in this direction by showing that international activities can promote the acquisition of market knowledge (Yli-Renko, Autio, & Tontti, 2002) and technological knowledge (Zahra et al., 2000). But these studies chiefly investigate the impact of international activities on the acquisition of either market knowledge or technological knowledge. Consequently, they do not provide much insight into how international activities could be sources of multiple strands of knowledge.

4) Virtually no research has been conducted on the role that the prior knowledge base of SMEs and their knowledge management routines might play in directing the path of knowledge acquisition and growth. Investigating these issues is of interest, since they offer potential for understanding the conditions under which knowledge acquisition from internationalization and firm growth might be hindered or enhanced (Melin, 1992).
1. Introduction

1.5 Purpose and clarification of the key concepts

In order to address the unresolved issues listed above, this dissertation will go beyond the often investigated contingent relation between a set of internal and external antecedents and firm growth/internationalization and will focus on the effects of SMEs’ international activities on firm growth. The internationalization of SMEs will transcend the narrow focus on export behavior to include the vast array of downstream and upstream international activities carried out by young as well as established SMEs. Furthermore, a wider sectoral focus will be chosen to include also low-tech firms and service firms.

The overall purpose of the dissertation is to investigate how SMEs benefit from current international activities to continue growing in international as well as domestic markets. Attention is placed on prior knowledge of SMEs, their acquisition of new market and technological knowledge, and the processes through which SMEs transform and use knowledge.

In the context of this dissertation, SMEs are defined following the European Union cut-off of firms employing between 10 and 250 employees. This choice of an employment criterion is motivated by the fact that employment figures are frequently used for sample selection (Wiklund, 1998), rendering the results of the study comparable with others.

Growth is understood as “an increase in size or an improvement in quality as a result of a process of development” (Penrose, 1959/1995, p. 1). Thus, in this dissertation, a distinction is made between growth as a process, which is the continuous, unfolding process of development, and growth as an increase in size or as an improvement in quality, which is the ‘more or less incidental result’ or output of the overall growth process. This latter can have different connotations, i.e. different growth outcomes can be highlighted and different indicators can be used to measure it, with sales, employees, profitability, cash flow, and company value being the most commonly used (Birley & Westhead, 1990). Growth outputs are further discussed in Section 2.7.2 and the operationalization of firm growth is presented in Chapter 6.

Internationalization is conceptualized as the involvement in activities across national borders (Jones, 1999, 2001; Welch & Luostarinen, 1988). As such, it is part of a firm’s growth process. International activities include both operations abroad (production facilities, R&D, or marketing activities) and transactions with other companies from other countries (i.e. through import and export). Specifically, in the context of this dissertation, a firm is considered to be international if it is involved in one or more of the following activities: purchasing from abroad, production completed abroad, R&D completed
abroad, or foreign sales and marketing directed at international markets. The rationale for choosing these activities is explained in Section 2.7.2.

The dissertation places knowledge at the center of firm growth through internationalization. A distinction is made between knowledge as a resource (or stock of knowledge) and knowledge processes (or flows of knowledge) (Dierickx & Cool, 1989). Knowledge (or stock of knowledge) is an intangible resource which is available to the firm and which the firm can use. All firms have some prior endowment of knowledge and can acquire new knowledge through either direct experience (e.g. learning by doing) or through the experience of others (e.g. vicarious learning) (Huber, 1991). Knowledge becomes productive through specific processes of resource transformation and its application. These processes are embedded in a firm’s routines and day-to-day activities. These concepts are further explained in Section 2.7.2.

1.6 Outline of the dissertation

The structure of the dissertation is shown in Figure 1.1. In Chapter 2 I develop a knowledge-based model of firm growth through internationalization. The model is based on multiple theoretical perspectives. From the model I derive the four specific questions which will be addressed in the dissertation.

In Chapter 3 I focus on the first two research questions, which relate to the first part of the research model, and derive testable hypotheses. In Chapter 4 I focus on the last two research questions, which relate to the second part of the research model, and derive testable hypotheses.

The subsequent two chapters deal with method issues. In Chapter 5 I present the research design. The discussion ranges from my view on reality and knowledge to sampling and data collection issues. It also introduces my choices of data analysis. In Chapter 6 I present the operationalization and validation of the key variables along with the measurements of the other variables used in the analyses.

Chapters 7 and 8 illustrate more in detail the choice of data analysis and contain the major empirical part of the dissertation: Chapter 7 provides the analyses and results relative to the hypotheses developed in Chapter 3, and Chapter 8 provides the analyses and results relative to the hypotheses developed in Chapter 4.

Finally, in Chapter 9, I discuss the findings and answer the research questions set out in Chapter 2. The most important findings are also discussed in relation to the theories at the root of my research model. This discussion provides the basis for revising and extending the research model. Then, I illustrate the strengths and weaknesses of the study and provide suggestions for future research. Finally, I present the implications of my findings for practitioners and policy makers.
Chapter 1
Introduction

Chapter 2
Building a knowledge-based model of firm growth through internationalization

Chapter 3
Internationalization, prior and new knowledge

Chapter 4
New knowledge, knowledge processes, and firm growth

Chapter 5
Method: Research design

Chapter 6
Method: Measurements and key constructs

Chapter 7
Analysis and results: Internationalization, prior and new knowledge

Chapter 8
Analysis and results: New knowledge, knowledge processes, and firm growth

Chapter 9
Discussion and conclusion

Figure 1.1 Structure of the dissertation.
2 Building a knowledge-based model of firm growth through internationalization

2.1 Introduction

A comprehensive approach to the study of firm growth can be found in Penrose’s seminal work, which first appeared in 1959. Interestingly, as pointed out by Garnsey (1998), Penrose’s (1959/1995) work has not fully been used for analyzing the phenomenon she was most interested in: the growth of the firm. Indeed, Penrose’s theory has had more impact on theorizing about strategy than on studies related to growth (Foss, 2002).

This chapter begins by highlighting the essence of Penrose’s theory and proceeds with a preliminary analysis of how this theory can be used for explaining the expansion and development over time of international small and medium-sized firms. Penrose’s framework is then related to the existing literature on internationalization. These contributions are categorized into three different headings: the ‘why’ literature, the ‘how’ literature, and the ‘when’ literature. In reviewing this literature, I argue that Penrose’s theory of the growth of the firm can provide additional insights and the glue that can bind together parts of the existing literature on internationalization. Specifically, it is the shared focus on knowledge resources that functions as a common denominator of different theories on internationalization and allows their accommodation within Penrose’s framework. The chapter proceeds by introducing the knowledge-based view of the firm (KBV) and the literature on organizational learning and absorptive capacity, which enrich the Penrosian account of firm growth by offering theoretical and empirical insights into the role of knowledge and knowledge processes. The chapter concludes by integrating all these perspectives into a knowledge-based model of firm growth through internationalization and presenting the specific research questions that will be addressed in this dissertation.
2.2 Penrose’s theory of the growth of the firm

In Penrose’s view, growth is an entrepreneurial, self-reinforcing process, which is driven by entrepreneurs seeking to exploit productive business opportunities. As she explains: “Growth is essentially an evolutionary process and based on the collective knowledge, in the context of a purposive firm” (Penrose, 1959/1995, p. xiii).

She conceptualizes a firm as a bundle of physical and human resources whose productive services are released and made cohesive within and by a specific administrative framework. Important is the conceptual distinction between resources and services of resources. Penrose (1959/1995) notes: “[s]trictly speaking, it is never resources themselves that are the ‘inputs’ in the production process, but only the services that the resources can render” (p. 25).

At a minimum, the process of growth of a firm consists of an expansion of its resource base and collateral change of its administrative structure. Expansion is based on the identification and exploitation of productive opportunities by entrepreneurs; at any point in time it is limited by the human, and in particular the managerial, resources available to the firm; its incentives and direction are determined by the unique collection of unused resources; and it allows firms to take advantage of economies of growth. These concepts are explained below.

*Productive opportunities*

Productive opportunities of a firm are defined as “all of the productive possibilities that its ‘entrepreneurs’ see and can take advantage of” (Penrose, 1959/1995, p. 31). This means that the set of opportunities is not something ‘fixed’ that exists ‘out there’, but depends on the entrepreneurs’ expectations and perceptions of what the company can or cannot achieve. In the words of Penrose (1959/1995, p. xiii):

“The relevant environment, that is the set of opportunities for investment and growth that its entrepreneurs and managers perceive, is different for every firm and depends on its specific collection of human and other resources.”

All organizational members are entrepreneurs when they act as innovators. As Penrose (1959/1995, p. 31) explains:

“The term ‘entrepreneur’ […] is used in a functional sense to refer to individuals or groups within the firm providing entrepreneurial services, whatever their position or occupational classification may be. Entrepreneurial services are those contributions to the operation of the firm which relate to the introduction of and acceptance on behalf of the firm of new ideas, particularly with respect to products, location, and significant changes in the
2. Building a knowledge-based model of firm growth through internationalization

*administrative organization of the firm, to the raising of capital, to the making of plans for expansion, including the choice of expansion."

**Limits to growth**

Penrose maintains that at any given point in time, the actual growth pursuable by firms is limited—the available human resources, especially managerial know-how, set bounds to the productive opportunities a firm can seize.

“Expansion,” writes Penrose, “does not take place automatically; on the contrary… it must be planned” (p. 44). This implies that, in the short run, a firm cannot act upon all the productive opportunities its entrepreneurs ‘see’ and unlimitedly expand. Entrepreneurial ideas need to be executed and “the capacities of the existing managerial personnel of the firm” (p. 45) for doing so, while also supervising existing operations, are limited.

Hiring managers is not a solution to the problem either, as employing new personnel needs to be organized as well; and, to provide services, the new employees need to have firm-specific knowledge, e.g. “knowledge of their fellow-workers, of the methods of the firm, and of the best way of doing things in the particular set of circumstances in which they are working” (p. 52). The amount and variety of managerial services is additionally limited by the uncertain and risky nature of the expansion process itself. In order to decrease uncertainty and risk, firms indeed need to devote managerial services to the search for and scanning of information.

However, the amount of managerial resources is not fixed in the long term. It does change and increase over time as the firm grows. First, after a period of expansion, part of the managerial services absorbed by organizing will be gradually released and thereby become available for other uses. Second, during the process of expansion, managers increase their knowledge about the resources possessed by the firm and their uses. As Penrose writes (1959/1995, p. 53): “increasing experience shows itself in two ways—changes in knowledge acquired and changes in the ability to use knowledge”. She describes knowledge as having two forms: one, the objective knowledge, which can be formally expressed and transmitted; the other, the experience, which is difficult to transmit, but whose acquisition increases the services rendered by human resources. Thus, new managerial services are released as a consequence of the learning taking place during the period of expansion.

**The inducement to and direction of expansion**

Unused services are an internal stimulus to growth and innovation, and determine in part the direction of expansion. Unused services always exist because of the ‘multiple serviceability’ and ‘indivisible’ nature of resources. Most resources can be used in different ways and render multiple services; however, one cannot divide a resource into parts and acquire only one or a few ‘services’: “a bundle of services must be acquired even if only a ‘singly’ service should be wanted” (Penrose, 1959/1995, p. 67). In addition, as illustrated
above, the pool of unused services tends to increase as a consequence of learning. Since the opportunity cost of unused services is zero, there are internal incentives to use them and grow. As Penrose puts it, “if these services can profitably be used only in expansion, the firm will have an incentive to expand” (p. 79). She also explains:

“There is a close relationship between the various kinds of resources with which a firm works and the development of ideas, experiences, and knowledge of its managers and entrepreneurs, and we have seen how changing experience and knowledge affect not only the productive services available from resources, but also ‘demand’ as seen by the firm” (p. 85).

Thus, “demand” from the point of view of the single firm is highly subjective: it depends on what the firm’s managers think the firm can do, which in turn depends on the ‘inherited resources’ the firm possesses—its own previously acquired resources—and the services these resources can render. The history of the Hercules Powder Company well illustrates the role of the firm’s technological and market know-how in shaping the firm’s productive opportunity. Penrose, for instance, notes that new plastic products were developed partly because “they fit in and can be developed along the existing resources and market areas” (Penrose, 1960, p. 17).

However, as noted by Foss (2002), Penrose is not an advocate of narrow product or market specialization. Specialization in Penrose’s analysis rather means specialization in terms of an underlying base of resources and competences, which give rise to several growth options. In Penrose’s (1959/1995, p.77) words:

“A firm is basically a collection of resources. Consequently, if we assume that businessmen believe there is more to know about the resources they are working with than they do know at any given time, and that more knowledge would be likely to improve the efficiency and profitability of their firm, then unknown and unused productive services immediately become of considerable importance, not only because the belief that they exist acts as an incentive to acquire new knowledge, but also because they shape the scope and direction of search.”

In short, increased knowledge of the firm’s resources creates incentives and options for expansion.

Economies of growth
The advantage that a firm might gain when expanding on the basis of its unique collection of productive services is explained by Penrose (1959/1995) in terms of economies of growth. These are defined as
“[…] the internal economies available to an individual firm which make expansion profitable in particular directions. They are derived from the unique collection of productive services available to it, and create for the firm a differential advantage over other firms in putting on the market new products or increased quantities of old products” (p. 99).

Economies of growth differ from economies of size. Indeed, economies of growth are essentially transient economies: they come into existence during the process of growth when the firm exploits unused services, and they might disappear with the establishment and further expansion of the new activities. In order to explain this last point, Penrose provides an imaginary example of a manufacturer of glass bottles expanding into a new geographical market. Economies of growth are gained as the firm is able to use its knowledge and managerial capacity in setting up another glass bottles plant located closely to the new market. Yet, since the operations are split off and carried out in the new plants, the firm will not take advantage of the economies of scale resulting from large-scale production. From this example it also follows that economies of growth might remain as economies of scale only when “a reorganization of the old activities is required to take advantage of them, or if they apply jointly to the old and new activities” (p. 103).

2.3 Penrosian growth as a self-reinforcing process of knowledge integration

A Penrosian process of firm growth can be described in terms of a repetitive sequence of expansion, an increase in the firm’s resource base and ‘services’ that the resources can render, and new expansion. Five aspects of this process are of importance for the development of a Penrosian model of firm growth (Figure 2.1).

First, growth is illustrated as a self-reinforcing process under certain conditions. This does not imply a necessary sequence of stages which firms need to follow as auspicated by most process theories on firm growth (e.g. Churchill & Lewis, 1983; Greiner, 1972; Kazanjian, 1988; Quinn & Cameron, 1983; Scott & Bruce, 1987). Penrose’s process of development resembles Van de Ven and Poole’s (1995) teleological type of organizational change model. As the authors explain, “unlike life-cycle theory, teleology does not prescribe a necessary sequence of events or specify which trajectory development of the organizational entity will follow. […] In this theory, there is no prefigured rule, logically necessary direction, or set of stages in a teleological process”. In addition, “[a]lthough teleology stresses the purposiveness of the actor or unit as the motor for change, it also recognizes limits on action. The organization’s
environment and resources constrain what it can accomplish […] Goals are socially contracted and enacted based on past actions” (p. 516).

Second, knowledge is the key factor which facilitates and limits firm growth. Increased knowledge results, first, in an expansion of the firm’s productive opportunity set, and second, in the release of managerial services that can be put into use (Foss, 2002). As Turvani (2002) puts it, “Penrose was aware of the importance of knowledge creation and utilization and this is why she devoted much attention to the human resource organized within the firm” (p. 196). Thus, Penrose’s conceptualization of a firm as a bundle of resources can be rephrased as a firm being a “pool of forms of knowledge” (Tuvalni, 2000, p. 200), and Penrose’s limit to firm growth can be reinterpreted, as Penrose herself writes in the foreword of the 1995 edition of her book, by saying that “a firm’s rate of growth is limited by the growth of knowledge within it” (p. xvi- xvii).

Third, this ‘growth of knowledge’ does not happen automatically. It requires a process that successfully integrates the old with the new (Ghoshal, Hahn, & Moran, 1997). As a firm expands, it acquires new knowledge, and this new knowledge needs to be integrated into the firm before new pools of potential
2. Building a knowledge-based model of firm growth through internationalization

‘services’ become available for future expansion. Penrose brings the example of ‘new men brought in’. At first, “they will find that many things are problematic merely because of their relative unfamiliarity with the firm and its processes. As executives become more familiar with their work and succeed in integrating themselves into the organization under their control, the effort required from them will be reduced and their capacity will therefore become less completely used, while at the same time that capacity will itself have increased through experience and general growth in knowledge” (p. 52). Thus, a firm might grow not only because it has better knowledge, but because it has the ability to integrate and make better use of its knowledge base (Spender, 1993).

Fourth, entrepreneurship is the sine qua non for continuous growth. As Penrose writes (p. 8), “For a firm, enterprising management is the one identifiable condition without which continued growth is precluded—this is one necessary (though not sufficient) condition for continued growth”. Specifically, it is the continuous exploitation of new productive opportunities which drives the growth of the Penrosian firm (Cantwell, 2002). The perception of these opportunities is subjective: the environment is treated as an ‘image’ in the entrepreneurs’ mind (Foss, 2002). Entrepreneurship can involve novelty not only in products, but also in processes, locations, organizational designs, financial innovations, and so forth. In addition, “the entrepreneur is an innovator from the point of view of the firm, not from the point of view of the economy as a whole” (Penrose, 1959/1995, p. 36). Thus, as suggested by Mahoney and Michael (2005), Penrose expands the concept of entrepreneurship while also capturing its pragmatic utility: “Something can only be new to the world once, but it can be new to a distinct firm (or customer for that matter) and still create utility for one or both parties” (p. 16).

Fifth, and partly related to the previous points, history matters. The firm’s underlying base of knowledge and competences, or ‘inherited resources’, is important. Inherited resources comprise valuable market and technological expertise and are the basic ingredients for the exploitation of new opportunities (Ghoshal et al., 1997). Novelty, in Penrose’s view, is indeed created through learning from the established market and technological base of the firm, by extending and adapting it for novel purposes (Cantwell, 2002). As noted above, Penrose argues that unused productive services of existing resources “shape the scope and direction of the search for knowledge” (Penrose, 1959/1995, p. 77).

2.4 International expansion of SMEs: a territory for applying Penrose’s theory

“There are differences between national and international firms but the differences are not to require a theoretical distinction between the two types of
organizations, only a recognition that national boundaries make an empirical difference to their opportunities and costs.”

(Penrose, 1987, p. 563)

An organization which is expanding across national borders provides a promising territory for applying Penrose’s theory of the growth of the firm. As Penrose (1959/1995, p. xv) acknowledges, “[…] it is easy to envisage a process of expansion of international firms within the theoretical framework of the growth firms”.

In a broad sense, internationalization can be seen as a part of a firm’s growth and developmental process, as it involves the establishment of supply-related and market-related activities across national borders (Jones, 1999; Welch & Luostarinen, 1988). Thus, embarking on international operations encompasses Penrose’s primary meaning of growth, “an increase in size or an improvement in quality as a result of a process of development” (Penrose 1959/1995, p. 1). In addition, international markets are loci for learning, which is at the heart of Penrose’s growth processes. As explained by Barkema and Vermeulen (1998), when operating in foreign markets, firms are exposed to different ideas, events, and stimuli, which expand their experiences and foster their learning. Furthermore, Penrose’s theory was explicitly developed for explaining the growth of firms ‘which do want to grow’. Firms which have expanded into international markets show a certain ambition of growing, at least outside the national borders.

Despite Penrose’s emphasis on large firms, her framework provides useful insights for understanding why and how international small and medium-sized firms continue to grow (Garnsey, 1998). In Penrose’s view, firms of smaller sizes are constrained in their direction and ability to grow by their limited resources. Yet, this effect is attenuated once the firm grows and accumulates more resources. Thus, Penrose’s framework makes inroads into why and under what conditions SMEs that have expanded internationally can continue to grow. Following Penrose’s logic, international expansion provides small and medium-sized firms with alternative resources and adds new possibilities for
their future expansion. For this positive spiral to happen, the new resources must be constantly accommodated by processes which integrate and combine them with the firm’s stock of inherited resources (Ghoshal et al., 1997). For instance, knowledge of the specific product/service requirements by international customers can be spotted when exporting to foreign markets. Yet, this knowledge needs to be integrated into the firm and combined with the firm’s current technological know-how for new products/services to be offered to international customers.

2.5 The theory of the growth of the firm and internationalization theories

Traditionally, international business (IB) studies have drawn eclectically rather than systematically on Penrose’s theory of the growth of the firm (Pitelis, 2002). However, lately, there has been a renewed interest in the potential relevance of Penrose’s theory to the study of firm internationalization (e.g.

---

1 In fairness, it must be observed that Penrose focuses mainly on large firms and holds a quite ‘pessimistic view’ on the possibility for growth of small firms. However, we should keep in mind that she wrote her book in the United States in a time when American powerful industrial corporations were unchallenged. Thus, in the light of recent achievements of small and medium-sized companies, some of Penrose’s assumptions about small firms (e.g. that the owners of small firms are content with comfortable profits and are unwilling to grow) can be relaxed and her insights applied to these firms. It seems particularly reasonable to do so in the case of international SMEs, which, as mentioned, have shown some willingness and capacity to grow. In addition, in Penrose’s framework what matters are economies of growth and not only economies of size. And, as Penrose (1959/1995, p. 262) explains, “Economies of growth exist for all sizes of firm, and therefore growth for any size of firm may be an efficient use of resources both from the point of view of the firm and from the point of view of the economy as a whole”. There are even certain situations where small firms have more favorable conditions to grow than larger ones. As Penrose puts it, “If, therefore, the opportunities for expansion in the economy increase at a faster rate than the large firms can take advantage of them and if the large firms cannot prevent the entry of small firms, there will be scope for the continued growth in size and number of favorably endowed small firms, some of whom will themselves enter the ‘large’ category in time. I propose to call those opportunities for small firms the interstices in the economy” (Penrose 1959/1995, p. 222). The concept of interstices seems to anticipate that of market niche, which is often used to describe growth strategies of small firms (Quéré, 2003).
Dunning, 2003; Kay, 2005; Steen & Liesch, 2007). As pointed out by Pitelis (2002), Penrose’s theory of the growth of the firm can provide an overall framework, additional insights, and the glue that can bind together the existing literature on internationalization.

Earlier research on internationalization is discussed here and categorized under different headings. As it will be impossible to review all the conceptual and empirical works which have been conducted concerning firm internationalization, a selection of theories has been made on the basis of my perception of the most important contributions for explaining SME internationalization. The first group of contributions is labeled the ‘why’ literature as these theories focus on the reasons for the formation and expansion overseas of multinational enterprises, MNEs. Particular attention is attributed to the reasons of entry mode choices. These comprise the institutional arrangements for organizing and governing international business transactions, such as contractual transfers, joint ventures, or wholly-owned operations (Andersen, 1997). I call the second group of theories the ‘how’ literature, as these theories try to explain the actual processes through which firms internationalize. The third group of contributions is labeled the ‘when’ literature, as these academic studies try to reveal the distinguishing characteristics of firms internationalizing at a very young age. The insights that Penrose’s theory of the growth of the firm can provide to each contribution on firm internationalization will be also discussed. A summary of the works reviewed linked to Penrose’s potential insights is provided in Table 2.1.

2.5.1 The ‘why’ literature: Internationalization as entry mode of multinational enterprises

2.5.1.1 Internalization perspective: Foreign Direct Investment (FDI)

“Multinational corporations are a substitute for the market as a method of organizing international exchange. They are ‘…islands of conscious power in an ocean of unconscious cooperation’, to use D.H. Robertson’s phrase.”

(Hymer, 1970)

---

2 Some of these works discuss a curious fact. Penrose did not apply her theory of the growth of the firm to the study of international firms, despite the potential relevance of this theory to the analysis of international firms and the interest Penrose developed, later on in her career, in multinational firms. As Dunning (2003, p. 10) notes, “[…] Penrosian IB related writings in the 1970s were mainly directed to evaluating the interface between large multinational firms and national governments; and, for the most part, from the perspective of economic welfare of developing governments.”
2. Building a knowledge-based model of firm growth through internationalization

Since the 1960s, a stream of research, rooted in economics, has focused attention on the reasons for the formation of multinational enterprises (MNEs) and their expansion overseas. Classic and neoclassic economic theories with their focus on international trade between countries and their restrictive assumptions of perfect competition could not explain these phenomena. Several definitions of MNEs are available. As summarized by Rugman (1980, p. 4), an MNE has been defined as “one firm with subsidiaries in six or more nations” or “one with income generating in more than one nation” or “one with a ratio of foreign to total operations above some arbitrary percentage”. These definitions feature a multinational enterprise as a firm which controls productive assets in countries other than its country of origin and is, thereby, active in goods and factor markets of different nations. Thus, emphasis is placed on the development of foreign direct investment (FDI), rather than other international activities, such as exporting or licensing.

Common to these theories which attempt to explain why international production takes place is the recognition of market imperfections. Yet, they differ on the types of market imperfections they focus on. In 1960, Stephen H. Hymer was the first to focus attention on MNEs per se and to relate their existence and development to structural imperfections of the market. Following the industrial organization tradition, Hymer (1976/1960) argued that structural imperfections of the market enable MNEs to use their international operations to close their markets and, thereby, achieve ‘market power’ advantage, which he called ‘monopolistic advantage’. Thus, Hymer saw the development of productive assets abroad, achieved either through internal expansion, mergers, or acquisitions, as a natural expansion of a firm’s activities in the pursuit of ‘monopolistic advantage’ (Pitelis, 2002). The choice of FDI over other market-based international activities, such as exporting or licensing, is justified by the type of advantage the firm is after. As explained by Pitelis (2002), the process of monopolization requires, almost by definition, a degree of control over international activities that only FDI can ensure.

Building on Hymer’s tradition, also the internalization perspective developed by Buckley and Casson (Buckley & Casson, 1976, 1979, 1985) focuses on market imperfections as the rationale behind FDI. However, here the emphasis is not on structural imperfections, but on ‘natural’ imperfections of the markets, which are defined as those deriving from excessive market transaction costs (Dunning & Rugman, 1985). In order to reduce these costs, companies internalize transactions within the boundaries of the firm, and when internalization of markets occurs across national borders, MNEs are created. According to Buckley and Casson (1979), transaction costs arise from the
‘public good’ nature of knowledge-based, intangible assets. They suggest that internationalization is particularly beneficial in “industries where flows of technical and marketing knowledge are important” (p. 48). Yet, knowledge is very costly to produce and difficult to price, and this leads firms to favor its application and commercialization within their boundaries. Indeed, it is the access to these internally generated and disseminated knowledge resources which enables MNEs to outperform national firms competing in the same markets. In the words of Buckley and Casson (1979, p. 49), “[m]ost important among these inputs are proprietary knowledge (the output of past R&D), marketing knowledge (arising from a worldwide intelligence system) and production experience”.

The eclectic theory developed by Dunning (1988) and the ‘Ownership, Location, Internalization’ (OLI) paradigm (Dunning, 1998, 2000) provide a synthesis of Hymer’s (1970) work and the internalization perspective. In the author’s view, FDI and foreign activities of MNEs can be better explained by the interplay of three sets of factors. The first set of factors concerns the extent to which firms possess ownership (or competitive) advantages in any particular market or set of markets. These advantages include Hymer’s ‘monopolistic advantages’ stemming from the firm’s ability to exploit structural imperfections of final product markets, but also efficiency advantages, stemming from unique assets possessed by the firm as a consequence of structural imperfection in factor or intermediate product markets. The greater the ownership advantages of firms interested in investing in international markets are, in comparison to the firms located in those markets, the more these firms are likely to invest in international production.

The second set of factors relates to whether it is beneficial (less costly) for the firms which possess the above ownership advantages to internalize them through FDI or to sell them or their rights to others in loco organizations. Ceteris paribus, the greater the benefits of internalizing cross-border activities are, the more firms are likely to engage in FDI, instead of involving themselves in contractual arrangements with companies in loco. The third set of factors relates to the ‘where’ of production and concerns the extent to which the firms

3 The relationship between the choice of internalizing market imperfections and the ‘public good’ nature of knowledge resources is further explained by Rugman (1980, p. 6). The generation of marketing and production knowledge requires investments in R&D, which are private costs for individual firms. Yet, once the knowledge is developed, it becomes a public good, as its consumption by the firm does not reduce the consumption by other firms. And, consequently, it cannot be priced in the market, because the price of public goods is zero. These cases of market failure can be overcome by the assignment of property rights (such as patents) or by bringing the transactions under the control of the firm through FDI. The first alternative is not feasible in an international context, because of the lack of acceptance of international mechanisms for the protection of property rights. This leaves firms with the latter alternative: internalizing the transactions.
2. Building a knowledge-based model of firm growth through internationalization

perceive that “it is in their best interest to combine spatially transferable intermediate products produced in the home country, with at least some immobile factor endowments or other intermediate products in another country” (Dunning, 1988, p. 9). Ceteris paribus, the more firms need to use immobile and natural resources which are available in foreign locations to better exploit their own ownership advantages, the more they are likely to engage in FDI (Dunning, 1988). Thus, Dunning adds to the internalization perspective the location factor which had been largely overlooked (Pitelis, 2002).

To summarize, the existing economic theories on firm internationalization can be integrated under the umbrella concept of internalization perspective: they explain why multinational firms choose to replace markets by administrative fiat, that is by internalizing them (Pitelis, 2002). These theories are based on a set of assumptions: bounded rationality and opportunism of the strategic actors, structural or natural imperfections in the market, mobility of resources among firms, including know-how between parent companies and their foreign subsidiaries. Common to these theories is also the emphasis on knowledge assets, mainly technological or market-based, as sources of a firm’s sets of advantages (Figure 2.2).

There are also related issues with the internalization perspective. First, it explains why MNEs expand in international markets through FDI, but leaves out the issue of the direction of the expansion. Second, the aforementioned theories tend to emphasize the exploitation of monopolistic advantages (Hymer, 1976/1960), the internalization of market transaction costs (Buckley & Casson, 1976, 1979, 1985), and an eclectic synthesis with the inclusion of location issues (Dunning, 1988, 2000). In all these cases, the inducements to international expansion are to be found in the external environment in the form of structural and natural imperfections of the markets as well as geographical/location factors. Little is said about internal factors which induce internationalization (Pitelis, 2002). Third, the internalization perspective provides a static account of firms’ advantages, leaving aside the processes through which a specific advantage has been accumulated or evolved over time.

Figure 2.2 Model of the internalization perspective. Source: Compiled by the author.

- Superior technical efficiency
- Superior marketing methods

Foreign direct investments

Competitive advantage
Insights from Penrose’s theory

Penrose’s theory of the growth of the firm offers useful insights for complementing the aforementioned economic theories. First, by combining the internalization perspective with Penrose’s theory of the growth of the firm, FDI are to be considered as one expansion activity in a sequence of activities leading to optimal growth patterns. Penrose’s theory also informs the direction of such expansion (Pitelis, 2002). As Penrose writes, “At all times a firm has a foothold in certain types of productions and in certain types of markets, both of which are here called ‘areas of specialization’” (p.109). Thus, firms will expand in areas where they have certain competences. As already noted, the kind of specialization which is auspicated by Penrose does not necessarily imply path-dependency or rigidity. As it is a specialization in terms of resource base and competences (rather than products), there is ample room for seizing new business opportunities (Foss, 2002). For instance, firms with knowledge of international markets can diversify into new product markets which are ‘unrelated’ to the firm’s existing product portfolio. Second, Penrose’s theory complements the deterministic view of firms’ internationalization, where firms follow market opportunities (monopolistic advantages and location advantages) or protect themselves from threats in the external markets (transaction costs), with a voluntaristic view, where firms envisage opportunities for expansion (at home as well as abroad) on the basis of their unused productive services. As Penrose (1960, p. 2) explains,

“At all times there exist within every firm pools of unused productive services and these, together with the changing knowledge of management, create a productive opportunity which is unique for each firm. Unused productive services are, for the enterprising firm, at the same time a challenge to innovate, an incentive to expand, and a source of competitive advantage.”

The above quotation also provides the basis for questioning another core assumption of the internalization perspective: the ‘public good’ nature of knowledge-based resources and their subsequent non-tradability. The types of opportunities for expansion that knowledge-based resources provide are ‘unique to each firm’. It is, therefore, their firm-specific character which makes them difficult to transfer across markets, not the fact that there is no market price for them (Kogut & Zander, 1992).

Third, Penrose’s account of firm growth makes inroads into the processes beneath what the internalization perspective labels as ‘ownership advantages’. Again, as is well explained by the above quote, a firm is a repository of collective knowledge and, as such, has a unique capacity to learn and deploy its resources. In the words of Spender (1993, p. 9), “a firm may achieve rents not only because it has better resources, but because it has the ability to make better use of its whole resources set”.

42
2. Building a knowledge-based model of firm growth through internationalization

2.5.1.2 Organizational capability perspective

Recently internationalization scholars have become more interested in firm-level explanations of entry choices (Peng, 2001) and taken in some of the insights from Penrose’s theory of the growth of the firm as well as from the resource-based theory. The development of this line of research is closely connected with the elaboration by Madhok (Madhok, 1997; Madhok & Tallman, 1998) and others (Chang, 1995; Erramilli, Sanjeev, & Chekitan, 2002) of the organizational capability framework.

In accordance with the internalization perspective, the organizational capability framework sees the earning of rents as the ultimate objective of firms’ international expansion. However, while the internalization theories focus only on the exploitation of current advantages in international markets, the organizational capability framework calls for a balance between the exploitation of a current advantage and the development of new ones.

A firm is regarded as “a bundle of relatively static and transferable resources, which are then transformed into capabilities through dynamic and interactive firm-specific processes where individual skills, organization and technology are inextricably woven together” (Madhok, 1997, p. 421). Important resources are intangible resources such as skills and competences (know-how), which are developed and integrated into the functioning of the organization by organizational capabilities. And, it is this ‘embedded’ nature of capabilities in firms’ processes and routines which limits their imitability by competitors and consequently provides firms with economic rents. Hence, firms compete primarily on the basis of their capabilities. Yet, in today’s rapidly changing environment the sustainability of competitive advantage calls for a constant development and enhancement of the firm’s knowledge base and capabilities. This is described by Madhok (1997, p. 42) as a dynamic process governed by a “firm’s ability to acquire, evaluate, assimilate, integrate, diffuse, deploy and exploit knowledge”.

Therefore, entry decisions into international markets are ‘bounded’ by capability-related issues. In more detail, when choosing an entry mode, a firm should not only consider the (transaction) cost side of the deal. Rather, it also needs to look at the value-generating potentials of the transaction in terms of both exploitation of its current knowledge base and possible development of its knowledge base. Different scenarios are put forward by Madhok (1997, p. 42). In situations where firms possess a strong knowledge base, internalization of transactions through FDI is more beneficial. Yet, this choice is not made on the basis of the failure of the market under the assumption of opportunism of business partners or the assumption of a ‘public good’ nature of knowledge resources, as postulated by the internalization perspectives. Here, the choice of transferring knowledge internally is made because the costs of implementing such arrangements are marginal, whereas it would be very difficult to transfer tacit knowledge to other firms without loss in the value of such knowledge. On the other hand, capabilities can also be a constraint when a firm enters a market
which is unfamiliar and far away from its store of knowledge. Here, the firm needs to supplement its knowledge base with new knowledge from business partners. Therefore, in these situations, collaboration is the most suitable entry mode as it is a “useful vehicle for enhancing knowledge in critical areas of functioning where the requisite level of knowledge is lacking and cannot be developed within an acceptable timeframe or costs” (Madhok, 1997). Joint ventures are depicted as the collaboration agreements which provide the highest potential for learning and capability development (see Figure 2.3).

The organizational capability framework is rooted in the resource-based view (RBV) of the firm (Barney, 1991; Wernerfelt, 1984) and its more recent development, the dynamic capabilities approach (Teece, Pisano, & Shuen, 1997). Bounded rationality of the strategic actors and imperfect mobility of idiosyncratic resources are the two assumptions at the heart of both frameworks. Despite the canonical reference to Penrose as the founding mother of the resource-based theory (Rugman & Verbeke, 2002), only some dimensions of Penrose’s richly faceted work can be found in the RBV (Foss, 2002) and in the organizational capability framework. In the organizational capability framework, the ideas that firms are broader sets of fungible resources and that expansion involves a balance between exploitation of existing resources and development of new ones relate directly to Penrose’s theory. Thus, both Penrose’s theory of the growth of the firm and the organizational capability framework offer useful insights for complementing the internalization perspectives and make inroads into the internal inducements to international expansion, partially into the direction of such expansion, and into the dynamics beneath firms’ knowledge-based ownership advantages.

Figure 2.3 Model of the organizational capabilities perspective. Source: Compiled by the author based on Madhok (1997).

Yet, there are also important differences between Penrose’s theory and the organizational capabilities framework. Following the RBV, the organizational capability framework starts out from a perfect neoclassical world and introduces selected imperfections, namely the imperfect imitability of ‘embedded’ capabilities which allow managers to focus on efficiency differences across firms
and gain economic rents in situations of equilibrium. In these terms, differently from Penrose, yet in line with RBV, the organizational capabilities framework takes for granted that managers know which are the most valuable resources or capabilities, and how best to use and develop them. In addition the focus is placed on 'value appropriation': it instigates managerial action into developing and enhancing idiosyncratic capabilities which act as barriers against imitation by current or potential competitors.

**Insights from Penrose's theory**

In the light of these differences, Penrose’s theory of the growth of the firm provides additional ‘lenses’ for interpreting entry choices of international firms. First, in Penrose’s framework, opportunities for expansion (abroad as well as at home) are possibilities that the entrepreneur ‘sees’ and ‘thinks the firm can accomplish’. Hence, opportunities for expansion are ‘subjective’ or particular to a given firm and do not ‘exist out there’. This is not another version of the idea of bounded rationality or tacit knowledge. Penrose explicitly recognizes that managers make sense of their own world and that their cognitive development is shaped by the learning processes taking place within firms (Foss, 2002). In these terms, the decision of entering an international market as well as the choice of entry modes might depend on the entrepreneur’s ideas on both the external environment and the internal resources s/he ‘thinks’ the firm might use. And, these decisions change as the firm expands and learns (Foss, 2002). Specifically, the firm’s inherited resources and organizational capabilities can greatly influence the entrepreneur’s image and expectations for the future (Kor, Mahoney, & Michael, 2007). Hence, Penrose’s theory complements the organizational capability framework by stressing the importance of ‘inherited resources’ and the subjective nature of productive opportunities.

Second, Penrose’s theory is not concerned with economic rents per se. Rather it focuses on ‘value creation’: managerial goals are the optimal growth rate (Rugman & Verbeke, 2002). Specifically, she adopts a disequilibrium approach in which the achievement of a rent-based competitive advantage is not the sole objective of firms (Rugman & Verbeke, 2002). The protection of the current advantage is only instrumental to the optimal growth process (Kor & Mahoney, 2004). As Penrose writes, “[i]n entering any new field, a firm must consider […] whether or not its resources are likely to be sufficient for the maintenance of the rate of investment that will be required to keep up with competitors’ innovations and expansion in existing fields as well as in new ones” (pp. 136-137). Thus, Penrose’s work complements the organizational capability perspective by stressing the importance of continuous innovation to renew a firm’s economic value, not to achieve efficiency rents.
2.5.2 The ‘how’ literature: Internationalization stage models and network models

Leaving aside explanations of the existence of MNEs, another stream of international business research has focused on the actual process through which individual firms expand internationally. Different models have been developed to illustrate this process. Andersen (1993) classifies these models into two groups: Innovation-Related Internationalization Models (I-M) and the Uppsala Internationalization Models (U-M). Common to the models in the first group is the idea that internationalization occurs as a series of management innovations within the firm (Bilkey & Tesar, 1977; Reid, 1981). The focus of this review is placed on the second type of models, the Uppsala Models and their more recent developments within the industrial network approach. These are the models most widely cited and debated in the literature on internationalization processes (Prashantham, 2005).

2.5.2.1 The Uppsala Model

Pioneering works in this area are the contributions by Johanson and Wiedersheim-Paul (1975) and by Johanson and Vahlne (1977), which are often characterized as the Uppsala Internationalization Model, U-Model. By investigating four Swedish cases, Johanson and Wiedersheim-Paul (1975) observed that firms start international activities on a small scale and in neighboring countries and then proceed incrementally by increasing their involvement in different countries. On the basis of these observations, the authors suggest a four-stage model of internationalization. A firm progresses from no regular exports to the establishment of independent representatives or agents abroad; then, it proceeds with the establishment of sales subsidiaries and finally sets up production facilities in the foreign country. Following this establishment profile, firms enter markets of successively greater ‘psychic distance’. Psychic distance is defined as “factors preventing or disturbing the flows of information between firms and market. Examples of such factors are differences of languages, culture, political systems, level of education, level of industrial development, etc” (Johanson & Wiedersheim-Paul, 1975, p. 18).

The work by Johanson and Vahlne (1977) elaborates and refines the model further. In an attempt to explain the gradual process described above, the authors focus on the interplay between the development of knowledge about foreign markets and operations on the one hand, and an increase in commitment to foreign markets on the other hand. The model, which is grounded in the work of Cyert and March (1963), Penrose (1959/1995), and Carlson (1966), distinguishes between state and change aspects of internationalization. State aspects are market commitment and knowledge about foreign operations. Change aspects consist of decisions to commit resources as well as performance of current business activities. The interplay
2. Building a knowledge-based model of firm growth through internationalization

between state and change aspects gives rise to a circular process where market knowledge and market commitment affect the decision to commit resources and the current international activities; and these, in turn, affect market knowledge and market commitment (Figure 2.4). Crucial is the distinction between objective and experiential market knowledge. Following Penrose, it is argued that market-specific knowledge is experiential in nature and, thus, can be acquired primarily through experience. Therefore, a firm is expected to increase its involvement in a specific foreign market as it gains experience from its current activities; or, put differently, acquiring considerable knowledge allows the firm to assume greater risks and continue growing in international markets.

![Figure 2.4 The internationalization process model. Source: Johanson and Vahlne (1977).](image)

Over the last two decades, the establishment chain model has been the object of several empirical tests, providing inconclusive results. Support for the firm’s incremental internationalization process has been found in some studies (Kwon & Hu, 1995; Luostarinen, 1979). Yet, other studies fail to corroborate the successive-stages-of-establishment chain (Clark, Pugh, & Mallory, 1997; Oviatt & McDougall, 1997; Sullivan & Bauerschmidt, 1990; Turnbull, 1979). Stronger support is found in the literature for the key role played by experiential market knowledge in the internationalization process. Pedersen and Petersen (1998) confirm that companies’ internal accumulation of foreign market knowledge is a determinant of the pace of commitment to foreign markets. Eriksson et al. (1997, p. 343) further develop the concept of experiential market knowledge by dividing it into three components: 1) internationalization knowledge, which comprises a firm’s experience in organizing internationalization; 2) foreign business knowledge, which refers to “experiential knowledge of clients, the market, and competitors”; and 3) foreign
institutional knowledge, which comprises “government, institutional framework, rules, norms, and values”. Their results suggest that the lack of internationalization knowledge has a strong impact on the lack of both business and institutional knowledge, which in turn influence the perceived cost of internationalization.

The Uppsala Model has been hotly debated by internationalization scholars. While a set of shortcomings has been acknowledged even by Johanson and Vahlne (1990), other limitations are still unaddressed. The set of shortcomings which have also been accepted by Johanson and Vahlne (1990) include: a too deterministic view of the internationalization process, especially in the stage formulation of the model by Johanson and Wiedersheim-Paul (1975); a focus on the early stages of internationalization and consequently limited consideration of the internationalization process taking place in more experienced companies; and a limited account for interdependences between different country markets. In the following section, we will see how Johanson and Vahlne (1990) address these issues by embracing a network approach to firm internationalization.

Yet, there are other concerns with the Uppsala Model. First, it has been argued that the Uppsala Model holds a defensive view on the international expansion of firms. International entry is seen as a ‘shock’ that might threaten the survival of firms; thus, internationalizing firms seek to avoid uncertainty by committing more resources to international markets only in an incremental fashion (Sapienza, Autio, George, & Zahra, 2006). Foreign market knowledge functions as key regulator of this process. Second, the model focuses on market knowledge as the sole explanatory variable of the internationalization process. As mentioned above, experiential market knowledge has been extended to include also institutional market knowledge and internationalization knowledge (Eriksson et al., 1997). Nevertheless, the impact of other types of knowledge resources, such as technological ones is not considered.

**Insights from Penrose’s theory**

Penrose’s contribution has been seminal to the development of the Uppsala Model. Hers is the idea of the cumulative nature of firms’ activities and the emphasis on knowledge resources as a key force for firm expansion. Yet, there are additional insights in Penrose’s theory which could further develop the internationalization model as presented by Johanson and Vahlne (1977) and, thereby, address the above-mentioned shortcomings. First, Penrose was not interested in firms’ survival, but in firms that ‘do want to grow’. Thus, she holds a more offensive view on firm growth: expansion is an opportunity to use a firm’s resource base (especially unused services of existing resources), not a threat to survival. Second, in Penrose’s view, the knowledge relevant for future expansion is not limited to market knowledge. Equally important knowledge resources are what she calls ‘production bases’ or ‘technological bases’. Both these insights well complement and further develop the Uppsala Model.
2. Building a knowledge-based model of firm growth through internationalization

2.5.2.2 The network approach

When discussing the shortcomings of the U-Model, Johanson and Vahlne (1990) argue that the model can be complemented by a network perspective. Indeed, firms do not operate in isolation. Rather, “firms in industrial markets establish, develop, and maintain lasting business relationships with other business actors” (p. 19). These business actors might comprise customers, customers’ customers, competitors, suppliers, supplementary suppliers, agents and consultants as well as and other public agencies (Johanson & Vahlne, 1990). Thus, business relations do not only concern dyadic formal relationships (i.e. the contractual relationship between a firm and its customers), but include all formal and informal relationships among networks of firms (Chetty & Blankenburg Holm, 2000). Industries and markets can be considered as networks of business relationships in which each firm occupies specific positions. These positions are “developed through activities in the network and define important possibilities and constraints for present and future activities” (Johanson & Mattsson, 1988, p. 308).

The process of internationalization involves the establishment and development of network positions by a firm in foreign markets (Johanson & Mattsson, 1988). Specifically, firms can achieve internationalization in three ways: first, by establishing relationships in a country-based network which is new to the firm (international exertion); second, by deepening the relationships with foreign networks in which the firm has already a position (penetration); and third, by connecting and coordinating networks in different countries (international integration) (Johanson & Mattsson, 1988). Ultimately, the internationalization process of a firm is influenced by both the degree of internationalization of the firm and the degree of internationalization of the market (Johanson & Mattsson, 1988).

In summary, the network approach to internationalization draws on the theory of social exchange and resource dependency (Coviello & McAuley, 1999) and sees internationalization of a firm as “a set of connected learning processes” which are influenced by various network members (Axelsson & Johanson, 1992, p. 208). Each international activity, such as foreign market entry, is part of a process which takes place over extended periods of time (Axelsson & Johanson, 1992) and involves several actors. By developing network positions, a firm gains access to resources and markets, which enable as well as limit its future international expansion (Chetty & Blankenburg Holm, 2000).

Several empirical studies address specifically the role of networks as sources of social and cognitive ties in internationalization processes. For instance, Blomstermo et al. (2004) study the perceived role of networks as sources of international experience in a sample of SMEs from Sweden and New Zealand. Their results show that network experiential knowledge increases firm performance. Likewise, Chetty and Blankenburg Holm (2000) examine the role of networks in the internationalization of four manufacturing SMEs. The
authors find that networks can help firms to expose themselves to new opportunities and obtain knowledge.

Compared to the 'why' literature on internationalization, the network approach complements the internalization view on FDI. As pointed out by Coviello and McAuley (1999), in the network approach, externalization (rather than internalization) occurs. Like the Uppsala Model, the network approach stresses the cumulative nature of a firm’s activities. Yet, while the former focuses on the internal development of knowledge as a 'unilateral process’, the latter considers also the market and the firm’s relationships in the market. Thus, it includes a more ‘multilateral element’ in the internationalization process (Johanson & Vahlne, 1990). In these terms, the network approach complements the Uppsala Model as it better illustrates the internationalization process of firms which operate in highly internationalized markets and cooperate in industrial systems (Johanson & Mattsson, 1988).

Nevertheless, the network approach to internationalization does not answer to other shortcomings of the Uppsala Model. First, like the Uppsala Model, the network approach holds a defensive view on firms’ international expansion. Second, although the network approach is very useful for understanding the role of social and cognitive ties in the process of internationalization, it leaves unexamined the role played by knowledge resources other than market knowledge.

Insights from Penrose’s theory

The additional insights from Penrose’s theory, which could further develop the internationalization model presented by Johanson and Vahlne (1977), equally apply to the network approach to internationalization: a more offensive view on firm growth and a broader conceptualization of a firm’s knowledge base, to include technological know-how.

2.5.3 The ‘when’ literature on internationalization: International entrepreneurship

2.5.3.1 International Entrepreneurship (IE) perspective

Over the past decade, another stream of international business research has developed which focuses on a particular phenomenon: young firms which compete internationally almost from inception (McDougall et al., 1994). These have been labeled, inter alia, ‘infant multinationals’ (Lindqvist, 1991), ‘international new ventures’ (INVs) (McDougall, et al., 1994), ‘high-growth new ventures’ (Bloodgood et al., 1996), and ‘born globals’ (Madsen & Servais, 1997). This stream of research develops because the process models on firm internationalization, such as the Uppsala Model, could not account for the growing number of early internationalizing firms. Specifically, Oviatt and
McDougall (1997) observe that in today’s new competitive landscape the internationalization of small firms, especially those operating in high-tech sectors, does not follow a gradual process.

Oviatt and McDougall (1994) divide INVs into three groups: new international market makers, geographically focused ventures, and global start-ups. The first group, new international market makers, consists of INVs which are either import/export start-ups or multinational traders. Their competitive advantage depends on “1) unusual abilities to spot and act on (sometimes by charging high-fees) emerging opportunities before increased competition reduces profits in markets they had established; 2) knowledge of markets and suppliers; 3) ability to attract and maintain loyal networks of business associates” (Oviatt & McDougall, 1994, p. 58). The second group comprises geographically focused start-ups. These firms derive their competitive advantage from serving the specialized needs of a particular region of the world through the use of foreign resources. Important is the coordination of multiple value-chain activities, such as technological development, human resources, and production. Firms in the third group, global start-ups, represent the ‘most radical manifestation’ of INVs. These firms coordinate multiple international activities in several locations around the world. They do not simply adjust to global markets. Global start-ups actively try to take advantage of opportunities for acquiring resources and selling outputs wherever in the world they obtain the highest value.

Empirically, several studies investigate the reasons behind the emergence of INVs. For instance, McDougall et al. (1994) argue that for explaining the formation of INVs the following factors are important: the characteristics and competences of the founders (their ability to combine resources across national borders), the reasons why these individuals decide to compete in international markets rather than in domestic markets (the international spirit), and the type of international activities they undertake (hybrid of strategic alliances and networks). In these terms, several studies attempt to identify the specific characteristics which distinguish INVs (Rialp, Rialp, & Knight, 2005). Along with the founder knowledge, such as his or her experience of international markets (Bloodgood et al., 1996), other factors such as firm knowledge intensity (Autio et al., 2000) or access to networks (Blomstermo, Eriksson, Lindström, & Sharma, 2004) are found to be of relevance for international market development. Though the classification by Oviatt and McDougall (1994) of INV international activities comprises a wide range of international activities (inward investments, outward investments, and trade activities), most studies have focused on exports. Only a few studies (Jones, 1999, 2001) look at the frequent occurrence of cross-border links established by INVs operating in high-tech sectors. Specifically, Jones (2001) examines the initial steps in international activities of SMEs in a sample of small high-tech firms. Her results suggest that SMEs begin their international involvement by trade-related activities, both importing and exporting goods and services. Yet, she also finds
that production and research activities abroad are an integral part of the international expansion process of small high-tech firms.

A few studies have also begun to investigate the growth implications of these early international attempts. For instance, Yli-Renko et al. (2001) focus on how knowledge acquired from intra- and inter-organizational relationships can function as a key driver of the international growth of technology-based new ventures. Similarly, Autio et al.’s (2000) study shows that early internalization and knowledge intensity of INVs are associated with faster international growth. Another study by Zahra et al. (2000) focuses on the acquisition and integration of technological know-how and its impact on firm performance.

![Figure 2.5 Model of the IE perspective. Source: Compiled by the author.](image)

To sum up, the IE perspective focuses on knowledge as the key driver of early internationalization of ventures. The Penrosian root of the perspective has been acknowledged by a number of authors (inter alia, Prashantham, 2005; Sapienza et al., 2006; Yli-Renko et al., 2002). Some scholars in this perspective even suggest that young firms have an inherent ‘learning advantage of newness’: compared to older international firms, newer firms exposed to international markets have not yet developed learning impediments and can better and more rapidly acquire new competences and know-how (Autio et al., 2000). In turn, this newly acquired knowledge-base can be “leveraged as platform for expanding the scope of these firms’ activities, products, and markets” (Sapienza et al., 2006, p. 919), providing the basis for entrepreneurial growth in domestic and international markets (Figure 2.5).

However, the entrepreneurial behaviors in international markets exhibited by established firms have been largely overlooked. In particular, further research is called for in regard to what has been labeled as ‘international corporate entrepreneurship’ (ICE), that is “those activities a firm undertakes to identify, evaluate, select and pursue opportunities outside its home market” (Zahra et al., 2004, p. 147). ICE unfolds in new as well as established firms as they reconfigure their resources in the pursuit of opportunities in international
markets they are already serving (i.e. by introducing new products), or in new international markets.

In addition, most empirical studies in the IE tradition still focus on one or two types of knowledge resources: the knowledge intensity of the INVs and the prior knowledge of the entrepreneur(s). More research is, thus, needed on INVs’ learning advantage of newness and its link to ICE and growth. Zahra (2005), for instance, acknowledges the appeal of the ‘learning advantages of newness’ thesis, but also raises some concerns, e.g. “With their skill base being so narrow, how do these firms develop these capabilities? How does this capacity change as these firms’ internationalization continues?” (p. 26).

**Insights from Penrose’s theory**

Penrose’s theory of the growth of the firm provides a conceptual basis for bringing together the different ‘types’ of knowledge resources highlighted by IE scholars, and linking firms’ learning in international markets to ICE activities. By applying Penrose’s framework, it is possible to illustrate the international development of INVs in the following terms: The accumulated knowledge that accompanies international expansion along with the INV’s endowment of knowledge (its knowledge intensity and/or the entrepreneurs’ prior experience) enable INVs’ entrepreneurs to ‘see’ and pursue new opportunities in foreign markets. This framework applies equally well to ICE activities performed by established companies. For instance, through the lenses of Penrose’s theory, a ‘learning advantage of foreignness’ thesis could be developed to explain ICE of international SMEs: as a small firm is able to grow across its national borders, it accumulates new knowledge, so that there will be plenty of productive opportunities to exploit.
Table 2.1 A comparison of different internationalization theories and insights from Penrose's framework. Source: Compiled by the author

<table>
<thead>
<tr>
<th>Key focus</th>
<th>Internationalization theories</th>
<th>Underlying theories</th>
<th>Explanatory variable</th>
<th>Aspects to develop</th>
<th>Insights from Penrose's framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Why’ literature: Firm foreign market entry modes</td>
<td>- Hymer’s framework - Internalization theory - Eclectic framework</td>
<td>- Industrial organization - Transaction costs</td>
<td>Transaction characteristics, stemming especially from firm-specific resources such as knowledge</td>
<td>- External inducement to international expansion: firms adapt to market conditions - Static account of firms’ advantage - No indication of the direction of international expansion</td>
<td>- Internal inducement to international expansion: firms envisage opportunities on the basis of their unused productive services - Dynamic account of firm growth - Expansion in areas where the firm has resource or competence bases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Firm know-how</td>
<td>- Value appropriation - ‘Objective’ opportunities for foreign market entry</td>
<td>- Value creation - ‘Subjective’ opportunities for foreign market entry</td>
<td></td>
</tr>
<tr>
<td>Organizational capabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘How’ literature: Internationalization process</td>
<td>Uppsala Model - Penrose’s theory - Behavioral theory</td>
<td>Market knowledge gained through experience in international market</td>
<td>- Defensive view on firm expansion - Only experiential market knowledge</td>
<td>- Offensive view on firm expansion - Other types of knowledge-based resources.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Theory</td>
<td>- Social exchange theory - Resource dependency theory - Behavioral theory</td>
<td>Social and cognitive ties established among network members</td>
<td>- Defensive view on firm expansion - Only experiential market knowledge</td>
<td>- Offensive view on firm expansion - Other types of knowledge-based resources.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘What’ literature: The phenomenon of international new ventures</td>
<td>International new venture perspective - Entrepreneurship literature - Resource-based view</td>
<td>Entrepreneur’s knowledge Technical know-how Learning advantage of newness</td>
<td>- Main focus on ICE activities of young firms</td>
<td>- New knowledge can enable ICE activities also in established firms</td>
<td></td>
</tr>
</tbody>
</table>

Compiled by the author
2. Building a knowledge-based model of firm growth through internationalization

2.6 A knowledge-based conceptualization of the internationalization process

From the above discussion it appears that Penrose’s theory provides an overall framework and adds insights that bind together some of the existing literature on firm internationalization. It could be argued that it is the shared focus on knowledge which functions as a common denominator for the different internationalization theories (Knight & Liesch, 2002) and ultimately allows their accommodation within Penrose’s theory of the growth of the firm.

Knowledge is, indeed, at the heart of the received wisdom on firm internationalization (Prashantham, 2005). Internalization scholars share with Penrose the idea that knowledge augmentation enhances a firm’s growth prospects. The internalization perspective highlights MNEs’ unique advantages relative to those possessed by their foreign competitors (Buckley & Casson, 1976; Dunning, 1988). Scholars in this tradition increasingly acknowledge that these unique advantages stem from MNEs’ knowledge-based, intangible assets and point at “the growing importance of multinationality, per se, as an intangible asset in its own right” (Dunning, 2000, p. 169). The organizational capability perspective maintains that operating in diverse environments may be a key asset of the international firm and a key source of its success, since it provides the firm with a superior knowledge base (Madhok, 1997). The link between knowledge resources and firm growth lies also at the heart of the Uppsala internationalization model (Johanson & Vahlne, 1977) and the IE literature (McDougall et al., 1994). In the Uppsala Model, the accumulation of experiential knowledge through progressive internationalization increases a firm’s commitment to further internationalization (Johanson & Vahlne, 1977). The literature on international new ventures highlights the advantages of learning through internationalization for young entrepreneurial firms (Autio et al., 2000).

The areas of overlap between the different internationalization theories, in terms of the strand of knowledge identified, are diagrammatically illustrated in Table 2.2. Although different strands of knowledge are investigated, market and technological knowledge are those most often considered.

Despite this focus on knowledge, the knowledge management processes have been largely overlooked by internationalization literature. Lately, this deficiency has even been acknowledged by Johanson and Vahlne (2003, p. 90), who write that “the development, integration and transfer of knowledge should be regarded as a critical aspect of strategic management of internationalization”. Likewise, the IE literature holds that research needs to better explore capability development and deployment that arise from “intricate configurations of resources and operating routines” (Sapienza et al., 2006, p. 926).
Table 2.2 Areas of overlap between the different internationalization theories. Source: Compiled by the author

<table>
<thead>
<tr>
<th>Knowledge focus</th>
<th>Internalization perspective</th>
<th>Organizational capabilities perspective</th>
<th>IE perspective</th>
<th>Uppsala Model</th>
<th>Network approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur’s knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm market knowledge</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm technological knowledge</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network resources</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Knowledge as well as knowledge management processes are central to the knowledge-based view of the firm (KBV) (Grant, 1996a, 1996b; Grant & Baden-Fuller, 2004; Kogut & Zander, 1992, 1996; Spender, 1996a, 1996b) as well as to the literature on organizational learning (Huber, 1991; Levitt & March, 1988; March, 1991) and on absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002a). These perspectives enrich the Penrosian account by offering theoretical and empirical insights into the sources and role of knowledge within firms, and into the processes of knowledge integration and application. Though these processes are pivotal to Penrose’s theory, a concrete account and elaboration of the mechanisms through which they actually take place in organizations is, to some degree, missing in the theory (Nonaka & Takeuchi, 1995).

2.6.1 The knowledge-based view

Lately, strategy research has witnessed a widespread use of a knowledge perspective, which is underlined by the emerging knowledge-based view (KBV) (Eisenhardt & Santos, 2002). At the heart of the KBV is the idea that the primary role of a firm is the integration of knowledge and that knowledge is by far its most important strategic resource (Grant, 1996a, 1996b; Grant & Baden-Fuller, 2004) Kogut and Zander (1996, p. 503) define a firm as “a social community specializing in the speed and efficiency in the creation and transfer of knowledge” and understand this knowledge as consisting of know-how (procedural knowledge) and information (declarative knowledge). As the authors explain, “by information we mean knowledge that can be transmitted without loss of integrity once the syntactical roles required for deciphering it are known. Information includes facts, axiomatic propositions, and symbols” (Kogut & Zander, 1992, p. 386). An example of a factual statement is the expression ‘inventory consists of 100 items’ (Kogut & Zander, 1993).
Following von Hippel (1988), Kogut and Zander (1992) define know-how as “the accumulated practical skill or experience that allows one to do something smoothly and efficiently”.

The distinction between know-what and know-how relates back to Penrose’s (1959/1995) seminal distinction between objective knowledge and experience, and it has been pivotal in the development of the KBV (Eisenhardt & Santos, 2002). In Grant’s (Grant, 1996a, 1996b) view, know-how is the source of a firm’s sustainable advantage, because it is firm-specific and relatively immobile in nature. Specifically, know-how is the primary source of Ricardian rents (Grant & Baden-Fuller, 2004).

Wiklund and Shepherd (2003b) argue that procedural knowledge about markets and technology are two strands of know-how which have important performance implications for firms. Market knowledge favors the discovery and exploitation of opportunities, because “1) awareness of customer problems may have great generality and thus constitute real market opportunities; 2) it is easier to determine the market value of scientific discoveries, technological change, etc.; 3) the locus of innovation often lies with users of new technologies who cannot easily articulate their needs for not-yet-developed solutions to problems, and therefore the organization must share some of the same tacit knowledge as its users” (Wiklund & Shepherd, 2003b, p. 1309). Also technological knowledge increases a firm’s ability to discover and exploit opportunities. It might indeed lead to technological break-through or enhance a firm’s ability to effectively exploit an opportunity.

Spender (1996a) focuses on knowledge processes rather than on knowledge per se as a sort of economic asset. According to the author, it is important to move beyond the categorization of knowledge into static types (e.g. procedural and declarative knowledge; tacit and explicit knowledge) and the claim that competitive advantage is more likely to derive from intangible firm-specific knowledge. Spender (1996a) is interested in the activity of ‘loose coupling’ which sustains the dialectic between the different types of knowledge.

Kogut and Zander (1992; 1993; 1996; 2003a) call for a dynamic perspective on the knowledge-based view of the firm. Like Spender, the authors are critical towards what they call the ‘lego view’ of the firm which focuses solely on knowledge assets. They argue that firms learn new skills by recombining knowledge on the basis of their existing capabilities and organizing principles. Specifically, they use the term ‘combinative capabilities’ to describe organizational processes by which firms synthesize and generate new applications from their current know-how. In short, a company’s knowledge evolves in a path-dependent way, through the replication and recombination of existing knowledge. Ultimately, it is the ability to replicate knowledge which limits the firm’s growth rate.

In summary, in line with Penrose, the proponents of the KBV reconceptualize a firm as a ‘repository of knowledge’ and provide distinctive insights into the sources of superior firm performance and growth (Figure 2).
Some KBV proponents focus more on knowledge per se as the most strategically relevant resource (i.e. Grant & Baden-Fuller, 2004). They see the KBV as a development of the resource-based view. Know-how is believed to best embody the characteristics of unique resources (valuable, rare, hard to imitate, and difficult to substitute) and therefore to be the primary source of sustainable competitive advantage. Important know-how resources are market and technological knowledge (Wiklund & Shepherd, 2003b). Other proponents of the KBV see organizations as complex systems of knowledge emergence and application (Kogut & Zander, 1992, 1996; Spender, 1996a). These authors even argue that the KBV developed in parallel with but largely independently from the resource-based view (cf. Kogut & Zander, 2003b). They place emphasis on 'combinative capabilities'; that is, the organizational processes by which firms recombine knowledge resources and generate new applications from those resources. In these terms, the KBV enriches Penrose’s account of the processes of knowledge integration.

Two important issues are, however, not fully addressed by the KBV. The first concerns the source(s) of organizational know-how, e.g. how do organizations acquire knowledge? The second issue concerns the nature of combinative capabilities, e.g. what do combinative capabilities consist of? The learning literature and the literature on absorptive capacity help to shed light on these issues.

2.6.2 Literature on organizational learning

There is a vast and rather fragmented literature on organizational learning (Fiol & Lyles, 1985; Huber, 2004; Zahra et al., 2004). Partly, this fragmentation stems from definitional issues: some scholars are interested in organizational learning as a noun, while others are concerned with organizational learning as a verb. Huber (2004) presents this distinction in terms of learning as an outcome and learning as a process. In the language of the KBV, learning as a noun (or outcome) corresponds to ‘knowledge resources’ or ‘knowledge assets’ and learning as a verb (or process) corresponds to ‘knowledge processes’, e.g. knowledge acquisition.

The outcome of learning is central to the economic literature on learning curves (Argote, Beckman, & Eppler, 1990). Studies in this tradition attempt to explain why, despite the absence of new investment in land, labor, and capital, firms exhibit significant productivity improvements (Bell, Whitwell, & Lukas, 2002). Learning by doing is at the heart of this dilemma: experience yields knowledge, which in turn allows firms to reduce production costs.

Organization and management theory is more concerned with the process of learning. In this literature a fundamental reason for fragmentation is that the concept of organizational learning is embedded in different traditions. The behavioral tradition emphasizes adaptation to experience (Cyert & March, 1963; March & Olsen, 1976). The underlying tenet is that individuals have
Building a knowledge-based model of firm growth through internationalization

limited information from which to make decisions as well as limited capacity to process information. Therefore, they rely on established routines to process information and make decisions. When routines do not lead to the desired outcomes or aspirations, individuals go through a search process for a better solution. People tend to be satisfied with a solution that works and will continue searching in that direction when future problems arise. Learning occurs when routines are adapted. In short, organizations are goal-oriented activity systems that learn from experience by repeating successful behaviors and disregarding unsuccessful ones. Such learning from experience has its own traps—that is, it tends to favor exploitation of current competences over exploration of new knowledge (Levinthal & March, 1993). Therefore, scholars advocate that organizations strike a balance between allocating resources to the exploitation of existing knowledge and to the exploration of new knowledge (March, 1991).

The cognitive tradition stresses an organization’s interpretation of events (Argyris & Schön, 1978; Hedberg, 1981). Learning occurs as patterns of cognitive associations and causal beliefs are communicated and institutionalized. In the words of Argyris and Schön (1978, p. 29): “Organizational learning occurs when members of the organization act as learning agents for the organization, responding to changes in the internal and external environments of the organization by detecting and correcting errors in the organizational theory-in-use and embedding the results of their inquiry in private images and shared maps of the organization”. The authors also develop a three-fold typology of learning: single loop-learning, double-loop learning, and deutero-learning. Single-loop learning entails the detection and correction of errors while maintaining the central feature of an organization’s systems of norms, policies, and objectives. Double-loop learning involves also the restructuring or change of the systems of norms together with their underlying assumptions. The learning of how to carry out single- and double-loop learning is what is called deutero-learning. Departing from this typology, other categorizations have been suggested. Fiol and Lyles (1985) present the concepts of lower-level learning and higher-level learning. Miner and Mezias (1996) talk about adaptive and generative learning and Kuwada (1998) distinguishes between business-level learning and corporate-level learning.

Cognitive elements of learning have been incorporated into the behavioral tradition. For instance, in line with the behavioral tradition, Levitt and March’s (1988) contribution keeps a routine-based, history-dependent and target-oriented view on organizational learning. Yet, it equally emphasizes how organizations develop conceptual frameworks or paradigms for interpreting experiences.

Common to both traditions is that learning is grounded in the cognitive and behavioral capabilities of individuals (Bell et al., 2002). Individuals learn both from the organization in which they become socialized and from their own experience (March, 1991). However, the issue of individual learning as the
building block for organizational learning is still much debated. Huber (1991) resolves this issue by presenting organizational learning as a firm-wide information-acquisition phenomenon. Specifically, he writes, “an entity learns if, through its processing of information, the range of its potential behaviors is changed” (Huber, 1991, p. 89). This definition includes three further specifications: 1) “an organization learns if any of its units acquires knowledge that it is recognized as potentially useful to the organization […]”, 2) more organizational learning occurs when more of the organization’s components obtain this knowledge and recognize it as potentially useful” […], and 3) “more organizational learning occurs when more and more varied interpretations are developed” (Huber, 1991, p. 89-90).

Huber, among others, shares with Penrose the interest in experiential learning—that is, the change in know-how in response to direct organizational experience. However, he also identifies different mechanisms through which organizations can acquire knowledge, besides experiential learning. For instance, firms can acquire knowledge via imitation—also labeled vicarious learning—or via scanning the environment for information as well as noticing, which involves the unintended acquisition of knowledge about the external environment. Levitt and March (1988) classify these forms of learning into two poles: learning from direct experience and learning from the experience of others. Similar distinctions have also been drawn in the literature on social psychology. For instance, Bandura (1986) posits that social learning is enhanced by one or two of the following mechanisms: learning by enacting, when people construct conceptions of behavior from observing the effects of their own actions; and learning by modeling, when people construct conceptions of behavior by observing the actual performance of others and the consequences of their actions.

The short review presented here is by no means exhaustive of the vast literature on organizational learning. It focuses mainly on those contributions which are more in line with Penrose’s framework and the KBV. By integrating the insights of Huber and Penrose, organizational learning can be defined as the acquisition of new knowledge that can be used to enhance firm growth immediately or over time. In addition, the works by Huber (1991; 2004) and by Levitt and March (1988) extend Penrose’s theory by illustrating forms of knowledge acquisition other than experiential learning. Finally, it is important to notice that Penrose’s theory incorporates elements of the cognitive tradition. By combining the insights of Argyris and Schön (1978) and Penrose (1959/1995), organizational entrepreneurs can be seen as ‘learning agents’, whose cognitive development, moulded in social processes (Foss, 2002), drives the identification of unique productive opportunities for the firm (Kor & Mahoney, 2004).
2.6.3 Literature on absorptive capacity

The notion of absorptive capacity is closely related to organizational learning as it focuses on how organizations absorb knowledge from external sources. The construct was developed by Cohen and Levinthal (Cohen & Levinthal, 1990), who define it as a firm’s ability “to recognize the value of new, external knowledge, assimilate it and apply it to commercial ends”.

Since Cohen and Levinthal’s seminal work, much has been written on what constitutes a firm’s absorptive capacity. For instance, in a recent review, Lane and Koka (2006) find more than 900 academic articles which use the absorptive capacity construct. I agree with Kim (1998), who sees absorptive capacity as comprising two important elements: prior knowledge and intensity of efforts. The first element, prior knowledge, consists of “individual units of knowledge available within the organization. Accumulated prior knowledge increases the ability to make sense of and assimilate new knowledge” (Kim, 1998, p. 507). Drawing a parallel between prior knowledge and memory, Cohen and Levinthal (1990) posit that “more objects, patterns and concepts that are stored in memory, the more readily is new information about these constructs acquired and the more facile is the individual in using them in new settings” (p. 129). Accordingly, not only the depth, but also the breadth of prior knowledge is important for the acquisition of new knowledge. Extending this argument further, Lane and Lubatkin (1998) maintain that the broader a company’s knowledge base, the broader the range of other firms from which it can learn.

The second element, the intensity of efforts, “represents the amount of energy expended by organizational members to solve problems” (Kim, 1998 p. 507). This element encompasses more the organizational routines/processes aspect of absorptive capacity, as it refers to the efforts made by an organization to internalize the knowledge. Lane et al. (2006) note that the role of organizational structures in enhancing knowledge transfer is an important aspect of Cohen and Levinthal’s conceptualization of absorptive capacity. In their words, “absorptive capacity […] depends on processes and routines within the organization that enable the organization to share, communicate, and transfer individual level learning to the organizational level learning” (pp. 846-847). Probably the most elaborated reconceptualization of absorptive capacity in terms of organizational routines and processes is offered by Zahra and George (2002a). The authors define absorptive capacity as a “set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic capability” (p. 186). Absorptive capacity varies along two dimensions: the potential capacity, which comprises routines and activities for knowledge acquisition and assimilation; and the realized capacity, which centers on routines and activities for knowledge transformation and exploitation. Zahra and George (2002a, p. 186) also argue that more attention needs to be devoted to the realized absorptive capacity, which reflects the firm’s capacity to leverage the knowledge that has been
absorbed. Zahra and George’s reconceptualization of absorptive capacity has, very recently, been extended and empirically validated by Jansen, Van Den Bosch, and Volberda (2005). The absorptive capacity construct has also been extended to international firms. Specifically, absorptive capacity has been used to explain learning among international joint venture partners (Lane, Salk, & Lyles, 2001; Shenkar & Li, 1999) and knowledge flows within multinational corporations (Gupta & Govindarajan, 2000; Minbaeva, Pedersen, Bjorkman, Fey, & Park, 2003). These studies are of importance as they center on the transfer of knowledge that exists in the form of ‘know-how’ rather than on the transfer of ‘know-what’ or operational information (cf. Gupta and Govindarajan, 2000).

To sum up, the literature on absorptive capacity is important on several fronts. First, the fact that absorptive capacity comprises a company’s prior knowledge extends Penrose’s conceptualization of ‘inherited resources’. While Penrose’s theory acknowledges the role of a firm’s inherited resources, the absorptive capacity literature offers a compelling explanation and empirical evidence of why this prior knowledge base is important—that is for the acquisition of new knowledge. Second, Zahra and George’s (2002) reconceptualization of absorptive capacity in terms of organizational routines and processes sheds light on those mechanisms that firms can use to integrate and use knowledge. To a certain extent, it could even be argued that Zahra and George’s ‘realized absorptive capacity’ operationalizes Kogut and Zander’s (1992) ‘combinative capabilities’: firms synthesize and generate new applications from current know-how through organizational routines and processes which facilitate the transfer of knowledge throughout the organization, its recombination with existing know-how as well as its application.

2.7 Integrating the perspectives into a knowledge-based model of firm growth through internationalization

2.7.1 A knowledge-based model of firm growth through internationalization

The integration of the different internationalization theories into Penrose’s framework of firm growth, combined with insights from the knowledge-based view of the firm (Grant, 1996a, 1996b; Kogut & Zander, 1992; Wiklund & Shepherd, 2003b) and the literature on organizational learning (Huber, 1991; Levitt & March, 1988) and absorptive capacity (Cohen & Levinthal, 1990;
Building a knowledge-based model of firm growth through internationalization

Kim, 1998; Zahra & George, 2002a) gives rise to a knowledge-based model of firm internationalization and growth (Figure 2.6). It could be said that the Penrose model of growth provides the ‘skeleton’ of the model, and the theoretical and empirical literature on firm internationalization, KBV, organizational learning, and absorptive capacity provides the conceptual ‘flesh’ to be added to the ‘bones’ of the model.

When looking at the ‘skeleton’ of the model, internationalization is a part of and inseparable from the overall growth and development process of SMEs (Jones, 1999). International activities are viewed as components in a firm’s overall process of growth and development. Internationalization begets growth. It provides firms with new resources and, thereby, expands the ‘productive opportunities’, alias the range of activities that the firm can carry out. A vital resource is knowledge, specifically market and technological know-how. Knowledge coming from different international operations is contingent upon the firm’s prior knowledge; and it is rendered productive through organizational processes of knowledge transformation and exploitation.

Figure 2.6 A knowledge-based model of growth through internationalization. Source: Compiled by the author, inspired by Penrose (see Figure 2.1).
Different growth outcomes are the ‘more or less incidental result’ of this growth process.

Simply put, under the assumption that firms ‘do want to grow’, this model sheds light on the mechanisms under which growth initiated by expansion into international markets can be maintained. Going back to the purpose of my thesis, this model suggests how SMEs can benefit from their international activities to continue growing in domestic as well as international markets.

2.7.2 Specification of the components of the model

The ‘flesh’ to be added to the overall ‘skeleton’ of the model is provided by the theoretical and empirical literature on firm internationalization, KBV, organizational learning, and absorptive capacity. When reviewing this body of literature, I discussed most of the components of the model—particularly prior and new knowledge and processes of knowledge transformation and exploitation. Hence, only a brief illustration of these components will be presented here.

Internationalization

Internationalization is conceptualized as the involvement in activities across national borders (Jones, 1999, 2001; Welch & Luostarinen, 1988, 1993). In the internationalization literature, international activities have been identified and labeled on the basis of different criteria. The internalization perspective commonly uses an ownership criterion (Buckley & Ghauri, 1993; Jones, 1996). International activities are seen as ranging along a continuum from those involving no ownership (such as export activities, licensing, franchising) to those involving full ownership (i.e. wholly-owned subsidiaries abroad). A shortcoming of the classifications using this criterion is that they do not consider import-related activities.

Some proponents of the network approach (Karlsen et al., 2003) and of the IE perspective (Jones, 1999, 2001) use a more comprehensive criterion which focuses on the direction of the stream of activities. That is, they focus on whether the activity in question ‘enters’ or ‘exits’ the country where the firm has its main operations. Inward activities are those which ‘enter’ the firm’s domestic market (i.e. importing); outward activities are those which ‘exit’ the firm’s domestic market (i.e. exporting and foreign direct investments) (Jones, 1999, 2001; Welch & Luostarinen, 1993). As noted by Agndal (2004), this classification might generate confusion. For instance, a product might be produced abroad, an outward activity, then brought back to the firm’s home country, thereby becoming an inward activity, and finally be sold to other countries, thus again turning into an outward activity. In order to avoid this confusion, Agndal (2004) suggests using another criterion: a value chain perspective. Upstream activities include inbound logistics and operations and downstream activities include marketing, sales and, services.
2. Building a knowledge-based model of firm growth through internationalization

Following Agndal’s (2004) classification, two downstream international activities and three upstream international activities will be given particular attention in this thesis. Specifically, *downstream internationalization* comprises involvement in the following activities: foreign sales and marketing directed at foreign markets; *upstream internationalization* includes involvement in the following activities: purchasing from abroad, production completed abroad, and R&D completed abroad. These are the international activities most commonly conducted by European SMEs, according to a study by the Observatory of European SMEs (2003).

(*Prior and new*) knowledge
Building on the KBV (Dierickx & Cool, 1989; Grant, 1996a, 1996b; Grant & Baden-Fuller, 2004; Wiklund & Shepherd, 2003b), knowledge is conceptualized as an intangible resource which is available to the firm and which the firm can use. Drawing on the literature on absorptive capacity (Cohen & Levinthal, 1990; Kim, 1998), *prior knowledge* is defined as the firm’s current endowment of market and technological expertise.

*New knowledge* consists of market know-how and technological know-how that SMEs can gain when operating in international markets. Market knowledge comprises knowledge on how to sell, advertise, and distribute products/services as well as knowledge about customer relationships; technological knowledge entails knowledge on how to manufacture or develop methods or tools needed to serve the market.

Network knowledge, which is another important knowledge resource often associated with international operations, is considered as a dimension of market knowledge. Network knowledge is often operationalized as knowledge of customers’ customers and business partners (Blomstermo, Eriksson, Lindstrand et al., 2004). As such it well fits the aforementioned conceptualization of market knowledge.

Processes of knowledge transformation and exploitation
Following the contributions by Zahra and George (2002a), the *processes of knowledge transformation and exploitation* are conceptualized as organizational routines and activities directed at recombining knowledge and at incorporating the recombined knowledge into the firm’s operations. Recombination and exploitation are facilitated by, for instance, formal and informal meetings (Nonaka, 1991), easy access to information, (Szulanski, 1997), and systems which encourage reflexivity and action (Nonaka & Takeuchi, 1995).

Growth outcomes
Following Penrose (1959/1995), a distinction is made between the growth process, which is the continuous, unfolding process of development, and the
increase in size or improvement in quality which is the ‘more or less incidental result’ or outcome of the overall growth process.

The literature at the heart of my research model suggests three different types of ‘growth outcomes’. The body of literature I label the ‘why’ literature is mainly concerned with a firm’s ‘increase in size’ vis-à-vis the ‘increase in size experienced’ by competitors, or growth relative to competitors. Indeed, the achievement of a competitive advantage is seen as the main growth outcome. This view is shared by some KBV proponents (e.g. Grant, 1991). The ‘how’ literature centers on the firm and its expansion in international markets, regardless of competitors. Hence, the focus is placed on a firm’s ‘increase in size’ in international markets, or international growth. The body of literature I label the ‘when’ literature suggests a third dimension of the ‘increase in size’—namely, the ‘newness’ of the ‘increase in size’. Put differently, the IE literature is also interested in entrepreneurial growth, resulting from actions such as serving new customers, developing and commercializing new products/services, and moving into new markets. All three growth outcomes are considered in the model.

2.7.3 Research questions

Based on the above research model (Figure 2.6), four research questions will be addressed in this thesis. These are:

1) What are the effects of downstream/upstream internationalization on the acquisition of market knowledge and technological knowledge?
2) What is the role of prior knowledge in these relationships?
3) What are the effects of the newly acquired knowledge on different growth outcomes?
4) What is the role of processes of knowledge transformation and exploitation in these relationships?

In the following two chapters these research questions will be translated into a set of testable hypotheses.
3 Internationalization, prior and new knowledge

3.1 Introduction

This chapter focuses on the relationships between SME internationalization, prior and new knowledge. It addresses the following two research questions set forth in the previous chapter: What are the effects of downstream/upstream internationalization on the acquisition of market knowledge and technological knowledge? What is the role of prior knowledge in these relationships?

These research questions relate to the first part of my research model. The model was developed in Chapter 2 by combining different bodies of literature into an overall framework for understanding firm growth through internationalization. However, the expected relationships linking the different components of the model were not discussed in detail. By going deeper into the literature used to build the research model, this chapter frames the relationships illustrated in the first part of the model and derives testable hypotheses. A more detailed illustration of the expected relationships is displayed in Figure 3.1, which also shows the first part of the research model in relation to the rest of the model.

The chapter begins with a discussion of the different forms through which SMEs can learn from international activities as a basis for the arguments that follow. These different forms of learning have already been introduced in Chapter 2 (Section 2.6.2), when reviewing the literature on organizational learning. Subsequently, I relate the different forms of learning to the strands of knowledge to be acquired, namely the acquisition of new market knowledge and new technological knowledge. This discussion and the related hypotheses will also highlight the moderating role of a firm’s prior knowledge base.
3.2 Different forms of learning from internationalization

As illustrated in Chapter 2, the literature on organizational learning (Huber, 1991; Levitt & March, 1988) suggests that there are several forms through which SMEs can acquire new knowledge from cross-border activities. Traditionally, these forms of learning have been thought as ranging along a continuum from more to less based on direct personal experience (Bengtsson, 2004) (see Figure 3.2). Towards one end are those forms involving learning from hands-on, direct experience, of which learning by doing is the most common. As Huber (1991; 2004) remarks, the most useful knowledge for a decision situation is often the product of a firm’s own, direct experience or ‘learning by doing’. Experiencing an event, as well as the context of that event, helps firms to understand processes more fully and triggers the development of more effective routines (Eisenhardt & Martin, 2000). Of crucial importance in this regard is the firm’s experience of diversity and variation in its new foreign markets (Barkema, Bell, & Pennings, 1996). As Huber (2004, p. 125) remarks, “firms can learn by experiencing variation, but they cannot learn by experiencing standardization”. Firms operating in international markets are
exposed to much wider and more diverse operating circumstances than firms competing in local markets (Jones, 2001). By tackling the different challenges inherent in these diverse circumstances, firms are able to accumulate a great deal of knowledge (Zahra et al., 2004). Another form of learning from direct experience is experimental learning. This learning is oftentimes triggered by responding to mistakes or small losses (Huber, 2004). For instance, small failures provide motivation to learn, as such failures spur individuals to pay attention to what went wrong (Eisenhardt & Martin, 2000). International markets are initially unfamiliar in terms of customers, suppliers, and competitors. Thus, SME learning might result from responding to mistakes as well as from searching for new solutions (Buckley, 1997).

Towards the other end of the continuum there are forms of learning from the experience of others. Huber (2004, p. 132) explains that “firms possess knowledge, but the amount they possess is minuscule compared with the knowledge already existing in the industry, in adjacent industries, in the business world and in society in general”. Consequently, in international markets SMEs can acquire externally held knowledge which supplements their current knowledge base. Specifically, firms can learn from gathering intelligence on the behavior of competitors and other business actors, also labeled vicarious learning (Zahra et al., 2004). In addition, firms can learn from scanning the environment for information; from noticing, even unintentionally important aspects and conditions of the organization’s external environment; and from grafting. Dodgson (1993) calls these forms of learning ‘external learning’ and emphasizes their innovating potential.

Recent studies suggest an additional form of learning which lies somewhere in the middle of the continuum: learning from interacting with different business stakeholders or actors. This form of learning combines learning from direct experience and learning from the experience of others, as it involves the knowledge gained by interacting with foreign customers, suppliers, and business partners (Sapienza, De Clercq, & Sandberg, 2005). Research has investigated the opportunity to learn from various forms of international relationships: relationships with key customers (Yli-Renko et al., 2001) and key suppliers (Lee & Jang, 1998), joint ventures (Shenkar & Li, 1999), strategic alliances (Dussauge, Garrette, & Mitchell, 2000; Simonin, 1999), and R&D contacts (Kim & Inkpen, 2005).
All the previously mentioned forms of knowledge acquisition, even those involving learning from the experience of others, occur as the firm becomes engaged in cross-border activities. For instance, even learning as imitation of international competitors would not take place if the firm were not present in international markets. In addition, these forms of learning are not mutually exclusive. When exporting, for instance, a firm can simultaneously learn from its own direct experience, from observing foreign competitors and from interacting with foreign customers, business partners, or third parties.

As my interest is on the content of the learning of SMEs from different international activities, in the following subsections I will distinguish between learning by doing on the one hand, and other forms of learning on the other hand. Cohen and Levinthal (1989) argue that learning by doing is a process by which a firm becomes more practiced, and hence more efficient at doing what it is doing. Via learning by doing, an organization builds knowledge and capabilities around the tasks it performs (Henderson & Clark, 1990). Thus, learning by doing implies the acquisition of new knowledge in the domain of the activities performed. Other forms of knowledge acquisition may accommodate learning that transcends the specific domain of activities performed. For instance, by observing others, organizations can potentially learn a myriad of marketing strategies, but also administrative practices and technologies (Levinthal & March, 1993). Hence, other forms of learning may lead to a more diverse knowledge base (Tsang, 2002a).
3. Internationalization, prior and new knowledge

3.3 Learning by doing from internationalization

Learning by doing suggests that firms acquire new knowledge in the domain of the activities they perform. Thus, it is logical to expect that the completion of international downstream activities enhances the acquisition of market knowledge; and that the completion of international upstream activities enhances the acquisition of technological knowledge. There is a vast literature that supports this argument, ranging from studies on the learning curve (Argote et al., 1990) to models developed especially for explaining firm internationalization, such as the Uppsala internationalization model (Johanson & Vahlne, 1977).

3.3.1 Downstream internationalization and the acquisition of market knowledge

The involvement in international activities, such as exporting or marketing abroad, provides SMEs with important insights into foreign markets and foreign customers. For instance, Bjerre and Sharma’s (2002) study shows that when operating in a foreign market, firms can gain insights into the nature of that market, competitors, and buyers’ preferences. Similarly, Gronhaug and Haugland (2005) find that firms undertake downstream investments in early internationalization stages in order to learn about the market. The accumulation of this knowledge might be easier for SMEs than for large multinational firms. In large multinational firms, market knowledge held by subsidiaries is difficult to pass on to others (Bjerre & Sharma, 2002). In contrast, SMEs are noted for having processes and structures that are less rigid, less sophisticated, and less complex (Coviello & Martin, 1999), which favors the sharing of market knowledge (Carson & Gilmore, 2000).

It has been argued that knowledge about foreign markets and foreign customers is market-specific and thus has no value outside that one local market (Blomstermo, Eriksson, Lindstrand et al., 2004; Johanson & Vahlne, 1977). Yet, there is also evidence of the contrary. For instance, Carlsson et al. (2005) find that firms with pre-existing international experience performed better in the Chinese market than competitors without that experience. Similarly, Eriksson et al. (1997) find that accumulated international experience which affects knowledge about markets, customers, and institutions is not related to a specific country market, or, as they say: “It is a firm-specific experience relevant to all markets” (p. 352).

The knowledge that firms might acquire from downstream internationalization is not limited to insights into foreign customers and foreign markets. It might also include information on foreign trade regulations...
(Eriksson et al., 1997) and how to overcome export barriers (Yang, Leone, & Alden, 1992). Relevant for the acquisition of this knowledge are also other downstream activities such as investments in formal marketing research. Empirical studies show that these activities provide SMEs with valuable information that can improve their export performance (Hart & Tzokas, 1999). More importantly, engaging in downstream activities across national borders can foster the firm’s ability to further develop such activities in international markets. For instance, downstream activities enhance a firm’s ability to gather information, coordinate activities and identify market trends in foreign markets (Chetty & Eriksson, 2002). This is probably one reason why Eriksson et al. (1997) stress the importance of the acquisition of knowledge concerning what the firm is capable of doing when exposed to new and unfamiliar markets. This evidence suggests:

Hypothesis 1: **Downstream internationalization is positively related to the acquisition of market knowledge.**

### 3.3.2 Upstream internationalization and the acquisition of technological knowledge

Upstream internationalization affects technological learning, as demonstrated by the acquisition of new technological skills and know-how (Zahra et al., 2000). Evidence of the link between the engagement in upstream international activities and technological learning is provided by the literature on learning curves. This literature focuses on the effect of cumulative production experience on production skills. Several empirical studies show that the average costs of production decrease with increased production (Argote et al., 1990). It has also been shown that productivity improvements come from performing other upstream activities such as R&D or sourcing (Malerba, 1992).

Learning by doing is a common way of acquiring new technological know-how, especially for SMEs. Buckley (1997, p. 75) posits that in host countries SMEs acquire technological skills mainly through personal experience. Also international transfer of technologies occurs through learning by doing. As Buckley further explains (1997, p. 75) “typically, […] on-the-job training plus the supply of machinery and parts which embody the technology, is the crucial transfer mechanism in SMEs. Manuals and technical handbooks are used by a minority of SMEs”. Learning by doing might also offset some of the problems associated with attaining and transferring technological knowledge. First, learning by doing facilitates the acquisition and transfer of the know-how-based dimension of technological knowledge. Kogut and Zander (1992) maintain that know-how is not easily transmitted and replicated, and that its transfer calls for interaction within small groups and mutual adaptation. Second, learning by doing allows SMEs to take advantage of different international knowledge bases.
3. Internationalization, prior and new knowledge

(Zahra et al., 2000), while neutralizing, at least in part, some of the problems associated with cultural distance. For instance, learning by doing overcomes the problems associated with the acceptance of ‘imported’ technologies (Teece, 1977, 1986), especially from culturally distant countries (Andersen, 1999).

Upstream internationalization influences the depth and breadth of SME technological learning. Research shows that high-control modes of entry in international markets, such as fully-owned production units overseas, promote deeper and broader technological learning in smaller and younger firms (Zahra et al., 2000). However, technological learning is not only related to production overseas. Studies confirm the importance of international suppliers for a company’s technical development (Andersen, 1999) and of cross-border R&D activities for technological learning (Kim & Inkpen, 2005).

SMEs’ motives for going abroad reflect the importance of upstream activities for the acquisition of technological knowledge. A recent survey of European SMEs shows that the traditional cost-driven motives for engaging in both foreign production and foreign sourcing are increasingly supplemented by the need for accessing new technologies and complementary competences (Observatory of European SMEs, 2003). Research confirms that firms use foreign locations to supply technology which is complementary to the technological capabilities in the home market (Zander, 1999, p. 265). This evidence suggests:

Hypothesis 2: Upstream internationalization is positively related to the acquisition of technological knowledge.

3.4 Other forms of learning from internationalization

SMEs undertaking different downstream/upstream international activities may learn directly from their own experience, indirectly via observing competitors and scanning of the environment, and from interacting with partners and third parties. Hence, the engagement in one specific set of activities across national borders might simultaneously prompt different forms of learning. While learning by doing brings knowledge in the domain of the activities performed, other forms of learning facilitate the acquisition of a more diverse knowledge base. For instance, when carrying out after-sales support activities, SMEs can also gain – besides market knowledge, via learning by doing – technical insights, for example through discussing with customers who use the products (Malerba, 1992). Similarly, when sourcing from other countries, SMEs can acquire – besides technological know-how, via learning by doing – also market knowledge, for instance through listening to suppliers who describe the local
market conditions (Korhonen, Luostarinen, & Welch, 1996). Thus, it is logical to expect that downstream internationalization enhances technological learning and that upstream internationalization enhances market learning. Hypothesis 3a and Hypothesis 4a below build on this argument.

Having said that different forms of learning might occur simultaneously does not imply that that they have the same intensity. Knowledge arises primarily from experiencing certain situations and can be best acquired through learning by doing (Penrose, 1959). Thus, ceteris paribus, downstream internationalization is likely to bring more market learning than technological learning; and upstream internationalization is likely to bring more technological knowledge than market knowledge. Hypothesis 3b and Hypothesis 4b below build on this argument.

3.4.1 Downstream internationalization and the acquisition of technological knowledge

There are several reasons to expect SMEs to broaden their technological knowledge when engaged in international downstream activities. First, interacting and working closely with international customers may provide SMEs with opportunities to improve their technological know-how. Tighter relationships and close interactions with customers characterize SMEs’ internationalization (Karagozoglu & Lindell, 1998). Indeed, the limited scale of operations leads most SMEs to enter international niche markets and offer customized solutions to their clients (Buckley, 1997). Such direct involvement with customers can promote technological learning (Zahra et al., 2000). Second, SMEs can also learn indirectly by observing foreign competitors. For instance, SMEs selling in international markets have an opportunity to learn about state-of-the-art technologies from international competitors (Bengtsson, 2004).

Third, downstream internationalization can provide opportunities for systematic experimentation and improvement. SMEs selling in foreign markets face new and diverse customers’ needs, which can trigger experimental learning (Buckley, 1997). As explained by Barkema and Vermeulen (1998), international product markets – which are unfamiliar compared with domestic markets – trigger mistakes and stimulate a search for new solutions that will further expand the firm’s technological domain. In addition, international competition requires more efficient and effective management of upstream and value-added activities (Karagozoglu & Lindell, 1998). Wolff and Pett (2006) show that exporting has a positive effect on both product improvement and process improvement. Similarly, Bell et al. (2004) find that UK SMEs develop ‘leading edge’ products and processes when expanding into international markets.
Finally, a multinational presence may foster technological capabilities in other ways as well. Oftentimes, the volume generated in domestic markets is not enough for supporting competitive levels of R&D (Karagozoglu & Lindell, 1998). Foreign sales increase the returns from innovation and allow firms to recoup R&D investments (Barkema & Vermeulen, 1998). For instance, Simon’s (1992) study confirms that German medium-sized firms market and sell their products internationally in order to recover R&D expenditures. These arguments suggest:

Hypothesis 3a: Downstream internationalization is positively related to the acquisition of technological knowledge.

The previous hypothesis suggests that SMEs might acquire technological knowledge by engaging in downstream activities. However, the learning literature maintains that direct experience is the prime source of learning (Barkema & Vermeulen, 1998). Following this reasoning, when involved in downstream activities SMEs are expected to primarily become more practiced and more efficient at performing market-related activities. Consequently, they are expected to acquire knowledge primarily on how to market and deliver products and services to others across national borders. Tsang’s (2002b) study on firms’ learning from international joint venturing experiences provides empirical support for this asymmetrical learning pattern. Tsang finds that firms mainly achieve experiential rather than vicarious learning. Likewise, van Geenhuizen and Indarti (2005) find that learning by doing and experimentation are considered as the most important knowledge sources by a sample of SME managers. Thus, ceteris paribus, we can expect that SMEs involved in downstream internationalization gain less technological knowledge than market knowledge. This argument suggests:

Hypothesis 3b: The relationship between downstream internationalization and the acquisition of technological knowledge is weaker than the relationship between downstream internationalization and the acquisition of market knowledge.

3.4.2 Upstream internationalization and the acquisition of market knowledge

International upstream activities give SMEs a range of opportunities that can broaden their market knowledge. First, when engaged in value-added activities overseas, SMEs can acquire knowledge on foreign markets via intentional environmental scanning (Bengtsson, 2004). For instance, Karlsen et al.’s study (2003) shows that initial importing activities in foreign markets allow firms to gather information “about the market and new prospects, who was important
and how to operate, in the face of high perceived risk and uncertainty” (p. 394). Second, SMEs can come across relevant market knowledge via unintentional noticing (Bengtsson, 2004). Indeed, they can learn about the ‘nuts and bolts’ of a foreign market by observing the behavior of local businesses (Karagozoglu & Lindell, 1998). For example, importing activities may involve trips to foreign markets and the direct observation of suppliers’ behaviors and their trade techniques (Korhonen et al., 1996).

Third, upstream relationships with foreign actors provide important learning platforms. Research confirms that relationships with international suppliers enhance market knowledge (Karlsen et al., 2003). Lee and Jang (1998) posit that these relationships often go beyond just buying and selling and include the sharing of information about the market situation. Besides long-term relationships with specific suppliers, smaller firms are also renowned for their networking capability (Chetty & Blankenburg Holm, 2000; Jones, 1999). Upstream internationalization fosters SME involvement in established networks of international firms, which, in turn, are sources of relevant market knowledge (Korhonen et al., 1996). Lee and Jang (1998) posit that these relationships often go beyond just buying and selling and include the sharing of information about the market situation. Besides long-term relationships with specific suppliers, smaller firms are also renowned for their networking capability (Chetty & Blankenburg Holm, 2000; Jones, 1999).

Upstream internationalization fosters SME involvement in established networks of international firms, which, in turn, are sources of relevant market knowledge (Korhonen et al., 1996). These observations suggest:

Hypothesis 4a: Upstream internationalization is positively related to the acquisition of market knowledge.

The previous hypothesis proposes that SMEs might acquire technological knowledge when engaged in upstream international activities. Yet, as we discussed for Hypothesis 3a, organizational learning theorists have long contended that knowledge arises primarily from direct experience (Barkema & Vermeulen, 1998). Thus, when engaged in upstream activities, SMEs are primarily expected to become more experienced, and hence more efficient, at performing production/supply-related activities. SMEs are expected to primarily improve their technological know-how. To date, there is a lack of large-scale studies investigating different strands of learning from upstream international involvement (Zahra et al., 2000). On this issue, most empirical evidence comes from case studies investigating the connections between upstream internationalization and downstream internationalization. For instance, Kuada and Sørensen’s (1999) study confirms that the interaction with foreign suppliers provides firms primarily with crucial high quality technological know-how and, to a lesser extent, with information on foreign
3. Internationalization, prior and new knowledge

Market opportunities. Hence, ceteris paribus, SMEs involved in upstream internationalization can be expected to gain less market knowledge than technological knowledge. These observations suggest:

Hypothesis 4b: The relationship between upstream internationalization and the acquisition of market knowledge is weaker than the relationship between upstream internationalization and the acquisition of technological knowledge.

3.5 The role of prior knowledge

The literature presented in Chapter 2 maintains that firms are not tabulae rasae. All firms are repositories of knowledge and have a certain endowment of knowledge resources. As already said, Penrose (1959/1995) talks about ‘inherited resources’ that include the firm’s stock of resources, e.g. current technological know-how and market know-how; while Cohen and Levinthal (Cohen & Levinthal, 1990) use the expression ‘prior knowledge’ and argue that “prior knowledge permits the assimilation and exploitation of new knowledge” (pp. 135-136). Likewise, Kim (1998, p. 507) suggests that a prior-knowledge base consists of individual units of knowledge available to make sense of and to assimilate and use new knowledge. As such, prior knowledge is an important component of a firm’s absorptive capacity. Zahra and George (2002) go even further and posit that prior knowledge is part of a firm’s acquisition capability described as the firm’s capability to identify and acquire new knowledge.

The importance of a firm’s current knowledge base for learning has led some scholars to warn against the trap of exploiting current competences at the expense of exploring new knowledge (Levinthal & March, 1993). Other scholars have noted the challenges of unlearning. For instance, the adoption of new knowledge involves not only the learning of the new, but also the unlearning of the old (Hedberg, 1981). Yet, while prior knowledge per se is unlikely to give rise to new knowledge, it still constitutes the foundation through which new knowledge may be acquired and old knowledge may be discarded. Penrose (1959/1995) views prior knowledge as the sine qua non for learning. In her view, new knowledge is created through learning from established market and technological bases, by extending and adapting them for novel purposes. Consequently, as discussed in Chapter 2, the firm’s endowment of knowledge resources (or ‘inherited resources’ in Penrose’s terminology) at any instant of time limits the learning that the firm can manage in any given period of time. As Huber (2004) puts it, “the more knowledge a firm possesses, the more effectively it can learn” (p. 133).

A firm’s prior endowment of knowledge is a key contingency of SME learning from internationalization. First, prior knowledge facilitates the absorption of knowledge incoming from international markets. This knowledge
is oftentimes complex in nature (Zahra et al., 2004) and difficult to absorb (Lane et al., 2006). Firms having within themselves a high level of intellectual capital in the form of knowledge workers are more able to assimilate the complex information incoming from the international marketplace (Huber, 2004). Second, prior knowledge enables SMEs to leverage their limited resources. When faced with the opportunity to learn from international markets, larger firms might afford costly trial-and-error processes to develop experience-based learning. SMEs, on the other hand, in their quest for new knowledge, need to capitalize on the know-how they already have (Almor & Hashai, 2004). For instance, prior technological know-how increases SMEs’ ability to make sense of the diverse needs and demands of foreign customers and refine their technological offering. Zahra et al. (2004) give another example: engineers with idiosyncratic knowledge working with R&D can spot similar knowledge in foreign markets and articulate the relevance of this knowledge for their firm’s operations.

Huber (2004), among others, suggests that the depth of a firm’s knowledge in one area is not the only variable that determines the firm’s ability to absorb new knowledge. The breadth or diversity of its expertise is relevant as well. This is consistent with Penrose (1959/1995), who views a firm’s stock of ‘inherited resources’ as including both market know-how and technological know-how. Thus, market knowledge and technological knowledge, taken together, represent important knowledge-based resources applicable to the ability of SMEs’ ability to assimilate knowledge from international activities. Accordingly, the following section of this chapter develops hypotheses building on the logic that SMEs’ prior knowledge moderates the relationship between different downstream/upstream internationalization and the acquisition of market knowledge and technological knowledge.

### 3.5.1 Prior knowledge and learning by doing from internationalization

Accumulated prior knowledge influences a firm’s learning by doing. When experiencing an event, organizations need to have an understanding of the context of that event to seek and gain new knowledge (Inkpen & Dinur, 1998). For instance, a firm needs to have knowledge and understanding in a given area if it is to learn from its partner in that area (Hamel, 1991). Kim and Inkpen (2005) find that the ability to learn from alliance partners is partly influenced by a firm’s prior knowledge of alliance management. Conversely, not having an adequate prior knowledge base might inhibit learning by doing. Kim (1998) reports the case of Hyundai Motor Company, which needed to expand its prior technological knowledge base in order to intensify technological learning efforts.
3. Internationalization, prior and new knowledge

The view presented here on the importance of prior knowledge resources to firms’ learning by doing parallels that expressed in previous research on SME internationalization. In the Uppsala model, at any given stage of a firm internationalization process, the acquisition of experiential foreign market knowledge is influenced by the knowledge gained during previous stages (Johanson & Vahlne, 1977). Also the literature on international entrepreneurship (IE) acknowledges the role that prior knowledge plays in this regard, though individual prior knowledge substitutes for firm-level prior knowledge. Specifically, this line of research posits that the knowledge embodied in prior managerial experience influences the learning process by importing previously learnt routines into the firm’s repertoires of emerging routines (Sapienza et al., 2006).

Previously, I suggested that via learning by doing in the downstream domain, SMEs can acquire market knowledge and that via learning by doing in the upstream domain, SMEs can acquire technological knowledge. Specifically, I proposed a positive relationship between downstream international activities and the acquisition of market knowledge (hypothesis 1) and a positive relationship between upstream internationalization and the acquisition of technological knowledge (hypothesis 2). Now, I propose that a firm well endowed with knowledge resources will be even more likely to 1) acquire market knowledge from performing international downstream activities, and 2) acquire technological knowledge from performing international upstream activities. Thus:

Hypothesis 5a: Prior knowledge enhances the positive relationship between downstream international activities and the acquisition of market knowledge.
Hypothesis 5b: Prior knowledge enhances the positive relationship between upstream international activities and the acquisition of technological knowledge.

3.5.2 Prior knowledge and other forms of learning from internationalization

A firm’s stock of prior knowledge resources makes it possible for companies to engage in different types or forms of learning other than learning by doing. As already mentioned, the capacity to recognize and draw into the firm unfamiliar and not previously available knowledge depends on what the firm knows when it encounters the new knowledge (Autio et al., 2000). As Cohen and Levinthal (1990) remark, “the prior possession of relevant knowledge and skills is what gives rise to creativity permitting the sort of associations and linkages that may have not been considered before” (p. 130).

Hence, scarcity of prior knowledge limits a firm’s ability to seek and recognize the value of externally held knowledge (Huber, 2004). For instance, scarce endowment of prior knowledge limits a firm’s vicarious learning. Eden
Levitas and Martinez (1997) argue that the mere observation of competitors possessing relevant knowledge will not lead to its full acquisition by knowledge-deficient firms. Limited prior knowledge also restricts a firm’s learning from international business actors. Indeed, without an adequate knowledge base firms cannot recognize or grasp the knowledge that customers or alliance partners provide (Huber, 2004). For instance, limited prior knowledge restricts a firm’s ability to gain technological insights from interacting with foreign business customers (Yli-Renko et al., 2001). Similarly, Lane and Lubatkin (1998) suggest that a firm must also possess some amount of prior knowledge to acquire knowledge incoming from international alliance partners. Also in their 2001 follow-up study, Lane and his colleagues find support for a positive relationship between a firm’s prior knowledge and learning from international partners (Lane et al., 2001). Likewise, Shenkar and Li (1999) show that the possession of complementary knowledge is a prerequisite for knowledge search in international cooperative ventures.

Earlier, I proposed a positive relationship between downstream international activities and the acquisition of technological knowledge (hypothesis 3a) and a positive relationship between upstream internationalization and the acquisition of market knowledge (hypothesis 4a). Now, I propose that a firm that is well endowed with knowledge resources will be even more likely to 1) acquire market knowledge from performing international upstream activities, and 2) acquire technological knowledge from performing international downstream activities. Thus:

Hypothesis 6a: Prior knowledge enhances the positive relationship between downstream international activities and the acquisition of technological knowledge.
Hypothesis 6b: Prior knowledge enhances the positive relationship between upstream international activities.
4 New knowledge, knowledge processes and firm growth

4.1 Introduction

This chapter focuses on the growth implications of the new knowledge acquired from internationalization. It also considers the role of processes of knowledge transformation and exploitation. Specifically, it addresses the following research questions: What are the effects of the knowledge acquired from internationalization on different growth outcomes? What is the role of knowledge processes in these relationships?

These research questions relate to the second part of my research model. By going deeper into the literature used to build the research model, this chapter frames the relationships illustrated in the second part of the model and derives testable hypotheses. A more detailed illustration of the expected relationships is displayed in Figure 4.1, which also shows the second part of the research model in relation to the rest of the model.

The chapter begins by discussing the multifaceted relationship between knowledge obtained from internationalization and different growth outcomes. In the literature at the heart of my research model I identify three complementary views on these relationships and derive corresponding hypotheses. Subsequently, the discussion and the related hypotheses highlight the moderating role of processes for the transformation and exploitation of knowledge.
4.2 Knowledge acquired from internationalization and firm growth

The theoretical perspectives at the root of my model recognize the centrality of knowledge augmentation for a firm’s future expansion. Despite this common ground, these theoretical perspectives appear to differ in terms of the role and the growth implications of new knowledge. On the basis of these differences, three views on the role of knowledge and its growth implications can be identified. These views are summarized in Table 4.1.
4. New knowledge, knowledge processes and firm growth

Table 4.1 Views on the role of knowledge resources and their growth implications. Source: the author, inspired by Prashantham (2005)

<table>
<thead>
<tr>
<th>Theoretical perspectives</th>
<th>Role of knowledge</th>
<th>Growth implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Some KBV proponents</td>
<td>Rent-yielding role</td>
<td>Firm’s growth relative to competitors</td>
</tr>
<tr>
<td>- Internationalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perspective</td>
<td>Commitment-regulating</td>
<td>International growth</td>
</tr>
<tr>
<td>- Organizational capability perspective</td>
<td>role</td>
<td></td>
</tr>
<tr>
<td>perspective</td>
<td>Enabling role</td>
<td>Entrepreneurial growth</td>
</tr>
<tr>
<td>- Uppsala internationalization model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- International new venture perspective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some proponents of the knowledge-based view (KBV) (among others Grant, 1996a, 1996b, 2004), the internalization perspective (Buckley & Casson, 1976; Dunning, 2000) and the organizational capability perspective (Madhok, 1997) stress the rent-yielding role of knowledge. Knowledge is seen as an idiosyncratic organizational asset which may be a source of competitive advantage or, as stated by Grant and Baden-Fuller (2004, p. 66): “Knowledge is the overwhelmingly important productive resource in terms of market value and the primary source of Ricardian rents”. Likewise, the internalization perspective (Buckley & Casson, 1976) and the organizational capability perspective (Madhok, 1997) see international firms as possessors of some rent-yielding, firm-specific advantages, primarily in the form of know-how. By leveraging these unique knowledge assets, a firm can improve its relative performance vis-à-vis its rivals; and growth is achieved as a firm grows more than the majority of its competitors.

The Uppsala internationalization model (Johanson & Vahlne, 1977) assigns a commitment-regulating role to knowledge (Yli-Renko et al., 2002). The knowledge gradually accumulated by a firm increases both the firm’s ability to organize and manage international activities and its willingness to commit more resources to these activities (Johanson & Vahlne, 1977). In turn, a firm’s increased commitment in foreign markets translates into an increased presence in and dependence upon those foreign markets. As explained by Johanson and Vahlne (2003, p. 91), “Through commitment to foreign markets the firm becomes dependent on these markets. It becomes bound to the markets […] For instance, when operating in an expanding market the firm will have reason not only to serve that market to the same extent as earlier but to increase its investments in the market in a way that corresponds to its growing dependence on the sales in that market”. Thus, knowledge resources incoming from international markets increase a firm’s growth in international markets.

While the Uppsala internationalization model emphasizes the behavioral constraints imposed by the firm’s existing knowledge base, the international
new venture perspective “stresses the growth amplification capacities inherent in knowledge resources” (Sapienza et al., 2003, p.2). Accordingly, the international new venture perspective assigns an enabling role to knowledge: it provides firms with a platform for proactively pursuing opportunities and taking entrepreneurial actions (Sapienza et al., 2006; Yli-Renko et al., 2002). Entrepreneurial actions undertaken by international SMEs might result in entrepreneurial growth, such as the development and commercialization of new products, the entry into new markets and/or the service of new customers (Hitt, Ireland, Camp, & Sexton, 2001).

These views on the role of knowledge and its growth implications are complementary rather than contradictory. In Penrose’s framework, knowledge resources are relatively malleable: they might give rise to different sets of services and, consequently, might play different roles (Turvani, 2002). Taken alone, each of the aforementioned views emphasizes one side of the multi-sided relationship between knowledge resources and firm growth; taken together, they consider a wide set of knowledge roles and a vast range of growth implications (Prashantham, 2005; Sapienza et al., 2006). It could even be argued that each view emphasizes a different aspect of Penrose’s theory of the growth of the firm (Yli-Renko et al., 2002).

The rent-yielding role of knowledge is consistent with Penrose’s view that firms can make efficiency gains and grow by exploiting underutilized resources (Lockett, 2005). The commitment-regulating role of knowledge highlights the path-dependent character of firm growth. The enabling role of knowledge is consistent with Penrose’s view that growth is an entrepreneurial process which is driven by entrepreneurs seeking to exploit productive business opportunities, and in which the ability to perceive productive opportunities depends upon the learning taking place in the organization. Consequently, in SMEs, new knowledge acquired from internationalization can be expected to play multiple roles and have several growth implications. In the following, I develop hypotheses which specify the different growth implications of newly acquired knowledge.

As I discussed in Chapter 2, it is important to note that Penrose was not interested in the resources that yield rents/sustainable competitive advantage (SCA) in equilibrium through isolating mechanisms (Foss, 2002). As explained by Lockett (2005, p. 87): “Penrose’s notion of competitive advantage was linked to the acceptance of the disequilibrium approach and very much removed from the equilibrium based theory of SCA. That is, firms may have a position of advantage but that advantage will be eroded over time […]. This position echoes that there are no barriers to entry/isolating mechanisms in the medium long term.”

84
4. New knowledge, knowledge processes and firm growth

4.2.1 New knowledge and firm growth relative to competitors

A firm’s advantage over rivals is arguably rooted in its intangible, firm-specific resources (Barney, 1991; Kogut & Zander, 2003a). Market knowledge and technological knowledge generated from internationalization have a great potential to contribute to SME growth relative to that of major competitors. First, new market and technological insights enable SMEs to improve their competitiveness by predicting and responding to changes in customers’ preferences, creating and maintaining durable relationships with customers, and channel members (Song, Droge, Hanvanich, & Calantone, 2005), as well as operating more efficiently (Wolff & Pett, 2006). Second, knowledge resources have been found to enhance firm performance in dynamic environments (Miller & Shamsie, 1996). Consequently, knowledge resources are particularly crucial for the success of SMEs competing in highly dynamic and competitive international markets (Majocchi & Zucchella, 2003).

Third, the knowledge base generated from internationalization is rooted in each firm’s experience (Kogut & Zander, 1993). Consequently, it is largely idiosyncratic and difficult to be imitated or replicated by competitors (Madhok, 1997). Etemad and Wright (1999) view such internally developed resources as sources of a firm-specific advantage over competitors. Similarly, Liesch and Knight (1999, p. 358) argue that: “precisely because it is difficult to obtain, a surplus of tacit knowledge on internationalization is likely to provide a firm with competitive advantage”. When it comes to using the newly acquired knowledge base, Liesch and Knight (1999) suggest that SMEs might have an inherent advantage over larger firms. SMEs are more innovative, more customer oriented and faster in implementing new technologies and meeting customers’ needs. Likewise, Karagozoglu and Lindell (1998) comment that flexibility and responsiveness to change give smaller firms an advantageous platform: smaller firms are able to exploit the newly acquired knowledge in ways that larger firms can not.

These arguments are supported by Yli-Renko et al. (2001), who found that the acquisition of market and technological knowledge in young technology firms contribute to their ability to build competitive advantage. Further, Yeoh (2004) found that a firm’s technological learning and market learning are positively related to its performance. A study by Lu and Beamish (2001) shows that the performance and competitiveness of international SMEs improve as new knowledge is developed. There is also evidence that new knowledge resources generated from internationalization support a firm’s superior growth in international markets. For instance, Knight and Cavusgil’s (2004) study confirmed that each firm’s unique knowledge base derives its superior growth from international markets. This evidence suggests:

Hypothesis 7a: The knowledge acquired from internationalization is positively related to a firm’s overall growth relative to that of its competitors.
Hypothesis 7b: The knowledge acquired from internationalization is positively related to a firm’s international growth relative to that of its competitors.

4.2.2 New knowledge and international growth

Market and technological knowledge generated from internationalization also contributes to a firm’s growth in international markets (Kogut & Zander, 1992; Vachani, 1998). The Uppsala internationalization model suggests that market knowledge, developed when managing foreign activities, supports further foreign expansion (Johanson & Vahlne, 1977). Specifically, the newly developed international expertise and skills enable firms to overcome the risks and disadvantages of foreignness. Support for this view can be found in Eriksson et al.’s (1997) study. The authors show that knowledge about foreign markets reduces perceptions of the costs of further internationalization, which may lead to an increased commitment in those markets. In a study of Norwegian firms, Juul and Walters (1987) found that market knowledge gathered by a foreign subsidiary in one country is used for exporting in other countries. Further, the findings of Hart and Tzokas (1999) suggest that export marketing information enhances international growth, and Presutti et al.’s (2007) study shows that market knowledge acquired from key foreign customers enhances sales growth in international markets.

The acquisition of new technological insights may boost international expansion. First, technological knowledge renders the firm less constrained by distance or national boundaries (Autio et al., 2000). There is evidence that technology-intensive SMEs are indeed significantly more export-oriented than their less technologically-based counterparts (Keeble, Lawson, Lawton Smith, Moore, & Wilkinson, 1998). Second, international expansion is a means of exploiting the newly acquired technological insights. This is particularly true for resource-constrained SMEs, which can ill afford to underutilize the resources at their disposal. For instance, Bell et al. (2004) report that internationalizing SMEs accelerated their cross-border expansion to motivate the acquisition of new technologies. Further, there is evidence that international growth is enhanced by a firm’s technological capabilities (Leiblein & Reuer, 2004), process innovation (Lefebvre, Lefebvre, & Harvey, 1993), and product innovation (Wolff & Pett, 2006).

In sum, new market and technological knowledge supplements the intrinsic deficiencies in SME resources and capabilities which impose constraints on their international growth (Etemad & Wright, 1999; Lu & Beamish, 2001). This argument holds for growth-oriented SMEs, too. Nummela, Puumalainen and Saarenketo (2005) study suggests that growth-oriented companies want to grow internationally, but only a few of them achieve growth in international markets because of limited knowledge resources. This evidence suggests:
4. New knowledge, knowledge processes and firm growth

Hypothesis 8: The knowledge acquired from internationalization is positively related to a firm's international growth.

4.2.3 New knowledge and entrepreneurial growth

As discussed above, knowledge resources generated from internationalization also enable the identification and exploitation of previously unexploited opportunities. As such, they foster entrepreneurial growth: the development and commercialization of new products, the entry into new markets and/or the service of new customers (Hitt et al., 2001).

As explained by Wiklund and Shepherd (2003b, p. 1308), “knowledge about market and technology are two strands of procedural knowledge that […] increase a firm’s ability to discover and exploit opportunities”. Overall, new knowledge, both about market and technology, might lead to a modification and restructuring of the theory in use in the firm and mental models (Blomstermo, Eriksson, & Sharma, 2004). Nonaka and Takeuchi (1995) suggest that periodic ‘breakdowns’ of routines, habits, and cognitive frameworks in an organization might inspire individuals’ intention and commitment throughout the organization. When illustrating the consequences of such a breakdown in a Japanese firm, Nonaka and Takeuchi (1995, p. 98) note: “these employees, who had pride in the traditional core business, felt that unless they could […] develop a completely new product based on a unique technology, their ability to improve competitiveness would be questioned”. Hence, new knowledge might help the firm to fashion new behaviors through which unexploited market opportunities can be pursued (Ireland, Hitt, Camp, & Sexton, 2001).

Market knowledge contributes to the discovery and exploitation of opportunities in at least two ways. First, experiential market knowledge makes it possible for the firm to perceive and act upon ‘concrete’ opportunities, such as responding to their customers’ problems and proposing alternative solutions (Johanson & Vahlne, 1977). Shane’s (2000) study confirms that people’s prior knowledge of customers’ problems influences the discovery of new products and services. Second, foreign market knowledge reduces the liability of foreignness of SMEs (Hymer, 1970). Hence, knowledge allows SMEs to take advantage of new local opportunities, which are not available to purely domestic firms (Andersen & Foss, 2005). As confirmed by Chetty and Campbell-Hunt’s (2003) study, knowledge acquired through internationalization may open whole new markets and new products.

Also new technological knowledge can enhance the discovery and exploitation of opportunities (Wiklund & Shepherd, 2003b). First, new technological knowledge provides a base through which innovations (Leonard-Barton, 1995) and new business methods (Knight & Cavusgil, 2004) can be developed. New technological insights might also facilitate the development of new core competences and thereby decrease a firm’s likelihood of falling into
competency traps (Levitt & March, 1988). Second, new technological knowledge provides firms with a platform for targeting new customers and new markets (Autio et al., 2000; Zahra et al., 2000). Abernathy and Clark (1985) found that technologies can be used to create new market niches. Notably, firms do not need to anticipate the new applications as they accumulate new technological skills and knowledge. Cattani (2005), in a study of the emergence and evolution of fiber optics technology, shows that firms can generate economically valuable innovations from skills and knowledge already acquired, instead of creating new resources from scratch. Hence, SMEs can enter new markets or serve new customers by capitalizing on their diverse technological expertise (Wind & Mahajan, 1997).

New opportunities could be discovered and exploited in both domestic and international markets (Yli-Renko, Autio, & Tontti, 2000). Given that market and technological knowledge resources allow SMEs to act in new ways (Huber, 1991), we can expect SMEs to do things differently and accomplish new things in the home market as well as abroad. Thus,

Hypothesis 9a: The knowledge acquired from internationalization is positively related to a firm’s entrepreneurial growth in domestic markets.

Hypothesis 9b: The knowledge acquired from internationalization is positively related to a firm’s entrepreneurial growth in international markets.

Penrose (1959/1995) maintains that at any time there are limits to the number of opportunities an entrepreneur can ‘see’ and take advantage of. She further holds that the ability to ‘see’ previously unrecognized opportunities – labeled entrepreneurial judgment – is contingent upon the knowledge and insights within the firm (Ghoshal, Hahn, & Moran, 2002). Similarly, the entrepreneurship literature maintains that a person’s idiosyncratic knowledge “creates a ‘knowledge corridor’ that allows him/her to recognize certain opportunities, but not others” (Shane, 2000, p.452). Hence, ceteris paribus, new market knowledge and technological knowledge generated from international markets are more likely to enhance the discovery and exploitation of opportunities in international markets than in domestic markets. This prediction is in line with Eriksson et al.’s (1997) view, which assumes that knowledge acquired from internationalization is, to a certain extent, contentwise different from other types of knowledge, such as the knowledge acquired from domestic operations. Consequently, it is more likely to influence a firm’s entrepreneurial growth in international markets than in domestic markets. Thus,

Hypothesis 9c: The relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets is stronger than the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets.
4. New knowledge, knowledge processes and firm growth

4.3 The moderating role of processes of knowledge transformation and exploitation

The previous hypotheses consider the impact of new market and technological knowledge on different growth outcomes. The literature on which I build my research model suggests that these effects may be enhanced by the processes through which organizations manage knowledge. As discussed when building the theoretical model, Penrose’s theory of the growth of firms acknowledges the relevance of these knowledge processes. In Penrose’s view, knowledge assets are of value to the extent that they are actually integrated and applied in the operations of an organization. Thus, a firm’s ability to pool and apply its knowledge influences the prospect of successful action.

The literature on absorptive capacity takes this discussion one step further and focuses on the organizational processes directed at communicating, sharing, transferring, and exploiting knowledge. As already discussed in Chapter 2, the labels and definitions for these knowledge processes vary widely. Drawing on Zahra and George (2002) I consider the processes of knowledge transformation and exploitation.

In the following, I develop hypotheses concerning the moderating role of these knowledge processes on the relationship between knowledge resources and growth outcomes.

4.3.1 New knowledge, knowledge processes and firm growth relative to competitors

Knowledge processes may enhance the rent-yielding role of new knowledge and its impact on firm growth relative to competitors. The knowledge-based view maintains that for knowledge to yield an advantage it must be integrated and deployed effectively (Grant, 1991, 1996a, 1996b). Also the organizational capability perspective highlights the processes through which knowledge is integrated, diffused, deployed, and exploited. These knowledge processes enhance the value of new knowledge resources and their rent-earning potential (Madhok, 1997).

However, as noted by Lane et al. (2006), these theoretical developments have not been fully grounded in empirical reality. There is a lack of research into the role of knowledge processes in affecting a firm’s competitive advantage (Eisenhardt & Santos, 2002). Even so, there are a number of studies which focus on one or a few knowledge processes and their impact on superior firm performance and growth. For instance, Andersen and Foss (2005), in a study of international firms in the computer products industry, show that information
technology facilitates the recombination of knowledge across geographical boundaries, which in turn leads to superior growth. In field interviews with several enterprises, Kohli and Jaworski (1990) noted that coordinated efforts among different organizational functions allowed for the transformation and recombination of knowledge and were instrumental for the firm’s competitiveness. Also a recent study by Yeniyurt, Gavusgil and Hult (2005) reveals that processes and routines for knowledge exploitation, such as those processes which allow a firm to initiate actions based on information generated and disseminated across the organization, positively influence its global market advantage. This discussion leads to the following hypotheses:

Hypothesis 10a: Knowledge processes enhance the positive relationship between knowledge acquired from internationalization and growth relative to competitors.

Hypothesis 10b: Knowledge processes enhance the positive relationship between knowledge acquired from internationalization and international growth relative to competitors.

4.3.2 New knowledge, knowledge processes and international growth

Knowledge processes may also enhance the regulating role of new knowledge and its impact on international growth. For international knowledge to be effective in disciplining a firm’s international expansion, it must be effectively transferred internally (Eriksson et al., 1997) and recombined with the existing knowledge base. This reduces the likelihood of incorrect assumptions about the new knowledge (Huber, 1999). In addition, processes of knowledge transformation allow smaller firms to make the best use of the new knowledge resources. Knowledge can be combined with fixed assets (e.g. sales and distribution channels or manufacturing resources) in foreign markets (Autio et al., 2000; Haathi, Madupu, Yavas, & Babakus, 2005) to lower internationalization costs.

Also processes of knowledge exploitation, such as those processes which encourage the modification of products and services to meet the needs of foreign markets (Knight, 2001), are important for the increased commitment of SMEs in foreign markets. Empirically, Eriksson and Chetty (2003) find that absorptive capacity affects the perception of the lack of foreign market knowledge. Knowledge processes make it easier for the firm to have a realistic perception of its knowledge base and influence the firm’s commitment and positive disposition towards foreign activities. On the contrary, the lack of internal processes for the transformation and exploitation of new knowledge might endanger a firm’s further internationalization efforts. Karlsen et al. (2003) report the obstacles faced by a Norwegian firm attempting to further
expand into the Russian markets. Because much of the information and insights gained from prior internationalization were not properly shared and transferred across the firm, the company incurred high costs when attempting to further penetrate the Russian market. This discussion leads to the following hypothesis:

Hypothesis 11: Knowledge processes enhance the positive relationship between knowledge acquired from internationalization and international growth.

4.3.3 New knowledge, knowledge processes and entrepreneurial growth

Knowledge processes may also enhance the enabling role of new knowledge and its impact on entrepreneurial growth. Given that new knowledge generated from internationalization is context-specific and culturally bound (Zahra, Hayton, Marcel, & O’Neill, 2001), its recombination with what the firm already knows is critical for fostering entrepreneurial action (Zahra et al., 2004).

First, the transformation of new knowledge is important for innovation (Galunic & Rodan, 1998; Huber, 2004). The new knowledge is acquired by and from individuals who are geographically dispersed (Buckley & Carter, 2004). Novelty might be enhanced by organizational processes which bring together the knowledge acquired at different places and from different sources (Buckley & Carter, 1999). The literature maintains that recombining dispersed knowledge is problematic, since it entails complex systems for “tracking down and identifying all necessary ‘parts of the puzzle’” (Galunic & Rodan, 1998, 1198). This is arguably faster and less complex in SMEs (Buckley, 1997), giving a competitive edge to those SMEs which encourage knowledge transformation. Huber (2004) adds to this the fact that increased competition and faster changes in products and markets require recombination to be accomplished quickly. This strengthens even more the competitive edge of those SMEs which encourage knowledge transformation.

Second, processes of knowledge recombination entail the recognition of apparently incongruous sets of information (Zahra & George, 2002a). These processes might help SMEs in maintaining a balance between existing products and services and newer opportunities in the marketplace (Winch & Bianchi, 2006). Third and most importantly, processes of knowledge recombination shape a firm’s entrepreneurial mindset; for example, they change how the firm sees itself and its competitive environment (Zahra & George, 2002a). Thus, they might help entrepreneurs to ‘see’ new services and uses for the newly acquired knowledge (Penrose, 1959/1959).

Firms must also be able to act fast on new opportunities (Kohli & Jaworski, 1990). The presence of processes and routines which encourage the prompt use of the new knowledge in new or existing initiatives, plays to the strengths of SMEs. Knowledge exploitation is particularly important in SMEs. Compared
with large firms, SMEs are superior in the generation of new knowledge, but less capable of appropriating returns from these innovations (Acs & Preston, 1997). In addition, the possibility of gaining first-mover advantage is crucial for small, highly focused SMEs (Kohn, 1997). This discussion leads to the following hypotheses:

Hypothesis 12a: *Knowledge processes enhance the positive relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets.*

Hypothesis 12b: *Knowledge processes enhance the positive relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets.*
5 Method: Research design

5.1 Introduction

I begin this chapter by presenting my view on reality and knowledge as a precursor to the illustration of how I conducted the empirical part of my research. Thereafter, the choice of research design is introduced. The chapter continues by presenting the sample design and data collection. The chapter concludes with a short illustration of the analysis. The specific analysis techniques used to test the hypotheses will be further presented in Chapter 7 and Chapter 8, while the measurement of the key variables will be illustrated in Chapter 6.

5.2 My view on reality and knowledge

My research aims at investigating the relationships between downstream/upstream internationalization, (prior and new) knowledge, knowledge processes, and firm growth. I believe that these social phenomena exist in the world and not only in my mind. In addition, I believe that some reasonably stable relationships are to be found among social phenomena. Hence, the orientation that guides my work holds similarities with a realist view (Bhasker, 1975; Boyd, 1983; Papineau, 1985).

My realist beliefs are rather evident in the language I use throughout the thesis. For instance, in the introduction chapter I write: “At an aggregate level, there is evidence that SMEs with international activities experience higher growth rates than domestic SMEs”. My confidence in the possibility of identifying fairly stable relationships between phenomena is particularly evident in the model I develop to account for SME growth through internationalization (Figure 2.6) and in the hypotheses I develop in Chapter 3 and Chapter 4.

To say that social phenomena exist not only in my mind does not imply that they are the same as material things. Social phenomena are, for the most part, intangible or ‘unobservable’ (Hunt, 1990). Nevertheless, they exist and influence human and organizational activities because people construe them in common ways (Miles & Huberman, 1994). As pointed out by Nash, “the social bonds that constitute social systems are just as real, if not in the same way, as

---

5 In fairness it should be noted that several forms of philosophical realism exist (see Hjørland (2004) for a review).
the molecular bonds of things like sticks and stones” (p. 447). In the words of Hunt (1990, p. 11):

“…to the extent that there are theories that have long-run success in explaining phenomena, predicting phenomena, or assisting in the solution of pragmatic problems in society, we are warranted in believing that something like the postulated entities and their structure of relationships exists, that is, they truly represent or correspond to some reality external to the theorists”.

In line with the realist tradition I also recognize the fallibility of any knowledge claim (Sayer, 2000). There is no ‘god’s eye view’ which guarantees that we know the world with certainty (Hult, Ketchen, & Slater, 2005). When doing research, observations are theory-dependent and the background knowledge held by an observer can influence in major ways what is observed (Hanson, 1958). However, accepting that our accounts of the world are both bounded and perceptually laden does not make research invalid. If a theory works in practice, that is it has long-term success, gives an indication that something like what that theory postulates actually exists, whilst acknowledging that there may be more than one approximately correct way of accounting for it. Research contributes to the development of theories and to their critical testing with different methods and in different contexts (Tsang & Kwan, 1999).

When translating these concepts into my research, I believe that I can inquire into social phenomena (e.g. organizational knowledge), how they come about, and what their effects are. Specifically, I will investigate how these social phenomena are developed as well as what influence they have on organizational activities (Miles & Huberman, 1994). In the light of this discussion, questions might arise. Having accepted that my perception of the phenomena under study is influenced by my prior knowledge and existing theories, and having asserted that there is nothing which can be considered as absolutely certain, what is the nature of the knowledge to be generated by my thesis? With this work, I build on existing theories and hope to produce new knowledge that can be expected to be meaningfully shared by others and that, therefore, might inspire them in productive ways.

Implications for organizational knowledge

There is a link between my orientation presented above and my view of organizational knowledge. Building on existing theories, I define organizational knowledge as an intangible resource which a firm has and can use. Organizational knowledge is a product of human action and of complex social interplay. Knowledge in an organization is also dependent on what is already known to members of the organization and what kinds of information are present in the organizational environment (Simon, 1991). All of this renders organizational knowledge profoundly connected with the conditions under which it was acquired (Dodgson, 1993) as well as with the processes through which it is internally managed (Mahoney, 1995).
5. Method: Research Design

Of course, this is one possible view of organizational knowledge, very much in line with mainstream KBV. Because any way of seeing becomes a way of not seeing, certain elements of myopia are inherent in my framework. For instance, I overlook aspects of organizational knowledge, such as its interpretation or meaning, which are instead highlighted by critical and postmodern epistemologies (for a review see Styhre (2003)). In addition, there are certain risks associated with defining organizational knowledge as a resource. First, one might support a static view of organizational knowledge (Empson, 2001). Second, one might presume that organizational knowledge can be easily traded or exchanged (Spender, 1996b). These risks can be minimized by stressing the intangible and firm-specific nature of organizational knowledge. In my framework, organizational knowledge does not originate from the purchase or transfer of pieces of knowledge. It is rather a dynamic product of social processes and, as such, it changes over time.

5.3 Research design

The research design is the plan for how the research will be conducted (Creswell, Plano Clark, Gutmann, & Hanson, 2003). It is often argued that the choice of research design is related to the researcher’s view on social reality and knowledge. For instance, Burrell and Morgan (1985, p.2) maintain that “different ontologies, epistemologies and models of human nature are likely to incline social scientists towards different methodologies”. Important in this passage is the verb ‘to incline’, which implies a tendency to favor one research design over others, yet not the imprisonment in a philosophical paradigm. My choice of research design is not solely inspired by my philosophical stance. It is also the result of a concurrent and iterative process involving also the demands of my inquiry context and the information I need to answer the questions I set forth.

The overall research model and hypotheses suggest causal relationships between pairs of variables. Causality implies one factor causing another. This can be addressed by a quantitative approach—where the term ‘quantitative’, broadly speaking, refers to having many cases, applying formal measurements, and using statistical analysis techniques (Davidsson, 2004).

Basically, quantitative data can be collected through surveys, experiments (Bryman & Cramer, 1999; Orum & Feagin, 1991), and secondary sources. For my study, a survey method was chosen over the experiment method, because of the complexity of the relations investigated. As noted by Bryman and Cramer (1999), many variables cannot be manipulated, which is the basic feature of experiments. Hence, their relationships with other variables can only be examined through a survey. A survey entails the collection of data on a number of variables from a large number of cases (Orum & Feagin, 1991). In my study,
the ‘cases’ surveyed are firms or, rather, small and medium-sized firms. Indeed, the study’s unit of analysis is the firm, and the theories I use to build my research model, starting from Penrose’s theory of the growth of the firm, are firm-level theories. Data on these cases, when available, were also gathered from secondary sources, though these secondary data alone would not have been enough for the study. As is well explained by Davidsson (2004, p. 143): “Secondary data are, to a large extent, as streetlights. They do illuminate some area but they do not necessarily cast light on the issue you are interested in”. The data for measuring the key variables of my study (e.g. organizational knowledge) cannot be found in registers.

To establish causal relationships in survey studies it is important to measure the cause before the effect (Menard, 2002). This calls for a longitudinal study, which involves collecting data on the causes before the data on the effects. Investigating the causal relationships set forth in my model is further complicated by the fact that the theories at the heart of my research suggest a non-recursive pattern of relationships: causal influences flow not only from internationalization to acquisition of knowledge, but also from acquisition of knowledge to internationalization. In this case, it becomes even more difficult to adequately model the process with only cross-sectional data—an i.e. data collected at the same point in time (Menard, 2002). Hence, in my research I use a longitudinal design.

In longitudinal studies it is difficult to establish the ‘right’ temporal design, that is, to decide on the length of time between the different data collection points. Ultimately, this choice depends on the relationships to be tested. For the relationship between internationalization and acquisition of new knowledge I chose a short time span: six months. The reasoning for choosing this time span is twofold. First, it is reasonable to expect that, given the smaller size of the firms, the insights gained from international operations are quickly shared throughout the organization. Second, and most importantly, CEOs might not recall correctly the know-how their firms gained from international activities, if waiting too long (Golden, 1992). For the relationship between knowledge acquired from internationalization and firm growth a much longer span was chosen: six years. This is mainly because I am interested in the long-term implications of the knowledge acquired from internationalization. In addition, it responds to the call for assessing firm growth through internationalization over a longer period of time (McDougal and Oviatt, 1996). It is important to mention that there are also pragmatic reasons behind the choice of both: the six-month and the six-year time lags. These pragmatic reasons will become more evident in the next section as I proceed by illustrating the sample design and the data collection.
5.4 Sample design and data collection

When choosing an appropriate sample, what is important is not only the statistical, but also the theoretical representativeness of the sample—the cases studied should be relevant for the theory I want to test (Davidsson, 2004). My research aims at investigating the relationships between upstream/downstream internationalization, (prior and new) knowledge, knowledge processes, and firm growth in SMEs. Hence, the cases studied should comprise SMEs which have international activities in the downstream (foreign sales or marketing directed at international markets) or upstream (sourcing from abroad, production or R&D completed abroad) domain. Sweden is a suitable context for this study. First, in small market countries, such as Sweden, internationalization is common. Second, in Sweden the response rates in survey studies tend to be higher than those in other countries (Harzing, 2000), especially when the targeted population comprises small companies (Davidsson, 2004). However, in Sweden—as probably in most other countries—there are no comprehensive lists of SMEs which have international activities in the downstream or upstream domain. Hence, it was not possible to strictly follow the guidelines to an ideal probability sample design, which would entail identifying a sampling frame of all international SMEs in Sweden and then selecting a random sample from that population. The approach had to be different, identifying a sample of eligible international SMEs via a screening sample.

At Jönköping International Business School (JIBS) a longitudinal study was initiated and led by Per Davidsson to investigate entrepreneurship and growth issues in small and medium-sized firms. This study’s sample, which is used as a screening sample, was designed to be theoretically representative of SMEs, and statistically representative of SMEs in four broad industry groups (manufacturing, professional services, wholesale/retail, and other services) in Sweden. Initially, the data were collected at three points in time through three survey instruments: a telephone interview in spring 1997, a mail questionnaire in the fall of 1997, and a telephone interview in spring 2000. Data on the focal screening issue—whether or not the respondents reported having at least one (upstream or downstream) international activity—were included in the telephone interview in the spring of 2000. Out of the 1,633 firms which responded to the telephone interview, 885 firms reported being involved in at least one of the following activities: foreign sales, marketing directed at international markets, sourcing from abroad, and production or R&D completed abroad. These 885 international SMEs were thus selected as eligible cases and followed up longitudinally. In fall 2000, these firms received a mail questionnaire. Then, in spring 2006, they were contacted again via telephone, and, in the fall, received a mail questionnaire. The development of the sample is graphically displayed in Figure 5.1.
It is appropriate to point out that I was not involved in the design of the overall study initiated in 1997 and in the first four data collection points. However, I wrote a codebook for those data, designed and led the subsequent data collections carried out in 2006, and compiled the data from external sources.
Below, I provide more information on the construction of the original sample, the sample development, the fielding procedures, the response rates, and the survey instruments.

5.4.1 The construction of the original sample

The original sample was obtained from Statistics Sweden and comprises 2,455 privately owned firms. The sampling frame was constructed by Statistics Sweden. It covered all privately owned small and medium-sized firms registered in Sweden as AB in the four broad industry groups listed above. Small and medium-sized enterprises were defined in terms of number of employees: 10-49 employees for small-sized firms and 50-249 employees for medium-sized firms (which are the European Union’s cutoff for small and medium-sized enterprises, respectively).

The businesses’ industrial sectors were defined and framed according to the Standard Swedish Industrial Classification (SNI 92). The sampling frame was stratified using three criteria to meet the survey requirement of providing a diverse sample with analyzable subgroups. The stratifying criteria were:

- Employment size class, divided into two groups: 10-49, 50-249.
- Corporate governance, divided into three groups: independent firms, members of company groups with up to 249 employees (small company group), and members of company groups with 250 or more employees (large company group).
- Industrial sector, divided into four groups: manufacturing, professional services, wholesale/retail, and other services.

The sampling frame was divided into 24 strata (4 industrial sectors * 2 size classes * 3 corporate governance groups), and 110 firms were drawn from each stratum (or all firms if the total number was less than 110), yielding a stratified sample of 2,455 firms.

5.4.2 Sample development and data collection

In spring 1997 the 2,455 firms comprising the original sample were contacted and interviewed over the telephone. The telephone interview gathered information on the CEO characteristics (i.a. age, gender, education) and CEO

---

6 The Swedish Standard Industrial Classification (SNI 92) is a statistical classification for grouping production units into industrial categories. SNI 92 is based on the statistical classification of economic activities in the European Community and was adopted in Sweden in 1992. It is a hierarchical classification comprising five levels. The first level identifies 17 main industrial sectors. Each industrial sector is then subdivided into major groups (second level), groups (third level), subgroups (fourth level) and detailed groups (fifth level). A 5 digit code is used to identify each industry subunit.
experience (i.a. prior managerial and working experience). It also collected data on the firms’ previous and future development (i.a. growth relative to competitors, growth aspirations). Out of the original 2,455 firms, information was obtained from 2,034 firms. Reasons for non-response are known: 104 firms could not be reached or contacted by any means, and 166 firms refused the interview. These 270 firms were dropped from the sample along with 30 firms which had suspended their operations and 121 firms which were deselected for technical reasons, i.e. they were already involved in other studies conducted at JIBS.

In fall 1997, a questionnaire was mailed to the 2,034 SMEs that had completed the telephone interview. The questionnaire included scales to measure the firms’ endowment of knowledge resources as well as the characteristics of their competitive environment (i.a. environmental heterogeneity). In addition, the respondents were asked to provide information on the type of relations that their company had with other companies in Sweden as well as abroad. The mail questionnaire was returned by 1,283 firms.

A further screening of all firms interviewed by telephone in 1997 was carried out in order to access their “appropriateness” as members of the sample, that is their genuine status of “privately owned businesses”. Although government-owned companies were excluded from the sampling frame, a few of them were selected for the initial sample because they were technically registered as AB companies. As a result of this process, 14 companies out of the 2,034 interviewed by telephone were excluded from further investigation.

The screening questions to distinguish between international and domestic SMEs were included in the follow-up telephone interview carried out in 2000. Specifically, in spring 2000, the 2,020 privately owned SMEs that completed the telephone interview in 1997 were contacted again and interviewed over the telephone. The interview focused on the firms’ international activities, i.e. foreign sales, marketing directed at foreign markets, purchases from abroad, and production and R&D conducted abroad. It also gathered information on CEO characteristics (i.a. age, gender, education) and CEO experience (i.a. prior managerial and working experience). 1,633 firms responded to the telephone interview and 885 reported having at least one of the aforementioned international activities.

These 885 firms were selected as an eligible sample of international SMEs and were mailed a questionnaire in fall 2000. The questionnaire investigated the firms’ acquisition of know-how and insights from international operations. 436 firms returned the mail questionnaire.

In 2006 a new data collection was launched to follow up the development of the 885 international SMEs. Prior to contacting these firms, their status was checked in two different data sources (i.e. Affärsdata and Amadeus). It was revealed that 218 firms had suspended their operations or changed their legal
5. Method: Research Design

form of business and they were dropped from the sample. In spring 2006, attempts were made to contact by telephone those 667 firms which were still in business and had not been taken over. A short telephone interview was designed to gather information on the firms’ upstream/downstream international activities. Out of the selected 667 firms, 109 firms could not be interviewed as they either refused the interview or could not be reached, 3 firms did not complete the questionnaire, but still wanted to be part of the study, and 555 completed the telephone interview. Those 555 which completed the telephone interview and the 3 firms which had shown interest in the study, received a mail questionnaire in fall 2006. The questionnaire included scales to measure the firms’ growth and internationalization as well as organizational processes for the transformation and exploitation of knowledge. 311 firms responded to the mail questionnaire.

The targeted respondent was the CEO. This choice was made in the light of the key role played by the CEO in SMEs (Wiklund, 1998). In smaller firms, chief executives are directly involved in the business (Preisendorfer & Voss, 1990) and have first-hand information on what is going on in the firm (Yusof & Aspinwall, 2000). In addition, decisions concerning the internationalization of smaller businesses rest very much in the hands of the CEOs (Coviello & Munro, 1997).

The CEOs’ answers to the surveys’ instruments were combined with a series of separated field data. These additional sets of information were partly provided by Statistic Sweden and partly gathered from two datasets, Amadeus and Affärsdata. Amadeus is a financial database that, combining data from over 30 specialist regional information providers (IPs), supplies 10 years of detailed accounting and ownership information on all European incorporated companies. Also Affärsdata is a financial database that provides detailed accounting and ownership information on Swedish companies.

The following information was collected by Statistics Sweden from various registers: firm size class in 1997; firm governance type; start-up year and week; firm industrial sector, according to SNI 92, in 1997 and in 2000; number of employees in 2000. The following data were taken from Amadeus and Affärsdata: names and locations of firms and firm governance type.

These findings are in line with available official statistics on the survival of Swedish firms. In 2006, 5,249 firms went bankrupt out of a total of 337,330 firms, yielding an exit rate of circa 0.01 % for that year (www.ekonomifakta.se). In my sample, the percentage of cases dropped is slightly higher (0.04 % per year) because I also exclude firms which changed their legal form.

Specifically, the information was collected by Statistics Sweden from the Central Register of Firms and Establishments (CFAR) and the Swedish Patent and Registration Office (PRV).
5.4.4 Response rate

A study’s response rate (RR) is calculated by dividing the number of cases that responded by the number of cases selected for the study. Having identified the study’s sample through a screening sample makes it difficult to calculate and assess the study RR. Table 5.1 reports the RRs for the screening sample as well as for the sample of selected SMEs.

Table 5.1 Response rate (RR) for the screening sample and for the selected sample

<table>
<thead>
<tr>
<th>Survey instrument</th>
<th>Panel size (eligible cases)</th>
<th>Number of respondents</th>
<th>Number of respondents from the selected sample of international SMEs</th>
<th>Screening sample RR</th>
<th>Selected sample RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone interview 1997</td>
<td>2,455</td>
<td>2,034</td>
<td>885</td>
<td>82.9 %</td>
<td>-</td>
</tr>
<tr>
<td>Mail questionnaire 1997</td>
<td>2,034</td>
<td>1,283</td>
<td>590</td>
<td>52.2 %</td>
<td>66 %</td>
</tr>
<tr>
<td>Telephone interview 2000</td>
<td>2,020</td>
<td>1,633</td>
<td>885</td>
<td>66.5 %</td>
<td>-</td>
</tr>
<tr>
<td>Mail questionnaire 2000</td>
<td>885</td>
<td>436</td>
<td></td>
<td></td>
<td>49.2 %</td>
</tr>
<tr>
<td>Telephone interview 2006</td>
<td>667</td>
<td>555</td>
<td></td>
<td></td>
<td>62.7 %</td>
</tr>
<tr>
<td>Mail questionnaire 2006</td>
<td>558</td>
<td>311</td>
<td></td>
<td></td>
<td>37.4 %</td>
</tr>
</tbody>
</table>

Note: RR is defined as the percentage of the selected 885 international SMEs that completed the survey instrument.

It should be noted that the screening sample RR can be calculated up till spring 2000. Indeed, firms that reported having only domestic operations in 2000 were not followed up in 2006. In addition, for the telephone interviews in 1997 and in 2000, the selected sample RR cannot be calculated. Because of the design of the study, it would be 100 percent in both cases.

Despite these problems inherent in the design of the study, the screening sample RRs and selected sample RRs compare favorably with similar longitudinal studies of international SMEs (Westhead, Wright, & Ucbasaran, 2001). The response rates for the screening sample for the three successive data collection points were 82 percent, 52 percent, and 66 percent. Also a noteworthy valid response rate of 37 percent was achieved with regard to the surviving sample of international SMEs that had not been taken over.
5. Method: Research Design

5.4.5 Pre-testing of survey instruments

As illustrated above, the data were collected from the respondents through six survey instruments: three telephone interviews and three mail questionnaires. Most multiple-item scales used in the analyses were included in the questionnaires sent by mail.

The initial versions of all three mail questionnaires were pre-tested. A first version of the 1997 mail questionnaire was pre-tested on a convenience sample of 121 firms. These firms were selected from the pool of firms that act as host companies to JIBS business students. Also a first version of the 2000 mail questionnaire was pre-tested on a convenience sample of JIBS host companies. 92 firms completed the pilot version of the questionnaire. In 2006, the questionnaire was pre-tested on a smaller convenience sample. I identified ten CEOs of international small and medium-sized enterprises as well as ten scholars with an extensive experience of Swedish SMEs. These individuals were asked to complete the questionnaires and provide comments and feedback on the question items. They were also asked to suggest improvements. The interviews revolved around issues such as the formulation and clarity of the question items, their applicability to Swedish SMEs, and the overall structure of the questionnaire.

After pre-testing, the questionnaires were refined, e.g. some question items were excluded from the questionnaires and the phrasing of other question items was changed.

5.5 A short introduction to the choice of analysis

When conducting empirical analyses, there needs be a balance between sophistication and simplicity (Wiklund, 1998). I believe that a way to keep this balance is to test the hypotheses using regression analysis. Regression analysis comprises a family of techniques which can be used to test the causal relationships hypothesized. In addition, regression analysis tends to be less sensitive than other techniques to departures from normality, at least in the independent variables. Furthermore, regression analysis techniques are particularly suitable for estimating moderation effects (Hair et al., 2006). More information on the specific regression analysis technique used to test each of the hypotheses of the study will be provided in Chapter 7 and Chapter 8.

The research model could also be analyzed in its entirety through sophisticated statistical techniques, such as structural equation modeling. Structural equation modeling is a family of statistical models that permit estimating the series of interrelated relationships simultaneously (Hair, 1998). However, there are two features of SEM which render these techniques
unsuitable for testing my hypotheses. First, the most widely used technique to estimate SEM models is maximum likelihood estimation (MLE). MLE “is more efficient and unbiased when the assumption of multivariate normality is met” (Hair, Black, Babin, Anderson, & Tatham, 2006, p. 743). As will become more evident in the next chapter, some variables in my study are not normally distributed. Hence, I cannot use SEM with MLE. Techniques other than MLE are available for estimating models with variables which depart from multivariate normality. However, these techniques, such as the asymptotically distribution-free (ADF) technique, would need a substantial increase in sample size (Hair et al., 2006). Also this is a problem in my study. The sample with available information on all the variables in the research model is not large enough to use the ADF technique. Second, as pointed out by Hair et al. (2006), moderation effects between continuous variables are complicated to estimate and interpret with SEM techniques and thus not recommended.

I will, instead, use SEM to perform confirmatory factor analysis (CFA) and, thereby, to provide a confirmatory test of the measured variables I use in the analyses. Specifically, SEM will be applied to test the extent to which the measured variables, suggested by theory and emerged from factor analysis, represent the constructs in my model. More information on CFA will be provided in the next chapter. Here, it is important to mention that the two SEM features listed above will not be an issue when only performing CFA. First, some variables are normally distributed. Hence, SEM with MLE estimation can be used. To confirm the measures which are not normally distributed I can use the ADF technique. The sample size will be large enough, as it will comprise all cases with full information only on those variables. Second, CFA does not involve testing moderation effects.
6  Method: Measurement of the constructs

6.1  Introduction

This chapter deals with the measurement component of my research model. I start by presenting the major issues concerning operationalization of constructs and validation of measurements. Thereafter, I will present the operationalization of the key constructs which comprise my research model and the steps I take to validate them. Finally, I introduce the measurements of the other variables used in the analysis.

6.2.  Some basics on measuring constructs

6.2.1  Operationalization

The hypotheses outlined in Chapters 3 and 4 suggest relationships among several concepts. These are more properly called 'constructs': they are something we 'construct', and, per se, do not exist as observable dimensions of behavior (Nunnally & Bernstein, 1994). The process of translating these constructs into measured variables is labeled operationalization (Davidsson, 2004). Specifically, in order to develop measures of constructs, we need indicators or related observable variables which stand for those constructs; and for constructs with many facets more than one indicator is required. Multiple-item measures can well serve this purpose (Bryman & Cramer, 1999).

Several are the advantages of multiple-item measures. First, a set of items is more likely to capture the totality of a broad construct (Sullivan, 1996). Second, a set of items allows for a larger variation in respondents’ behavior. Thus, it better grasps differences among respondents (Bryman & Cramer, 1999). Third, when only one item is used, any circumstance which might distort the accuracy of the measure will contaminate the results (Sullivan, 1996). Multiple-item scales also have disadvantages. For instance, Ramaswamy et al. (1996) warn against the use of measures that comprise several items, as the aggregating components can hide the effect of individual components.
6.2.2  Validity and reliability

No measure is useful without some evidence of its validity, which “deals with how well it measures what it purports to measure in the context in which it is applied” (Nunnally & Bernstein, 1994, p. 112). This is a tricky issue, “because proving validity – that our operationalization actually measures what is intended to measure – is a never-neverland” (Davidsson, 2004, p. 105). In general, it is considered appropriate to use measures that have already been tested. The rationale is that established measures have already proved to have theoretically meaningful characteristics (Davidsson, 2004). Though important, this is not a definitive test. Validity in one context does not automatically guarantee validity in other contexts (Nunnally & Bernstein, 1994). The validation of a construct is a multifaceted process which requires a series of tests that examine the measurement property of the indicators (O’Leary-Kelly & Vokurka, 1998). As I will discuss below, factor analysis and confirmatory factor analysis (CFA) are useful procedures for providing validity information (Levine, 2005).

Measures also need to be reliable. Reliability refers to the degree to which measures are free from random error and therefore yield consistent results (Davidsson, 2004). Reliability can take two forms: external reliability and internal reliability (Bryman & Cramer, 1999). External reliability refers to the degree of consistency of a measure over time. Tests of external reliability presuppose a research design in which the same scale is applied to the same subjects on different occasions. Due to time and financial constraints, it is difficult for a researcher to administer the same instrument to the same subjects on two occasions. In addition, it is difficult to decide on the ‘right’ time span. On the one hand, if the two occasions are too separated in time, intervening events might account for the discrepancy between the two measures. On the other hand, if the two occasions are too close in time, participants might recall their answers and therefore inflate the consistency between the two measures (Bryman & Cramer, 1999). Internal reliability refers to the degree of consistency between multiple measurements of a variable (the multiple indicators of a construct) (Hair, 1998) and is particularly important in connection with multiple-item measures (Bryman & Cramer, 1999). Several diagnostic measures to assess internal consistency are available. Cronbach’s alpha, which measures the consistency of the whole scale, is probably the best known and most widely used (Hair et al., 2006). When the correlation between the items measuring one construct is high, alpha assumes values close to unity and researchers conclude that the scale is reliable. In general, the accepted lower level of Cronbach’s alpha is 0.70. However, for exploratory research it might decrease to 0.60 (Hair, 1998). Davidsson (2004) notes that survey researchers may not afford including a large number of items in questionnaires. Thus, they may not be able to have a ‘ prefect’ measure of a construct which covers all its facets. In these cases, Davidsson (2004, p. 107) recommends to “have measures
6. Method: Measurement of the constructs

that roughly captures more of X, albeit with a lower Alpha (low reliability) than one which very precisely covers but a fraction of X”.

Factor analysis

Factor analysis plays a part in assessing both validity and reliability of a multiple-item measure. As explained by Nunnally and Bernstein (1994, p. 111):

“[…] it essentially consists of methods for finding clusters of related variables. Each such cluster, or factor, consists of a group of variables whose members correlate more highly among themselves than they do with variables outside the cluster. Each factor is thought as a unitary attribute which is measured to greater or lesser degree by particular instruments depending on their correlation with the factor”.

There are different methods of extracting ‘clusters of related variables’ or factors: principal component analysis (PCA) and common factor analysis. With PCA, factors are defined to be linear combinations of the original variables that are uncorrelated and account for the maximum proportions of the variation in the original data (Landau & Everitt, 2004). Thus, PCA is recommended for data reduction as it summarizes the variance of the original variables into a minimum number of factors (Hair, 1998).

Common factor analysis is concerned with whether the covariance or correlations between a set of observed variables can be explained in terms of a smaller number of unobservable latent variables or common factors. It roughly works as a regression analysis in which the original variables are regressed on the common factors (Landau & Everitt, 2004). Since the factors are unobserved, some assumptions are made. First, it is assumed that the factors are in a standardized form with mean zero and unitary standard deviation. Second, it is assumed that the residual terms are uncorrelated with each other and with the common factors. In this way, it is assumed that the correlation between the observed variables stems from their relationship with the factors. For the actual estimation, there are several approaches. The most popular ones are principal factor analysis and maximum likelihood factor analysis (Landau & Everitt, 2004). In short, common factor analysis tries to explain the correlations (or covariance) of the original variables and is employed when the primary purpose is to identify underlying factors or dimensions that the original variables have in common (Hair, 1998).

Which method to choose is debatable. According to Hair et al. (2006) common factor analysis is theoretically sound, as it aims at explaining the common or shared variance among the variables. Yet it is more problematic than principal component analysis. In addition, as mentioned above, common factor analysis relies on a set of specific assumptions. Below, I will perform both analyses and make a comparison between the two factor models.
Another decision to make when performing factor analysis concerns the number of factors to extract. One common criterion is to select those factors which have an eigenvalue greater than one, also known as Kaiser’s criterion (Hair et al., 2006). In this way, factors which explain less variance than one single variable are excluded (Bryman & Cramer, 1999).

In short, factor analysis is an appropriate tool for identifying factors among multiple items. It also provides preliminary insights for validating measures. First, it offers information on whether the items load on the appropriate factors—the one we expect from theory. Second, it shows whether the factors are distinct and potentially represent separate concepts by not having cross-loadings.

**Confirmatory factor analysis**

As the name suggests, confirmatory factor analysis (CFA) is a tool that enables researchers to confirm or reject an a priori pattern of factor loadings. CFA applies Structural Equation Modeling (SEM) to test the extent to which an a priori pattern of factor loadings represents the actual data. Thus, CFA can be used to 1) establish whether there is support for the factor structure emerged from factor analysis and theory, and 2) examine different aspects of its validity (Hair et al., 2006).

Factor analysis is considered an exploratory technique because there are no constraints on the variable loadings. Each variable has a loading on each factor, though their loadings vary in degree. Instead, when performing a CFA the researcher specifies which manifest variables define each factor. The researcher has complete control over which, and how many, items should be used per construct. In the CFA language, manifest variables are termed ‘indicators’ and factors are labeled ‘latent constructs’ (Hair, 1998). Usually, CFA assumes reflective measures; this is based on the idea that latent constructs cause the measured variables (Chin, 1998). CFA allows testing predetermined factor structures, using SEM, SEM focuses on the pattern of relationships across responses and employees variance-covariance or correlation matrix as input data. As already mentioned in Chapter 5, maximum likelihood estimation (MLE) is the most commonly used estimation technique. However, because MLE is sensitive to nonnormality, other methods are also used. The asymptotically distribution-free (ADF) estimation has received much attention, because of its insensitivity to nonnormal distribution of the data (Hair et al., 2006).

The metric most commonly used to assess the fit of the factor structure is the chi-squared goodness of fit (GOF). However, the chi-squared GOF is biased against larger samples. Thus, it is difficult to use it as a sole indicator of fit (for more information see Hair et al., 2006, pp. 745-747). In this study, I will use three additional measures of model fit: the comparative fit index (CFI), which compares the proposed model with a null model which assumes that all observed variables are uncorrelated; the incremental fit index (IFI), which
6. Method: Measurement of the constructs

compares the proposed model with a null model, adjusted by degrees of freedom; and the root mean squared error of approximation (RMSEA), which is a measure of absolute fit and assesses how well the model proposed reproduces the observed data (Hair et al., 2006).

One of the advantages of CFA is that it allows assessing different aspects of a construct’s validity (Hair et al., 2006). First, CFA allows checking what has been labeled convergent validity — “the extent to which indicators of a specific construct converge or share a high proportion of variance in common” (Hair et al., 2006, p. 771). Reliability, measured by Cronbach’s alpha, is an indicator of convergence, but CFA provides additional tools for estimating convergence among items measures. For instance, high CFA loadings on one factor indicate that the items converge on one common construct. A summary measure of convergence is also provided by the variance extracted (VE), which is calculated as the average percentage of variation explained among the items. Second, CFA allows assessing “the extent to which a construct is truly distinct from other constructs” (Hair et al., 2006), which is also known as discriminant validity. A common procedure is to conduct a second CFA, in which the correlations among factors are constrained at 1.0. If the fit of the unconstrained model is not better than the fit of the constrained model, then the discriminant validity is insufficient.

6.3 Operationalizing and validating the key constructs

6.3.1 Upstream and downstream internationalization

Operationalization

Internationalization scholars seem to agree that the degree of a firm’s internationalization is not a state but a continuous choice that managers make relative to domestic circumstances (Sullivan, 1996). Consequently, most measures of firm internationalization are ratios. In addition, the vast majority of studies use a single indicator: foreign sales as percentage of total sales. More recently, the use of a single item has been the object of discussion. Sullivan (1996) argues that multiple-item measures should be used rather than a single item indicator. Similarly, other scholars recognize that multiple-item measures better represent the different facets of firm internationalization (i.a. Reuber & Fischer, 1997; Zahra & George, 2002a).

In this thesis, firm internationalization is defined as the involvement in business activities across national borders (Jones, 1999, 2001; Welch & Luostarinen, 1988, 1993). Thus, the degree of a firm’s internationalization can be operationalized in terms of the percentage share of its business activities
conducted internationally (Zahra & George, 2002a). In addition, the study highlights two dimensions of firm internationalization: upstream internationalization and downstream internationalization. Accordingly, the degree of a firm’s upstream internationalization can be operationalized as the percentage share of its upstream activities conducted abroad; and the degree of a firm’s downstream internationalization can be operationalized as the percentage share of its downstream activities conducted abroad.

To measure the percentage share of SME downstream activities abroad and the percentage share of SME upstream activities abroad I use five items taken from George, Zahra and Wiklund (2005). Specifically, two items are intended to measure the percentage share of SME downstream activities abroad: export shares and share of advertising budget directed at international markets; and three items are intended to measure the percentage share of SME upstream activities abroad: share of purchase from abroad, share of R&D expenditure abroad, and share of production completed abroad. These items appear to be relevant in the context of SME internationalization. They cover the international activities most commonly conducted by European SMEs, according to a study by the Observatory of European SMEs (2003). George et al.’s (2002) study uses these items to measure degree of internationalization of SMEs.

Validating the scales
As a first step to factor analysis, I need to assess the factorability of the five items (Hair, 1998). The correlation matrix—which is not reported here due to space limitations—shows that all correlations are statistically significant. Also the Bartlett’s shows that the correlations, when taken together, are significant at the p<.001 level. Furthermore, the measure of sampling adequacy (MSA) — which considers the correlation patterns between variables – falls in the acceptable range (0.50) with a value of .58. Also MSA values for each variable are above 0.50. These results show that there is a base level of statistical correlations within the set of variables for proceeding with the factor analysis.

I use PCA to extract the dimensions of SME internationalization. As mentioned above, I expect the five items to load on two factors. The emerging factor structure reflects my expectations. Applying the root criterion of retaining factors with eigenvalues greater than 1.0, export shares and share of advertising budget directed at international markets load on one factor, while share of purchase from abroad, share of R&D expenditure abroad, and share of production completed abroad load on another factor. The two-factor solution represents 66.1 percent of the five items, which in social science is considered sufficient in terms of total variance explained (Hair, 1998). Using varimax rotation, I rotate the factors to obtain a simpler factor pattern. With varimax rotation, the factors remain uncorrelated throughout the rotation process. The rotated factor solution has significant loadings on both factors. The loadings obtained for the PCA are reported in Table 6.1. The factor loadings are 0.60 or above, meaning that more than one-half of the variance is accounted for by the
6. Method: Measurement of the constructs

loadings on a single factor. In addition, the factor solution shows a single high loading for each item only on one factor, i.e. there are no cross-loadings higher than 0.2.

Table 6.1 PCA results and CFA results for downstream internationalization and upstream internationalization

<table>
<thead>
<tr>
<th>Items</th>
<th>Source</th>
<th>PCA loadings</th>
<th>CFA loadings</th>
<th>Variance extracted (VE)</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstream intern.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export shares</td>
<td>George et al. (2005)</td>
<td>0.91</td>
<td>0.95***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of advertising budget directed at international markets</td>
<td>George et al. (2005)</td>
<td>0.91</td>
<td>0.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstream intern.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of production completed abroad</td>
<td>George et al. (2005)</td>
<td>0.84</td>
<td>0.92***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of R&amp;D completed abroad</td>
<td>George et al. (2005)</td>
<td>0.71</td>
<td>0.68***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of purchase from abroad</td>
<td>George et al. (2005)</td>
<td>0.60</td>
<td>0.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CFA model summary statistics
Chi-squared=13.82, d.f.= 4, (p<0.001); CFI=0.976; IFI=0.940; RMSEA=0.075

Note: the Z-statistics are reported where available, ***p<0.001.

It is reasonable to expect that the degree of downstream internationalization and the degree of upstream internationalization are correlated. Thus, I also apply the nonorthogonal (oblique) rotation. The results are similar to the orthogonal results. There are no differences in factor structure and the loadings are very similar. As I discuss above, principal component factor analysis has some limitations: it only considers that common variance associated with a set of variables. Therefore, I rerun the analysis using common factor analysis. Both maximum likelihood and principal axis are used as extraction methods. Again, the results are very similar to the results of CPA reported in Table 6.1.

In short, the emerging factor structure reflects my theoretical prediction: the five items load on two factors, one capturing downstream internationalization and the other capturing upstream internationalization. In addition, the factor analysis provides some indication of discriminant validity: there is no evidence of cross-loadings.
I proceed in the validation, using CFA. The fit metrics, reported at the foot of Table 6.1, indicate that a two-factor structure fits the data moderately well. The overall model chi-squared is 13.82 with 4 degrees of freedom. The p-value associated with this result is highly significant. However, given the problems associated with using this test alone, I examine other fit indices closely. The value of RMSEA is below the 0.8 guideline. Also the CFI (0.97) and IFI (0.94) exceed the guidelines (above 0.9).

The constructs demonstrate convergent validity. As displayed in Table 6.1, the CFA standardized factor loadings are all above 0.41 (recommended minimum level in social science is 0.40 (Ford, MacCallum, & Tait, 1986). The average variance extracted is 0.49 for upstream internationalization and 0.67 for downstream internationalization (recommended minimum level in social science is 0.50 (Hair et al., 2006)). I also calculate Cronbach’s alpha of the two constructs. Downstream internationalization has a satisfactory Cronbach’s alpha value of 0.75, while the internal consistency for upstream internationalization is found to be somewhat low (alpha=0.60). Nevertheless, this value is still acceptable, especially if considering the exploratory nature of the scale (Hair et al., 2006).

In order to ensure the discriminant validity, I conduct a second CFA in which the correlation among factors is constrained to 1.0. Then, I use the chi-squared difference test to compare the chi-squared of the former, unconstrained model, and the chi-squared of the latter, the constrained model. The test is highly significant (p<0.001), suggesting that the correlation between the factors is significantly different from 1.0. Accordingly, the two streams of international activities seem to be not only theoretically but also empirically distinguishable.

Overall, the CFA provides evidence of convergent and discriminant validity for the two constructs. Therefore, in the analysis, downstream internationalization will be measured by an index of the standardized values of export shares and share of advertising budget directed at international markets, and downstream internationalization will be measured by an index of the standardized values of share of purchase from abroad, share of R&D expenditure abroad, and share of production completed abroad.

6.3.2 Organizational knowledge: prior knowledge and acquisition of new market knowledge and technological knowledge

Operationalization
Measuring organizational knowledge is not an easy task (Spender & Grant, 1996). Commonly used proxies, such as patents and citation counts, are often

---

Since the items are not normally distributed I use the asymptotically distribution-free (ADF) estimation provided by AMOS.
6. Method: Measurement of the constructs

crude and inadequate; they are, for instance, restricted to technology- or science-based industries (King & Zeithaml, 2003). In addition, as discussed in Chapter 2, the study focuses on the procedural type of knowledge, i.e. market and technological know-how. This knowledge is difficult to measure as it is use-specific and embodied in actions and skills (Gupta & Govindarajan, 2000). At the same time, organizational knowledge is captured through language, rendering the measurement of procedural knowledge dependent on declarative knowledge. As pointed out by King and Zeithaml (2003, p. 765), “[a]lthough it is impossible to articulate all that one knows about organizational knowledge […], we suggest that experienced top and middle managers are particularly adept at recognizing and articulating organizational knowledge”. The authors conclude that survey-based measures tapping CEOs’ organizational knowledge can provide a way of measuring such knowledge.

CEOs’ assessments are often the preferred method of grasping the endowment of knowledge in firms, especially in SMEs (Autio et al., 2000). Therefore, I intend to measure a firm’s prior knowledge via its CEO’s rating of the firm’s knowledge position vis-à-vis its competitors. The questionnaire instructions read as follows: “Compared to other companies in your industry, does your company have a weak or strong position in terms of: 1) staff with a positive commitment to the company’s development, 2) technical expertise, 3) expertise regarding development of products or services, 4) highly productive staff, 5) expertise in marketing, 6) special expertise regarding customer service, 7) special expertise regarding management, 8) innovative markets, 9) staff educated in giving superior customer service, 10) staff who like to contribute with ideas for new products/services, and 11) staff capable of marketing your products/services well?” The same instrument was used by Wiklund and Shepherd (2003).

Survey-based measures have also been considered appropriate for assessing knowledge acquisition (Yli-Renko et al., 2001) and effectively used, among others, by Zahra et al. (2000), Gupta and Govindarajan (2000), and Yli-Renko et al. (2001). Therefore, I intend to measure the acquisition of market and technological knowledge with 10 statements reflecting the market and technological know-how that SMEs have acquired from their international activities. The items are based on Zahra et al. (2000), Gupta and Govindarajan (2000), and Yli-Renko et al. (2001). The questionnaire instructions read as follows: “Companies may learn different skills from their international operations. We are interested in knowing the extent to which your company has learnt new skills and insights from its operations outside Sweden in a set of different areas”. The original 10 areas are: 1) production technology (ways to produce products/services), 2) production design (ways to work out the production process), 3) production planning, 4) R&D, 5) new product/service development, 6) promotion, 7) sales, 8) distribution, 9) customer relationships, and 10) introduction of new products/services.
Validating the measure of prior knowledge

As earlier, I start by assessing the factorability of the eleven items intended to measure knowledge resources. The Bartlett’s test shows that the correlations, when taken together, are significant at the $p < 0.001$ level. In addition, MSA falls in the acceptable range (above 0.50) with a value of 0.74, and the MSA values for each item are above the recommended level of 0.50.

Then I use PCA with varimax rotation to extract the dimensions of prior knowledge. I expect the eleven items to load on two factors: one capturing market knowledge expertise and the other capturing technological knowledge expertise. Applying the root criterion of retaining factors with eigenvalues greater than 1.0, a three-factor solution emerges. The amount of explained variance is 0.59, which is below the value (0.60) deemed as satisfactory in social sciences (Hair et al., 2006). In addition, several items have high loadings on more than one factor. Rerunning the analysis with oblique rotation method and common factor analysis does not eliminate these cross-loadings. Hence, I rerun a series of PCA analyses, deleting, one by one, the items with high cross-loadings, until I obtain a well-defined factor structure. This procedure leaves seven items in the analysis. The reduced set of seven items loads on two factors. The first factor captures a firm’s prior market knowledge and covers the following items: 1) expertise in marketing, 2) special expertise regarding customer service, 3) staff capable of marketing your products/services well, and 4) innovative markets. The second factor captures a firm’s prior technological knowledge and covers three items: 1) technical expertise, 2) expertise regarding development of products or services, and 3) highly productive staff. The amount of explained variance slightly increases to 60 percent. In short, with the simplified pattern of loadings (all above 0.46), no cross-loadings higher than 0.30, and the overall level of explained variance high enough (above 0.60), the seven-item/two-factor solution is acceptable. The loadings for the PCA are reported in Table 6.2.

The constructs demonstrate a somewhat unsatisfactory convergent validity. As displayed in Table 6.2, one of the CFA standardized factor loadings is 0.32 (below the recommended minimum level of 0.40 (Ford et al., 1986)). The average variance extracted is 0.47 for market knowledge and 0.46 for technological knowledge (below the recommended minimum level 0.50 (Hair et al., 2006)). In addition, market knowledge has a satisfactory Cronbach’s alpha value of 0.77, while the internal consistency for technological knowledge is found to be somewhat low (alpha =0.66).
6. Method: Measurement of the constructs

In order to assess the discriminant validity, I conduct a second CFA in which the correlation among factors is constrained to 1.0. In practice, this is the same as specifying that the items that make up the two constructs could just as well make up only one construct (Hair et al., 2006). Then, I use the chi-squared difference test to compare the chi-squared of the former, the two-factor model, and the chi-squared of the latter, the one-factor model. The test is significant (chi-squared 207.553, (1) p<0.001), suggesting that the correlation among the factors are statistically significantly different from 1.0. Though the fit measures are slightly worse, the one-construct model has a better convergent validity than the two-construct model: all CFA loadings are higher than 0.42 (the recommended minimum level is 0.40) and the average variance extracted is 0.56 (the recommended minimum level is 0.50). The one-construct model also has a satisfactory alpha value of 0.76. These results need to be interpreted bearing in mind that theoretically the two constructs represent one concept: firms’ endowment of knowledge.

Hence, when considering the CFA results as a whole, as well as the theoretical bases, support is found for using one overarching scale, encompassing market knowledge and technological knowledge. The scale will be constructed by computing an index of the items listed in Table 6.2.
Table 6.2 PCA results and CFA results for prior knowledge

<table>
<thead>
<tr>
<th>Scale/factor</th>
<th>Items +</th>
<th>PCA loading</th>
<th>CFA Loading (two-construct model)</th>
<th>CFA Loading (one-construct model)</th>
<th>VE (two-construct model)</th>
<th>VE (two-construct model)</th>
<th>Alpha (two-construct model)</th>
<th>Alpha (one-construct model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior knowledge (market)</td>
<td>Expertise in marketing</td>
<td>0.80</td>
<td>0.76***</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special expertise regarding customer service</td>
<td>0.66</td>
<td>0.57***</td>
<td>0.64***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staff capable of marketing products/services well</td>
<td>0.73</td>
<td>0.64***</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innovative markets</td>
<td>0.80</td>
<td>0.77</td>
<td>0.81***</td>
<td></td>
<td></td>
<td>0.56</td>
<td>0.76</td>
</tr>
<tr>
<td>Prior knowledge (technology)</td>
<td>Technical expertise</td>
<td>0.88</td>
<td>0.69***</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expertise regarding development of products or services</td>
<td>0.84</td>
<td>0.90***</td>
<td>0.87***</td>
<td></td>
<td></td>
<td>0.46</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>Highly productive staff</td>
<td>0.46</td>
<td>0.32***</td>
<td>0.42***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: + All items are measured on a seven-point scale on which 1 is a “very weak position” and 7 is a “very strong position”; source of the items: Wiklund and Shepherd (2003); the Z-statistics are reported where available, ***p<0.001.
Validating the scales for the acquisition of market knowledge and technological knowledge

Again, I start by assessing the factorability of ten items intended to measure acquisition of market and technology knowledge. Bartlett’s test shows that the correlations, when taken together, are significant at the p<.0001 level. In addition, MSA falls in the acceptable range (above 0.50) with a value of .0.89 and the MSA values for each item are above the recommended level of 0.50.

Then I use PCA with varimax rotation to extract the dimensions of knowledge acquisition. I expect the 10 items to load on two factors. Applying the root criterion of retaining factors with eigenvalues greater than 1.0, a two-factor solution emerges: the first factor captures the acquisition of market knowledge and covers insights and skills in the following areas: 1) promotion, 2) sales, 3) distribution, 4) customer relationships, and 5) market introduction of new products/services; the second factor captures the acquisition of technological knowledge and covers insights and skills in the following areas: 1) production technology (ways to produce products/services), 2) production design (ways to work out the production process), 3) production planning, 4) R&D, and 5) development of new products/services. The two-factor solution represents 70 percent of the total variance, which in social science is considered sufficient in terms of total variance explained (Hair, 1998). When considering the loadings of each item on each factor, I find that two items have moderate-sized loadings on both factors. Specifically, the acquisition of new skills and insights into the introduction of new products/services loads 0.63 on factor 1 (acquisition of market knowledge) and 0.47 on factor 2 (acquisition of technological knowledge); the acquisition of new skills and insights into the development of new products/services loads 0.57 on factor 2 (acquisition of technological knowledge) and 0.45 on factor 1 (acquisition of market knowledge). Rerunning the analysis with oblique rotation method does not eliminate these cross-loadings. These items persist to have cross-loadings also when employing common factor analysis, with both maximum likelihood and principal axis extraction methods. Hence, I decided to delete these two items.

I re-specify the PCA with the eight remaining items. Now the factor structure is very well defined, representing two distinct factors. The first factor captures the acquisition of market knowledge and covers insights and skills in the following areas: 1) promotion, 2) sales, 3) distribution, and 4) customer relationships. The second factor captures the acquisition of technological knowledge and covers insights and skills in the following areas: 1) production technology (ways to produce products/services), 2) production design (ways to work out the production process), 3) production planning, and 4) R&D. This solution accounts for 77 percent of the total variance. In addition, all factor loadings are above 0.68 and the highest cross-loading is 0.35. Given the sample size of 335 firms, factor loadings of 0.40 and higher are considered significant (Hair et al., 2006). The loadings for the PCA are reported in Table 6.3.
The next step is to validate the results via CFA. The results displayed at the foot of Table 6.3 indicate that the two-factor solution fits the data moderately well. The overall model chi-squared is 81.30 with 19 degrees of freedom. The value of RMSEA is below the 0.8 guideline. Also the CFI and IFI exceed the guidelines (above 0.9).

The constructs demonstrate convergent validity. As displayed in Table 6.3, the CFA standardized factor loadings are all above 0.64 (recommended minimum level is 0.40 (Ford et al., 1986)). The average variance extracted is 0.75 for the acquisition of market knowledge and 0.88 for the acquisition of technological knowledge (recommended minimum level 0.50 (Hair et al., 2006)). The two constructs also have satisfactory Cronbach’s alpha values: 0.92 for the acquisition of market knowledge and 0.88 for the acquisition of technological knowledge.

In order to ensure the discriminant validity, I conduct a second CFA in which the correlation between factors is constrained to 1.0. In practice, this is the same as specifying that the items that make up the two constructs could just as well make up only one construct (Hair et al., 2006). Then I use the chi-squared difference test to compare the chi-squared of the former, unconstrained model, and the chi-squared of the latter, the constrained model. The test is significant (chi-squared 12.708 (1), p<0.001), suggesting that the correlation between the factors are significantly different from 1.0. However, the differences are not very important, particularly when considering the other fit measures. CFI equals 0.96; IFI is 0.96, and RMSEA is 0.65. The values of these fit indices indicate that the differences between the constrained and unconstrained models are minimal. In addition, the two constructs are strongly correlated (r= 0.6). Theoretically, there is a good explanation for this. The two constructs represent different dimensions of the same underlying concept: knowledge acquisition.
6. Method: Measurement of the constructs

Table 6.3 PCA results and CFA results for acquisition of market and technological knowledge

<table>
<thead>
<tr>
<th>Scale/ factor</th>
<th>Items* New insights and knowledge in the following areas:</th>
<th>Source</th>
<th>PCA loading</th>
<th>CFA loading</th>
<th>VE</th>
<th>Alpha two const.</th>
<th>Alpha one const.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of market knowledge</td>
<td></td>
<td>Gupta and Govindarajan (2000)</td>
<td>0.89</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>ibidem</td>
<td>0.86</td>
<td>0.87***</td>
<td>0.75</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distribution</td>
<td>ibidem</td>
<td>0.80</td>
<td>0.85***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customers relationships</td>
<td>ibidem; Yli-Renko et al. (2001)</td>
<td>0.68</td>
<td>0.63***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition of techn. knowledge</td>
<td>Production technology (ways to produce products or services)</td>
<td>Zahra et al. (2000)</td>
<td>0.92</td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Production design (ways to work out the production or service delivery process)</td>
<td>ibidem</td>
<td>0.88</td>
<td>0.95***</td>
<td>0.64</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Production planning (ways to plan the production or service delivery)</td>
<td>ibidem</td>
<td>0.82</td>
<td>0.81***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R&amp;D</td>
<td>ibidem</td>
<td>0.81</td>
<td>0.79***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CFA model summary statistics, Chi-squared=81, df=19, (p<0.001); CFI=0.966; IFI=0.966; RMSEA=0.06

Note: All items are measured on a five-point scale on which 1 is 'very little' and 5 is 'a great deal'. The Z-statistics are reported where available, ***p<0.001

6.3.3 Processes of knowledge transformation and exploitation

Also processes of knowledge transformation and exploitation are difficult to measure. Single item scales, such as R&D spending, do not cover the richness of these processes. R&D spending reflects the investment in knowledge (King
& Zeithaml, 2003), rather than knowledge processes, which cover the manner in which a firm’s knowledge flows are organized, including its organizational form and the way individuals cooperate and exchange information (Turner & Makhija, 2006).

Zahra and George (2002) describe these knowledge processes as part of a firm’s realized absorptive capacity (RCAP) and argue for an operationalization focused on the routines and organizational processes that RCAP comprises. Knowledge transformation comprises routines and processes for the internalization and conversion of knowledge, while knowledge exploitation comprises routines and processes for the application of knowledge. Jansen et al.’s (2005) study on business units’ absorptive capacity provides an empirical operationalization of the theoretical constructs proposed by Zahra and George (2002). Specifically, to measure the processes of knowledge transformation, Jansen et al. (2005) develop a six-item scale which assesses the extent to which a business unit is able to facilitate recognizing opportunities and consequences of new external knowledge for existing operations, structures, and strategies; to measure the processes of knowledge exploitation Jansen et al. (2005) use a six-item scale gauging a unit’s ability to incorporate and use new external knowledge in their operations. Interestingly, in Jansen et al.’s (2005) study the two sets of knowledge processes are found to be empirically distinct dimensions of absorptive capacity. On the other hand, Zahra and George’s (2002) theoretical conceptualization highlights their combination into the RCAP construct.

In my study, I use the items developed by Jansen et al. (2005). The wording of the items is adapted to reflect the fact that the focus of my study is on international SMEs rather than on business units of larger firms. In addition, when pre-testing the instrument on ten CEOs of international SMEs, I find that three items of Jansen et al.’s original scale do not apply to the context of SMEs. Hence, these items were excluded from the final questionnaire sent out to companies. The following nine items were included in the questionnaire: 1) in this organization we consider the consequences of changing demands in international markets in terms of new products and services, 2) in this organization, we record and store newly acquired knowledge of international markets for future needs, 3) this organization quickly recognizes the usefulness of new knowledge of international markets for our existing operations, 4) our employees share practical experience of international markets, 5) in our organization we meet to discuss consequences of new trends in international markets, 6) we constantly consider how to better use knowledge of international markets, international customers, or international business partners, 7) in our organization we have difficulty in implementing new products and services in international markets (reverse) 8) In this organization, it is clear how activities regarding international markets should be performed, 9) in this organization, international client or supplier complaints fall on deaf ears (reverse).
Validating the measures for processes of knowledge transformation and exploitation

As earlier, I first assess the factorability of nine items intended to measure processes of knowledge transformation and exploitation. The Bartlett’s test shows that the correlations, when taken together, are significant at the $p<.0001$ level. In addition, MSA falls in the acceptable range (above 0.50) with a value of 0.89 and the MSA values for each item are above the recommended level of 0.50.

Then I use PCA with varimax rotation to extract the dimensions of knowledge processes. Applying the root criterion of retaining factors with eigenvalues greater than 1.0, a two-factor solution emerges. The amount of explained variance is 0.61, which is just above the value (0.60) deemed as satisfactory in social sciences. However, two items have high loadings on more than one factor. Rerunning the analysis with oblique rotation method and common factor analysis does not eliminate these cross-loadings. The course of action taken is to delete the two items, leaving 7 items in the analysis. The reduced set of seven items loads on one factor. The PCA factor loadings are reported in Table 6.4. The amount of explained variance slightly increases to 61.2 percent. In sum, with the simplified pattern of loadings (all above 0.64) and the overall level of explained variance high enough (above 0.60), the seven-item/one factor solution is acceptable.

The next step is to validate the results via CFA. The results displayed at the foot of Table 6.4 indicate that the one-factor solution fits the data well. The overall model chi-squared is 45.8 with 14 degrees of freedom. The value of RMSEA is 0.030, much below the 0.8 guideline. The value of CFI (0.97) and the value of IFI (0.97) exceed the guidelines (above 0.9). The construct demonstrates convergent validity. As displayed in Table 6.4 the CFA standardized factor loadings are all above 0.63 (recommended minimum level in social science is usually 0.40) and the average variance extracted is 0.55 (recommended minimum level 0.50). The construct has also a satisfactory Cronbach’s alpha value of 0.89. I also compare the one-factor construct with the plausible rival two-factor model. The fit indices for the two-factor model are slightly worse than those for the one-factor model. Specifically, CFI and IFI are still 0.97, but RMSEA increases to 0.032.

Overall, the CFA results support the use of one scale to measure processes of knowledge transformation and exploitation. The scale will be constructed by computing an index of the items listed in Table 6.4.
Table 6.4 PCA results and CFA results for processes of knowledge transformation and exploitation

<table>
<thead>
<tr>
<th>Items+</th>
<th>PCA loading</th>
<th>CFA loading</th>
<th>VE</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformation</td>
<td>In this organization we consider the consequences of changing demands in international markets in terms of new products and services</td>
<td>0.85</td>
<td>0.84***</td>
<td></td>
</tr>
<tr>
<td>Transformation</td>
<td>In this organizations, we record and store newly acquired knowledge of international markets for future needs</td>
<td>0.84</td>
<td>0.61***</td>
<td></td>
</tr>
<tr>
<td>Transformation</td>
<td>This organization quickly recognizes the usefulness of new knowledge of international markets for our existing operations</td>
<td>0.83</td>
<td>0.74***</td>
<td></td>
</tr>
<tr>
<td>Transformation</td>
<td>Our employees share practical experience of international markets</td>
<td>0.81</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Transformation</td>
<td>In our organization we meet to discuss consequences of new trends in international markets</td>
<td>0.79</td>
<td>0.76***</td>
<td></td>
</tr>
<tr>
<td>Exploitation</td>
<td>We constantly consider how to better use knowledge of international markets, international customers, or international suppliers</td>
<td>0.69</td>
<td>0.80***</td>
<td>5.5</td>
</tr>
<tr>
<td>Exploitation</td>
<td>In this organization, it is clear how activities regarding international markets should be performed</td>
<td>0.64</td>
<td>0.84***</td>
<td></td>
</tr>
</tbody>
</table>

Note: + All items are measured on a five-point scale on which 1 is ‘strongly agree’ and 5 is ‘strongly disagree’. Source of items: Jansen et al. (2005); The Z-statistics are reported where available, ***p<0.001.
6. Method: Measurement of the constructs

6.3.4 Firm growth: Growth relative to competitors, growth relative to competitors in international markets, and entrepreneurial growth in domestic and international markets

Operationalization
There is little consensus on how to measure firm growth (Birley & Westhead, 1990; Weinzierlm, 1998). This is well illustrated by the several comprehensive reviews of the different measures used by entrepreneurship and management scholars such as Weinzierlm (1998), Delmar (1997), Wiklund (1998), and Achtenhagen, Melin, and Naldi (2004). Overall, these reviews show that different single indicators and formulae are commonly used to measure firm growth. Nonetheless, the use of multidimensional scales, comprising several indicators, has increased in the past years (see Delmar (1997) and Achtenhagen et al. (2004)). Scholars increasingly focus on profitable growth (Ireland et al., 2001)—they consider firm growth as a multidimensional construct encompassing an ‘expansion’ dimension and a more ‘financial’ dimension. To capture the ‘expansion’ dimension of business growth one or more of the following indicators are commonly used: sales, employment, and assets; the ‘financial’ dimension of business growth is captured by one or more of the following indicators: profits, ROA, ROE, gross margin, cash flow. This combination of expansion and financial indicators seems to reflect the practitioners’ view of firm growth as well. A recent study shows that, when asked about their view of firm growth, entrepreneurs consider profitable growth—i.e. profitable increase in sales—important for the growth of their businesses (Achtenhagen et al., 2004).

Multidimensional scales are not without limitations. Different dimensions of growth may have different determinants (Weinzierlm, 1998). In addition, when aggregating the different indicators into one overall scale, one risks masking the effect of individual indicators (Ramaswamy et al., 1996). Ultimately, the appropriate measure of firm growth depends on the specific theory (Davidsson et al., 2006).

Besides the indicators, another apple of discord is the source of information. Whether to use objective, self-reported, or subjective measures of firm growth is very much debated. In principle, objective measures, taken from external sources, seem preferable (Dess & Robinson, 1984). However, this information is not always available, especially from small firms (Covin & Slevin, 1989). This is particularly true for indicators of foreign growth. A few companies, and very unlikely SMEs, are required to publicly report their international results (Zahra & Garvis, 2000). In addition, even when available, objective financial data are difficult to interpret; and their comparison across different industries can be misleading (Covin & Slevin, 1989). Furthermore, subjective measures might be more relevant, since “top managers constantly interpret and select their own
environment [...] and base their actions on enacted environments that make sense to them” (Brush & Chaganti, 1999, p. 242).

For these reasons, I use self-reported data. In addition, two measures specifically require a relative assessment of firm growth compared with competitors: overall firm growth relative to competitors and firm growth relative to competitors in international markets. It would be difficult to obtain such information from archival sources; and Brush and Vanderwerf (1992) provide evidence that managers are knowledgeable about the sales and profits of their firms’ competitors.

Firm growth relative to competitors is assessed by asking the respondents to compare the growth of their firm with the growth exhibited by their two main competitors, over the previous three years, in terms of: 1) sales, 2) company value, 3) net profit, and 4) cash flow. The first two items — sales growth and growth of the company value — capture the ‘expansion’ dimension of firm growth. There is some agreement that sales or revenue growth is preferable to employment growth as indicator of a company’s expansion (Davidsson et al., 2006). Sales growth mirrors short-term as well as long-term changes in the firm (Wiklund, 1998). In addition, as mentioned above, it is one of the indicators used by practitioners themselves (Achtenhagen et al., 2004). Growth of company value is chosen because it is seen as the most important outcome variable by entrepreneurs and small business owners. Achtenhagen et al.’s (2004) study reveals that sales and profits are considered important by practitioners and are seen as instrumental for the achievement of a higher company value. The last two items—profit and cash flow— capture the financial dimension of firm growth (Ireland et al., 2001). Net profit is chosen over other profitability indicators, again because of its importance for practitioners (Achtenhagen et al., 2004). Cash flow is chosen because it is an index of financial soundness, particularly relevant in the context of SMEs. Cash flow problems have caused many small firms to fail (Brush, Edelman, & Manolova, 2002).

Firm growth relative to competitors in international markets is assessed by asking the respondents to compare the foreign growth of their firm with the international growth exhibited by their two main competitors, over the previous three years, in terms of 1) growth of foreign sales and 2) profitability of foreign operations. The other expansion (growth of the company value) and financial (cash flow) indicators of firm growth relative to competitors are not included. For these indicators it would be difficult to separate the figures relative to international markets from the overall figures. Likewise, international growth is measured in terms of 1) share of foreign sales and 2) share of profits generated from international operations.

---

10 Foreign sales comprises revenue from direct and indirect export, licensing revenue from abroad, and revenue obtained from sales subsidiaries abroad.
Entrepreneurial growth entails three types of actions: 1) serving new customers, 2) developing and commercializing new products/services, and 3) moving into new markets (Hitt et al., 2001). Accordingly, *entrepreneurial growth in domestic markets* is measured by asking the respondents to estimate what percentage of their sales came from 1) Swedish customers that the firm did not have three years before, 2) products or services that the firm was not selling or delivering in Sweden three years before, and 3) geographic markets in Sweden (e.g. regions) that the firm did not serve three years before. *Entrepreneurial growth in international markets* is measured by asking the respondents to estimate what percentage of their sales came from 1) international customers that the firm did not have three years before, 2) products or services that the firm was not selling or delivering in international markets three years before, and 3) international markets that the firm did not serve three years before.

It should be noted that these measures capture only the ‘expansion’ dimension of a company’s growth. The initial version of the mail questionnaire included also questions concerning the profitability of the aforementioned entrepreneurial actions undertaken by the companies in domestic and international markets; respondents were, for example, asked to estimate the share of their company’s profits incoming from Swedish customers which the company did not have three years before. However, when pre-testing the questionnaire, all the CEOs I interviewed said that it would have been difficult for them to provide an accurate answer to these questions. Hence, the questions were excluded from the questionnaire sent out to the sample.

One could argue that the three scales I intend to use to measure entrepreneurial growth in domestic markets represent one construct; and that the three scales I intend to use to measure entrepreneurial growth in international markets represent one construct. However, it is important to note that I do not necessarily conceive entrepreneurial growth as an overall firm endeavor, but rather as the outcome of three separate sets of actions: 1) serving new customers, 2) developing and commercializing new products/services, and 3) moving into new markets. While it might be true that a firm scores high on all three dimensions of entrepreneurial growth in domestic (or international) markets, conceptually it is possible that some firms score high on one dimension, for instance, selling to new Swedish customers, but low on the other two. Creating an aggregate index would disguise the effects of each single dimension. Hence, entrepreneurial growth in domestic markets and entrepreneurial growth in international markets will be included in the analysis as three separate variables, each

*Validating the measures for firm growth relative to competitors, growth relative to competitors in international markets and international growth*

As discussed above, I intend to measure firm growth relative to competitors, growth relative to competitors in international markets, and international...
growth using multiple-item scales. Since these scales comprise similar items, I validate them in the same analyses, to provide evidence of their convergent and discriminant validity.

First, I check the factorability of the eight items intended to measure these three constructs. The Bartlett’s test shows that the correlations, when taken together, are significant at the p<.0001 level. In addition, MSA falls in the acceptable range (above 0.50) with a value of .0.736, and the MSA values for each item are above the recommended level of 0.50.

Table 6.5 PCA results and CFA results for growth relative to competitors, growth relative to competitors in international markets, and international growth

<table>
<thead>
<tr>
<th>Scale/factor</th>
<th>Items+</th>
<th>Source</th>
<th>PCA loading</th>
<th>CFA loading</th>
<th>Variance extracted</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth relative to competitors</td>
<td>Sales growth</td>
<td>(Wiklund, 1998)</td>
<td>0.75</td>
<td>0.65***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Growth of company’s value</td>
<td>(Wiklund, 1998)</td>
<td>0.83</td>
<td>0.79***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Net profit</td>
<td>(Wiklund, 1998)</td>
<td>0.79</td>
<td>0.82</td>
<td>0.56</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>Cash flow</td>
<td>(Wiklund, 1998)</td>
<td>0.84</td>
<td>0.75***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth relative to competitors in international markets</td>
<td>Growth of foreign sales</td>
<td>(Zahra et al., 2004)</td>
<td>0.86</td>
<td>0.84***</td>
<td>0.64</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Profitability of foreign operations</td>
<td>(Zahra et al., 2004)</td>
<td>0.86</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International growth</td>
<td>Share of foreign sales</td>
<td>(Davidson, 1984)</td>
<td>0.92</td>
<td>0.73</td>
<td>0.72</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td>Share of profits incoming from international operations</td>
<td>(Davidson, 1984)</td>
<td>0.88</td>
<td>0.96***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CFA model summary statistics
Chi-squared=52.89 d.f.= 17, (p<0.001); CFI=0.964; IFI=0.965; RMSEA=0.029

Note: + The items pertaining to the first two scales (firm growth relative to competitors, and foreign growth relative to competitors) are measured on a five-point scale on which 1 is ‘much worse’ and 5 is ‘much better’. The Z-statistics are reported where available and ***p<0.001.
6. Method: Measurement of the constructs

Then I use PCA with varimax rotation to extract the dimensions of firm growth. Applying the root criterion of retaining factors with eigenvalues greater than 1.0, a two-factor solution emerges. The amount of explained variance is 0.65. Two items (share of profitability from foreign markets and share of foreign sales) have high loadings on more than one factor. Rerunning the analysis with oblique rotation method and common factor analysis does not eliminate these cross-loadings. Instead, rerunning the analysis and accepting to retain factors with an eigenvalue slightly lower than one (0.90) gives a three-factor solution. This factor structure reflects my expectations. The first factor captures growth relative to competitors and covers the executives’ rating of their company’s growth relative to competitors in terms of 1) sales growth, 2) growth of company value, 3) net profit, and 4) cash flow. The second factor captures growth relative to competitors in international markets and covers the CEOs’ rating of their company’s foreign growth relative to competitors in terms of 1) growth of foreign sales, and 2) profitability of foreign operations. The third factor captures international growth and covers the following items: 1) share of foreign sales and 2) share of profits generated from international operations. This solution accounts for 77 percent of the total variance. In addition, all factor loadings are above 0.68 and the highest cross-loading is 0.35. The loadings for the PCA are reported in Table 6.5.

The next step is to validate the results via CFA. The results displayed at the foot of Table 6.5 indicate that the three-factor solution fits the data well. The overall model chi-squared is 52.89 with 17 degrees of freedom. The value of RMSEA is 0.029, much below the 0.8 guideline. The value of CFI (0.96) and the value of IFI (0.96) exceed the guidelines (above 0.9). The constructs also demonstrate convergent validity. As displayed in Table 6.5, the CFA standardized factor loadings are all above 0.75 (recommended minimum level is 0.40) and the average variance extracted is between 0.56 and 0.72 (recommended minimum level 0.50). Also the Cronbach's alpha values are all above the minimum recommended level.

In order to ensure the discriminant validity of the three constructs, I conduct a second CFA in which the correlation among factors is constrained to 1.0. I then use the chi-squared difference test to compare the chi-squared of the former, unconstrained model, and the chi-squared of the latter, the constrained model. The test is significant (chi-squared 226.481(3), p<0.001), suggesting that the correlation between the three factors is significantly different from 1.0. I also examine each pair of constructs and find that all demonstrate discriminant validity.

Overall, the CFA provides evidence of convergent and discriminant validity for the three scales. Therefore, growth relative to competitors will be measured by computing an index of the first four items listed in Table 6.5; growth relative to competitors in international markets will be measured by an index of the fifth and sixth items listed in Table 6.5, and international growth will be measured by an index of the last two items listed in Table 6.5.
6.4 Other variables in the analysis

The study includes several variables that may influence SME learning and SME growth. Prior research suggests that CEO demographic characteristics, such as age, gender, level of education, and CEO experience might affect SME learning (Wiklund & Shepherd, 2003a) as well as SME growth (Manolova et al., 2002; Wiklund, 1998). The first two demographic characteristics were measured by self-reported age and gender. Level of education was measured by dummy coding whether or not the CEO had at least a bachelor degree. Prior experience was measured by three dummy variables. The first variable recorded whether or not the CEO reported having prior leadership experience. The second variable recorded whether or not the CEO reported having prior working experience from the same industry. The third variable recorded whether or not the CEO reported having prior working experience from other industries.

Firm characteristics, such as firm age, size, governance type, and the industry in which the firm competes are important predictors of SME learning (Zahra et al., 2000) as well as growth (for a review, see Delmar, 1997) and therefore included as controls. Firm age was measured by the number of years the firm had been in existence. Firm size was measured by the number of the firm’s employees. Governance type was measured by dummy coding whether the firm was independent or belonged to a business group. Industry was measured using dummy codes for the SMEs’ primary business. The analyses include three dummy variables reflecting the firms’ businesses: manufacturing, service and retail, and other industries.

Prior research suggests that characteristics of the competitive environment influence a firm’s knowledge acquisition. In particular the heterogeneity of a company’s environment can be expected to influence learning (Barkema & Vermeulen, 1998; Zahra et al., 2000). Thus, this factor will be included in the analysis estimating SME acquisition of knowledge. The scale for measuring heterogeneity is adapted from Miller and Friesen (1982). I use three of the four original items (alpha 0.85). Also prior growth can influence learning (Zahra et al., 2000); thus, it is included as control. The scale for measuring past growth is identical to the one measuring firm growth relative to competitors.

Other variables in the analyses are: growth aspiration, CEO perception of industry opportunities, location in main metropolitan areas, and Swedish name. As I will explain in Chapters 7 and 8, I use these variables when estimating sample selection and sample attrition. Growth aspiration is measured by asking the respondents to report the ideal size of the business in five years in terms of both sales and number of employees (Wiklund & Shepherd, 2003a). Industry opportunity is measured by a three-item scale that asks for respondents’ perceptions of the presence of industry-level opportunities (alpha 0.70) (George, Zahra, & Wiklund, 2005). Location in a main metropolitan area is measured by dummy coding whether or not the firm is located in one of the
6. Method: Measurement of the constructs

following Swedish cities: Stockholm, Gothenburg, or Malmö (Dahlqvist, Davidsson, & Wiklund, 2000). *Swedish name* is measured by dummy coding whether or not the firm has a Swedish name. I considered as a Swedish name any company's name comprising a Swedish word or expression. Non-Swedish names are international names or acronyms.
7 Analysis and results: Internationalization, prior and new knowledge

7.1 Introduction

This chapter empirically tests Hypotheses 1-6, which relate to the first part of the research model. These hypotheses were developed in Chapter 3.

I begin by discussing issues related to the sample I use to test the hypotheses. After that I illustrate the choice of statistical analyses. The chapter continues with a summary of the measurements. Thereafter, I present the analyses and results. Finally, I summarize the main results.

7.2 Sample selection and attrition bias

As discussed in Chapter 5, 885 Swedish SMEs were selected for testing the first part of the research model (Hypotheses 1-6). These are firms that in 2000 reported having at least one international downstream or upstream activity (the sample construction process is described in Chapter 5). Of these 885 firms, 236 provided full information for all variables I use to test Hypotheses 1-6.

Prior to embarking on the analysis, there are two important issues that need to be addressed in relation to this sample. First, the SMEs selected for testing the first part of the research model may be subject to two major types of biases: sample selection bias and sample attrition bias. Second, because of the high number of non-responses, methods for dealing with non-responses need to be considered. Below, I discuss sample selection and sample attrition bias. Non-response analysis and the methods for dealing with non-responses are illustrated in Appendix 1.

7.2.1 Sample selection bias

Sample selection bias relates to having restricted the analysis to the firms which in 2000 reported having international operations. Although the focus is on firms’ acquisition of knowledge from international activities, restricting the analysis to only international firms might create a possible selection bias. Since firms are able to decide on their involvement in international activities, it is
likely that the observed level of knowledge acquisition is conditional on unobserved factors that influence SME internationalization choice (e.g., industry, CEO background, etc.). In a well-known paper Heckman (1979) discusses sample selection bias and suggests a way to detect and correct it. The author was interested in studying market wages for women and recognized that the sample of working women was likely not random since the decision to work might have been the result of unobserved factors such as presence of small children in the family. In the context of international SMEs, a similar problem may arise. The sample of international SMEs is likely not random since the decision to internationalize is the result of unobserved factors. Failure to address this bias leads to the possibility that differences in the acquisition of market and technological knowledge from internationalization are directly attributed to SME downstream and upstream internationalization, when they are in fact due to unobserved factors associated with the decision to internationalize.

To detect and correct this bias, Heckman (1979) suggests a two-step technique, which I will use in my analysis. After Heckman, this technique is also called 'Heckit'. First, one should estimate a first-stage model to specify the selection equation and calculate an outcome variable, which is called Inverse Mills Ratio (IMR) or hazard rate or lambda. Then, one should use IMR as a control variable in the subsequent analysis of knowledge acquisition. With this modeling approach, it is possible to assess and possibly correct for sample selection bias in the estimation of knowledge acquisition.

The first-stage model can include variables influencing both the decision to be international and the level of knowledge acquisition from international markets. However, it is important that the model contains at least one variable that can be legitimately excluded from the subsequent analysis to safeguard against collinearity (Sales, Plomondon, Magid, Spertus, & Rumsfeld, 2004). This means that to be properly constructed the model should also include at least one variable that influences an SME’s decision to be international, but not directly the level of knowledge acquisition from internationalization. CEO demographic characteristics (CEO age, CEO gender, and CEO formal education in business administration), CEO experience (CEO prior managerial experience, CEO prior experience from the same industry, and CEO prior experience from other industries), major industry group, firm size class, firm age, major governance type, past growth relative to competitors, and prior knowledge have been found to influence firms’ internationalization (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006; Westhead, Wright, & Ucbasaran, 2001; Zahra & George, 2002a) as well as the acquisition of knowledge from international markets (Yli-Renko, 2001; Zahra et al., 2000). These variables will be included in the model along with two additional covariates: SME growth aspirations in 1997 and industry opportunity. These variables should predict SME decisions to be international in 2000. Prior research shows that managers’ aspiration to expand their business is positively related to actual growth (Wiklund & Shepherd, 2003a). Thus, SMEs that in 1997 had high
aspirations to expand their business should be more likely to be international in 2000 than firms with low growth aspirations. Furthermore, CEO perception of industry opportunities is likely to influence the decision to compete internationally. Research indicates that CEO perception of the environment in general, and of industry opportunity in particular, promotes internationalization (Bloodgood et al., 1996; Manolova et al., 2002). There are, however, no reasons to expect these variables to have a direct influence on SME knowledge acquisition from internationalization.

7.2.2 Sample attrition bias

The second type of bias, sample attrition bias, relates to the discontinued participation of some firms in the study. Specifically, sample attrition occurs when firms selected for a longitudinal study drop out from subsequent waves of the study. Attrition of the original sample is a potential threat of bias if the firms that dropped out of the study are systematically different from those who remain in the study (Miller & Hollist, 2007). Attrition may be systematic in a way similar to sample selection. The acquisition of knowledge from international operations is a time-consuming, difficult and, at times, even risky activity (Buckley, 1997). Those variables that influence the acquisition of knowledge may equally cause bankruptcy and failure, altering the correlations among the variables in the study. In addition, if some groups of firms drop out more frequently than others, the remaining sample may no longer resemble the original sample and the results may no longer be generalizable. For instance, the remaining sample in my study may have failed to retain those firms that devote extra efforts to acquiring knowledge from international markets and do not have time to participate in the investigation. Thus, the firms that responded to both data collections in 2000 might underrepresent the firms that spend considerable amounts of time acquiring knowledge from international operations and overrepresent firms that spend little time acquiring knowledge from international operations.

The Heckit procedure can be used to correct for attrition bias, too. As in the case of sample selection bias, I will create a proxy of the variable that explains attrition. This will be done by estimating a first-stage model similar to the one described above to detect selection bias. The dependent variable will be whether or not each firm participated in all waves of data collection up till late spring 2000, and the independent variables will be variables that may explain or predict dropout. The IMR obtained from this first step will then be included in the subsequent analysis of knowledge acquisition from internationalization.

Two first-stage models to predict attrition will be calculated: one baseline model and one model including whether or not the firms had international links and operations in 1997. The baseline model will include a first set of variables that can predict dropout as well as the degree of knowledge acquisition from internationalization. These variables are: CEO demographic characteristics.
(CEO age, CEO gender, and CEO formal education in business administration), CEO experience (CEO prior managerial experience, CEO prior experience from the same industry, and CEO prior experience from other industries), major industry group, firm size class, firm age, major governance type, and past growth relative to competitors. CEO characteristics and CEO experience are expected to determine the opportunities for firms to gain relevant experience and develop valuable networks (Cooper, Gimeno-Gascon, & Woo, 1994; Dahlqvist et al., 2000; Gimeno, Folta, Cooper, & Woo, 1997). As such, they may influence SME attrition as well as SME ability to acquire knowledge from internationalization. Also major industry group, firm size class, firm age, major governance type, and past growth relative to competitors can predict both attrition and knowledge acquisition. These variables have been used in prior studies as predictors of sample attrition (e.g., George et al., 2005) as well as control variables when estimating knowledge acquisition (Yli-Renko, 2001; Zahra et al., 2000). The first probit model will include another variable that should predict attrition but does not have a direct effect on knowledge acquisition from internationalization. Specifically, I will include a broad location dummy variable (major metropolitan areas vs. other locations) to capture the chances of a firm’s survival (Dahlqvist et al., 2000). There are no reasons to suppose that whether or not a firm is located in a major metropolitan area should directly impact the level of knowledge acquisition from international markets.

The second model will add a dummy variable measuring whether or not the firms had links with overseas companies or international operations in 1997. International links and operations are risky and time-consuming activities. As such, they may explain SME failure or respondents’ limited time for participating in the study. However, this information is available only for those firms that responded to the mail questionnaire in spring 1997. Thus, the second model is calculated on a smaller sample (n=967), which in itself may be subject to attrition.

7.3 Choices for data analysis

Two main data analyses are performed in this chapter: probit regression analysis and multivariate multiple regression analysis. Probit regression analysis is used to estimate the first-stage model in the Heckit technique. Multivariate multiple regression analysis is used to test Hypotheses 1-6. Below, I provide a short illustration of these statistical techniques and the rationale for their use.
7. Analysis and results: Internationalization, prior and new knowledge

7.3.1 Heckit first step: Probit analysis and Inverse Mills Ratio (IMR)

As mentioned above, I use the Heckit technique to assess and control for two sources of bias: sample selection and sample attrition bias. As a first step, I need to estimate two models, one for sample selection and the other for sample attrition. These models have a binary outcome. In the case of the sample selection model, the binary outcome is whether or not the firm is international in 2000; in the case of the sample attrition, the binary variable is whether or not the firm falls from the sample in fall 2000. There are two main approaches to derive regression models with binary outcomes: probit regression analysis and logistic regression analysis (Long & Freese, 2006). Both the probit model and the logistic model are examples of a larger class of generalized linear models (GLM) and are estimated by maximum likelihood (Liao, 1994). I chose probit regression analysis over logistic regression to follow Heckman’s original procedure.

Probit regression analysis assumes that an unobserved or latent variable can be hypothesized along with a measurement model relating the latent variable to the observed binary outcome (Long & Freese, 2006). For instance, when estimating sample selection, the dependent variable falls into two categories: it takes value 1 if the company is international in 2000 and it takes value 0 if it is not international. Probit analysis hypothesizes an underlying, latent variable, such as the propensity of being international, which determines the observed state. Indeed, not all companies are present in international markets with the same certainty. One company might be close to leaving the international arena, while another company might be firm in its decision to be international. Though we cannot observe the propensity to be international, at some point a change in that propensity results in a change in what is observed, namely whether the firm is international. In very simple terms, the probit model estimates the probability that the dependent variable falls into one category (e.g. the firm is international), given the independent variable which influences the propensity of falling into that category (for more information see Long and Freese, 2006). The regression coefficients of the probit model are the effects on a cumulative normal function of the probability that the dependent variable falls into a particular category. For instance, in the case of the probit model estimating sample selection, any regression coefficient would express the effect of a unit change in its variable on the cumulative normal probability that the firm is international. This effect is not easy to interpret (Liao, Welsch, & Stoica, 2003). A more detailed illustration of the probit regression analysis can be found in, among others, Long and Freese (2006), Wooldridge (2000) and Liao et al. (2003).

In terms of key statistics, I will focus most attention on the goodness of fit of these models as well as on the sign and statistical significance of the
independent variables. In maximum likelihood models a common method to examine goodness of fit is to assess the difference between the residuals of the model under the constraint that all regression coefficients are zero and the residuals of the model when the coefficients are estimated from the sample data. This difference can be tested as chi-squared statistic (Liao, 1994) via the LR chi-squared test. A significant value in this test indicates that the model fit is acceptable. I will also consider the pseudo R-squared measure. This can be interpreted in a similar way as the R-squared in regression analysis (Wooldridge, 2000). Concerning the estimated coefficients, their significance is estimated through the Wald statistic, which can be interpreted in a manner similar to t-test in regression analysis (see the next section for an illustration of R-squared and t-test in regression analysis).

Once the probit models have been estimated, the residuals (error terms) from each equation are used to calculate the IMR.\(^{11}\) The IMR derived from the sample selection probit model represents the firms’ propensity of being international; while the IMR derived from the sample attrition probit model, represents the propensity of attriting from the sample. IMR is a function not only of the observed or measured variables that are included in the probit model, but also of unobserved or unmeasured variables, which are captured by the error terms. Hence, adding the IMR into the subsequent multivariate multiple regression analysis introduces a term that captures both observed and unobserved variables that affect bias (Sales et al., 2004).

In the subsequent multivariate multiple regression analysis, the two IMRs will be entered one at a time, to safeguard against possible collinearity. At this stage, there are two ways to assess whether or not there is a significant bias. First, one can examine the statistical significance of the IMR coefficient. A non-statistically significant coefficient suggests that there is no significant bias in the model. Yet, the probit model could be not well-specified, resulting in a weak IMR. Thus, a second aspect needs to be taken into account: whether or not there have been significant changes in any of the parameter estimates of the other independent variables in the analysis. No significant changes in the parameters suggest that there are no significant biases in the model (Sales et al., 2004).

To sum up, the insertion into the multivariate multiple regression analysis of the IMR derived from the sample selection probit model allows assessing whether or not there is sample selection bias. The insertion into the multivariate multiple regression analysis of the IMR derived from the sample attrition probit model allows assessing whether or not there is sample attrition

\(^{11}\) The IMR is the ratio of standard normal probability density function (pdf) and cumulative density function (cdf) applied to the residuals for each firm in the dataset (Sales et al., 2004).
bias. In case these variables have significant coefficients and/or their inclusion significantly changes the parameters of the independent variables in the multivariate multiple regression analysis, they will be kept in the analysis to control for these sources of bias.

7.3.2 Multivariate multiple regression analysis

To test Hypotheses 1-6, presented in Chapter 3, I use multivariate multiple regression analysis, employing the 
mvreg procedure provided by Stata. Multivariate multiple regression, as its name suggests, is an extension of multiple regression analysis to allow for multiple dependent variables and for multiple predictors. Multiple regression analysis measures the relationship between one dependent variable and several independent variables. If there is more than one dependent variable, a multiple regression on each dependent variable would be required to examine the effect of the independent variables on them. Multivariate multiple regression, being a statistical technique that solves a set of regression equations simultaneously, instead allows for more than one dependent variable to be jointly regressed on the same set of independent variables (Johnson, Lorenz, & Lundvall, 2002; Srivastava, 2002). Thus, it is appropriate to use this technique to test the first part of my research model because it permits to simultaneously estimate the effect of downstream internationalization, upstream internationalization, and prior knowledge on both the acquisition of market knowledge and the acquisition of technological knowledge.

Multivariate multiple regression estimates the same individual coefficients and standard errors as one would obtain by estimating separate multiple regressions. Yet, multivariate multiple regression analysis, being a joint estimator, also estimates the between-equation covariances, so that coefficients across equations can be tested (Wooldridge, 2002). This feature is important for testing Hypothesis 3b, which expects downstream internationalization to be more related to the acquisition of market knowledge than to the acquisition of technological knowledge, and for testing Hypothesis 4b, which expects upstream internationalization to be more related to the acquisition of technological knowledge than to the acquisition of market knowledge.

I will use R-squared and the related F-ratio test to assess the overall fit and statistical significance of each regression model. Technically speaking, the R-squared provides a measure of the variance of the dependent variable that is explained by the independent variables (Hair et al., 2006). The F-ratio test allows us to test the null hypothesis that the sample is drawn from a population where R-squared is zero (Bryman & Cramer, 1999). I will also consider the regression coefficients and their related t-test to assess the impact and statistical significance of each independent variable. The regression coefficient represents the amount of change in the dependent variable for a one-unit change in the independent variable (Hair et al. 2006). The t-test and the level of significance
are for the null hypothesis that the regression coefficient is zero in the population from which the sample is taken (Bryman & Cramer, 1999).

Stata’s mvreg procedure also allows for a variety of statistical tests. I will use these additional tests for two purposes. First, I will use the F-test to assess the joint statistical significance of sets of variables, entered at different stages of the regression analysis. The first multivariate multiple regression analysis will only include control variables as predictors. In the second multivariate multiple regression analysis, I will also include downstream internationalization, upstream internationalization, and prior knowledge as predictors. Here, the F-test will be performed to ascertain the statistical significance of the three newly added predictors across both equations. In the third multivariate multiple regression analysis, I will add the interaction terms. Again, an F-test will be performed to ascertain the statistical significance of the two interaction terms across both equations. Second, I will use an F-test to assess whether the coefficient for downstream internationalization is the same in each equation and to assess whether the coefficient for upstream internationalization is the same in each equation. As mentioned above, along with the value of the regression coefficients for downstream internationalization and for upstream internationalization, these tests are important for testing Hypothesis 3 (which expects downstream internationalization to be more related to the acquisition of market knowledge than to the acquisition of technological knowledge) and Hypothesis 4 (which expects upstream internationalization to be more related to the acquisition of technological knowledge than to the acquisition of market knowledge).

Prior to using multivariate multiple regression analysis, I will assess collinearity and multicollinearity among the variables. Collinearity occurs as two independent variables are highly correlated, while multicollinearity occurs when any single independent variable is highly correlated with a set of other independent variables (Hair et al., 2006). Collinearity and multicollinearity can decrease the predictive ability of the regression model as well as influence the estimation of the regression coefficients and their statistical significance tests (Hair et al., 2006). In order to ascertain the absence of severe collinearity among the variables, I will examine their correlations. High correlations (.90 or above) are generally considered indicators of substantial collinearity. In order to measure multicollinearity among the variables, I will examine the tolerance and variance inflation factor (VIF) of each independent and control variable. Tolerance is defined as “the amount of variability of the selected independent variable not explained by other independent variables” (Hair et al., 2006, p. 227), and the variance inflation factor is calculated as the inverse of the tolerance value. Thus, a high tolerance value and a small VIF indicate little multicollinearity. A common cutoff threshold is a tolerance value of .10, which corresponds to a VIF of 10. Yet, more restrictive cutoffs are recommended, too. Indeed, a cutoff for the tolerance value of .10 would correspond to a multiple correlation of .95 (Hair et al., 2006).
Multicollinearity problems are very likely to arise when interaction terms are included in the regression analysis. Indeed, the multiplicative terms will be highly correlated with their component parts. Centering the variables prior to forming the interaction term has been suggested as a way of reducing this problem (Jaccard, Turrisi, & Wan, 2003). Thus, in the analysis I will center the following scales: prior knowledge, downstream internationalization, and upstream internationalization. The interaction terms will be created using the products of these centered scores.

To sum up, Hypotheses 1 through 6 are tested using multivariate multiple regression technique. Each multivariate multiple regression analysis involves two equations: one that has the acquisition of market knowledge as dependent variable and the other that has the acquisition of technological knowledge as the dependent variable. The first analysis includes only the control variables as predictors. In the second analysis I introduce also upstream international activities and downstream international activities as predictors. Finally, in the last analysis add the interaction terms.

7.4. Measurements: A summary of the variables used in the analyses

In the analyses I use data collected at four points in time through four survey instruments: telephone interview (spring 1997), mail questionnaire (fall 1997), telephone interview (spring 2000) and mail questionnaire (fall 2000). Information was also taken from Statistics Sweden (SCB). Detailed information on the study’s data collection and measurements is provided in Chapters 5 and 6. Below, I provide a summary of this information for the variables used in this chapter. Specifically, Table 7.1 presents a summary of the control variables, their data sources and data collection points; Table 7.2 presents a summary of the independent and dependent variables, their data sources and data collection points.
Table 7.1 Summary of the control variables to be used in the probit analyses and multivariate multiple regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement description</th>
<th>Data sources</th>
<th>Data collection point</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO age</td>
<td>Age of the CEO</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>CEO gender</td>
<td>Dummy variable (0=female CEO; 1=male CEO)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>Dummy variable (0=CEO reported not having a formal education in business administration; 1=CEO reported having a formal education in business administration)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>Dummy variable (0=CEO reported not having prior management experience; 1=CEO reported having prior management experience)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>Dummy variable (0=CEO reported not having prior working experience from the same industry; 1=CEO reported having prior working experience from the same industry)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>Dummy variable (0=CEO reported not having prior working experience from another industry; 1=CEO reported having prior working experience from another industry)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>Industry group</td>
<td>Four dummy variables (1=manufacturing; 2=professional services; 3=retail and wholesale; 4=other services)</td>
<td>SCB</td>
<td>1997</td>
</tr>
<tr>
<td>Size class</td>
<td>Dummy variable (0=small, 9-49 employees; 1=medium, 50-249 employees)</td>
<td>SCB</td>
<td>1997</td>
</tr>
<tr>
<td>Firm age</td>
<td>Number of years since the firm was founded</td>
<td>SCB</td>
<td>1997</td>
</tr>
<tr>
<td>Major governance type</td>
<td>Dummy variable (0=part of a business group; 1=independent)</td>
<td>SCB</td>
<td>1997</td>
</tr>
<tr>
<td>Past growth relative to competitors</td>
<td>Multiple-item scale (the respondents were asked to compare the growth of their firm with the growth exhibited by their two main competitors in terms of 1) profit, 2) sales growth, 3) cash flow, and 4) growth of net worth)</td>
<td>Mail questionnaire</td>
<td>Fall 1997</td>
</tr>
<tr>
<td>Heterogeneity</td>
<td>Multiple-item scale (three items gauging the differences among products or services)</td>
<td>Mail questionnaire</td>
<td>Fall 1997</td>
</tr>
</tbody>
</table>
Table 7.2 Summary of the independent and dependent variables to be used in the probit analyses and multivariate multiple regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement description</th>
<th>Data sources</th>
<th>Data collection point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables (Probit analyses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth aspirations</td>
<td>Multiple-item scale (two items: respondents’ ideal size of the business in five years in terms of 1) employees, and 2) sales)</td>
<td>Phone interview</td>
<td>Spring 1997</td>
</tr>
<tr>
<td>Industry opportunity</td>
<td>Multiple-item scale (three items gauging respondents’ perceptions of the presence of industry-level opportunities)</td>
<td>Mail questionnaire</td>
<td>Fall 1997</td>
</tr>
<tr>
<td>Geographical location</td>
<td>Dummy variable (0=not located in major metropolitan area; 1=located in major metropolitan area)</td>
<td>SCB</td>
<td>1997</td>
</tr>
<tr>
<td>International links</td>
<td>Dummy variable (0=no link or operations outside Sweden in 1997; 1=at least one link/operation outside Sweden in 1997)</td>
<td>Mail questionnaire</td>
<td>Fall 1997</td>
</tr>
<tr>
<td><strong>Independent variables (Multivariate multiple regression analysis)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Multiple-item scale (seven items covering the respondents’ access to market and technological knowledge)</td>
<td>Mail questionnaire</td>
<td>Fall 1997</td>
</tr>
<tr>
<td>Downstream internationalization</td>
<td>Multiple-item scale (two items: 1) export share, and 2) share of advertising budget abroad directed at international markets)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>Upstream internationalization</td>
<td>Multiple-item scale (three items: 1) share of purchase from abroad, 2) share of R&amp;D expenditure abroad, and 3) share of production completed abroad)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td><strong>Dependent variable (Probit analyses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International in 2000</td>
<td>Dummy variable (0=no international activities in 2000; 1=at least one downstream or upstream international activity in 2000)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>Attrition in 2000</td>
<td>Dummy variable (0=participated in all surveys up till and including the mail questionnaire in fall 2000; 1=otherwise)</td>
<td>All four instruments</td>
<td></td>
</tr>
<tr>
<td><strong>Dependent variable (Multivariate multiple regression analysis)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition of market knowledge</td>
<td>Multiple-item scale (The extent to which the respondents had gained insights and skills in the following areas: 1) promotion, 2) sales, 3) distribution, and 4) customer relationships)</td>
<td>Mail questionnaire</td>
<td>Fall 2000</td>
</tr>
<tr>
<td>Acquisition of technological knowledge</td>
<td>Multiple-item scale (The extent to which the respondents had gained insights and skills in the following areas: 1) production technology (ways to produce products/services), 2) production design (ways to work out the production process), 3) production planning, and 4) research and development)</td>
<td>Mail questionnaire</td>
<td>Fall 2000</td>
</tr>
</tbody>
</table>
7.5 Results

In this section I present the results. The section is structured as follows. Section 7.5.1 analyzes the correlational properties of the data and discusses some initial patterns among the study variables. Section 7.5.2 reports the results for the first-stage probit model estimating sample selection bias. Section 7.5.3 reports the results for the first-stage probit model estimating sample attrition bias. Section 7.5.4 reports the results for the multivariate multiple regression analysis.

7.5.1 Correlation analysis

Table 7.3 shows the means, standard deviations, and correlations among the variables. It also displays the correlations between the study’s variables and the control variables. The intercorrelations between the independent and dependent variables are displayed in Table 7.4. Among the study’s independent and control variables, the correlation with the greatest magnitude is 0.35. Thus, collinearity does not seem to be a problem. As explained above, the absence of strong correlations does not automatically ensure absence of multicollinearity. As a second check, I examine the tolerance and variance inflation factors (VIF) of each independent and control variable. The smallest tolerance of each independent variable is 0.77 and the largest VIF of each independent variable is 1.29, a sign that multicollinearity is not a problem.

I will not interpret these correlations in relation to the hypotheses. Nevertheless, some interesting relationships and non-relationships emerge which are worth discussing.
Table 7.3 Means, standard deviations, and correlations among the study’s variables and the control variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CEO age</td>
<td>47.17</td>
<td>7.18</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CEO gender</td>
<td>0.97</td>
<td>0.16</td>
<td>0.00</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CEO formal business education</td>
<td>0.74</td>
<td>0.44</td>
<td>0.10</td>
<td>0.03</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CEO prior management experience</td>
<td>0.72</td>
<td>0.45</td>
<td>-0.05</td>
<td>-0.04</td>
<td>0.13</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CEO prior experience from same industry</td>
<td>0.70</td>
<td>0.46</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.19*</td>
<td>-0.03</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CEO prior experience from other industries</td>
<td>0.67</td>
<td>0.47</td>
<td>-0.04</td>
<td>0.06</td>
<td>0.13*</td>
<td>0.26*</td>
<td>-0.35*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Manufacturing</td>
<td>0.34</td>
<td>0.50</td>
<td>-0.04</td>
<td>0.07</td>
<td>-0.08</td>
<td>-0.11</td>
<td>-0.19*</td>
<td>0.18*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Service</td>
<td>0.24</td>
<td>0.43</td>
<td>0.00</td>
<td>0.15*</td>
<td>-0.04</td>
<td>0.07</td>
<td>0.11</td>
<td>-0.14*</td>
<td>-0.16*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Retail</td>
<td>0.07</td>
<td>0.26</td>
<td>0.01</td>
<td>0.05</td>
<td>-0.05</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.15*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Medium size</td>
<td>0.53</td>
<td>0.50</td>
<td>-0.02</td>
<td>0.01</td>
<td>0.12*</td>
<td>0.07</td>
<td>-0.07</td>
<td>0.04</td>
<td>0.11</td>
<td>-0.07</td>
<td>0.03</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Firm age</td>
<td>28.45</td>
<td>20.07</td>
<td>-0.07</td>
<td>0.07</td>
<td>0.17*</td>
<td>-0.01</td>
<td>-0.13*</td>
<td>0.11</td>
<td>0.01</td>
<td>0.02</td>
<td>0.18*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Independent</td>
<td>0.25</td>
<td>0.43</td>
<td>0.03</td>
<td>-0.03</td>
<td>0.01</td>
<td>-0.08</td>
<td>-0.03</td>
<td>-0.04</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.03</td>
<td>0.04</td>
<td>-0.15*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Past growth relative to competitors</td>
<td>3.63</td>
<td>0.63</td>
<td>0.05</td>
<td>0.13*</td>
<td>0.06</td>
<td>0.04</td>
<td>0.00</td>
<td>-0.14*</td>
<td>0.08</td>
<td>0.03</td>
<td>0.02</td>
<td>0.08</td>
<td>-0.01</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Heterogeneity</td>
<td>4.37</td>
<td>1.37</td>
<td>0.04</td>
<td>0.02</td>
<td>0.07</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.13*</td>
<td>-0.15*</td>
<td>0.14*</td>
<td>0.03</td>
<td>0.02</td>
<td>-0.09</td>
<td>-0.01</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>15. Prior knowledge</td>
<td>4.63</td>
<td>0.59</td>
<td>0.00</td>
<td>-0.05</td>
<td>0.12*</td>
<td>0.04</td>
<td>-0.02</td>
<td>-0.13</td>
<td>-0.15*</td>
<td>0.05</td>
<td>0.09</td>
<td>0.13*</td>
<td>-0.03</td>
<td>0.03</td>
<td>0.27*</td>
<td>0.13*</td>
</tr>
<tr>
<td>16. Downstream internationalization</td>
<td>0.16</td>
<td>0.94</td>
<td>-0.03</td>
<td>0.07</td>
<td>0.01</td>
<td>0.11</td>
<td>-0.13*</td>
<td>0.17*</td>
<td>0.25*</td>
<td>0.16*</td>
<td>0.15*</td>
<td>0.12</td>
<td>-0.07</td>
<td>-0.15*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>17. Upstream internationalization</td>
<td>0.04</td>
<td>0.70</td>
<td>0.01</td>
<td>0.04</td>
<td>0.16*</td>
<td>0.12</td>
<td>-0.15*</td>
<td>0.12</td>
<td>-0.01</td>
<td>-0.11</td>
<td>0.12</td>
<td>0.09</td>
<td>0.24*</td>
<td>-0.08</td>
<td>0.04</td>
<td>-0.06</td>
</tr>
<tr>
<td>18. Acquisition of market knowledge</td>
<td>2.38</td>
<td>1.04</td>
<td>0.06</td>
<td>0.00</td>
<td>0.01</td>
<td>0.08</td>
<td>0.00</td>
<td>0.07</td>
<td>0.07</td>
<td>-0.06</td>
<td>0.02</td>
<td>0.20*</td>
<td>0.07</td>
<td>-0.10</td>
<td>0.08</td>
<td>-0.02</td>
</tr>
<tr>
<td>19. Acquisition of technological knowledge</td>
<td>2.10</td>
<td>0.94</td>
<td>0.03</td>
<td>-0.08</td>
<td>0.11</td>
<td>0.14*</td>
<td>0.01</td>
<td>0.12</td>
<td>0.06</td>
<td>-0.03</td>
<td>-0.09</td>
<td>0.12</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.10</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Note: N=236 observations; * correlations significant at least at p<.05.
Table 7.4 Intercorrelations among the study’s independent and dependent variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Downstream int.</td>
<td>0.02</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Upstream int.</td>
<td></td>
<td>0.28*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>18. Acquisition of market knowledge</td>
<td>0.10</td>
<td>0.31*</td>
<td>0.19*</td>
<td></td>
</tr>
<tr>
<td>19. Acquisition of technological knowledge</td>
<td>0.16*</td>
<td>0.21*</td>
<td>0.29*</td>
<td>0.57*</td>
</tr>
</tbody>
</table>

Note: N=236 observations; * correlations significant at least at p<0.05.

None of the variables measuring CEO experience (CEO prior managerial experience, CEO prior experience from the same industry, and CEO experience from other industries) show significant correlations with the acquisition of market knowledge. CEO experience variables are not related to the acquisition of technological knowledge either, with one exception. CEO prior management experience has a significant positive correlation with the acquisition of technological knowledge (r=0.14, p<0.05). It seems that CEO management know-how improves the chances of ‘getting things right’ when dealing with international business partners and acquiring ambiguous and sticky technological knowledge (Hamel, 1991; Simonin, 1999). Conversely, market knowledge is acquired regardless of CEO prior know-how.

Also interesting are some non-relationships. For instance, CEO demographic characteristics (CEO age, CEO gender, and CEO formal education in business administration) are neither correlated with the acquisition of market knowledge nor with the acquisition of technological knowledge. I would have expected them to influence the level of market and technological know-how acquired from international activities. Prior studies, in fact, maintain that, in smaller firms, the personality of the chief executive is an important determinant of firm development (Preisendorfer & Voss, 1990). In addition, none of the dummy variables for industry group is significantly correlated with the acquisition of market knowledge or the acquisition of technological knowledge. This may indicate that there are no industry-specific conditions which facilitate the acquisition of market or technology knowledge.

7.5.2 Probit model for sample selection bias

Table 7.5 presents the results from the probit model capturing SME decisions to be international in 2000. The dependent variable takes value 1 if the firm
was international in 2000 and 0 if the firm was not international in 2000. The
inverse Mills ratio (IMR) derived from this model will be added to the
multivariate multiple regression analysis to assess and if necessary control for
sample selection bias.

Table 7.5. Probit model for selection bias model (dependent variable =
international in 2000)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Probit coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO age</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO gender (male)</td>
<td>0.51**</td>
<td>0.19</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>0.14</td>
<td>0.10</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>0.19</td>
<td>0.11</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.30***</td>
<td>0.13</td>
</tr>
<tr>
<td>Service</td>
<td>0.22</td>
<td>0.12</td>
</tr>
<tr>
<td>Retail</td>
<td>-0.22</td>
<td>0.14</td>
</tr>
<tr>
<td>Medium size</td>
<td>0.03**</td>
<td>0.09</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.27**</td>
<td>0.10</td>
</tr>
<tr>
<td>Firm age</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Past growth relative to competitors 1997</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>Growth aspiration</td>
<td>0.25**</td>
<td>0.10</td>
</tr>
<tr>
<td>Industry opportunity</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.41**</td>
<td>0.52</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-538.21</td>
<td></td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>235.61***</td>
<td></td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>954</td>
<td></td>
</tr>
</tbody>
</table>

Note: * p<0.05; ** p<0.01; ***p<0.001.

Overall the probit model is significant (LR chi-squared test=235.61, p< 0.0001)
and rather successful in explaining SME international entry: it explains eighteen
percent of the variance.

The results indicate that international firms are more likely to have a male
CEO (coefficient=0.51, p<0.01). This is consistent with prior research. Male
CEOs may have more opportunities than their female counterparts to develop
valuable network contacts for expansion (Manolova, 2005). The results also
show that manufacturing firms are significantly more likely to internationalize
than firms competing in other industries (coefficient=1.30, p<0.001). This
finding is in line with prior research, which suggests that manufacturing firms
are more internationally oriented, while service firms are more focused on local
markets (Westhead, Wright, & Ucbasaran, 2001). In addition, the results
indicate that medium-sized firms are more likely to internationalize than small
firms (coefficient=0.03, p<0.5). Nor is this result surprising. Compared with
small firms, medium-sized firms may find it easier to internationalize because of
potential slack resources that can be allocated to international expansion (Hitt
The significant negative coefficient associated with being an independent firm (coefficient=-0.27, p<0.01) indicates that independent firms are less likely to internationalize than firms which are part of a business group. Again, this result is not unexpected. Compared with firms that are part of a business group, independent firms have less access to resources and contacts to use for international expansion. Furthermore, the results show that international SMEs tend to have higher growth aspirations. The coefficient associated with the measure of growth aspiration is significant and positive (coefficient=0.25, p<0.05). These findings are in line with prior research on SME internationalization (Fujita, 1998). In short, international SMEs appear to be manufacturing medium-sized firms, whose male CEOs are willing to use their network and business group resources to expand internationally.

All CEO demographic characteristics but gender, are not significant. The fact that CEO demographic characteristics (e.g. level of education) do not differentiate between internationalized and non-internationalized firms is consistent with prior research (Manolova et al., 2002). However, it is more surprising that none of the variables measuring CEO experience is significant. This result seems to suggest that relevant expertise in how to manage a business has limited effect on the decision to internationalize. Wiklund and Shepherd’s (2003a) study may offer an explanation of this puzzling phenomenon. The authors found that CEO experience affected small firm growth only in interaction with growth aspirations. In other words, it could be argued that expert CEOs internationalize only when they actually intend to expand the business.

Also the perception of opportunities in the industry is not significant. One explanation could be that the perception of opportunities in the industry fosters expansion in domestic markets too. Consequently, it does not discriminate between international and domestic SMEs. Also past growth relative to competitors is not significant. Thus, past growth relative to competitors does not seem to influence SME choice of strategy and, in particular, SME choice of international entry. Furthermore, prior knowledge does not significantly distinguish between international and domestic firms. It is worth pointing out that market and technological knowledge resources are considered as key drivers of the internationalization of small firms (Brush et al., 2002). Yet, this is not the only possible interpretation of the role of knowledge resources. It could also be argued that a firm’s endowment of market and technological knowledge is not essential for going international, but it rather enhances the continuation of the internationalization process (Johanson & Vahlne, 1977). The secondary role played by market and technological knowledge in international entry emerges also from McDougall et al.’s (2003) study. The authors found that prior technical experience and prior market experience do not significantly distinguish between international and domestic new ventures.

To sum up, the first-stage probit model estimating sample selection is significant and has a fairly high explanation power. In addition, the results are
7. Analysis and results: Internationalization, prior and new knowledge

largely consistent with expectations and results published in the literature. Hence, sample selection does not appear to have a random structure: the predictors included in the model uniquely influence SME decisions to be international in 2000. The results obtained from the probit model estimating sample selection will be used in the formulation of the IMR. To test whether sample selection bias affects the estimates of knowledge acquisition from internationalization, the IMR will be included in the multivariate multiple regression estimating knowledge acquisition from internationalization.

7.5.3 Probit model for sample attrition bias

Table 7.6 presents the results from the probit model capturing attrition. The dependent variable takes value 1 if the respondent attrited from the sample and 0 otherwise.

Model 1 introduces the baseline model including variables that can explain attrition between the first data collection point in 1997 and the data collections up to fall 2000. Model 2 adds a dummy variable measuring whether or not the firms had international links or international operations in 1997. This information was collected in spring 1997 and is only available for those firms that responded to the mail questionnaires in spring 1997. Thus, model 2 suffers of a reduction in sample size.

Model 1 is significant (LR chi-square test=35.78, p<0.001). However, it does not seem to be very successful in explaining attrition. Model 1 is able to account for slightly more than 1 % of the variance. This may indicate a nearer random pattern of dropouts. However, this result should be interpreted with caution as the low explanatory power of the model might also result from the omission of important exogenous variables. Nevertheless, if the former holds, the IMR to be constructed will be unlikely to have a significant coefficient when included in the subsequent multivariate multiple regression analysis (Berk, 1983).
Table 7.6. Probit model for attrition bias model (dependent variable=1 if the firm attrites; 0 otherwise)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probit coefficient</td>
<td>Standard error</td>
<td>Probit coefficient</td>
<td>Standard error</td>
</tr>
<tr>
<td>CEO age</td>
<td>0.01**</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO gender</td>
<td>-0.08</td>
<td>0.12</td>
<td>0.05</td>
<td>0.18</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>-0.10</td>
<td>0.07</td>
<td>-0.03</td>
<td>0.09</td>
</tr>
<tr>
<td>CEO prior management</td>
<td>-0.01</td>
<td>0.07</td>
<td>0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>0.07</td>
<td>0.07</td>
<td>0.14</td>
<td>0.10</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.02</td>
<td>0.07</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.05</td>
<td>0.08</td>
<td>-0.08</td>
<td>0.12</td>
</tr>
<tr>
<td>Service</td>
<td>-0.20*</td>
<td>0.08</td>
<td>-0.14</td>
<td>0.12</td>
</tr>
<tr>
<td>Retail</td>
<td>0.17</td>
<td>0.09</td>
<td>0.17</td>
<td>0.13</td>
</tr>
<tr>
<td>Medium size</td>
<td>-0.03</td>
<td>0.06</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Firm age</td>
<td>-0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.03</td>
<td>0.07</td>
<td>0.27**</td>
<td>0.09</td>
</tr>
<tr>
<td>Past growth relative to competitors</td>
<td>-0.04</td>
<td>0.05</td>
<td>-0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Main metropolitan areas</td>
<td>0.20**</td>
<td>0.07</td>
<td>-0.17</td>
<td>0.09</td>
</tr>
<tr>
<td>International links and operations</td>
<td></td>
<td></td>
<td>0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.04</td>
<td>0.29</td>
<td>-0.56</td>
<td>0.42</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-1198.90</td>
<td></td>
<td>-654.18</td>
<td></td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>35.78***</td>
<td></td>
<td>28.09***</td>
<td></td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>0.01</td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1787</td>
<td></td>
<td>967</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p<0.05; **p<0.01; ***p<0.001

When looking at the coefficients of Model 1, only CEO age, main industry group (service), and location (main metropolitan area) seem to distinguish between dropouts and firms remaining in the sample. SMEs which leave the study between 1997 and 2000 tend to have significantly older CEOs (coefficient of CEO age=0.01, p<0.01). In addition, service firms seem to be significantly less likely to drop out from the sample (coefficient of retail=-0.20, p<0.05), while firms located in main metropolitan areas seem to be significantly more likely to drop out from the sample (main metropolitan area coefficient=0.20, p<0.01).

The fact that CEO age distinguishes between respondents and dropouts is consistent with prior studies. The age of the CEO can be a proxy of his or her experience and accumulated know-how. Thus, firms with older CEOs should be more likely to survive. CEO age is also correlated with the probability of the CEO to remain on the post (Geddes & Vinod, 1997). CEO tenure, in turn,
can be expected to enhance the likelihood of continued participation in the study. It could be argued, for instance, that CEOs who responded to the first telephone interview in 1997 may feel ‘morally compelled’ to continue participating in the study as they are contacted again over the years. On the contrary, a newly appointed CEO, who did not personally participate in the study from day one, might be less willing to spend time filling in the follow-up questionnaires. The fact that service firms are more likely to stay on could be explained by their local orientation (Westhead, Wright, & Ucbasaran, 2001). By being more locally oriented than manufacturing firms, service firms bear less costs, also in terms of time, and less risk of doing business in unknown environments. In short, service firms can be expected to have more time to participate in the study as well as to be less likely to fail due to liability of foreignness.

At first glance the fact that firms located in main metropolitan areas are more likely to attrite appears puzzling. In principle, being located in a main metropolitan area should enhance SME survival. However, the dropout rate of firms located in main metropolitan areas may be due to time shortage. In general, life in metropolitan areas is more hectic than in rural areas, rendering individuals located in major cities less willing to devote time to the study.

With the exception of CEO age, all variables measuring CEO personal characteristics and expertise do not seem to significantly distinguish between SMEs which leave the study and SMEs that remain. Also, issues related to firm size, age, performance, and governance do not appear to matter. These non-significant results strengthen the idea that, for the most part, attrition from the sample is random.

Also Model 2, which adds SME international links and operations, is significant (LR chi-squared test=28.09, p<0.0001), but does not seem to be very successful in explaining attrition. It accounts for 2 % of the variance. Thus, even when considering the impact of international links and operations, attrition seems to have a random structure. This is also supported by the fact that, in Model 2, all predictors but one are not significant. Specifically, firms that attrited from the sample and those that remained appear to differ only in terms of their main governance type, with independent firms being more likely to stay on.

To sum up, both probit models estimating attrition are significant but have low explanation power. In addition, most estimated coefficients, even across model specifications, are not significant. Hence, sample attrition appears to have a nearly random structure: the predictors included in the models do not influence dropouts from the sample. Next, the IMR will be calculated from each probit model and included in the subsequent multivariate multiple regression analysis. As explained by Berk (1983), if there is a near random pattern of attrition, the IMR will not have a statistically significant coefficient. In addition, its inclusion in the regression should not significantly change the estimates of independent variables.
7.5.4 Multivariate multiple regression estimating knowledge acquisition from internationalization

As described earlier, Hypotheses 1-6 are tested with multivariate multiple regression analysis, using Stata mvreg procedure. Table 7.9 reports the multivariate multiple regression equations, with the acquisition of market knowledge and the acquisition of technological knowledge as dependent variables. Table 7.10 contains a summary of the hypothesis results. As explained earlier, I perform the analysis in subsequent steps. In Model 1, I enter the control variables: CEO age, gender, formal education in business administration, CEO prior managerial experience, CEO prior experience from the same industry, CEO prior experience from other industries, major industry group, size class, major governance type, firm age, past growth relative to competitors, and environmental heterogeneity. Then, in Model 2, I include the independent variables prior knowledge acquisition of market knowledge and acquisition of technological knowledge (Model 2). Finally, in Model 3, I add the two interaction terms, the interaction between prior knowledge and downstream internationalization and the interaction between prior knowledge and upstream internationalization.

Corrections for sample bias

Three additional analyses are performed. First, I run the multivariate multiple regression analysis with the correction for sample selection bias. Specifically, I include in the analysis the IMR obtained from the probit model estimating sample selection. Second, I run the analysis, correcting for sample attrition bias. Here, I add the IMR obtained from the first probit model estimating sample attrition. Third, I run the multivariate analysis with an additional correction for sample attrition. Specifically, I add in the analysis the IMR obtained from the second probit model estimating sample attrition.

The results for these analyses (which cannot be displayed here due to space limitations) show that all IMRs are statistically insignificant. In addition, the results for the variables of interest do not differ substantially. These results suggest that the selection of international firms in 2000 does not seem to have an impact on the matter of interest in the study. In addition, as anticipated by the low estimating power of the probit models estimating sample attrition, the results suggest that dropouts from the sample have a nearly random structure. In other words, it seems that valid inferences can be made without worrying about these possible forms of bias. Hence, I will discuss the results in terms of those reported in Table 7.7, which do not contain sample corrections. Below, I will start presenting the significance and explanatory power of the models, before moving into testing of the specific hypotheses.
Overall fit of the models

Model 1 (Table 7.7), which includes the control variables, is only significant at p<0.1 and accounts for 9 percent of the variance in the acquisition of market knowledge and 9 percent of the variance in the acquisition of technological knowledge. Of all the control variables, only medium size has a significant positive effect on the acquisition of market knowledge; while the impact of medium size on the acquisition of technological knowledge is only significant at p<0.1. The other non-relationships, which were anticipated by the correlation analysis, are, in themselves, interesting. It seems that SME acquisition of market and technological knowledge from international markets is not dependent on any CEO characteristic or firm-level characteristic but size class.

Model 2 (Table 7.7), which includes the study’s independent variables, is highly significant and explains 19 percent of the variance in the acquisition of market knowledge and 22 percent of the variance in the acquisition of technological knowledge. Thus, the R-squares for the two equations increase by 10 and 13 percent, respectively. An F-test is performed to assess the joint statistical significance of the independent variables entered into Model 2. This test (F=9.02, p<0.001) shows that the study’s independent variables, as a group, are significant. This result, together with the increase in R-squares, shows that prior knowledge, downstream internationalization, and upstream internationalization are important predictors of SME acquisition of market and technological knowledge.

Model 3 (Table 7.7), which adds the interaction terms, is significant. It explains 22 percent of the variance in the acquisition of market knowledge and 24 percent of the variance in the acquisition of technological knowledge. Thus, after the inclusion of the interaction terms, the R-squares of the equations increase by 3 and 2 percent, respectively. Again, an F-test is performed to test the joint significance of the interaction terms across equations. This test (F=1.60, p=1.76) is not significant. Thus, the two interaction terms, together, do not seem to have an impact, neither on the acquisition of market knowledge nor on the acquisition of technological knowledge.

Having presented the results of the three models in general terms, we can now move to the testing of the hypotheses.

Results for Hypothesis 1 and Hypothesis 2

To test Hypothesis 1, which suggests that downstream internationalization is positively related to the acquisition of market knowledge, we can examine the coefficient of downstream internationalization on the acquisition of market knowledge in Model 2 (Table 7.7). This hypothesis is supported as downstream internationalization has a significant positive relationship with the acquisition of market knowledge (beta=0.36; p<0.001). The same coefficient is significant and positive also in Model 3 (beta=0.37; p<0.001), suggesting that the significant positive impact of downstream internationalization on the acquisition of market knowledge is stable across the two models.
To test Hypothesis 2, which expects upstream internationalization to be positively related to the acquisition of technological knowledge, we can look at the coefficient of upstream internationalization on the acquisition of technological knowledge in Model 2. This coefficient is positive and significant (beta=0.39; p<0.001), providing support for Hypothesis 2. In addition, the significant positive impact of upstream internationalization on the acquisition of technological knowledge is maintained in Model 3 (beta=0.34; p<0.001).

Results for Hypothesis 3a and Hypothesis 3b

Hypothesis 3a suggests that downstream internationalization is positively associated with the acquisition of technological knowledge. In Model 2, downstream internationalization has a positive significant impact (beta=0.14; p<0.05) on the acquisition of technological knowledge. This result is stable also in Model 3 (beta=0.15; p<0.05). Thus, support is found for the first part of Hypothesis 3 (Hypothesis 3a). The second part of Hypothesis 3 (Hypothesis 3b), expects the relationship between downstream internationalization and the acquisition of technological knowledge to be weaker than the relationship between downstream internationalization and the acquisition of market knowledge.

In Model 2 the coefficient of downstream internationalization on the acquisition of technological knowledge is significantly smaller than the coefficient of downstream internationalization on the acquisition of market knowledge. The same holds for Model 3. Thus, support is found also for Hypothesis 3b.

\[12\] In Stata it is possible to perform a test for the inequality for two coefficients. Specifically, I test the following null hypothesis; \( H_0: \beta(\text{Downstream internationalization in equation with acquisition of technological knowledge}) \geq \beta(\text{Downstream internationalization in equation with acquisition of market knowledge}) \). First, I test whether the two coefficients are equal (F(1,216) p=0.0021). Then, I use the results to calculate the appropriate p-value of \( H_0 \). The p-value of \( H_0 \) is 0.009. Thus, \( H_0 \) can be rejected.
Table 7.7 Multivariate multiple regression analysis

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
<th>Model 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acquisition of market knowledge</td>
<td>Acquisition of technological knowledge</td>
<td>Acquisition of market knowledge</td>
<td>Acquisition of technological knowledge</td>
<td>Acquisition of market knowledge</td>
<td>Acquisition of technological knowledge</td>
</tr>
<tr>
<td>CEO age</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO gender</td>
<td>-0.010</td>
<td>-0.473</td>
<td>-0.120</td>
<td>-0.546</td>
<td>-0.076</td>
<td>-0.512</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>-0.06</td>
<td>0.25+</td>
<td>-0.06</td>
<td>0.20</td>
<td>0.01</td>
<td>0.24+</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>0.15</td>
<td>0.17</td>
<td>0.07</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>0.10</td>
<td>0.19</td>
<td>0.18</td>
<td>0.29&quot;</td>
<td>0.17</td>
<td>0.27+</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.12</td>
<td>0.24</td>
<td>0.08</td>
<td>0.25+</td>
<td>0.08</td>
<td>0.24+</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.18</td>
<td>0.12</td>
<td>0.13</td>
<td>0.18</td>
<td>0.10</td>
<td>0.16</td>
</tr>
<tr>
<td>Service</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.09</td>
<td>0.07</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>Retail</td>
<td>0.22</td>
<td>-0.28</td>
<td>0.37</td>
<td>-0.30</td>
<td>0.26</td>
<td>-0.36</td>
</tr>
<tr>
<td>Medium size</td>
<td>0.47***</td>
<td>0.21+</td>
<td>0.38***</td>
<td>0.11</td>
<td>0.38***</td>
<td>0.12</td>
</tr>
<tr>
<td>Firm age</td>
<td>-0.28+</td>
<td>-0.10</td>
<td>-0.19</td>
<td>-0.03</td>
<td>-0.14</td>
<td>-0.01</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td>Past growth relative to competitors</td>
<td>0.15</td>
<td>0.11</td>
<td>0.17</td>
<td>0.07</td>
<td>0.13</td>
<td>0.05</td>
</tr>
<tr>
<td>Heterogeneity</td>
<td>-0.00</td>
<td>0.06</td>
<td>0.03</td>
<td>0.08+</td>
<td>0.03</td>
<td>0.08+</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>0.05</td>
<td>0.20+</td>
<td>0.12</td>
<td>0.23&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstream internationalization</td>
<td>0.36***</td>
<td>0.14*</td>
<td>0.37***</td>
<td>0.15&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstream internationalization</td>
<td>0.08</td>
<td>0.39***</td>
<td>0.02</td>
<td>0.34***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior knowledge* Downstream internationalization</td>
<td>-0.16</td>
<td>-0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior knowledge* Upstream internationalization</td>
<td>0.53&quot;</td>
<td>0.40&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.80</td>
<td>0.85</td>
<td>0.75</td>
<td>1.08</td>
<td>0.79</td>
<td>1.12</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.09+</td>
<td>0.09+</td>
<td>0.19***</td>
<td>0.22***</td>
<td>0.22***</td>
<td>0.24***</td>
</tr>
</tbody>
</table>

Note: N=236; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1.
Results for Hypothesis 4a and Hypothesis 4b
Hypothesis 4a suggests that upstream internationalization is positively associated with the acquisition of market knowledge. In both Model 2 and Model 3, upstream internationalization is not significantly related to the acquisition of market knowledge, providing no support for Hypothesis 4a.

Also, hypothesis 4b, which builds on hypothesis 4a, cannot be fully supported. Hypothesis 4b expects the impact of upstream internationalization on the acquisition of market knowledge to be weaker than the impact of upstream internationalization on the acquisition of technological knowledge. Since the coefficient of upstream internationalization in the acquisition of market knowledge equation is not significant, the impact of upstream internationalization on the acquisition of market knowledge could very well be zero.

Thus, these results seem to indicate that upstream internationalization has a positive and significant impact on the acquisition of technological knowledge. Yet, we cannot say whether this impact is stronger (or weaker, for that matter) than the one on the acquisition of market knowledge.

Results for Hypothesis 5a and Hypothesis 5b
Hypothesis 5a predicts that prior knowledge moderates the relationship between downstream international activities and the acquisition of market knowledge. Model 3 in Table 7.7 presents the equation that tests this prediction. The interaction of prior knowledge and downstream internationalization has no significant impact on the acquisition of market knowledge, providing no support for Hypothesis 5a. Hypothesis 5b suggests that prior knowledge moderates the relationship between upstream internationalization and the acquisition of technological knowledge.

Consistent with Hypothesis 5b, the interaction of upstream internationalization and prior knowledge has a positive and significant association with the acquisition of technological knowledge (beta=53; p<0.05). One way of facilitating the interpretation of the interaction effect is to plot the relation between upstream internationalization and the acquisition of technological knowledge at low (-1 standard deviation), medium, and high (+1 standard deviation) levels of prior knowledge. Figure 7.1 depicts the single slopes of upstream internationalization on the acquisition of market knowledge at these three different levels of prior knowledge. The calculations are based on the formulae provided in Aiken & West (1991). The graph suggests that SME acquisition of technological knowledge increases with upstream internationalization, but at a faster rate for SMEs with a greater endowment of prior knowledge.
7. Analysis and results: Internationalization, prior and new knowledge

Figure 7.1 Interaction plot illustrating the slope of upstream internationalization on the acquisition of technological knowledge at low, medium, and high values of prior knowledge.

Results for Hypothesis 6a and Hypothesis 6b

Hypothesis 6a proposes that prior knowledge moderates the relationship between downstream international activities and the acquisition of technological knowledge. As revealed in Model 3 (Table 7.7), the interaction of prior knowledge and downstream internationalization has no significant impact on the acquisition of technological knowledge, providing no support for Hypothesis 6a.

Hypothesis 6b suggests that prior knowledge moderates the relationship between upstream international activities and the acquisition of market knowledge. The equation that tests this precondition is shown in Model 3. Consistent with Hypothesis 6b, the interaction of upstream internationalization and prior knowledge has a positive and significant association with the acquisition of market knowledge (beta=0.40; p<0.05). Figure 7.2 plots the relation between upstream internationalization and the acquisition of market knowledge at low, medium, and high levels of prior knowledge. The graph confirms my belief that SMEs are more likely to acquire market knowledge from performing upstream international activities when they have higher levels of prior endowment of knowledge resources. By contrast, SME acquisition of
market knowledge suffers when increased upstream internationalization is coupled with low levels of prior knowledge.

7.6 Summary of the results

The chapter reports the empirical results concerning the relationships illustrated in the first part of the research model. Specifically, these results concern the relationships between downstream/upstream internationalization and the acquisition of market and technological knowledge as well as the moderating role of prior knowledge on these relationships. A summary of the hypotheses tested in this chapter and their support is presented in Table 7.8.
Table 7.8 Summary of hypotheses and results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Downstream internationalization is positively related to the acquisition of market knowledge</td>
<td>Supported</td>
</tr>
<tr>
<td>2. Upstream internationalization is positively related to the acquisition of technological knowledge</td>
<td>Supported</td>
</tr>
<tr>
<td>3a. Downstream internationalization is positively related to the acquisition of technological knowledge</td>
<td>Supported</td>
</tr>
<tr>
<td>3b. The relationship between downstream internationalization and the acquisition of technological knowledge is weaker than the relationship between downstream internationalization and the acquisition of market knowledge</td>
<td>Supported</td>
</tr>
<tr>
<td>4a. Upstream internationalization is positively related to the acquisition of market knowledge</td>
<td>Not supported</td>
</tr>
<tr>
<td>4b. The relationship between upstream internationalization and the acquisition of market knowledge is weaker than the relationship between upstream internationalization and the acquisition of technological knowledge</td>
<td>Not supported</td>
</tr>
<tr>
<td>5a. Prior knowledge enhances the positive relationship between downstream international activities and the acquisition of market knowledge</td>
<td>Not supported</td>
</tr>
<tr>
<td>5b. Prior knowledge enhances the positive relationship between upstream international activities and the acquisition of technological knowledge</td>
<td>Supported</td>
</tr>
<tr>
<td>6a. Prior knowledge enhances the positive relationship between downstream international activities and the acquisition of technological knowledge</td>
<td>Not supported</td>
</tr>
<tr>
<td>6b. Prior knowledge enhances the positive relationship between upstream international activities and the acquisition of market knowledge</td>
<td>Supported</td>
</tr>
</tbody>
</table>

I find strong empirical support to indicate that downstream internationalization is in fact positively related to the acquisition of market knowledge (Hypothesis 1) and that upstream internationalization is positively associated with the acquisition of technological knowledge (Hypothesis 2). Hence, these results support the overall expectation that SMEs, when involved in downstream and upstream international activities, learn by doing and acquire knowledge in the domain of the activities performed. That is, they acquire market knowledge when engaged in downstream activities and they acquire technological knowledge when engaged in upstream activities.

I also find that downstream internationalization is positively related to the acquisition of technological knowledge (Hypothesis 3a). In addition, as expected, the relationship between downstream internationalization and the
acquisition of technological knowledge is weaker than the relationship between downstream internationalization and the acquisition of market knowledge (Hypothesis 3b). These results indicate that SMEs engaged in downstream international activities can acquire knowledge through forms of learning other than learning-by-doing and broaden their technological knowledge domain as well. Yet, knowledge arises primarily through learning-by-doing in the domain of the activities performed. Indeed, ceteris paribus, downstream internationalization brings more market knowledge than technological knowledge.

I do not find empirical support to indicate that upstream internationalization is significantly associated with the acquisition of market knowledge (Hypothesis 4a). Consequently, nor is definitive support found for hypothesis 4b, which expected the relationship between upstream internationalization and the acquisition of market knowledge to be weaker than the relationship between upstream internationalization and the acquisition of technological knowledge. These results indicate that SME engagement in upstream international activities, per se, does not lead to other forms of learning broadening the firms’ market knowledge base.

Furthermore, I do not find support for the moderating role of prior knowledge in the relationship between downstream internationalization and the acquisition of market knowledge (Hypothesis 5a). However, I find that prior knowledge moderates the relationship between upstream internationalization and the acquisition of technological knowledge (Hypothesis 5b). Hence, greater endowment of prior knowledge seems to enhance SME learning-by-doing only when the firms are engaged in upstream international activities.

Finally, I do not find support for the moderating role of prior knowledge in the relationship between downstream internationalization and the acquisition of technological knowledge (Hypothesis 6a), but I find that prior knowledge moderates the relationship between upstream internationalization and the acquisition of market knowledge (Hypothesis 6b). Hence, greater endowment of prior knowledge seems to enhance forms of learning other than learning-by-doing only in the upstream domain. This result is important in the light of the not significant direct relationship between upstream internationalization and the acquisition of market knowledge (no support for hypothesis 4a). A high level of prior knowledge is the sine qua non for SME knowledge acquisition through forms of learning other than learning-by-doing in the upstream domain.
8 Analysis and results: New knowledge, knowledge processes, and firm growth

8.1 Introduction

This chapter empirically tests Hypotheses 7-12, relative to the second part of the research model. These hypotheses were developed in Chapter 4.

The chapter is organized as follows. I start by presenting and discussing issues related to the sample. The choice of statistical analyses is then introduced. Afterwards, I summarize the measurements of the variable before illustrating the analyses and results. Finally, I summarize the results.

8.2 Sample selection bias, attrition bias, and non-response analysis

As illustrated in Chapter 5, the sample comprises 885 SMEs which in 2000 reported having at least one downstream or upstream international activity. As for most longitudinal research design, the sample shrank over time: after the last data collection in 2006, there is full information for only 131 SMEs on all the variables relevant for testing Hypotheses 7-12. Again, sample selection and sample attrition bias might create problems. In addition, the high number of non-responses calls for a non-response analysis. This analysis is illustrated in Appendix 2.

8.2.1 Sample selection bias

When investigating SME growth, restricting the analysis to only international firms might create a selection bias. Since firms are able to decide on their involvement in international activities, it is likely that the observed levels of firm growth are conditional on unobserved factors that influence the internationalization choice of SMEs (e.g. industry, CEO background, etc.). To detect and correct for this bias, I will use the Heckit two-step technique.

The probit model will include variables influencing both the decision to be international and SME growth. To be properly constructed, the model should
also include at least one variable that influences an SME decision to be international, but not directly SME growth. To identify such a variable is not an easy task. Internationalization is, per se, a business expansion. Most factors influencing the choice of internationalization also influence firm growth. However, whether the firm has or has not a Swedish name can be expected to influence the likelihood of a firm’s internationalization, but not directly its growth. First, the choice of a Swedish name might imply a certain local orientation of the firm. Second, having a name that is difficult to understand and remember outside Sweden can make it more difficult for companies to go international. Thus, I will include in the probit model whether or not the firm has a Swedish name. This factor is not expected to predict SME growth. The other variables in the probit model are: CEO age, major industry group, firm size class, major governance type, and growth aspirations. The analysis carried out in Chapter 7, Section 7.5.2 shows that these variables significantly predict SME decisions to be international in 2000. These factors can be expected to influence SME growth as well (Wiklund, 1998).

8.2.2 Sample attrition bias

Growth is risky and time-consuming for small and medium-sized firms. The variables that affect SME growth may also cause bankruptcy, failure (George et al., 2005) and unwillingness to continue participating in the study. Given the longitudinal nature of the study, attrition from the sample can occur at different points in time. At a minimum, we can identify two key attrition points. First, there is the fall from the sample when a firm responding to the data collections in 1997 drops out from the data collections carried out in 2000. Second, there is the fall from the sample when a firm responding to the first data collection in 2000 drops out from the subsequent data collection carried out in 2006. The likelihood of attrition in 2000 was estimated in Chapter 7. That analysis seems to indicate that there are no systematic reasons attached to firms’ nonparticipation in the study in the year 2000. In this chapter, I will focus on the attrition in 2006. The probit model will estimate the probability that the 885 firms – which in spring 2000 reported having at least one downstream or upstream international activity – drop out of the sample in 2006. The IMR obtained from this analysis will be included in the subsequent analyses.

The probit model will include a first set of variables that can predict drop-out as well as firm growth. These variables are: CEO demographic characteristics (CEO age, CEO gender, and CEO formal education in business administration), CEO experience (CEO prior managerial experience, CEO prior experience from the same industry, and CEO prior experience from other industries), major industry group, firm size class, firm age, major governance type, and past performance (Cooper et al., 1994). The probit model should also include at least another variable that predicts attrition but does not have a direct
effect on firm growth. As for the sample selection model discussed above, it is not easy to identify factors which may affect firm survival, but not firm growth. In a study of new Swedish firms, Dahlqvist et al. (2000) find that whether or not a firm is located in a main metropolitan area is related to its marginal survival, but not to its performance, measured in terms of sales growth, employment growth, and profitability. This result seems to suggest that, at least in Sweden, a firm’s location in a main metropolitan area may influence its survival, but not directly its growth. I will include a broad location dummy variable (major metropolitan areas vs. other locations) in the probit model estimating sample attrition. The relevance of a firm’s location for estimating attrition is confirmed by the probit model estimating attrition in 2000 (see Chapter 7). In that analysis a firm’s location is a significant predictor of attrition. Instead, most of the above factors (CEO gender, CEO experience, firm size, firm age, and past growth) do not seem to significantly differ between respondents and dropouts in 2000. These non-significant relationships are interpreted as indicating a nearer random pattern of dropouts in 2000. Thus, these factors are kept in the probit model seeking to explain attrition from the sample in 2006. 

8.3 Choices for data analysis

Several analyses are used in this chapter. Probit analysis is used as a first step in the Heckit technique when assessing and controlling for sample selection and sample attrition bias. Multiple regression analysis, multivariate multiple regression analysis, and fractional logit regression analysis are used to test Hypotheses 7-12. Below, I briefly present the multiple regression analysis and the fractional logit regression analysis. An illustration of the probit regression analysis, the Heckit technique, and the multivariate multiple regression analysis can be found in Chapter 7.

8.3.1 Multiple regression analysis

As already mentioned in Chapter 7, multiple regression analysis measures the relationship between one dependent variable and several independent variables. Thus, it seems a suitable technique to test Hypotheses 7-12, each expecting a positive relationship between the knowledge acquired from international markets and different growth outcomes. Technically speaking, multiple regression analysis predicts the scores of one dependent variable on the basis of

---

13 It should be noted that to predict attrition from the sample in 2000, I use data collected in 1997, while to predict attrition from the sample in 2006 I used data collected in 2000.
scores on the predictors (or independent variables). This is achieved by producing a model, in the form of a linear equation, which identifies the best weighted combination of predictor variables to best explain the dependent variable (Hair et al., 2006). The regression equation is as follows:

\[ y_i = \beta_0 + \beta_1 x_1 + \ldots + \beta_k x_k + \epsilon_i \]

In this equation, \( y_i \) is the predicted score on the dependent variable, the \( x \)s are the predictors or independent variables, and the betas are the weights or coefficients associated with the predictors. Each beta reflects the relative contribution of its variable, controlling for the effects of the other variables. The epsilon term is the residual or error for each case and it represents the deviation of the observed value of the response for this case from that expected by the model (Landau & Everitt, 2004). To estimate the coefficients betas, multiple regression analysis uses the method of least squared, which minimizes the sum of squared differences between the actual and predicted values of the dependent variable (Hair et al., 2006).

To assess the overall fit and statistical significance of the multiple regression equation, I will consider the R-squared and the related F-ratio test. Multiple regression, in comparison with multivariate multiple regression, offers a few additional statistics: the adjusted R-squared and the test of significance for the change in R-squared. As the name suggests, the adjusted R-squared is a modified measure of the R-squared that takes into account the number of independent variables included in the regression analysis and the sample size (Hair et al., 2006). Indeed, the more variables that are included in the regression analysis, the higher is the R-squared. In multiple regression it is possible to calculate the significance of the change in R-squared resulting from the inclusion of additional variables in the equation. This F-test will be particularly useful in assessing the statistical significance of the different sets of variables entered into the analysis at different steps. First, I will only include control variables as predictors. Second, I will add the knowledge acquired from international markets and the processes of knowledge transformation and exploitation as predictors. Third, I will include the interaction term. For the hypothesis testing, I will consider the regression coefficients and their related t-tests.

Even though multiple regression analysis is one of the most widely used multivariate techniques (Hair et al., 2006), it has its limitations. First, as discussed in Chapter 7, it only allows for one dependent variable. Specifically, multiple regression analysis is not suitable for simultaneously estimating more than one regression equation and testing hypotheses across equations. Hence, I will use multivariate multiple regression analysis for estimations which involve testing hypotheses across equations. Second, the application of multiple regression analysis might be problematic when the dependent variable is a proportion. In my analysis, some dependent variables are measured by
proportions, e.g., entrepreneurial growth in domestic markets (share of sales from new customers in Sweden, share of sales from new products/services in Sweden and share of sales from new geographic markets in Sweden) and entrepreneurial growth in international markets (share of sales from new customers in international markets, share of sales from new products/services in international markets and share of sales from new international markets).

There are at least two problems I might encounter when predicting these proportions with regression analysis. First, the regression estimation can generate expected values outside the interval \([0, 1]\), which would be impossible for a proportion (Long, 1997). Second, the regression estimation implies that a unit increase in each independent variable changes the dependent variable by the same amount, regardless of the initial value of the independent variable; and continually increasing one unit of the independent variable would drive the dependent variable to be greater than one or smaller than zero (Papke & Wooldridge, 1996). Because of these problems, alternative approaches to multiple regression analysis need to be considered when estimating fractional variables.

### 8.3.2 Fractional logit regression analysis

An approach to modeling fractional dependent variables is the fractional logit regression analysis (also known as flogit), developed by Papke and Wooldridge (1996). This method models the conditional expected value of the dependent variable, \(y\), as a logistic function:

\[
E(y | x) = \frac{\exp(x\beta)}{1 + \exp(x\beta)}
\]

Like a logistic model, this model ensures that the predicted values of \(y\) are in the interval \([0, 1]\) and that the effect of any independent variable, \(x\), on \(E(y | x)\) diminishes as \(x\beta\) increases. The model is fitted using maximum quasi-likelihood (Wooldridge, 2002). Maximum quasi-likelihood is chosen over maximum likelihood because \(y\) is not restricted to 0 or 1. A more detailed illustration of fractional logit regression can be found in Papke and Wooldridge (1996).

When estimating two or more fractional logit models with Stata, it is possible to estimate and store the simultaneous (co)covariance of the coefficients, via a specific estimation command: suest. Like multivariate multiple regression analysis, this procedure allows testing coefficients across the equations. This feature is important for testing Hypothesis 9c, which expects the relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets to be stronger than the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets.

In a recent study, Wagner (2001) shows that the fractional logit method proposed by Papke and Wooldridge (1996) is superior to other methods
used to estimate models with proportions as dependent variables. However, the results Wagner obtains when using the Papke-Wooldridge procedure are, to a large extent, in line with the results he obtains when employing multiple regression analysis. In addition, with reference to the fractional logit estimation, Wooldridge (2002, p. 662) notes that “Inference is complicated by the fact that the binary response density cannot be the actual density of \( y \) given \( x \)”. For instance, it is not possible to assess the goodness of fit of a fractional logit model by assessing the difference between the residuals of the model under the constraint that all regression coefficients are zero and the residuals when the coefficients are estimated from the sample data.

Faced with a trade-off between appropriateness of the analysis from an econometric point of view and interpretability of the results, I choose to estimate models with fractional variables with both methods: fractional logit regression analysis and regression analysis. This is not an uncommon choice. Several studies estimating models with fractional dependent variables report the results from both types of analyses (e.g. Keswani & Stolin, 2006; Rugman & Sukpanich, 2006). Accordingly, Hypothesis 9 and Hypothesis 12 will be tested using fractional logit regression as well as regression analysis.

8.4. Measurements: A summary of the variables used in the analyses

In the analyses I use data collected at four points in time through four survey instruments: telephone interview (spring 2000), mail questionnaire (fall 2000), telephone interview (spring 2006), and mail questionnaire (fall 2006). Information was also taken from Statistics Sweden (SCB) and different datasets such as Amadeus and Affärsdata. Detailed information on the study’s data collection and measurements is provided in Chapter 5 and Chapter 6. Below, I provide a summary of this information for the variables used in this chapter. Specifically, Table 8.1 presents a summary of the control variables, their data sources, and the data collection points; Table 8.2 presents a summary of the independent and dependent variables, their data sources, and data collection points.
Table 8.1 Summary of the control variables to be used in the probit analyses and multivariate multiple regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement description</th>
<th>Data sources</th>
<th>Data collection point</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO age</td>
<td>Age of the CEO</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>CEO gender</td>
<td>Dummy variable (0=female CEO; 1=male CEO)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>Dummy variable (0=CEO reported not having a formal education in business administration; 1=CEO reported having a formal education in business administration)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>Dummy variable (0=CEO reported not having prior management experience; 1=CEO reported having prior management experience)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>Dummy variable (0=CEO reported not having prior working experience from the same industry; 1=CEO reported having prior working experience from the same industry)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>Dummy variable (0=CEO reported not having prior working experience from another industry; 1=CEO reported having prior working experience from another industry)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>Industry group</td>
<td>Four dummy variables (1=manufacturing, 2=professional services; 3=retail and wholesales; 4=other services)</td>
<td>SCB</td>
<td>2000</td>
</tr>
<tr>
<td>Firm size</td>
<td>Number of employees</td>
<td>SCB</td>
<td>2000</td>
</tr>
<tr>
<td>Firm age</td>
<td>Number of years since the firm was founded</td>
<td>SCB</td>
<td>2000</td>
</tr>
<tr>
<td>Major governance type</td>
<td>Dummy variable (0=part of a business group; 1=independent)</td>
<td>Affärsdata and Amadeus</td>
<td>2000</td>
</tr>
</tbody>
</table>
Table 8.2 Summary of the independent and dependent variables to be used in the probit analyses and in the multivariate multiple regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement description</th>
<th>Data sources</th>
<th>Data collection point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables (Probit analyses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth aspirations</td>
<td>Multiple-item scale (two items: respondents’ ideal size of the business in five years in terms of 1) employees, and 2) sales</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>Swedish name</td>
<td>Dummy variable (0=the firm has a non-Swedish name; 1=the firm has a Swedish name)</td>
<td>SCB, Affärsdata and Amadeus</td>
<td>2000</td>
</tr>
<tr>
<td>Geographical location</td>
<td>Dummy variable (0=not located in major metropolitan area; 1= located in major metropolitan area)</td>
<td>SCB, Affärsdata and Amadeus</td>
<td>2000</td>
</tr>
<tr>
<td><strong>Independent variables (Multiple regression, multivariate multiple regression, and fractional logit regression analyses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge acquired from internationalization</td>
<td>Multiple-item scale: the extent to which the respondents gained insights and skills in the following areas: 1) promotion, 2) sales, 3) distribution, 4) customer relationships, 5) production technology (ways to produce products/services), 6) production design (ways to work out the production process), 7) production planning, and 8) research and development.</td>
<td>Mail questionnaire</td>
<td>Fall 2000</td>
</tr>
<tr>
<td>Processes of knowledge transformation and exploitation</td>
<td>Multiple item scale: the extent to which the respondents 1) adapt to changing demands in international markets, 2) record and store new knowledge incoming from international markets, 3) quickly recognize the usefulness of new knowledge, 4) share practical experience on international markets, 5) meet to discuss the consequences of new trends in international markets, 6) consider how to better use knowledge on international markets, and 7) know how activities should be performed</td>
<td>Mail questionnaire</td>
<td>Fall 2006</td>
</tr>
<tr>
<td><strong>Dependent variable (Probit analyses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International in 2000</td>
<td>Dummy variable (0=no international activities in 2000; 1=at least one downstream or upstream international activity in 2000)</td>
<td>Phone interview</td>
<td>Spring 2000</td>
</tr>
<tr>
<td>Attrition in 2006</td>
<td>Dummy variable (0=participated in all surveys up till and including the mail questionnaire in fall 2006; 1= otherwise)</td>
<td>All instruments</td>
<td></td>
</tr>
</tbody>
</table>
8. Analysis and results: New knowledge, knowledge processes, and firm growth

Table 8.2 Cont’d

<table>
<thead>
<tr>
<th>Dependent variable (Multiple regression, multivariate multiple regression, and fractional logit regression analyses)</th>
<th>Methodology</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth relative to competitors</td>
<td>Multiple-item scale. The respondents were asked to compare the growth of their firm with the growth exhibited by their two main competitors in terms of 1) profit, 2) sales growth, 3) cash flow, and 4) growth of net worth</td>
<td>Mail questionnaire</td>
</tr>
<tr>
<td>Growth relative to competitors in international markets</td>
<td>Multiple-item scale. The respondents were asked to compare the growth of their firm with the growth exhibited by their two main competitors in terms of 1) growth of foreign sales, and 1) profitability of foreign operations</td>
<td>Mail questionnaire</td>
</tr>
<tr>
<td>International growth</td>
<td>Multiple-item scale. Two items: 1) share of foreign sales, and 2) share of profits from international operations</td>
<td>Phone interview &amp; Mail questionnaire</td>
</tr>
<tr>
<td>Entrepreneurial growth in the domestic market</td>
<td>Three measures: 1) share of sales from new customers in Sweden, 2) share of sales from new products/services in Sweden, and 3) share of sales from new geographic markets in Sweden</td>
<td>Mail questionnaire</td>
</tr>
<tr>
<td>Entrepreneurial growth in international markets</td>
<td>Three measures: 1) share of sales from new customers abroad; 2) share of sales from new products/services abroad, and 3) share of sales from new international markets</td>
<td>Mail questionnaire</td>
</tr>
</tbody>
</table>

8. 5 Results

In this section I present the results. The section is structured as follows. Section 8.5.1 analyses the correlational properties of the data and discusses some initial patterns among the study variables. Section 8.5.2 reports the results for the first-stage probit model estimating sample selection bias. Section 8.5.3 reports the results for the first-stage probit model estimating sample attrition bias. Section 8.5.4 reports the results for the multiple regression, multivariate
multiple regression, and fractional logit regression analyses. In this section I will also present the additional analyses correcting for sample selection and sample attrition bias.

8.5.1 Correlation analysis

Table 8.3 shows the means, standard deviations, and partial correlations between all the variables to be included in the analyses and the control variables. The intercorrelations between independent variables and dependent variables are presented in Table 8.4. Collinearity does not seem to be a problem. Among the study’s independent and control variables, the correlation with the greatest magnitude is 0.24.

The tolerance and variance inflation factors (VIF) of each independent and control variable seem to suggest that also multicollinearity is not a problem. The smallest tolerance of each independent variable is 0.38 and the largest VIF of each independent variable is 2.60.

Several interesting patterns emerge when considering the correlations among the different growth variables. Overall growth relative to competitors has a significant positive correlation with international growth relative to competitors. This is expected. Clearly, SME international growth relative to competitors contributes to SME overall growth relative to competitors. Interestingly, this does not seem to be the case for the other measures of SME growth. Overall growth relative to competitors is not significantly correlated with any of the other growth variables. In other words, exporting and growing entrepreneurially, per se, does not seem to improve a firm’s overall growth vis-à-vis its competitors.

Instead, exporting and growing entrepreneurially in international markets improves a firm’s international growth relative to competitors. International growth relative to competitors has a significant positive correlation with international growth and with all three measures of entrepreneurial growth in international markets. International growth, in turn, has significant positive correlations with all three measures of entrepreneurial growth in international markets but significant negative correlations with all three measures of entrepreneurial growth in domestic markets.

Overall these findings indicate that growth in international markets might come at the expense of growth in domestic markets, and vice versa. Hence, these findings highlight an interesting trade-off between international and domestic growth. This trade-off might be due to the limited resource base of SMEs (Sapienza et al., 2005). International growth draws attention to international operations and shifts resources from domestic to international efforts. In the same way, domestic growth draws attention to domestic operations and shifts resources into the home market.
### Table 8.3 Means, Standard Deviations of all variables and correlations between control variables and all variables

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CEO age</td>
<td>50.22</td>
<td>8.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CEO gender</td>
<td>0.96</td>
<td>0.19</td>
<td>-0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CEO formal business education</td>
<td>50.24</td>
<td>8.22</td>
<td>0.00</td>
<td>-0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CEO prior management experience</td>
<td>0.96</td>
<td>0.19</td>
<td>-0.04</td>
<td>0.07</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CEO prior experience from same industry</td>
<td>0.73</td>
<td>0.45</td>
<td>-0.04</td>
<td>0.03</td>
<td>-0.06</td>
<td>-0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CEO prior experience from other industries</td>
<td>0.72</td>
<td>0.45</td>
<td>0.06</td>
<td>0.10</td>
<td>0.16*</td>
<td>0.20*</td>
<td>-0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Manufacturing</td>
<td>0.56</td>
<td>0.50</td>
<td>-0.13*</td>
<td>0.04</td>
<td>-0.13*</td>
<td>-0.11</td>
<td>-0.11</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Service</td>
<td>0.23</td>
<td>0.42</td>
<td>0.07</td>
<td>0.06</td>
<td>0.12*</td>
<td>0.10</td>
<td>0.14*</td>
<td>0.00</td>
<td>-0.61*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Recall</td>
<td>0.07</td>
<td>0.26</td>
<td>0.08</td>
<td>-0.09</td>
<td>0.05</td>
<td>-0.07</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.31*</td>
<td>-0.15*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Size</td>
<td>75.22</td>
<td>69.15</td>
<td>0.06</td>
<td>0.04</td>
<td>0.05</td>
<td>0.02</td>
<td>-0.10</td>
<td>0.10</td>
<td>-0.01</td>
<td>0.08</td>
<td>-0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Firm age</td>
<td>30.58</td>
<td>21.38</td>
<td>-0.11</td>
<td>-0.05</td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.06</td>
<td>0.00</td>
<td>0.14*</td>
<td>-0.11</td>
<td>-0.04</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Independent</td>
<td>0.25</td>
<td>0.43</td>
<td>0.06</td>
<td>0.07</td>
<td>-0.04</td>
<td>0.04</td>
<td>0.09</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.09</td>
<td>-0.07</td>
<td>0.08</td>
<td>-0.12*</td>
<td></td>
</tr>
<tr>
<td>13. Knowledge acquired from internationalization</td>
<td>2.38</td>
<td>0.92</td>
<td>0.14</td>
<td>-0.03</td>
<td>0.03</td>
<td>0.01</td>
<td>0.03</td>
<td>0.15</td>
<td>-0.06</td>
<td>0.03</td>
<td>-0.06</td>
<td>0.08</td>
<td>-0.01</td>
<td>-0.07</td>
</tr>
<tr>
<td>14. Knowledge processes</td>
<td>2.81</td>
<td>0.87</td>
<td>-0.11*</td>
<td>0.09</td>
<td>0.03</td>
<td>0.00</td>
<td>0.01</td>
<td>0.05</td>
<td>-0.06</td>
<td>0.08</td>
<td>-0.08</td>
<td>0.11*</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>15. Growth relative to competitors</td>
<td>3.41</td>
<td>0.71</td>
<td>0.01</td>
<td>-0.06</td>
<td>0.03</td>
<td>0.03</td>
<td>-0.08</td>
<td>-0.01</td>
<td>-0.10</td>
<td>-0.01</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.09</td>
<td>-0.08</td>
</tr>
<tr>
<td>16. Growth relative to competitors-international</td>
<td>3.04</td>
<td>1.01</td>
<td>-0.03</td>
<td>0.03</td>
<td>0.06</td>
<td>0.07</td>
<td>0.02</td>
<td>0.12*</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.14*</td>
<td>0.11</td>
<td>0.06</td>
<td>-0.01</td>
</tr>
<tr>
<td>17. International growth</td>
<td>-0.02</td>
<td>0.96</td>
<td>-0.12*</td>
<td>0.10</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.13*</td>
<td>0.14*</td>
<td>-0.03</td>
<td>-0.17*</td>
<td>0.06</td>
<td>0.15*</td>
<td>-0.16*</td>
</tr>
<tr>
<td>18. Share of sales-new customers-Sweden</td>
<td>0.13</td>
<td>0.15</td>
<td>0.12*</td>
<td>-0.04</td>
<td>-0.01</td>
<td>0.04</td>
<td>0.06</td>
<td>-0.02</td>
<td>-0.19*</td>
<td>0.09</td>
<td>0.04</td>
<td>-0.06</td>
<td>-0.18*</td>
<td>0.02</td>
</tr>
<tr>
<td>19. Share of sales-new customers-international</td>
<td>0.06</td>
<td>0.09</td>
<td>-0.03</td>
<td>0.11</td>
<td>0.05</td>
<td>0.08</td>
<td>0.02</td>
<td>0.12*</td>
<td>0.04</td>
<td>-0.04</td>
<td>-0.12*</td>
<td>0.02</td>
<td>-0.06</td>
<td>-0.03</td>
</tr>
<tr>
<td>20. Share of sales-new product-Sweden</td>
<td>0.11</td>
<td>0.16</td>
<td>0.04</td>
<td>0.02</td>
<td>-0.06</td>
<td>-0.06</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.01</td>
<td>-0.05</td>
<td>0.16*</td>
<td>0.07</td>
<td>-0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>21. Share of sales-new product-international</td>
<td>0.04</td>
<td>0.09</td>
<td>0.01</td>
<td>0.07</td>
<td>-0.01</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.14*</td>
<td>0.16*</td>
<td>-0.11</td>
<td>-0.04</td>
<td>0.07</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>22. Share of sales-new markets-Sweden</td>
<td>0.06</td>
<td>0.11</td>
<td>-0.03</td>
<td>0.08</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.10</td>
<td>0.07</td>
<td>-0.06</td>
<td>-0.01</td>
<td>-0.06</td>
<td>-0.06</td>
<td>-0.10</td>
<td>0.11*</td>
</tr>
<tr>
<td>23. Share of sales-new markets-international</td>
<td>0.05</td>
<td>0.09</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.09</td>
<td>0.04</td>
<td>0.08</td>
<td>0.02</td>
<td>-0.01</td>
<td>-0.12*</td>
<td>0.13*</td>
<td>-0.03</td>
<td>0.11*</td>
</tr>
</tbody>
</table>

Note: * correlations significant at least at p<.05
Table 8.4 Intercorrelations among independent variables and dependent variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14. 0.23*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. 0.11</td>
<td>0.17*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. 0.32*</td>
<td>0.45*</td>
<td>0.43*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. 0.30*</td>
<td>0.42*</td>
<td>-0.03</td>
<td>0.37*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. 0.04</td>
<td>-0.19*</td>
<td>0.04</td>
<td>-0.18*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. 0.26*</td>
<td>0.28*</td>
<td>0.05</td>
<td>0.27*</td>
<td></td>
<td>0.47*</td>
<td></td>
<td></td>
<td>-0.11*</td>
<td>-</td>
</tr>
<tr>
<td>20. 0.07</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.16*</td>
<td></td>
<td>0.31*</td>
<td>0.09</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>21. 0.01</td>
<td>0.23*</td>
<td>0.01</td>
<td>0.16*</td>
<td></td>
<td>0.33*</td>
<td>-0.15*</td>
<td>0.38*</td>
<td>0.18*</td>
<td>-</td>
</tr>
<tr>
<td>22. 0.17*</td>
<td>-0.06</td>
<td>0.01</td>
<td>-0.09</td>
<td></td>
<td>-0.13*</td>
<td>0.41*</td>
<td>0.00</td>
<td>0.33*</td>
<td>0.028</td>
</tr>
<tr>
<td>23. 0.22*</td>
<td>0.21*</td>
<td>0.08</td>
<td>0.26*</td>
<td></td>
<td>0.17*</td>
<td>-0.07</td>
<td>0.42*</td>
<td>0.028</td>
<td>0.19*</td>
</tr>
</tbody>
</table>

Note: * correlations significant at least at p<0.05
Some interesting results emerge also when considering the relationships between the control variables and the growth variables. As regards CEO characteristics, only CEO age and CEO prior experience from other industries seem to matter. CEO age is negatively correlated with international growth but positively correlated with share of sales to new Swedish customers. This might be interpreted as indicating that younger CEOs are more active in international markets, whereas older CEOs pursue more growth in domestic markets. This interpretation is in line with Andersson, Gabrielsson and Wictor (2004), who argue that, compared with older CEOs, younger CEOs are more internationally oriented and see the world as their marketplace. Consistent with the literature is the positive correlation between CEO prior experience from other industries and most measures of SME growth in international markets. One benefit of exposing the CEO to different industries is the development of networks, which are critical for SMEs competing in the international marketplace (Daily, Certo, & Dalton, 2000).

Industry seems to matter for SME growth. The dummy variable measuring whether or not the firm is a manufacturing firm is significantly correlated with international growth and share of sales from new products/services abroad, but negatively correlated with share of sales from new customers in Sweden. The dummy variable measuring whether or not the firm is a retail firm is negatively correlated with most growth variables, but one: share of sales from new products/services in Sweden. These findings, taken together, seem to suggest that manufacturing firms tend to grow more in international markets, whereas retail firms are more locally oriented and expand by offering new products/services to their customers in the home market.

As regards the other characteristics of firms, firm size is only positively correlated with share of sales from new international markets. This is in line with the Uppsala school, which maintains that firms venture into more distant international markets after they have grown in closer countries (Johanson & Wiedersheim-Paul, 1975). Also the non-significant relationship between firm size and SME growth is interesting. The literature suggests that smaller firms suffer from severe resource constraints and tend to grow less than larger firms. These findings suggest that, in the context of international SMEs, size does not matter much for most growth outcomes.

The correlation table shows that firm age is positively correlated with international growth. The fact that older firms tend to grow more internationally is not surprising. SME internationalization is often regarded as a gradual and time-consuming process (Johanson & Wiedersheim-Paul, 1975). Interestingly, firm age is negatively correlated with share of sales from new Swedish customers. This can be interpreted as younger firms being more entrepreneurial when it comes to selling to new customers in the home markets. Alternatively, it is possible that young firms tend to grow mainly via selling to new customers in their local markets, while older firms have more options when it comes to expanding their business.
The correlations between firm governance and growth variables are notable. I had expected the dummy variable measuring whether or not the firm is independent (not part of a business group) to be negatively correlated with all growth measures, since independent firms have less access to resources than firms which are part of a business group. The correlations analysis does show a negative correlation between being independent and international growth. However, it also shows a positive correlation between being independent and entrepreneurial growth in terms of selling to new markets. This finding might suggest that firms which are part of a business group are limited in their scope of operations by the scope of operations of the business group, while independent firms are less geographically constrained.

8.5.2 Probit model for sample selection bias

Table 8.5 presents the results from the probit model capturing SME decisions to be international in 2000. The dependent variable takes value 1 if the firm was international in 2000 and 0 if the firm was not international in 2000. The IMR derived from this model will be added to the multiple regression analyses and to the fractional logit regression analyses to assess and, if necessary, control for sample selection bias.

Table 8.5 Probit model for selection bias model (dependent variable = international in 2000)

<table>
<thead>
<tr>
<th></th>
<th>Probit coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO gender (male)</td>
<td>0.38***</td>
<td>0.14</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.25***</td>
<td>0.10</td>
</tr>
<tr>
<td>Service</td>
<td>0.26**</td>
<td>0.09</td>
</tr>
<tr>
<td>Retail</td>
<td>-0.19</td>
<td>0.10</td>
</tr>
<tr>
<td>Size</td>
<td>0.28***</td>
<td>0.07</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.19***</td>
<td>0.07</td>
</tr>
<tr>
<td>Growth aspiration</td>
<td>0.14*</td>
<td>0.06</td>
</tr>
<tr>
<td>Firm name (Swedish)</td>
<td>-0.70***</td>
<td>0.09</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.14</td>
<td>0.17</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-874.21</td>
<td></td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>416.61***</td>
<td></td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1570</td>
<td></td>
</tr>
</tbody>
</table>

Note: p<0.05; ** p<0.01; ***p<0.001

The results at the foot of Table 8.5 indicate a reasonably good predictive power for the probit model. Overall the model is significant (LR chi-squared test=416.61, p< 0.0001) and explains nineteen percent of the variance (pseudo R-squared=0.19). This is not surprising. The model includes those factors that in the probit model estimated in Chapter 7 significantly distinguish between
domestic and international firms. As already discussed in Chapter 7, compared with domestic SMEs, international SMEs are more likely to have a male CEO, more likely to be manufacturing firms or service firms, less likely to be independent (not part of a business group), and more likely to be larger. In addition, international firms tend to have higher growth aspirations. Compared with the probit model estimated in Chapter 6, the probit model estimated above includes an additional variable: whether or not the firm has a Swedish name. This variable is a significant predictor of SME international entry. Compared with domestic SMEs, international SMEs are less likely to have a Swedish name.

8.5.3 Probit model for sample attrition bias in 2006

The sample may also be subject to attrition bias. I estimate the probability of attrition in 2006 using a probit model. The IMR obtained from the probit model will be added to the subsequent multiple regression and factional logistic regression analyses. Table 8.6 presents the results from the probit model capturing attrition. The dependent variable takes value 1 if the respondent attrited from the sample and 0 otherwise.

The probit model is significant (LR chi-squared test=36.63, p<0.0001) but not very successful in explaining attrition. As indicated by the pseudo R-squared, the model seems to account for only 4 % of the variance. This may mean a nearer random pattern of dropouts.

When looking at the coefficients, only main industry group (manufacturing) seems to distinguish between dropouts and firms remaining in the sample. Compared with the SMEs that responded to the data collection in 2006, SMEs which left the study after the data collection in fall 2000 are less likely to be manufacturing firms. This result is interesting when compared with the results obtained from an analysis estimating sample attrition in 2000 (see Chapter 6, section 6.5.3). SMEs which did not respond in 2000 are less likely to be service firms. This difference could be attributed to the fact that attrition up to the year 2000 is estimated for all SMEs, while attrition between 2000 and 2006 is estimated only for international firms. These findings, taken together, seem to suggest that, among all SMEs, those that leave the sample are less likely to be service firms, while among international SMEs those that leave the sample are less likely to be manufacturing firms. However, this difference could also be due to the difference in time span: the first attrition covers a three-year period, the second attrition covers six years.

All the other variables do not significantly distinguish between respondents and non-respondents. These non-significant results strengthen the idea that, for the most part, the drop out of international SMEs in 2006 is random. As an additional check, I also re-estimated the probit model including two additional variables: downstream internationalization and upstream internationalization.
Table 8.6 Probit model for selection bias model (dependent variable=1 if the firm attrited in 2006; 0 otherwise)

<table>
<thead>
<tr>
<th></th>
<th>Probit coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO age</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO gender</td>
<td>-0.13</td>
<td>0.22</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>-0.10</td>
<td>0.11</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>-0.13</td>
<td>0.11</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.42***</td>
<td>0.14</td>
</tr>
<tr>
<td>Service</td>
<td>-0.21</td>
<td>0.15</td>
</tr>
<tr>
<td>Retail</td>
<td>0.22</td>
<td>0.20</td>
</tr>
<tr>
<td>Size</td>
<td>-0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Firm age</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Independent</td>
<td>0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>Past performance</td>
<td>-0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Main metropolitan areas</td>
<td>0.12</td>
<td>0.11</td>
</tr>
<tr>
<td>Constant</td>
<td>1.19*</td>
<td>0.49</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-489.22</td>
<td></td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>36.63***</td>
<td></td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>815</td>
<td></td>
</tr>
</tbody>
</table>

Note: p<0.05; ** p<0.01; ***p<0.001

The degree to which international SMEs carry out activities in international markets can be expected to influence their survival. Neither are these variables statistically significant, nor does the model fit improve. Therefore, I will calculate the IMR from the probit model reported in Table 8.6.

8.5.4 Multiple regression, multivariate multiple regression, and fractional logit regression analysis

As described earlier, several analyses are performed to test Hypotheses 7-12. These hypotheses and the analyses I use to test them are listed in Table 8.7.

Corrections for sample bias

The analyses listed in Table 8.7 are estimated also including the IMR variable correcting for sample selection bias and the IMR variable correcting for sample attrition bias. The results do not appear to be significantly affected by sample attrition bias. The IMR variable correcting for sample attrition is not significant and its inclusion does not significantly change the other parameters in any of the analyses. Hence, I will report the results without the IMR variable controlling for sample attrition. I find instead evidence of sample selection bias.
8. Analysis and results: New knowledge, knowledge processes, and firm growth

in the estimation of international growth and entrepreneurial growth. Hence, for these analyses, I will report the results which include the IMR variable controlling for sample selection.

Table 8.7 Hypotheses and statistical analyses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Statistical analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>7a: Knowledge acquired from internationalization is positively related to overall growth relative to competitors</td>
<td>- Multiple regression</td>
</tr>
<tr>
<td>7b: Knowledge acquired from internationalization is positively related to international growth relative to competitors</td>
<td>- Multiple regression</td>
</tr>
<tr>
<td>8: Knowledge acquired from internationalization is positively related to international growth</td>
<td>- Multiple regression</td>
</tr>
<tr>
<td>9a: Knowledge acquired from internationalization is positively related to entrepreneurial growth in domestic markets</td>
<td>- Multivariate multiple regression - Fractional logit regression</td>
</tr>
<tr>
<td>9b: Knowledge acquired from internationalization is positively related to entrepreneurial growth in international markets</td>
<td>- Multivariate multiple regression - Fractional logit regression</td>
</tr>
<tr>
<td>9c: The relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets is stronger than the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets</td>
<td>- Multivariate multiple regression - Fractional logit regression (with suest)</td>
</tr>
<tr>
<td>10a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger is its overall growth relative to competitors</td>
<td>- Multiple regression</td>
</tr>
<tr>
<td>10b: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger is its international growth relative to competitors</td>
<td>- Multiple regression</td>
</tr>
<tr>
<td>11a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger is its international growth</td>
<td>- Multiple regression - Fractional logit regression</td>
</tr>
<tr>
<td>12a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger is its entrepreneurial growth in domestic markets</td>
<td>- Multivariate multiple regression - Fractional logit regression</td>
</tr>
<tr>
<td>12b: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger is its entrepreneurial growth in international markets</td>
<td>- Multivariate multiple regression - Fractional logit regression</td>
</tr>
</tbody>
</table>
Additional analyses of market knowledge and technological knowledge

In this chapter, knowledge acquired from internationalization is measured by one scale which encompasses market and technological knowledge. The hypotheses tested in this chapter indeed predict the effects of these two strands of knowledge, taken together, on firm growth. In addition, these two dimensions of knowledge are highly correlated ($r=0.6$, $p<0.001$), and including them in the analyses as two separate variables would create severe multicollinearity problems. However, to further interpret the results, the analyses in Table 8.7 will be repeated considering the impact of each strand of knowledge separately. Due to space limitations, I cannot display the results of these additional analyses. These results will, instead, be discussed in the text.

Fit of the models

The results obtained from the multiple regression analyses estimating growth relative to competitors appear in Table 8.8. Here, all three equations—Model 1, Model 2, and Model 3—exhibit an unsatisfactory fit. Model 1 contains only the control variables; the independent variables are entered in Model 2 and the interaction term is added in Model 3. The R-squared of each model is rather low and not statistically significant. This does not show that the study’s control and independent variables (knowledge acquired from internationalization and the processes of knowledge transformation and exploitation) make a contribution to the prediction of overall firm growth relative to competitors.
Table 8.8 Multiple regression analysis for overall growth relative to competitors and international growth relative to competitors

<table>
<thead>
<tr>
<th></th>
<th>Overall growth relative to competitors</th>
<th>International growth relative to competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td>Beta CEO age</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO gender</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Beta CEO formal business education</td>
<td>-0.042</td>
<td>-0.047</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td>Beta CEO prior experience from same industry</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Beta Manufacturing</td>
<td>-0.13</td>
<td>-0.11</td>
</tr>
<tr>
<td>Beta Service</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td>Retail</td>
<td>-0.23</td>
<td>-0.21</td>
</tr>
<tr>
<td>Size</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Firm age</td>
<td>0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.14</td>
<td>-0.13</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Knowledge processes</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Knowledge*Knowledge processes</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Constant</td>
<td>5.25***</td>
<td>5.31***</td>
</tr>
<tr>
<td>Observations</td>
<td>143</td>
<td>143</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Change R-Squared</td>
<td>0.07</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Note: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; beta=normalized beta coefficient
Also the results obtained from estimating growth relative to competitors in international markets are presented in Table 8.8. These equations exhibit a somewhat better fit. In Model 4, the control variables, taken together, do not have a statistically significant effect on growth relative to competitors in international markets. In this model, only the dummy variable measuring whether or not the CEO has prior experience from the same industry and the dummy variable measuring whether or not the firm is a retail firm are significant predictors. In Model 5, adding knowledge acquired from internationalization and processes of knowledge transformation and exploitation results in a 0.28 increase in R-squared. Altogether, Model 5 predicts 41 percent of the variance in growth relative to competitors in international markets. In Model 6, the addition of the interaction between knowledge acquired from internationalization and processes of knowledge transformation and exploitation predicts a total of 42 percent of the variance. However, this change is only marginally significant. The 0.01 increase in R-squared is significant only at p<0.1. Overall, these findings indicate that when the independent variables are in the equation, a significant amount of variance in growth relative to competitors in international markets is accounted for.

Table 8.9 Multiple regression analysis for international growth

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Beta</td>
<td>Beta</td>
</tr>
<tr>
<td>IMR (selection)</td>
<td>-0.43*</td>
<td>-0.41**</td>
<td>-0.40**</td>
</tr>
<tr>
<td>CEO age</td>
<td>0.04</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>CEO gender</td>
<td>0.04</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>CEO formal business educt</td>
<td>-0.12</td>
<td>-0.13+</td>
<td>-0.13+</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>0.08</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>0.03</td>
<td>-0.05</td>
<td>-0.05</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.25</td>
<td>-0.15</td>
<td>-0.14</td>
</tr>
<tr>
<td>Service</td>
<td>-0.17</td>
<td>-0.15</td>
<td>-0.14</td>
</tr>
<tr>
<td>Retail</td>
<td>-0.13</td>
<td>-0.04</td>
<td>-0.03</td>
</tr>
<tr>
<td>Size</td>
<td>0.13</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Firm age</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Independent</td>
<td>-0.22*</td>
<td>-0.17*</td>
<td>-0.17*</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization</td>
<td>0.21***</td>
<td>0.22**</td>
<td></td>
</tr>
<tr>
<td>Knowledge processes</td>
<td>0.32***</td>
<td>0.32***</td>
<td></td>
</tr>
<tr>
<td>Knowledge*Knowledge processes</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.27***</td>
<td>0.43***</td>
<td>0.43****</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.19</td>
<td>0.36</td>
<td>0.35</td>
</tr>
<tr>
<td>Change R-squared</td>
<td>0.16***</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

Note: N=136, *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; beta=normalized beta coefficient
The models estimating international growth are displayed in Table 8.9. All three multiple regression equations—Model 1, Model 2 and Model 3—are statistically significant. Model 1, which only includes the control variables, accounts for 27 percent of the variance in international growth. In Model 2, adding knowledge acquired from internationalization and knowledge processes results in an increase in R-squared of 16 percent. Both knowledge acquired from internationalization and knowledge processes contribute significantly to international growth. In Model 3, the addition of the interaction between knowledge acquired from internationalization and knowledge processes does not contribute significantly to international growth.

Overall, these findings indicate that when the independent variables are in the equation, a significant amount of variance in international growth is accounted for. It should be noted that the analyses estimating international growth include the IMR variable controlling for sample selection bias. The highly significant coefficient for the IMR term reveals that the unobserved factors underlying the firm’s probability of being international influence international growth. The negative coefficient for the IMR term further indicates that the greater the firm’s probability of being international based on these unobserved factors, the higher its international growth (see Dolton and Makepeace (1987) for more information on how to interpret negative IMR terms).

The models estimating entrepreneurial growth in domestic and international markets are displayed in Table 8.10, Table 8.11 and Table 8.12. Entrepreneurial growth is a multi-dimensional concept, encompassing share of sales from new customers, share of sales from new products/services, and share of sales from new markets. Accordingly, Table 8.10 presents analyses with share of sales from new customers in the domestic market and share of sales from new customers in international markets as dependent variables; Table 8.11 presents the analyses with share of sales from new products/services in the domestic market and share of sales from of new products/services in international markets as dependent variables; and Table 8.12 presents the analyses with share of sales from new geographic markets in Sweden and share of sales from new international markets as dependent variables. These models are estimated by multivariate multiple regression analysis (Models 1-3) and by fractional logit regression (Model 4).

The results presented in Table 8.10 show a satisfactory fit for the models estimating share of sales from new international customers, but not for the models estimating share of sales from new Swedish customers. The study’s control variables explain 16 percent of the variance in the share of sales from new Swedish customers (Model 1 – Domestic) and 17 percent of the variance in the share of the sales from new international customers (Model 1 – International). Adding knowledge acquired from internationalization and knowledge processes significantly increases the R-squared in Model 2 – International, but not the R-squared in Model 2 – Domestic. Altogether,
Model 2 – International explains 18 percent of the variance in share of sales from new international customers, while Model 2 – Domestic still explains 16 percent of the variance in the share of sales from new Swedish customers. Furthermore, the R-squared of Model 2 – Domestic fails to be significant. The inclusion of the interaction term results in an increase of the R-squared, predicting a total of 23 percent of the variance in sales from new Swedish customers (Model 3 – Domestic) and in sales from new international customers (Model 3 – International). However, the R-squared for Model 3 – Domestic is only significant at p<0.1. Overall, the estimates obtained from multivariate multiple regression analyses are consistent with the estimates obtained from the fractional logit regressions: Model 4 – Domestic and Model 4 – International.

Also the results presented in Table 8.11 show a satisfactory fit for the models estimating share of sales from new products/services in international markets, but not for the models estimating share of sales from new products/services in the home market. The control variables explain 14 percent of the variance in the share of sales from new products/services in Sweden (Model 1 – Domestic) and 17 percent of the variance in the share of the sales from new products/services in international markets (Model 1 – International). However, the R-squared for Model 1 – Domestic fails to be statistically significant. Adding knowledge acquired from internationalization and knowledge processes significantly increases the R-squared in Model 2 – International, but not the R-squared in Model 2 – Domestic. Altogether, Model 2 – International explains 22 percent of the variance in share of sales of new products/services in international markets, and Model 2 – Domestic explains 16 percent of the variance in share of sales from new products/services in Sweden. Furthermore, the R-squared of Model 2 – Domestic is still not significant. In Models 3, the addition of the interaction term does not result in a significant increase of the R-squared. Model 3 – International still predicts a total of 23 percent of the variance in sales from new products/services in international markets. Model 3 – Domestic predicts a total of 17 percent in the variance of sales of new products/services in Sweden, but it fails to be significant. Again, these results obtained from the multivariate multiple regression analyses are consistent with the estimates obtained from the fractional logit regressions: Model 4 – Domestic and Model 4 – International.

The analyses estimating entrepreneurial growth in terms of sales from new markets confirm the pattern described above. Table 8.12 shows a satisfactory fit for the models estimating share of sales in new international markets, but not for the models estimating share of sales from new products/services in the home market. The control variables explain 14 percent of the variance in the share of sales from new markets in Sweden (Model 1 – Domestic) and 16 percent of the variance in the share of the sales from new international markets (Model 1 – International). However, the R-squareds for both models are only significant at p<0.1.
Table 8.10 Multivariate multiple regression and fractional logit regression for entrepreneurial growth: Sales from new customers

<table>
<thead>
<tr>
<th></th>
<th>Models 1</th>
<th>Models 2</th>
<th>Models 3</th>
<th>Models 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>Intern.</td>
<td>Domestic</td>
<td>Intern.</td>
</tr>
<tr>
<td>IMR (selection)</td>
<td>0.29</td>
<td>-0.47**</td>
<td>0.30</td>
<td>-0.45*</td>
</tr>
<tr>
<td>CEO age</td>
<td>0.10</td>
<td>0.06</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>CEO gender</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>CEO formal business education</td>
<td>-0.05</td>
<td>-0.04</td>
<td>-0.04</td>
<td>-0.06</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.02</td>
</tr>
<tr>
<td>CEO prior experience from same industry (2000)</td>
<td>-0.02</td>
<td>0.05</td>
<td>-0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>-0.02</td>
<td>0.09</td>
<td>-0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.01</td>
<td>-0.38+</td>
<td>-0.01</td>
<td>-0.32</td>
</tr>
<tr>
<td>Service</td>
<td>0.01</td>
<td>-0.27+</td>
<td>0.01</td>
<td>-0.25</td>
</tr>
<tr>
<td>Retail</td>
<td>0.01</td>
<td>-0.07</td>
<td>0.00</td>
<td>-0.02</td>
</tr>
<tr>
<td>Size</td>
<td>-0.10</td>
<td>0.06</td>
<td>-0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Firm age</td>
<td>-0.02</td>
<td>-0.10</td>
<td>-0.02</td>
<td>-0.09</td>
</tr>
<tr>
<td>Independent</td>
<td>0.12</td>
<td>-0.06</td>
<td>0.12</td>
<td>-0.02+</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization</td>
<td>0.04</td>
<td>0.18+</td>
<td>0.03</td>
<td>0.19</td>
</tr>
<tr>
<td>Knowledge processes</td>
<td>-0.06</td>
<td>0.15+</td>
<td>-0.05</td>
<td>0.14</td>
</tr>
<tr>
<td>Knowledge*Knowledge processes</td>
<td>0.15+</td>
<td>-0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.16+</td>
<td>0.17+</td>
<td>0.16</td>
<td>0.18+</td>
</tr>
<tr>
<td>Pseudo log-likelihood</td>
<td>-38.12</td>
<td>-23.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N=137 observations; **** p<0.001, *** p<0.01, ** p<0.05, * p<0.1; Beta=normalized beta coefficients, z=fraction logit regression coefficient with suest
Table 8.11: Multivariate multiple regression and fractional logit regression for entrepreneurial growth: Sales from new products

<table>
<thead>
<tr>
<th></th>
<th>Models 1</th>
<th>Models 2</th>
<th>Models 3</th>
<th>Models 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMR (selection)</td>
<td>-0.08</td>
<td>-0.32+</td>
<td>-0.07</td>
<td>-0.32+</td>
</tr>
<tr>
<td>CEO age</td>
<td>-0.08</td>
<td>0.07</td>
<td>-0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>CEO gender</td>
<td>0.12</td>
<td>0.04</td>
<td>0.14</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO formal education</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.13</td>
</tr>
<tr>
<td>CEO prior management</td>
<td>-0.04</td>
<td>0.02</td>
<td>-0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>CEO prior experience from same industry</td>
<td>-0.09</td>
<td>-0.03</td>
<td>-0.11</td>
<td>-0.02</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>-0.01</td>
<td>0.06</td>
<td>-0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.03</td>
<td>-0.06</td>
<td>-0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>Service</td>
<td>0.04</td>
<td>-0.10</td>
<td>0.05</td>
<td>-0.12</td>
</tr>
<tr>
<td>Retail</td>
<td>0.38***</td>
<td>0.14</td>
<td>0.38***</td>
<td>0.16</td>
</tr>
<tr>
<td>Size</td>
<td>0.04</td>
<td>0.09</td>
<td>0.04</td>
<td>0.09</td>
</tr>
<tr>
<td>Firm age</td>
<td>-0.03</td>
<td>0.01</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Independent</td>
<td>0.07</td>
<td>-0.05</td>
<td>0.07</td>
<td>-0.04</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization</td>
<td>0.13</td>
<td>-0.09</td>
<td>0.13</td>
<td>-0.09</td>
</tr>
<tr>
<td>Knowledge processes</td>
<td>-0.10</td>
<td>0.23***</td>
<td>-0.11</td>
<td>0.23*</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.14</td>
<td>0.17*</td>
<td>0.16</td>
<td>0.22*</td>
</tr>
<tr>
<td>Pseudo log-likelihood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N=131 observations; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; beta=normalized beta coefficients; z= fraction logit regression coefficient with suest
Table 8.12 Multivariate multiple regression and fractional logit regression for entrepreneurial growth: Sales from new markets

<table>
<thead>
<tr>
<th></th>
<th>Models 1</th>
<th>Models 2</th>
<th>Models 3</th>
<th>Models 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>Intern.</td>
<td>Domestic</td>
<td>Intern.</td>
</tr>
<tr>
<td></td>
<td>beta</td>
<td>beta</td>
<td>beta</td>
<td>beta</td>
</tr>
<tr>
<td>IMR (selection)</td>
<td>0.25</td>
<td>-0.11</td>
<td>0.27</td>
<td>-0.06</td>
</tr>
<tr>
<td>CEO age (2000)</td>
<td>-0.11</td>
<td>-0.21*</td>
<td>-0.14</td>
<td>-0.26**</td>
</tr>
<tr>
<td>CEO gender (2000)</td>
<td>0.02</td>
<td>0.03</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>CEO formal business education (2000)</td>
<td>-0.09</td>
<td>0.01</td>
<td>-0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO prior management experience (2000)</td>
<td>0.011</td>
<td>0.07</td>
<td>0.01</td>
<td>0.06</td>
</tr>
<tr>
<td>CEO prior experience from same industry (2000)</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.04</td>
</tr>
<tr>
<td>CEO prior experience from other industries (2000)</td>
<td>0.13</td>
<td>-0.03</td>
<td>0.11</td>
<td>-0.08</td>
</tr>
<tr>
<td>Manufacturing (2000)</td>
<td>0.16</td>
<td>-0.31</td>
<td>0.18</td>
<td>-0.26</td>
</tr>
<tr>
<td>Service (2000)</td>
<td>0.02</td>
<td>-0.13</td>
<td>0.02</td>
<td>-0.10</td>
</tr>
<tr>
<td>Retail (2000)</td>
<td>-0.02</td>
<td>-0.08</td>
<td>-0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>Size (2000)</td>
<td>-0.08</td>
<td>-0.07</td>
<td>-0.08</td>
<td>-0.07</td>
</tr>
<tr>
<td>Firm age (2000)</td>
<td>-0.06</td>
<td>-0.01</td>
<td>-0.05</td>
<td>-0.00</td>
</tr>
<tr>
<td>Independent (2000)</td>
<td>0.25**</td>
<td>0.28**</td>
<td>0.26**</td>
<td>0.31***</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization (Fall 2000)</td>
<td>0.16+</td>
<td>0.32**</td>
<td>0.16+</td>
<td>0.32**</td>
</tr>
<tr>
<td>Knowledge processes (2006)</td>
<td>-0.11</td>
<td>-0.09</td>
<td>-0.11</td>
<td>-0.09</td>
</tr>
<tr>
<td>Knowledge*Knowledge processes</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.01</td>
<td>1.01</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.14</td>
<td>0.15+</td>
<td>0.16+</td>
<td>0.23**</td>
</tr>
<tr>
<td>Pseudo log-likelihood</td>
<td>-23.03</td>
<td>-3.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N=137 observations; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; beta=normalized beta coefficients; z=fraction logit regression coefficient with suest
Adding knowledge acquired from internationalization and knowledge processes significantly increases the R-squared in Model 2 – International, but not the R-squared in Model 2 – Domestic. Altogether, Model 2 – International explains 23 percent of the variance in share of sales from international markets, while Model 2 – Domestic still explains 16 percent of the variance in share of sales markets in Sweden. Furthermore, the R-squared of Model 2 – Domestic is only marginally significant (p<0.1). The inclusion of the interaction term results in a significant increase of the R-squared in Model 3 – International, which predicts a total of 23 percent of the variance in sales from new products/services in international markets. On the other hand, Model 3 – Domestic still predicts a total of 16 percent in the variance of sales from new products/services in Sweden and it is not statistically significant. These results are largely in line with the estimates obtained from the fractional logit regressions: Model 4-Domestic and Model 4-International.

Altogether, these analyses of entrepreneurial growth suggest a common pattern. The study’s independent variables (knowledge acquired from internationalization and knowledge processes), taken together, seem to explain a significant amount of variance in all three measures of entrepreneurial growth in international markets, but not in all three measures of entrepreneurial growth in domestic markets. In addition, results show that the sample selection correction term (IMR) is an important predictor of entrepreneurial growth in international markets. The negative parameter estimate for the IMR term further indicates that the greater the firm’s probability of being international in 2000, the higher its entrepreneurial growth in international markets.

Having described the models and their fit in some detail, I can now present the tests of hypotheses.

### Results for Hypotheses 7a and 7b

To test Hypothesis 7a, which suggests that knowledge acquired from internationalization is positively related to firm growth relative to competitors, we can examine the coefficient of knowledge acquired from internationalization on overall firm growth relative to competitors in Table 8.8. This coefficient is not significant in Model 2 and Model 3. Thus, no support is obtained for Hypothesis 7a. Support is instead found for Hypothesis 7b, which expects knowledge acquired from internationalization to be positively related to growth relative to competitors in international markets. In Model 5, the coefficient of knowledge acquired from internationalization is positive and significant (beta=0.18, p<0.05). The significant positive effect of knowledge acquired from internationalization is maintained also in Model 6 (beta = 0.19; p<0.05).

I obtain very similar results when estimating the models in Table 8.8 for market knowledge and technological knowledge, taken separately. Neither market knowledge nor technological knowledge is a significant predictor of firm growth relative to competitors. Instead, each strand of knowledge significantly
and positively contributes to growth relative to competitors in international markets.

In sum, these results suggest that knowledge acquired from internationalization is unrelated to overall firm growth relative to competitors, but is positively related to growth relative to competitors in international markets.

Results for Hypothesis 8
Hypothesis 8 suggests that knowledge acquired from internationalization is positively associated with international growth. Testing this hypothesis is accomplished by examining the coefficient of knowledge acquired from internationalization in Table 8.9. The results from the multiple regression analysis show that knowledge acquired from internationalization has a positive and significant effect on international growth in Model 2 (Beta=0.21, p<0.01) and in Model 3 (Beta=0.22, p< 0.01). Hence, I find support for Hypothesis 8.

To determine whether the results hold also for market knowledge and technological knowledge, taken separately, I re-estimated the models in Table 8.9, first with market knowledge as independent variable, and then with technological knowledge as independent variable. Both strands of knowledge result in being significant predictors of international growth. Thus, I find support for Hypothesis 8 even when the two strands of knowledge acquired from internationalization are taken separately.

Results for Hypothesis 9a
Hypothesis 9a predicts that knowledge acquired from internationalization is positively associated with entrepreneurial growth in domestic markets. Testing this hypothesis requires consideration of the effect of knowledge acquired from internationalization on the three dimensions of entrepreneurial growth in domestic markets: share of sales from new customers in domestic markets (domestic models in Table 8.10); share of sales from new products/services in the domestic markets (domestic models in Table 8.11) and share of sales from new geographic markets in Sweden (domestic models in Table 8.12).

Table 8.10 indicates that knowledge acquired from internationalization does not increase sales from new customers in the home market. The beta coefficient of knowledge acquired from internationalization is not significant in Model 2 – Domestic and Model 3 – Domestic. This result is confirmed by the fractional logit regression analysis. Also in Model 4 – Domestic, the z coefficient of knowledge acquired from internationalization fails to reach statistical significance. Very similar results are obtained when re-estimating the models in Table 8.10 for each strand of knowledge—market knowledge and technological knowledge—separately. Neither market knowledge nor technological knowledge is a statistically significant predictor of sales to new customers in the home market.
Knowledge acquired from internationalization does not seem to be a predictor of share of sales from new products/services in Sweden. The effect of knowledge acquired from internationalization is not statistically significant in any domestic model in Table 8.10. However, when re-estimating the models in Table 8.10 for each strand of knowledge separately, some interesting results emerge. Market knowledge acquired from internationalization does not predict sales from new products/services, but technological knowledge acquired from internationalization does.

The results displayed in Table 8.12 show that knowledge acquired from internationalization boosts sales from new geographic markets in Sweden. In Model 2 – Domestic and in Model 3 - Domestic the beta coefficient of knowledge acquired from internationalization is marginally significant (p<0.1), and in Model 4 – Domestic the z coefficient is fully significant (z coefficient 0.29, p<0.05). The odds ratio of 1.33 indicates that the share of sales from new geographic markets in Sweden increases by 0.02 for a unit increase in knowledge acquired from internationalization. These findings are confirmed by the re-estimation of the models in Table 8.12 for each strand of knowledge separately. Both market and technological knowledge acquired from internationalization significantly contribute to sales from new geographic markets in Sweden.

In sum, I find only limited support for Hypothesis 9a. Knowledge acquired from internationalization increases entrepreneurial growth in domestic markets when it comes to venturing into new geographic markets in Sweden. However, there is no evidence that this knowledge increases entrepreneurial growth when it comes to selling to new Swedish customers or providing new products/services to the Swedish market. Relevant is the additional analysis on the effect of each strand of knowledge, taken separately. Technological knowledge increases sales from new products/services in Sweden, but market knowledge does not.

Results for Hypothesis 9b

Hypothesis 9b predicts that knowledge acquired from internationalization is positively associated with entrepreneurial growth in international markets. This hypothesis is tested examining the effect of knowledge acquired from internationalization on the three measures of entrepreneurial growth in

\[ 14 \] The average share of sales from new geographic markets in Sweden is 0.06 (i.e. \( p = 0.06 \)). If \( p = 0.06 \), then \( p/(1-p) = 0.064 \). The odds ratio for knowledge acquired from internationalization is 1.33 indicating that for a unit increase in knowledge acquired from internationalization, the odds of having sales from new international customers are increased: \( (1.33)^*(0.064) = 0.085 \). Given a unit increase in knowledge acquired from internationalization, we would expect \( p/(1-p) = 0.085 \), so that \( p = 0.078 \). A comparison of the odds ratios shows that for a unit increase in knowledge acquired from internationalization, the share of sales from new international markets goes up by 0.02 (i.e. 0.079-0.064).
8. Analysis and results: New knowledge, knowledge processes, and firm growth

international markets: share of sales from new international customers (international models in Table 8.10), share of sales from new products/services in international markets (international models in Table 8.11) and share of sales from new international markets (international models in Table 8.12).

Table 8.10 shows that knowledge acquired from internationalization increases sales from new international customers. The coefficient of knowledge acquired from internationalization is positive and significant in Model 2 – International (beta=0.18, p<0.05) as well as in Model 3 – International. Similar results are obtained from the fractional logit regression analysis. In Model 4 – Domestic, the z coefficient for knowledge acquired from internationalization is positive and significant (z=0.31, p<0.01). The odds ratio of 1.31 indicates that the share of sales from new international customers increases by 0.02 for a unit increase in knowledge acquired from internationalization. These findings are confirmed by the re-estimation of the models in Table 8.10 for each strand of knowledge separately. Both market and technological knowledge acquired from internationalization significantly contribute to sales from new international customers.

Knowledge acquired from internationalization does not seem to increase sales from new products/services in international markets. The effect of knowledge acquired from internationalization is not statistically significant in any international model in Table 8.11. Again, these findings are confirmed by the re-estimation of the models for each strand of knowledge taken separately.

Sales from new international markets appear to be driven by knowledge acquired from internationalization. Table 8.12 shows that the effect of knowledge acquired from internationalization is positive and significant in Model 2 – International (beta=0.32, p<0.01) and in Model 3 – International (beta=0.32, p<0.01). This is confirmed by the fractional logit estimation. In Model 4 – International, the z coefficient of knowledge acquired from internationalization is significant and positive (z=0.86, p<0.001). The odds ratio of 2.37 indicates that the share of sales from new international markets increases by 0.06 for a unit increase in knowledge acquired from internationalization.

---

15 The average share of sales from new international customers is 0.06 (i.e. \( p = 0.06 \). If \( p = 0.06 \), then \( p/(1-p) = 0.064 \). The odds ratio for knowledge acquired from internationalization is 1.36 indicating that for a unit increase in knowledge acquired from internationalization, the odds of having sales from new international customers are increased: \( (1.36)^{(0.064)} = 0.086 \). Given a unit increase in knowledge acquired from internationalization, we would expect \( p/(1-p) = 0.086 \), so that \( p = 0.078 \). A comparison of the odds ratios shows that for a unit increase in knowledge acquired from internationalization, the share of sales from new international markets goes up by 0.02 (i.e., 0.079-0.064).
The results for analyses estimating the effect of each strand of knowledge, taken separately, confirm those reported in Table 8.12. In sum, I find partial support for Hypothesis 9b. Knowledge acquired from internationalization increases entrepreneurial growth in terms of selling to new international customers and to new international markets; yet, it does not contribute to entrepreneurial growth in terms of providing new products/services to international customers. The same conclusions can be drawn from the analyses estimating the effect of each strand of knowledge separately.

Results for Hypothesis 9c

Hypothesis 9c predicts that the effect of knowledge acquired from internationalization on entrepreneurial growth in international markets is stronger than the effect of knowledge acquired from internationalization on entrepreneurial growth in domestic markets. Testing this hypothesis would require performing a series of tests of inequality of coefficients across equations. Specifically, for all three dimensions of entrepreneurial growth (Table 8.10, Table 8.11 and Table 8.12), I should test the inequality between the beta coefficient of knowledge acquired from internationalization in Model 2 – Domestic and in Model 2 – International as well as the inequality between the z coefficient of knowledge acquired from internationalization in Model 4 – Domestic and in Model 4 – International.

However, knowledge acquired from internationalization does not have a significant effect on the following dimensions of entrepreneurial growth: sales to new Swedish customers (Table 8.10, Model 2 – Domestic and Model 4 – Domestic), sales from new products/services in Sweden (Table 8.11, Model 2 – Domestic and Model 4 – Domestic), and sales from new products/services in international markets (Table 8.11, Model 2 – International and Model 4 – International). I cannot perform the aforementioned tests of inequality between non-significant coefficients, since there is no evidence that these coefficients are statistically different from zero. Accordingly, as regards entrepreneurial growth measured by sales from new customers and by sales from new products, Hypothesis 9c cannot be supported.

Knowledge acquired from internationalization has a significant effect on both the share of sales from new geographic markets in Sweden (Model 4 –

---

16 The average share of sales from new international markets is 0.05. If $p = 0.05$, then $p/(1-p) = 0.053$. The odds ratio for knowledge acquired from internationalization is 2.37 indicating that for a unit increase in knowledge acquired from internationalization, the odds of having sales from new international customers are increased: $(2.37)²(0.053)=0.124$. Given a unit increase in knowledge acquired from internationalization, we would expect $p/(1-p)=0.124$, so that $p=0.11$. A comparison of the odds ratios shows that for a unit increase in knowledge acquired from internationalization, the share of sales from new international markets goes up by 0.06 (i.e., 0.11-0.05).
Domestic, Table 8.12) and the share of sales from new international markets (Model 4 – International). This means that I can test whether the z coefficient of knowledge acquired from internationalization in Model 4 – International is stronger than the z coefficient of knowledge acquired from internationalization in Model 4 – Domestic. The test of inequality shows that the effect of knowledge acquired from internationalization on the share of sales from new international markets is stronger than the effect of knowledge acquired from internationalization on the share of sales from new geographic markets in Sweden.

To sum up, I find only limited support for Hypothesis 9c. The relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets is stronger than the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets only for one dimension of entrepreneurial growth: venturing into new geographic markets.

Results for Hypotheses 10a and 10b
Hypothesis 10a predicts that processes of knowledge transformation and exploitation positively moderate the relationship between knowledge acquired from internationalization and growth relative to competitors. The data in Table 8.8 indicate that the interaction between knowledge acquired from internationalization and processes of knowledge transformation and exploitation is not significant (Model 3). Thus, I do not find support for Hypothesis 10a.

Hypothesis 10b predicts that the processes of knowledge transformation and exploitation positively moderate the relationship between knowledge acquired from internationalization and growth relative to competitors in international markets. The results in Table 8.8 for Model 3 show that the interaction term is significant, though only marginally (p<0.1). One way of interpreting this marginally significant effect is to further investigate the relation between knowledge acquired from internationalization and growth relative to competitors in international markets at low (-1 standard deviation), medium (mean), and high (+1 standard deviation) levels of knowledge processes.

The data in Table 8.13 indicate that at a low level (-1 standard deviation) of knowledge processes, an increase in knowledge acquired from internationalization positively affects performance relative to competitors in international markets. To perform the test of inequality I test the following null hypothesis: $H_0$: $z$-coefficient (Knowledge acquired from internationalization in Model 4 – Domestic) >= $z$ coefficient (Knowledge acquired from internationalization in Model 4 – International).

First, I test whether the two $z$ coefficients are equal (Chi-squared test=13.33, p=0.0003). Then I use the results to calculate the appropriate p-value of $H_0$. The p-value of $H_0$ is 0.0001. Hence, $H_0$ can be rejected. This implies that the coefficient of knowledge acquired from internationalization in Model 4 – International is significantly stronger than the coefficient of knowledge acquired from internationalization in Model 4 – Domestic.
internationalization increases growth relative to competitors in international markets more than it does at a medium level of knowledge processes. In fact the slope at a low level of knowledge processes (beta=0.31, p<0.001) is higher than the slope at a medium level of knowledge processes (beta=0.19, p<0.05). At a high level (+1 standard deviation) of knowledge processes, an increase in knowledge processes does not seem to have a statistically significant impact. In other words, at a high level of knowledge processes the relationship between knowledge acquired from internationalization and growth relative to competitors in international markets could be equal to zero.

Table 8.13 Single slope of knowledge acquired from internationalization on international growth relative to competitors at different levels of knowledge processes

<table>
<thead>
<tr>
<th>Levels of knowledge processes</th>
<th>Coefficient</th>
<th>Std. Err.</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high (+2 sd)</td>
<td>-0.04</td>
<td>0.155</td>
<td>-0.28</td>
<td>0.78</td>
</tr>
<tr>
<td>High (+1 sd)</td>
<td>0.07</td>
<td>0.100</td>
<td>0.74</td>
<td>0.46</td>
</tr>
<tr>
<td>Somewhat high (+0.5 sd)</td>
<td>0.13</td>
<td>0.082</td>
<td>1.62</td>
<td>0.11</td>
</tr>
<tr>
<td>Medium (mean)</td>
<td>0.19</td>
<td>0.077</td>
<td>2.51</td>
<td>0.01</td>
</tr>
<tr>
<td>Somewhat low (-0.5 sd)</td>
<td>0.25</td>
<td>0.086</td>
<td>2.92</td>
<td>0.00</td>
</tr>
<tr>
<td>Low (-1sd)</td>
<td>0.31</td>
<td>0.107</td>
<td>2.91</td>
<td>0.00</td>
</tr>
<tr>
<td>Very high (-2 sd)</td>
<td>0.43</td>
<td>0.163</td>
<td>2.63</td>
<td>0.01</td>
</tr>
</tbody>
</table>

These could be arbitrary points at which to test the slope. Thus, the same analysis was repeated for different levels of knowledge processes (+/-0.5, 1, and 2 standard deviations) (Table 8.13). This analysis supports the pattern discussed above: at very low levels (e.g. -2 standard deviations) of knowledge processes increasing knowledge acquired from internationalization increases growth relative to competitors in international markets less than it does at lower (-1 standard deviation) and at medium levels of knowledge processes. At very high levels of knowledge processes (e.g. +2 standard deviations) or at somewhat high levels (+0.5 standard deviation) the slope of knowledge processes was not statistically significant. These results contradict Hypothesis 10b. They show that the positive impact of knowledge acquired from internationalization decreases as knowledge processes increase from very low to medium levels. At high levels of knowledge processes, there is no evidence of a relationship between knowledge acquired from internationalization and growth relative to competitors in international markets. Interestingly, knowledge processes seem to have a direct effect on international growth relative to competitors. The coefficient of knowledge processes is positive and significant in Model 5 (beta=0.49, p<0.001) and in Model 6 (beta=0.048, p<0.001).

In sum, these results suggest that knowledge processes do not increase the effect of knowledge acquired from internationalization on either overall growth relative to competitors or on international growth relative to competitors. The
more fine-grained analysis reported above even reveals that the positive link between knowledge acquired from internationalization and growth relative to competitors decreases as knowledge processes increase from very low levels to medium levels. On the other hand, knowledge processes seem to have a direct effect on growth relative to competitors in international markets.

**Results for Hypothesis 11**

Hypothesis 11 predicts that the processes of knowledge transformation and exploitation positively moderate the relationship between knowledge acquired from internationalization and international growth. Testing Hypothesis 11 is accomplished by examining the interaction between knowledge acquired from internationalization and knowledge processes in Table 8.9. This interaction is not significant. Accordingly, I do not find support for the moderating role or knowledge processes. The direct effect of knowledge processes on international growth is significant and positive in Model 2 (beta=0.32, p<0.001) and in Model 3 (beta= 0.32, p<0.001).

In sum, contrary to my prediction, knowledge processes do not seem to moderate the relationship between knowledge acquired from internationalization and international growth. They rather seem to have a direct positive effect on international growth.

**Results for Hypothesis 12a**

Hypothesis 12a predicts that processes of knowledge transformation and exploitation positively moderate the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets. This hypothesis is tested by examining the effect of the interaction term on the three measures of entrepreneurial growth in domestic markets: share of sales from new Swedish customers (Table 8.10), share of sales from new products/services in the domestic markets (Table 8.11) and share of sales from new geographic markets in Sweden (Table 8.12).

In Table 8.10 the multivariate multiple regression estimations show that the interaction term is significant, though marginally (p<0.1), and positively associated with the share of sales from new Swedish customers (Model 3 – Domestic). This result is confirmed by the fractional logit estimation (Model 4 – Domestic). As above, one way of facilitating the interpretation of this marginally significant effect is to investigate the influence of knowledge acquired from internationalization on sales from new customers in Sweden at different levels of knowledge processes (+/-0.5, 1, and 2 standard deviations).

The data in Table 8.14 indicate that all these relationships are not statistically significant. Though the interaction term is marginally significant, there is no evidence of a positive effect of knowledge processes on the relationship between knowledge acquired from internationalization and sales from new customers in Sweden. Knowledge processes do not even seem to have a direct effect on sales from new customers in Sweden. As shown in Table 8.10,
the coefficient of knowledge processes fails to reach statistical significance in all domestic models.

Table 8.14 Single slope of knowledge acquired from internationalization on sales from new customers in Sweden at different levels of knowledge processes

<table>
<thead>
<tr>
<th>Levels of knowledge processes</th>
<th>Coefficient</th>
<th>Std. Err.</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high (+2 sd)</td>
<td>0.05</td>
<td>0.028</td>
<td>1.64</td>
<td>0.10</td>
</tr>
<tr>
<td>High (+1 sd)</td>
<td>0.03</td>
<td>0.018</td>
<td>1.40</td>
<td>0.16</td>
</tr>
<tr>
<td>Somewhat high (+0.5 sd)</td>
<td>0.01</td>
<td>0.015</td>
<td>1.01</td>
<td>0.32</td>
</tr>
<tr>
<td>Medium (mean)</td>
<td>0.00</td>
<td>0.014</td>
<td>0.31</td>
<td>0.75</td>
</tr>
<tr>
<td>Somewhat low (-0.5 sd)</td>
<td>-0.01</td>
<td>0.015</td>
<td>-0.41</td>
<td>0.69</td>
</tr>
<tr>
<td>Low (-1sd)</td>
<td>-0.02</td>
<td>0.019</td>
<td>-0.87</td>
<td>0.38</td>
</tr>
<tr>
<td>Very high (-2 sd)</td>
<td>-0.04</td>
<td>0.030</td>
<td>-1.28</td>
<td>0.20</td>
</tr>
</tbody>
</table>

The interaction between knowledge acquired from internationalization and knowledge processes fails to reach statistical significance also in all domestic models displayed in Table 8.11. There is not even evidence of a direct, linear effect of knowledge processes on the share of sales from new products/services in Sweden. In Model 2 – Domestic, Model 3 – Domestic and Model 4 – Domestic, the coefficient of knowledge processes is not statistically significant. Also the effect of knowledge acquired from internationalization on sales from new geographic markets in Sweden is not increased by the interaction with knowledge processes. The interaction term fails to reach statistical significance in all domestic models displayed in Table 8.12. In addition, knowledge processes do not even have a direct effect on sales from new geographic markets in Sweden. The coefficient of knowledge processes fails to reach statistical significance in all domestic models.

To sum up, I do not find support for Hypothesis 12a. Contrary to my prediction, higher levels of knowledge processes do not strengthen the relationship between knowledge acquired from internationalization and any of the measures of entrepreneurial growth in domestic markets. Knowledge processes do not even seem to have a direct effect on entrepreneurial growth in domestic markets.

Results for Hypothesis 12b

Hypothesis 12b predicts that processes of knowledge transformation and exploitation positively moderate the relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets. This hypothesis is tested by examining the effect of the interaction term on the three measures of entrepreneurial growth in international markets: share of sales from new international customers (Table 8.10), share of sales from new
8. Analysis and results: New knowledge, knowledge processes, and firm growth

products/services in international markets (Table 8.11) and share of sales from new international markets (Table 8.12).

In Table 8.10 the interaction term is not statistically significant in the multivariate multiple regression estimations (Model 3 – International), but marginally significant in the fractional logit estimation (Model 4 – International). As above, one way of interpreting this marginally significant effect is to investigate the influence of knowledge acquired from internationalization on sales from new customers in Sweden at different levels of knowledge processes (+/- 0.5, 1, and 2 standard deviations).

Table 8.15 Single slope of knowledge acquired from internationalization on sales from new customers in international markets at different levels of knowledge processes

<table>
<thead>
<tr>
<th>Levels of knowledge processes</th>
<th>Coefficient</th>
<th>Std. Err.</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high (+2 sd)</td>
<td>0.00</td>
<td>0.016</td>
<td>-0.01</td>
<td>1.00</td>
</tr>
<tr>
<td>High (+1 sd)</td>
<td>0.008</td>
<td>0.010</td>
<td>0.74</td>
<td>0.46</td>
</tr>
<tr>
<td>Somewhat high (+0.5 sd)</td>
<td>0.011</td>
<td>0.008</td>
<td>1.37</td>
<td>0.18</td>
</tr>
<tr>
<td>Medium (mean)</td>
<td>0.015</td>
<td>0.008</td>
<td>1.97</td>
<td>0.05</td>
</tr>
<tr>
<td>Somewhat low (-0.5 sd)</td>
<td>0.019</td>
<td>0.009</td>
<td>2.18</td>
<td>0.03</td>
</tr>
<tr>
<td>Low (-1sd)</td>
<td>0.023</td>
<td>0.011</td>
<td>2.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Very high (-2 sd)</td>
<td>0.031</td>
<td>0.017</td>
<td>1.81</td>
<td>0.07</td>
</tr>
</tbody>
</table>

The data in Table 8.15 indicate that at a low level of knowledge processes (-1 standard deviation), increasing knowledge acquired from internationalization increases sales from new international customers more than it does at a medium level (mean) of these processes. However, at a very low level of knowledge processes (-2 standard deviation), as well as at higher levels of knowledge processes (+0.5, 1 and 2 standard deviations), there is no evidence of a relationship between knowledge acquired from internationalization and sales from new international customers. Though the interaction term is marginally significant, knowledge processes do not seem to positively moderate the relationship between knowledge acquired from internationalization and sales from new international customers. There is not even evidence of a direct effect of knowledge processes on sales from new international customers. In Model 2 – International, Model 3 – International and Model 4 – International, the coefficient of knowledge processes is positive but not statistically significant (Table 8.10).

The interaction term is not significant in any international model in Table 8.11. However, knowledge processes have a significant and positive effect on sales from new products/services in international markets. Thus, knowledge processes seem to have a direct effect on the share of sales from new products/services in international markets, rather than a moderating effect, via their impact on knowledge acquired from internationalization.
The effect of knowledge acquired from internationalization on sales from new international markets is not increased by the interaction with knowledge processes. Table 8.12 indicates that the interaction term fails to reach statistical significance in all international models. Knowledge processes do not even have a direct effect on sales from new international markets. The coefficient of knowledge processes fails to reach statistical significance in all international models.

In sum, I do not find support for Hypothesis 12b. Contrary to my expectations, knowledge processes do not seem to moderate the relationship between knowledge acquired from internationalization and any of the three measures of entrepreneurial growth in international markets. Knowledge processes do not even seem to have a direct effect on entrepreneurial growth in international markets except in one case: they increase the share of sales from new products in international markets.

### 8.6 Summary of the results

This chapter reports the empirical results concerning the relationships illustrated in the second part of the research model. Specifically, these results concern the relationships between knowledge acquired from internationalization and different growth outcomes as well as the moderating role of knowledge processes in these relationships. A summary of the hypotheses tested in this chapter and their support is presented in Table 8.16.

The results indicate that market and technological knowledge acquired from internationalization is positively related to growth relative to competitors in international markets (Hypothesis 7b), but not to overall growth relative to competitors (Hypothesis 7a). On the one hand, these findings are consistent with my expectation that knowledge acquired from internationalization can be a source of a firm’s specific advantage over competitors; on the other hand, they refine my expectation: the new knowledge obtained from international markets is a source of a firm’s specific advantage only in international markets. In other words, this new knowledge plays a rent-yielding role only in international markets.

I also find that market and technological knowledge acquired from internationalization is positively related to international growth (Hypothesis 8). This result is consistent with the expectation that knowledge obtained from international markets plays a commitment-regulating role: it enhances the firm’s ability and willingness to sell its products/services in international markets.

With regard to the effect of knowledge acquired from international markets on entrepreneurial growth, the results are mixed. A positive relationship between knowledge acquired from internationalization and entrepreneurial
growth in domestic markets is found for one measure of entrepreneurial growth, but not for the other two (Hypothesis 9). Specifically, market knowledge and technological knowledge, taken together, increase sales from new geographic markets in Sweden, but not sales from new customers and sales from new products/services in Sweden. The additional analysis assessing the effect of market knowledge and technological knowledge, taken separately, provides some interesting observations. There is evidence that technological knowledge, alone, has a positive effect on sales from new products/services in Sweden. Overall, these findings indicate that the expected enabling role of knowledge acquired from internationalization in the domestic markets is limited: it only facilitates the entry into geographic markets which the firm did not serve previously. In addition, one of the two strands of knowledge—namely technological knowledge—enhances the commercialization of new products or services in Sweden.

Table 8.16 Summary of hypotheses and results

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7a: Knowledge acquired from internationalization is positively related to overall growth relative to competitors</td>
<td>Not supported</td>
</tr>
<tr>
<td>7b: Knowledge acquired from internationalization is positively related to international growth relative to competitors</td>
<td>Supported</td>
</tr>
<tr>
<td>8: Knowledge acquired from internationalization is positively related to international growth</td>
<td>Supported</td>
</tr>
<tr>
<td>9a: Knowledge acquired from internationalization is positively related to entrepreneurial growth in domestic markets</td>
<td>Supported for one measure</td>
</tr>
<tr>
<td>9b: Knowledge acquired from internationalization is positively related to entrepreneurial growth in international markets</td>
<td>Supported for two measures</td>
</tr>
<tr>
<td>9c: The relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets is stronger than the relationship between knowledge acquired from internationalization and entrepreneurial growth in domestic markets</td>
<td>Supported for one measure</td>
</tr>
<tr>
<td>10a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger its overall growth relative to competitors</td>
<td>Not supported</td>
</tr>
<tr>
<td>10b: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger its international growth relative to competitors</td>
<td>Not supported</td>
</tr>
<tr>
<td>11a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger its international growth</td>
<td>Not supported</td>
</tr>
<tr>
<td>12a: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger its entrepreneurial growth in domestic markets</td>
<td>Not supported</td>
</tr>
<tr>
<td>12b: The more a firm transforms and exploits the knowledge acquired from internationalization, the stronger its entrepreneurial growth in international markets</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
Somewhat more support is found for the expected positive effect of knowledge acquired from internationalization on entrepreneurial growth in international markets (Hypothesis 9b). Market knowledge and technological knowledge acquired from internationalization are positively related to two measures of entrepreneurial growth in international markets: sales from new international customers and sales from in new international markets. However, contrary to expectations, this new knowledge base does not increase sales from new products/services in international markets. Overall, these findings suggest that knowledge acquired from internationalization enables certain entrepreneurial actions in international markets, but not others. It helps reaching international customers and markets which the firm did not serve before; yet, it does not facilitate the development and commercialization of new products/services in international markets.

Contrary to my predictions, the results show that knowledge acquired from internationalization does not always enhance the discovery and exploitation of opportunities in international markets more than it does in the home market (Hypothesis 9a). Specifically, the findings indicate that the relationship between knowledge acquired from internationalization and entrepreneurial growth in international markets is stronger than the relationship between knowledge acquired from internationalization in Sweden only for one dimension of entrepreneurial growth: venturing into new geographic markets. As regards the other dimensions of entrepreneurial growth, knowledge acquired from internationalization has, most likely, no effect on SMEs reaching new Swedish customers, but a positive and significant effect on SMEs reaching new international customers; in addition, market knowledge and technological knowledge, taken together, have no effect on the commercialization of new products/services in either domestic or international markets.

Furthermore, I find that processes of knowledge transformation and exploitation do not moderate the relationship between knowledge acquired from internationalization and any measure of firm growth. First, contrary to my expectation, the results suggest that knowledge processes do not enhance the rent-yielding role of knowledge obtained from internationalization and its effect on overall growth relative to competitors and on international growth relative to competitors (Hypothesis 10). The positive link between knowledge acquired from internationalization and international growth relative to competitors even decreases as knowledge processes increase from very low to medium levels. Second, contrary to my prediction, the findings indicate that knowledge processes do not enhance the commitment-regulating role of knowledge obtained from internationalization and its effect on the international growth of SMEs (Hypothesis 11). Third, contrary to the hypotheses, high levels of knowledge processes do not produce any stronger effect of knowledge acquired from internationalization on either entrepreneurial growth in domestic markets (Hypothesis 12a) or entrepreneurial growth in international markets (Hypothesis 12b). Hence, there is no evidence that the processes through which
8. Analysis and results: New knowledge, knowledge processes, and firm growth

SMEs manage knowledge facilitate the enabling role of knowledge acquired from internationalization and its effect on entrepreneurial growth.

Although I do not hypothesize any direct relationships between knowledge processes and the different growth outcomes, the results provide some interesting observations. The processes through which SMEs transform and exploit knowledge directly increase international growth relative to competitors, international growth, and share of sales from new products/services in international markets. These findings, coupled with the earlier findings pointing at a non-moderating role of knowledge processes, refine the original proposed pathway: the processes through which SMEs manage knowledge affect certain growth outcomes in international markets directly rather than indirectly via their influence on knowledge acquired from internationalization. In other words, these knowledge processes are, per se, important for growth in international markets, as opposed to being important because they allow exploiting the knowledge acquired from internationalization. As concerns growth in the domestic market, the processes through which SMEs manage knowledge are neither directly nor indirectly important.
9 Discussion and conclusions

9.1 Introduction

The aim of this dissertation was to investigate how SMEs benefit from carrying out international activities to continue growing in international as well as domestic markets. To address this issue I developed a knowledge-based model of firm growth through internationalization. Penrose’s (1959/1995) theory of the growth of the firm provided the ‘skeleton’ of the model, while the empirical literature on firm internationalization, KBV, organizational learning, and absorptive capacity provided the conceptual ‘flesh’ added to the ‘bones’ of the model. From the model, I derived the research questions:

1) What are the effects of downstream/upstream internationalization on the acquisition of market knowledge and technological knowledge?
2) What is the role of prior knowledge in these relationships?
3) What are the effects of the newly acquired knowledge on different growth outcomes?
4) What is the role of processes of knowledge transformation and exploitation in these relationships?

These research questions were operationalized in a number of hypotheses. In the previous chapters I have presented the analyses relative to the hypothesis testing and shortly summarized whether or not the hypotheses were supported. I begin this chapter by discussing the results in the light of the literature and prior studies and answering the above research questions. Subsequently, I present the key findings of the study and their theoretical implications. This discussion leads to a revision and extension of the theoretical model. Thereafter, I illustrate the strengths and weaknesses of the study before suggesting directions for future research. Finally, I elaborate on the implications of the study for SME managers and policy markets.
9.2 Findings in relation to the research questions

9.2.1 What are the effects of downstream and upstream internationalization on the acquisition of new market knowledge?

The acquisition of market knowledge is an important aspect of SME internationalization. My research model suggests a positive link between downstream/upstream internationalization and the acquisition of new market knowledge.

The results from the regression models presented in Chapter 7 suggest that international SMEs acquire new market knowledge when they are directly engaged in downstream international activities. Specifically, the study shows that the extent to which SMEs export and carry out marketing activities abroad is associated with the firms’ accumulation of insights and knowledge on how to improve marketing, distribution, and customer relation activities. This result is in line with the literature stating that firms primarily acquire knowledge through learning by doing (Huber, 1991; Johanson & Vahlne, 1977; Penrose, 1959/1995). That is, practicing activities in the downstream domain is the most important mechanism for accumulating knowledge related to that domain. This can be further interpreted in the light of the downstream activities typically performed by SMEs. In host markets, SMEs lack the substantial asset base and market power of the large MNEs and they typically compete by differentiating their offering and meeting specific buyer needs (Fujita, 1998; Knight, 2001; Oviatt & McDougall, 1994). The results suggest that this niche strategy pays off in terms of accumulation of relevant market knowledge.

The learning literature suggests that firms may also learn indirectly via other forms of learning, e.g. observing other firms (Huber, 1991; 2004) or interacting with business partners. Thus, I expected SMEs to gain relevant market knowledge also when engaged in upstream international activities, e.g. when importing or carrying out R&D and production abroad. This does not seem to be the case, at least for this sample of Swedish SMEs: they do not appear to directly acquire new market knowledge when engaged in upstream international activities. One possible explanation is that when purchasing or producing abroad, SMEs are extremely focused on the tasks at hand and do not devote efforts to scanning the local market or gaining other information from their local partners. Upstream activities, compared with downstream activities, are rather demanding in terms of coordination of activities and exchange of information (Andersen, 1999). Time needs to be allocated to a myriad of
9. Discussion and Conclusions

activities ranging from selecting host-country firms as partners, setting up agreements, managing the supply processes, ensuring quality, and so forth (Fujita, 1998). As pointed out by Fujita (1998) these types of activities are intrinsically difficult to handle for small firms. As a result, there is little time for acquiring other information.

Note: In the figure the arrow shows a positive and statistically significant effect.

Figure 9.1 Illustration of the effects of downstream/upstream internationalization on the acquisition of new market knowledge.

In sum, the study shows that downstream internationalization and upstream internationalization have different effects on the acquisition of new market knowledge: downstream internationalization has a direct positive effect, while upstream internationalization has a non-significant direct effect (see Figure 9.1). These different effects might be due to the different nature of downstream/upstream activities carried out by SMEs in international markets.

9.2.2 What is the role of prior knowledge in the relationships between downstream/upstream internationalization and the acquisition of market knowledge?

The results become more intriguing as we consider the impact of prior knowledge on the relationships between downstream/upstream internationalization and the acquisition of market knowledge.

Prior knowledge does not emerge as a significant moderator of the relationship between downstream internationalization and the acquisition of new market knowledge. This finding is contrary to the hypothesis I put forward and, to a certain extent, challenges some of the ideas at the heart of the absorptive capacity literature. Kim (1998, p. 507) maintains that “accumulated
prior knowledge increases the ability to make sense of and to assimilate and use new knowledge”. This does not seem to be the case, at least when it comes to SMEs acquiring new knowledge from downstream international activities: higher levels of accumulated prior knowledge do not increase an SME’s ability to acquire market knowledge. This can be interpreted in the light of the typical downstream international activities carried out by SMEs. As mentioned above, many small firms, especially from small domestic markets, serve rather narrow, but well-defined market segments worldwide (Etemad, 2004). The development of tight and long-term relationships with international customers (Karagozoglu & Lindell, 1998) and/or foreign distributors (Knight & Cavusgil, 2004) might facilitate the learning by doing of market knowledge, regardless of the firm’s prior endowment of knowledge resources.

A further interpretation can be drawn when considering the conceptualization of prior knowledge. Following Huber (2004), I expected not only the depth, but also the breadth of expertise to be relevant for the acquisition of new market knowledge from downstream international activities. Accordingly, prior knowledge encompasses two strands of knowledge: the firm’s prior stocks of market know-how as well as its prior stocks of technological know-how. The non-significant moderating role of prior knowledge is to be read as a non-significant impact of both strands of prior knowledge, taken together, on the relationship between downstream internationalization and the acquisition of market knowledge. Simply put, the breadth or richness of preexisting knowledge does seem to enhance this relationship. Cohen and Levinthal (1990) argue that a broad and diverse knowledge base plays an important role in uncertain settings. As mentioned above, the strong and tight relationships which SMEs tend to establish with their international customers might give rise to a rather familiar setting, rendering a diverse and broad knowledge base not required for the acquisition of new market knowledge. It could even be argued that very high levels of prior knowledge hinder SMEs from acquiring new market knowledge from downstream international activities. Some scholars suggest that for organizations to learn new skills they need to dismiss current habits and ways of doing things (Hedberg, 1981). Very high levels of prior knowledge in the context of downstream international activities might inhibit this process.

Prior knowledge emerges as a significant moderator of the relationship between upstream internationalization and the acquisition of new market knowledge. Thus, accumulated prior knowledge influences forms of learning, other than learning by doing, in the upstream domain. This finding is important in the light of the non-significant relationship between upstream internationalization and the acquisition of new market knowledge, discussed above. International upstream activities seem to give SMEs an opportunity to broaden their market knowledge only when the firms have a prior endowment of knowledge resources. As discussed previously, international upstream activities are rather demanding and difficult to handle for resource-constrained
9. Discussion and Conclusions

SMEs (Andersen, 1999; Fujita, 1998). Having a prior knowledge base might be a critical factor for handling these activities: it leaves leeway for acquiring knowledge which goes beyond the specific activities at hand. Here, there are little risks of remaining stuck in the past: the uncertainty of upstream international activities naturally triggers a breakdown of existing routines and facilitates the creation of new knowledge (Nonaka & Takeuchi, 1995). By contrast, limited prior knowledge may result in a constant struggle to solve immediate problems, crippling learning attempts (Simon, 1992).

Note: In the figure black arrows show positive and statistically significant effects.

Figure 9.2 Illustration of the role of prior knowledge in the relationship between downstream/upstream internationalization in the acquisition of new market knowledge.

As a whole, the results indicate that the role of prior knowledge as a moderating factor between downstream/upstream international activities and the acquisition of new market knowledge is context-dependent. In the context of downstream international activities, the tight and strong relationships that SMEs have with their international customers render the firm’s endowment of knowledge superfluous for the acquisition of new market knowledge. In the context of difficult-to-handle upstream international activities, a firm’s prior endowment of knowledge resources is the sine qua non for the acquisition of new market knowledge by SMEs (see Figure 9.2).
9.2.3 What are the effects of downstream and upstream internationalization on the acquisition of new technological knowledge?

Also the acquisition of technological knowledge is an important aspect of SME internationalization. My research model suggests a positive link between downstream/upstream internationalization and the acquisition of new technological knowledge.

Starting from the effect of upstream international activities, the results of the regression models presented in Chapter 7 confirm the importance of upstream international activities for the acquisition of new technological knowledge. Specifically, the study shows that the extent to which SMEs source from abroad and carry out production and R&D abroad is directly associated with the firms' accumulation of new knowledge on how to manufacture, engineer, or, more generally, develop methods and tools needed to serve the market. These findings are consistent with prior research emphasizing the acquisition of new knowledge via experiential learning (Huber, 2004; Penrose, 1960) and are important for several reasons. First, they suggest that SMEs can acquire 'sticky' and 'context-bound' technological knowledge (Andersen, 1999), via experiential learning processes. Similar observations have been made in studies on knowledge transfers by SMEs. For instance, Buckley (1997) suggests that on-the-job-learning as well as the supply of machinery, parts, and products which embody a new technology are crucial transfer mechanisms in SMEs.

Second, these findings suggest that the uncertainty surrounding international upstream activities might spur learning. As mentioned above, upstream international activities are oftentimes regarded as uncertain (Fujita, 1998), risky (Buckley, 1997), and difficult to handle for small firms (Brush et al., 2002). This study indicates that facing these uncertain and risky conditions might trigger a process of learning and adaptation. Overall, these findings confirm the importance of upstream internationalization as a knowledge-seeking strategy (Martin & Salomon, 2003): upstream internationalization is not only a means of reducing costs, but an important platform for accessing new technological knowledge (Observatory of European SMEs, 2003).

Also downstream internationalization is positively related to the acquisition of technological knowledge. The results show that the extent to which SMEs export and carry out marketing activities abroad is directly associated with the firms' accumulation of new technological insights. As expected, the results also indicate that downstream internationalization brings more new market knowledge than new technological knowledge. These findings are important in at least three respects. First, they show the importance of forms of learning other than learning by doing. It appears that SMEs which are engaged in downstream international activities can gain—besides market knowledge, via learning by doing—also technological insights, via vicarious learning or via interacting with the local partners. This is also consistent with previous studies.
9. Discussion and Conclusions

For instance, Riddle and Gillespie (2003), show that Turkish clothing export entrepreneurs gain important information about new products and technological innovation from international customers. Second, these findings indicate that learning by doing and other forms of learning do not have the same intensity. Specifically, the fact that downstream internationalization brings more market knowledge than technological knowledge confirms that international SMEs primarily acquire knowledge via learning by doing. Third, these findings are important for the development of resource-constrained SMEs as they suggest important spin-off effects originating from downstream international activities. Besides the short-term payoff in terms of increased sales, these activities are important sources of market knowledge and, to a lesser extent, of technological knowledge.

Note: In the figure arrows show positive and statistically significant effects.

Figure 9.3 Illustration of the effect of downstream and upstream internationalization on the acquisition of new technological knowledge.

In sum, the study provides evidence of a positive and direct impact of downstream internationalization and upstream internationalization on the acquisition of new technological knowledge (see Figure 9.3).

9.2.4 What is the role of prior knowledge in the relationships between downstream/upstream internationalization and the acquisition of technological knowledge?

As for the role of prior knowledge in the relationships between downstream/upstream internationalization and the acquisition of technological knowledge, the regression analyses in Chapter 7 provide mixed results.
Prior knowledge emerges as a strong moderator of the relationship between upstream internationalization and the acquisition of new technological knowledge. This means that the effect of upstream internationalization on the acquisition of new technological insights is higher when the firm has a great endowment of market and technological knowledge. These findings are consistent with Huber’s (2004) position that a broad knowledge base, encompassing both market and technological know-how (Penrose, 1959/1995), increases the firm’s ability to decipher and understand new technological insights gained from international markets. SMEs’ international operations tend to be based on the experience of skilled employees (Fujita, 1998). Prior technological knowledge allows these individuals to make sense of and assimilate new technologies (Kim, 1998), and prior market knowledge, such as information about supplier relationships or customers’ needs, might influence their ability to extrapolate or comprehend the relevance of new technological insights (Shane, 2000). Put differently, higher levels of prior knowledge help SMEs to be better tuned to the developments in their upstream international environments, e.g. by exploring additional sources of information on raw materials and production processes as well as on services, such as installation, testing, and maintenance (Karlsen et al., 2003).

However, prior knowledge does not moderate the positive relationship between downstream internationalization and the acquisition of new technological knowledge. This means that having higher levels of market and technological know-how does not help SMEs to acquire externally held technological knowledge, when engaged in downstream international activities. At least the SMEs in this sample appear to be able to gain new technological knowledge regardless of their prior endowment of knowledge resources. As discussed above, this might be largely due to the nature of downstream international activities typically carried out by SMEs. Prior studies suggest that SMEs are either ‘pulled’ into foreign markets by large firms requiring suppliers or ‘pushed’ abroad to maintain a specific position in their business network (Buckley, 1997; Westhead, Wright, Ucbasaran, & Martin, 2001). In either case, SMEs maintain close and long-term contacts with their international customers (Karagozoglu & Lindell, 1998) and foreign distributors (Knight & Cavusgil, 2004), which allow them to acquire relevant technological knowledge also in the absence of a broad knowledge base.

Another explanation is that the impact of prior knowledge on the relationship between downstream internationalization and the acquisition of new technological knowledge is not linear, as suggested in the model, but curvilinear. It could be argued that some levels of prior knowledge enhance the positive relationship between downstream internationalization and the acquisition of new technological knowledge. However, higher levels of prior knowledge may render the acquisition of new technological knowledge unnecessary. In the words of De Clercq and Sapienza (2005, p. 520), “the new insights gained may seem obvious, or even tautological, since new insights
9. Discussion and Conclusions

appear only plausible when some new knowledge is brought to the table”. Alternatively, it could be argued that very high levels of knowledge might ‘blind’ SMEs or confine them to what has been labeled a ‘familiarity trap’ (Ahuja & Lampert, 2001)—“an overemphasis on refining and improving the existing knowledge base, precluding the firm from exploring alternative sources of knowledge and limiting the organization’s cognitive schemas” (Liao et al., 2003, p. 69). SMEs with very high levels of prior knowledge are more likely to be confined to this trap in the context of downstream international activities than in the context of upstream international activities. As already mentioned, the former are typically characterized by rather strong long-term relationships with a limited number of international customers or distributors, while the latter involve a myriad of activities which are difficult to handle, especially for smaller firms (Brush et al., 2002).

![Diagram of the role of prior knowledge in the relationship between downstream/upstream internationalization and the acquisition of new technological knowledge.](image)

*Note: In the figure black arrows show positive and statistically significant effects.*

**Figure 9.4 Illustration of the role of prior knowledge in the relationship between downstream/upstream internationalization and the acquisition of new technological knowledge.**

These results confirm the observation made above: the role of prior knowledge as a moderating factor between downstream/upstream international activities and the acquisition of new knowledge is context-dependent. Prior endowment of market and technological knowledge facilitates the acquisition of new technological knowledge in the uncertain context of upstream international activities. By contrast, SMEs are able to acquire new technological knowledge in
the context of downstream international activities, independently from their prior endowment of knowledge resources (see Figure 9.4).

9.2.5 What are the effects of knowledge acquired from internationalization on growth outcomes?

Following Penrose’s theory of the growth of the firm and in line with the international business (IB) literature, my research model attributes different roles to the newly acquired knowledge resources and suggests different growth outcomes.

SME growth relative to competitors

The regression results in Chapter 8 indicate that the knowledge acquired from internationalization is not a significant predictor of overall firm growth relative to competitors. However, it predicts SMEs’ growth relative to competitors in international markets. Similar results are obtained when I investigate the effects of market and technological knowledge separately. This means that market and technological know-how derived from international markets contributes to SMEs’ competitive advantage in international markets, but not necessarily in domestic markets. These results are important because they indicate that market and technological know-how acquired from internationalization might give rise to a unique bundle of firm-specific knowledge resources that SMEs can use to outperform their competitors in international markets. In these terms, the findings are consistent with the IB research which, following the resource-based view (RBV) (Barney, 1991) and the dynamic capabilities perspective (Teece et al., 1997), emphasizes the rent-yielding role of knowledge resources (e.g., Dunning, 2000; Madhok, 1997). However, the fact that this new knowledge base gives SMEs a growth advantage only in international markets suggests that the new knowledge base is not only firm-specific, but also specific to international markets. This, in turn, can be due to one or more of the following reasons. First, as a result of saturation in their domestic niche market, these firms use the new market and technological intelligence to support international success. For instance, Knight and Cavusgil (2004) find that leveraging unique services or technological excellence allows young firms to develop offerings that appeal to international niche markets, helping them to achieve some sort of ‘monopolistic’ advantage in international markets.

Second, it is possible that the newly acquired knowledge base contributes to SMEs’ competitiveness in more uncertain environments—such as international markets—rather than in more stable, domestic markets. This interpretation is consistent with Miller and Shamsie (1996), who find that knowledge-based resources are especially useful in changing, uncertain environments. In the authors’ words, “where the environment is particularly competitive and rivals are introducing many new offerings, the skills of experts who can adapt and
create better products will be especially valuable” (Miller & Shamsie, 1996, p. 526). Third, it could be that the content of the know-how acquired from international markets is context-specific and, thus, not easily transferable to domestic markets without costs. For instance, Yeoh (2004) finds that technological information gained from international expansion activities does not directly translate into greater profits for the company, because of the additional costs of internalizing the new technological insights in the current operations.

**SME international growth**

The results in Chapter 8 indicate that the knowledge acquired from internationalization is a significant predictor of SME international growth. Similar results are obtained when investigating the impacts of market know-how and technological know-how, taken separately. This means that market and technological know-how derived from international markets enhances SMEs’ continued expansion in international markets. These findings are consistent with the Uppsala internationalization model, which suggests that the knowledge acquired from international activities influences firms’ decisions concerning the commitment of resources to foreign markets (Johanson & Vahlne, 1977). Specifically these findings support the commitment-regulating role of newly acquired knowledge: knowledge derived from international markets influences the perceptions and commitments of the firm, so to solicit a greater disposition toward foreign activities (Yli-Renko et al., 2002). Similar results were obtained by Pedersen and Peterson (1998) who found that the accumulation of knowledge from foreign markets is a predictor of international growth.

The meaning of these results goes beyond support for the Uppsala internationalization model. First, they are in line with the predictions regarding the impact of the procedural type of knowledge (e.g. market know-how and technological know-how) on SME growth in international markets. This type of knowledge, as anticipated by Penrose (1959/95) and others, is more likely to have an impact on SME international growth than the declarative type of knowledge, e.g. know-what. The procedural type of knowledge is not necessarily connected to and dependent upon one specific international country. It allows a firm to “establish one or more wide and relatively impregnable ‘bases’ from which it can adapt and extend its operations in an uncertain, changing and competitive world” (Penrose, 1959/1995, p. 137).

Second, these results point at the importance of both strands of knowledge (market and technological) for SME growth in international markets. In these terms, they reconcile the Uppsala internationalization literature (Johanson & Vahlne, 1977), which solely focuses on market knowledge, with the international new venture literature (Oviatt & McDougall, 1994) and the internalization literature (Buckley & Casson, 1979), which also acknowledges the importance of technological knowledge. This is similar to what Buckley and
Carter (1999) call complementarity of knowledge. For a firm to expand its customer base in today’s dynamic international markets it is not enough to know how to market or distribute its products or services, without knowing how to develop its product/service offering. Vice versa is equally true. For instance, market knowledge is important for choosing what areas of R&D to undertake. This interpretation is consistent with prior studies which suggest that insufficient technical and market knowledge are two major obstacles faced by internationalizing firms (Brush & Chaganti, 1999).

SME entrepreneurial growth

The results provide only limited support for the expected positive effect of knowledge acquired from internationalization on entrepreneurial growth in domestic markets. Specifically, the results indicate that knowledge acquired from internationalization enhances sales from new geographic regions in the home market. Yet, it does not have a significant impact on sales from new customers or sales from new products/services in the home market.

The fact that knowledge acquired from internationalization enables SMEs to sell to new geographic areas in the home market is not surprising. Venturing into new geographic regions in Sweden is an example of geographic expansion, and as such it requires a knowledge base similar to that developed when expanding across national borders. Hence, the firm can quickly process this knowledge and use it in its ongoing operations (Zahra et al., 2004). In addition, this type of entrepreneurial action is not particularly risky for resource-constrained SMEs: it does not necessarily involve investments in specialized physical assets, such as capital investments in production and technological innovation; and it is psychically near (Johanson & Wiedersheim-Paul, 1975).

More surprising is the fact that the new market and technological knowledge does not seem to provide the basis for spotting and exploiting domestic opportunities, other than those related to geographic expansion. Building on the literature on international new ventures, I expected the new knowledge to provide SMEs with a platform for expanding not only their domestic markets (i.e. sales from new geographic regions in Sweden), but also the scope of their domestic activities (i.e. sales from new Swedish customers) and their product/service offering (i.e. sales from new products in Sweden). The non-significant impact of knowledge acquired from internationalization on sales from new domestic customers and new products/services in the home market might have several causes.

First, reaching new domestic customers or developing new products/services requires SMEs to diversify their position through market development or by undertaking technological innovation. These moves would require considerable efforts for SMEs and would draw time from alternative courses of action in international markets (Moss Kanter, 2000). In accordance with this interpretation, Sapienza et al. (2005) find evidence of a trade-off between international and domestic operations in young international ventures, and
argue that this trade-off might result from an unintended shift of resources from domestic to international efforts. Second, and partly related to the first point, it could also be that the new knowledge acquired from internationalization influences what productive opportunities SME managers ‘see’ and ‘take advantage of’: for instance, as a consequence of the new knowledge in the eyes of SME managers, the productive opportunities in the domestic markets become less attractive. This interpretation falls very much in line with Penrose’s concept of entrepreneurial judgment. When elaborating on the cognitive content of the firm’s productive opportunities, she posits that there “…is a close relation between the various kinds of resources with which the firm works and the development of ideas, experience and knowledge of its managers” (Penrose 1959/1995, p. 85). Similarly, the cognitive perspective on strategic change processes points at the interplay between managerial cognition and actions (Hellgren & Melin, 1993). Action regarding one strategic issue follows from the meaning attached to it; and this meaning is shaped by internal organizational characteristics (Lindell, Melin, Gahmberg, Hellqvist, & Melander, 1998).

Finally, another interpretation is suggested by the additional analyses of the separate impacts of market knowledge and technological knowledge on entrepreneurial growth in domestic markets. The results of these analyses can be summarized in the following points. First, both market knowledge and technological knowledge influence SME expansion into new geographic regions. Second, market knowledge alone does not seem to offer SMEs a platform for reaching new customers or for developing new products/services in the domestic market. Third, new technological knowledge alone enhances the development and commercialization of new products in the domestic market, but this effect disappears when new technological knowledge is combined with new market knowledge.

These findings suggest a different fungibility of market knowledge and technological knowledge across alternative uses and across domestic and international markets: a new market acquired from internationalization is not deployed for any alternative use in the domestic market but one: expanding in new geographic regions; technological knowledge is, instead, used both to adapt products/services to new geographic regions and to develop new products/services in the home market. This interpretation of the different fungibility of market and technological knowledge is in line with prior studies. For instance, Delios and Beamish (2001) contend that marketing assets are less fungible than it might first appear and require adaptation to a new host country setting. Instead, technological assets require little adaptation to be applicable in a new host country market. Concerning the non-complementarity between new market knowledge and new technological knowledge when it comes to developing new products, it may simply be that when developing and commercializing new products/services in the home market, SMEs do not
employ the new knowledge acquired from international markets, but rather their existing market know-how gained from domestic operations.

I find somewhat more support for the expected positive effect of knowledge acquired from internationalization on entrepreneurial growth in international markets. Specifically, the results indicate that knowledge acquired from internationalization enhances sales from new international markets and sales from new international customers. However, it does not have a significant impact on sales from new products/services in international markets. Similar results are obtained when estimating the impact of each strand of knowledge separately.

These results are consistent with the view, put forward by the international entrepreneurship literature, that new knowledge derived from international markets might play an enabling role: it facilitates the recognition and active pursuit of expansion opportunities (Yli-Renko et al., 2002). Viewed alongside my earlier findings, these results support the aforementioned trade-off between pursuing opportunities in international vs. domestic markets. First, there is some evidence that new market and technological knowledge influences the pursuit of opportunities more in international markets than in the domestic market. That is, the new knowledge base begets international market development (i.e. increase in sales from new international customers), but not domestic market development (i.e. increase in sales from new Swedish customers). Second, even when geographic expansion opportunities are pursued both in domestic and in international markets, the study shows that knowledge acquired from internationalization enhances international geographic expansion more than domestic geographic expansion.

As observed above, the fact that entrepreneurial growth in international markets comes at the expense of entrepreneurial growth in domestic markets can result from the close relation between the newly acquired knowledge and what opportunities SME managers can ‘see’ and can take advantage of (Penrose, 1959/1995). The knowledge derived from international markets opens to the firm a whole range of new productive opportunities, shifting managers’ attention away from the domestic markets. Seen through the lenses of the cognitive perspective (Kor et al., 2007; Lindell et al., 1998), these results confirm the interplay between what happens in the strategic development of a company (i.e. international expansion) and its managers’ cognitive processes (i.e. the perception of opportunities in international markets).
9. Discussion and Conclusions

What is somewhat surprising is that the knowledge accumulated in international markets does not enhance the development and commercialization of new products/services in international markets. One interpretation could be that SMEs with a strong knowledge base are more motivated to use this knowledge to expand their international market share, and cash in before this advantage is eroded, rather than to develop new product/service offerings. This interpretation is supported by recent studies on the success factors of international SMEs. Winch and Bianchi’s (2006) study, for instance, shows that smaller firms can achieve great success in international...
markets when they focus on their core offering and do not divert resources towards new areas of activities.

Overall, what appears evident from my findings is that knowledge acquired from internationalization is a malleable resource which can play several roles and positively influence different growth outcomes. First, it can play a rent-yielding role, contributing to SME growth advantages in international markets. Second, it can play a commitment-regulating role, enhancing SME growth in international markets. Third, it can function as an enabler of SME entrepreneurial actions, yet mainly in international markets. These effects are illustrated in Figure 9.5

9.2.6 What role do the processes of knowledge transformation and exploitation play in the relationships between knowledge acquired from internationalization and different growth outcomes?

Building on the absorptive capacity literature, my research model expects the effects of knowledge acquired from internationalization on growth outcomes to be positively moderated by the organizational processes and routines through which SMEs transform and exploit knowledge. In Zahra and George’s (2002a) view, these knowledge processes make up the firm’s realized absorptive capacity—the capacity to leverage the knowledge that has been acquired.

The analyses in Chapter 7 show that these knowledge processes do not moderate the relationship between the knowledge acquired from internationalization and any growth outcome. This means that, in SMEs which have more routines for the transformation and exploitation of knowledge, the new knowledge acquired from internationalization is not necessarily more likely to enhance 1) growth relative to competitors, 2) international growth, and 3) entrepreneurial growth in international and domestic markets.

One interpretation could be that in SMEs there is not the same need as in larger firms for specific knowledge management mechanisms affecting the transformation and exploitation of knowledge. According to Lane at al. (2006), the transformation of knowledge “involves several processes that affect how the newly acquired knowledge is combined with the existing knowledge in the firms […]. At the firm level, knowledge management processes affect how such knowledge is shared between and transferred to different parts of the organization. The desired outcome of such processes is a transformation of the collective schema of different organizational units arising from assimilating the new knowledge” (p. 858). Compared to large firms, SMEs are not hampered by bureaucracy and complex information systems (Liesch & Knight, 1999); they are also more flexible and faster in responding to changes (Chen & Hambrick, 1995; Karagozoglu & Lindell, 1998). Hence, it is possible that in SMEs knowledge is ‘naturally’ shared and transferred across individuals as part of their
day-to-day activities, and that, consequently, the transformation of their collective schema happens in the absence of specific routines and processes for doing so.

It may even be that in SMEs these organizational processes and routines for the transformation and exploitation of knowledge create a red tape problem (Greiner, 1972), limiting the actual transformation and exploitation of knowledge. Some evidence of this emerges from the additional analysis I conducted to better interpret the marginally significant (p<0.1) impact of knowledge processes on the relationship between knowledge acquired from internationalization and international growth (Table 7.15). The results of this analysis reveal that at a low level of knowledge processes the impact of the newly acquired knowledge base on international growth is stronger than at a medium level of knowledge processes. In other words, the positive impact of knowledge acquired from internationalization decreases as routines and processes for the transformation and exploitation of knowledge increase from very low to medium levels.

However, this interpretation does not tell the whole story. From the analysis it emerges that knowledge processes have a direct impact on the following three growth outcomes: growth relative to competitors in international markets, international growth, and sales from new products/services in international markets. These findings, coupled with the prior findings pointing at a non-moderating effect of knowledge processes, refine the originally proposed pathway: routines and processes for the transformation and exploitation of knowledge do not influence growth via their impact on the knowledge already acquired; rather they directly impact growth outcomes (see Figure 9.6).

This revised pathway falls very much in line with Todorova and Durisin’s (2007) recent reconceptualization of the absorptive capacity concept. The authors, drawing on the psychological literature on cognitive development, argue that transformation is not a consequence of assimilation of knowledge, but an alternative process to assimilation. Specifically, Todorova and Durisin (2007, p. 778) explain:

“When the new idea fits the existing cognitive schemas well, the new idea is only slightly altered to improve the fit and then incorporated into the existing cognitive structures. The existing cognitive structure does not change, and the knowledge is ‘assimilated’. Accommodation, through transformation as an alternative process to assimilation, occurs in the case where new situations and ideas cannot realistically be altered to fit the existing knowledge structure […] Transformation enables organizations to perceive new knowledge to some extent incompatible with prior knowledge, to build new cognitive structures, and to cope with path dependency.”

This alternative interpretation becomes even more plausible as we consider the growth outcomes directly enhanced by the processes of knowledge transformation and exploitation—namely, international growth relative to
competitors, international growth, and sales from new products/services in international markets. These are the types of growth outcomes which reflect ‘innovative international strategies’ (Calori, Melin, Atamer, & Gustavsson, 2000). To use Todorova and Durisin’s terminology, these are the types of growth outcomes which would require ‘new’ cognitive structures.

It is not surprising that growth relative to competitors in international markets and international growth are positively influenced by both knowledge acquired from internationalization and knowledge management processes. Growth advantages and international growth require a unique endowment of know-how, on the one hand, and a constant change and recombination of know-how, on the other hand (Calori et al., 2000; Sapienza et al., 2006).

Particularly interesting is, however, the case of sales from new products/services in international markets. These are not influenced by the knowledge a firm has accumulated in international markets; yet, they are increased by the organizational processes directed at the transformation and exploitation of knowledge. As mentioned above, SMEs with a strong knowledge base might be more motivated to use this knowledge to expand their international market shares rather than to develop new product/service offerings. This explains why having knowledge acquired from internationalization is not positively related to sales from new products/services in international markets. On the other hand, the development and commercialization of new products in international markets originate from new combinations of resources (Calori et al., 2000) and require a transformation of the firm’s current knowledge base (Moss Kanter, 2000). As Drucker (1985) points out, innovation needs incongruities and discontinuities—things that can be enabled by routines and processes which affect how organizational members transform and exploit knowledge (Nonaka, Byosiere, Borucki, & Konno, 1994). This explains why knowledge processes directly increase sales from new products/services in international markets.

To sum up, these results bring new light on the discussion on the role played by organizational processes for the transformation and exploitation of knowledge. Contrary to my prediction, these knowledge processes do not influence SME growth via their impact on the knowledge already acquired from internationalization. Rather, they have a direct effect on SME growth relative to competitors in international markets, SME international growth, and sales from new products/services in international markets (see Figure 9.6).
9. Discussion and Conclusions

Note: In the figure the arrows show positive and statistically significant effects. Highlighted (bold) arrows are the effects of knowledge processes. The dotted arrow between new knowledge and sales from new markets (Sweden) shows that the relationship is weaker than the relationship between new knowledge and sales from new markets (international).

Figure 9.6 Illustration of the effects of knowledge processes on the different growth outcomes
Figure 9.7 Overview of the results.

Note: In the figure the arrows show positive and statistically significant effects. Highlighted (bold) arrows are the effects that were hypothesized. The dotted line between downstream internationalization and the acquisition of technological knowledge shows that the relationship is weaker than the relationship between downstream internationalization and the acquisition of market knowledge. The dotted arrow between new knowledge and sales from new markets (Sweden) shows that the relationship is weaker than the relationship between new knowledge and sales from new markets (international).
9. Discussion and Conclusions

9.3 Key findings and theoretical implications

An overview of the findings of my study is shown in Figure 9.7, which displays the statistically significant relationships I found in the analysis. This section provides a summary of the most important findings. These are discussed in relation to the theories at the heart of my research model. Some of these thoughts were brought up in the previous section; others are new insights. When useful for the purpose of interpreting the findings, additional theoretical lenses are suggested. This discussion provides the basis for evaluating and revising my research model as well as for suggesting avenues for future research.

9.3.1 Knowledge acquisition from internationalization

Research suggests that international markets are loci for learning (i.a., Barkema & Vermeulen, 1998; Zahra et al., 2001). Operating in these diverse circumstances expands a firm’s experience and fosters the acquisition of new knowledge and insights. However, for the most part, prior studies have linked firms’ experience to different growth outcomes empirically and then used those empirical observations as a support for the theoretical argument that knowledge had been acquired (e.g. Autio et al., 2000; Lu & Beamish, 2001). In this way, the acquisition of knowledge remained a black box. This study attempts to open up this black box by investigating the effects of SME internationalization on the acquisition of new knowledge. Findings suggest that internationalization is an important source of market and technological knowledge. As illustrated in Chapter 7, over twenty percent of the variance in the acquisition of market knowledge and over twenty-four percent of the variance in the acquisition of technological knowledge are explained by a firm’s internationalization, in interaction with its prior knowledge base.

Despite the fact that SMEs are international along a broad range of value chain activities, prior research has overlooked the different value chain activities that SMEs perform in international markets and their potential implications for the strands of knowledge to be acquired. My findings shed light on which stream of internationalization (i.e. downstream and upstream) enhances the acquisition of which strand of knowledge (i.e. market and technological). Specifically, they suggest that downstream internationalization brings new market knowledge, and, to a lesser extent, new technological knowledge, while upstream internationalization brings only new technological knowledge.

These findings add to the seminal distinction, put forward by the literature on organizational learning, between knowledge acquisition from direct experience (learning by doing) and knowledge acquisition from the experience of others (e.g. vicarious learning, noticing, etc.) (Huber, 1991; Levitt & March, 1988). On the one hand they provide empirical support for the tenet that via learning by doing firms acquire new knowledge in the domain of activities
performed. On the other hand, they extend the literature by showing that SMEs acquire a broader knowledge base via forms of learning other than learning by doing only when engaged in downstream international activities. My interpretation is that these differences might be due to the different types of social relationships which characterize SMEs’ downstream internationalization and upstream internationalization. As mentioned earlier, SMEs compete in international markets by differentiating their offerings and meeting specific customer needs (Knight, 2001). Thus, they tend to have close and tight relationships with international customers and/or foreign distributors, which facilitate the acquisition of a broader knowledge base. In the upstream domain, international SMEs tend to have looser relationships with several actors. In addition, these activities have been defined as being ‘intrinsically difficult to handle’ for resource-constrained SMEs (Fujita, 1998). As such, they do not facilitate the acquisition of new knowledge which transcends the domain of the activities at hand.

The social capital theory supports this argument. Drawing on Hansen’s work (1996), Nahapiet and Ghoshal (1998) suggest that richer patterns of relationships and interactions are important when the meaning of information is uncertain and ambiguous and in the absence of prior knowledge. Social relationships are important not only for enhancing knowledge transfer across organizations (Yli-Renko et al., 2001), but also for making sense of insights and information gained vicariously in international markets. These insights and this information tend to be fragmented, context–specific, and culturally bound (Zahra et al., 2004). Stronger relationships (or strong ties in the social capital theory’s terminology) with international actors are important because they allow selecting, interpreting, and framing this information into a usable body of knowledge (Holm & Sharma, 2006). Business actors who are linked by stronger relationships have a greater motivation to be of assistance and are, in general, more available (Granovetter, 1992). This interpretation suggests a revision of the research model to include the characteristics of the social relationships that SMEs establish with international business actors. This revision will be illustrated in Section 9.4

9.3.2 Prior knowledge

The literature on absorptive capacity suggests that what a firm already knows, or its prior knowledge, is important for the acquisition of new knowledge, implying that knowledge acquisition is path-dependent (Levinthal, 1992). However, a few studies using large samples have investigated the role of a firm’s prior knowledge in the acquisition of new knowledge. For the most part, prior knowledge has been directly linked to firm performance and growth (Autio et al., 2000; George, Zahra, Wheatley, & Khan, 2001). The findings brought forward in this thesis clarify the role of a firm’s prior knowledge in the acquisition of new knowledge from different streams of international activities.
9. Discussion and Conclusions

They suggest that a firm with a larger endowment of prior knowledge is more likely to acquire market and technological knowledge from upstream internationalization, but not from downstream internationalization. Viewed alongside my earlier findings, this implies that having a prior endowment of knowledge is 1) an important factor for acquiring new technological knowledge from upstream internationalization, 2) the condition sine qua non for acquiring new market knowledge from upstream internationalization, and 3) irrelevant for the acquisition of new market and technological knowledge from downstream internationalization.

These findings extend the literature on absorptive capacity. First, knowledge acquisition is not necessarily path-dependent. SMEs can acquire new technological knowledge when engaged in downstream international activities, regardless of their prior market and technological knowledge base. Second, and partly related to the first point, these findings show that the role of prior knowledge in the acquisition of new knowledge is context-dependent—that is, prior knowledge is important in the context of upstream international activities, but not in the context of downstream international activities. Also Cohen and Levinthal (1989) acknowledge that the importance of prior knowledge might vary. Specifically, the authors suggest that it might vary depending on the ‘ease/difficulty of learning’, but they do not elaborate much on this issue. The social capital theory can be used to better interpret the ‘ease/difficulty of learning’. Having a prior knowledge base is important in contexts where learning is not facilitated by the type of social relationships that SMEs have with foreign actors, e.g. upstream international activities. Conversely, having a prior knowledge base is not important in contexts where learning is facilitated by strong relationships with other actors, e.g. downstream international activities. Again, this suggests a revision of the research model to include the type of social relationships that SMEs have with international actors.

9.3.3 New knowledge and firm growth

Research on firm internationalization has not yet reached a consensus on the growth implications of the knowledge that firms acquire from internationalization. It is particularly unclear what growth outcomes might result from this augmented knowledge base. The findings brought forward in this thesis suggest that new knowledge contributes to 1) SMEs’ growth advantage in international markets, but not necessarily in domestic markets, 2) SMEs’ international growth, and 3) SMEs’ entrepreneurial growth, mainly in international markets through market development.

These findings add to the understanding of the role of new knowledge in SME growth. With respect to the internationalization literature, they indicate that the roles played by the new knowledge are richer than what each theoretical perspective alone suggests or, put differently, the new knowledge plays all three roles suggested by the internationalization perspectives.
reviewed. In accordance with the internalization perspective (Buckley & Casson, 1976; Dunning, 1988) and the organizational capability perspective (Madhok, 1997), new knowledge can play a rent-yielding role contributing to SME growth relative to competitors in international markets; in accordance with the Uppsala Model (Johanson & Vahlne, 1977), new knowledge can play a commitment-regulating role and contribute to SME growth in international markets, and, in line with the international entrepreneurship (IE) perspective (Sapienza et al., 2006), new knowledge can play an enabling role and enhance entrepreneurial growth, though mainly in international markets.

The findings suggest some limits to the role played by this new knowledge as well. Know-how and insights gained when operating in international markets enhance growth outcomes in international markets but have little or no impact on growth outcomes in the home market. This has important implications for the knowledge-based view (KBV). Some KBV proponents see knowledge as the most strategically significant resource of a company (Eisenhardt & Santos, 2002). Knowledge allows achieving economies of scale and scope which are difficult to imitate by competitors (Grant & Baden-Fuller, 2004). Organizations may achieve economies of scale by applying distinctive knowledge to the same sort of organizational operations repeatedly and economies of scope by applying the new knowledge to different sorts of organizational operations (Shin, 2004). My findings add to this characterization of knowledge by showing that the benefits of international knowledge are somewhat confined in their scope—that is, the applicability of this knowledge is, to a large extent, restricted to international markets.

This is not the same as saying that the know-how and insights gained from international markets are necessarily specific to one international market because the content of this knowledge is specific to one foreign market, as suggested by some proponents of the Uppsala internationalization model. Rather, my findings suggest that this knowledge is more efficient—it enables the firm to better satisfy its customers' wants—in international markets than in the domestic market. An efficiency-based explanation of performance differences is one of the defining features of the resource-based view (Peteraf & Barney, 2003). Much attention has been devoted to firm-specific resources that cannot be productive, or at least as productive, outside the firm. Peteraf (1993) summarizes this argument by saying that “the firm and the factor [resource] are, in essence, a team” (p. 184). My findings add to this discussion by suggesting that the environment where the resources were developed plays a role as well. Knowledge-based resources cannot be productive, or at least as productive, outside the environment where these resources were developed. Thus, Peteraf’s passage can be rephrased: the firm, the environment where the firm operates, and the knowledge developed when operating in that environment, are in essence a team.

These findings can also be interpreted through the lenses of the cognitive perspective. As said earlier, the accumulation of international knowledge is
9. Discussion and Conclusions

associated with a shift of a firm’s operations toward international markets. Rather than being the outcome of a (bounded) rational decision making process, this choice may result from the ‘enactment’ of the organizational environment that the management team performs (Weick, 1979). Managers’ cognitive models, which are shaped by direct and vicarious experience in international markets, shape organizational actions, and vice versa (Lindell et al., 1998). As suggested by Mahoney, a firm’s current resources serve as cognitive drivers of future strategy (Mahoney, 1995; Mahoney & Michael, 2005). Thus, the knowledge gained when operating in international markets might function as a cognitive driver of future internationalization.

Finally, these findings add to the understanding of the effects of new knowledge on SME entrepreneurial strategies. Corporate entrepreneurship (CE) can be basically pursued by one or a combination of three strategies: targeting unserved market segments, venturing into new geographic markets, and developing new products/services, all of which are fertile ground for growing (Davidsson, 2003; Kazanjian et al., 2002; Slater & Narver, 2000). My findings indicate that the new knowledge which SMEs gain from operating in international markets contributes to the first two CE strategies in international markets: targeting new customer segments and venturing into new markets. These can be grouped under the umbrella name of international market development (Andersen & Suat Kheam, 1998). However, the new knowledge does not contribute to the third strategy: new product development in international markets. Interestingly, this latter CE strategy is the most proactive one, at least when using Lumpkin and Dess’s (1996) definition of proactiveness—that is, the extent to which a firm anticipates and acts on future needs by introducing new products or services.

9.3.4 Processes of knowledge transformation and exploitation

Scholars acknowledge the importance of organizational processes directed at the recombination of knowledge and at its application. However, little empirical attention has been given to the interplay between these processes, the knowledge gained from internationalization, and growth in the context of international SMEs. My findings show that organizational processes directed at the transformation and exploitation of knowledge do not positively moderate the relationship between knowledge acquired from internationalization and firm growth; rather they have a direct positive impact on SME growth relative to competitors in international markets, SME growth in international markets, and SME entrepreneurial growth, through product development in international markets.

Thus, we may need to rethink the role of organizational processes for the transformation and exploitation of knowledge, at least in the context of SME growth. Most conceptualizations of a firm’s absorptive capacity expect organizational processes directed at the transformation and exploitation of
knowledge to influence firm growth because they facilitate making the best use of the knowledge that has been acquired. For instance, Lane et al. (2006) maintain that these processes affect "how the newly acquired knowledge is combined with the existing knowledge of the firm" (p. 858). Similarly, Zahra and George (2002a) argue that these processes reflect "a firm’s capacity to leverage the knowledge that has been absorbed" (p. 190). However, my findings indicate that these processes do not affect firm growth via leveraging the positive effects of the knowledge acquired from internationalization. Rather, they directly enhance a firm’s advantage vis-à-vis competitors, its expansion, and its product innovation in international markets.

These findings seem to be more in line with Todorova and Durisin’s (2007) recent reconceptualization of absorptive capacity. In the authors’ view, well developed organizational processes and routines for the transformation and exploitation of knowledge do not recombine and exploit already acquired knowledge, but new knowledge that might even be incompatible with the knowledge already acquired. Todorova and Durisin (2007) argue that these processes may reflect “the transformation capability that allows firms to survive a competence-destroying change” (p. 778). As such, they are important for successfully competing in dynamic international markets through product and process innovation.

Having said that these processes do not recombine and exploit already acquired knowledge does not mean that they have no relation with the knowledge that has already been acquired. The processes through which the firm transforms and exploits new knowledge are likely to be a by-product of the learning taking place in the organization (Cohen & Levinthal, 1990). Accordingly, the knowledge obtained when operating in international markets can be expected to influence these processes, because it requires a firm to alter some of its core activities, or to generate new structures and routines (Sapienza et al., 2006). Organizational processes directed at the transformation and exploitation of knowledge are also path- and history-dependent (Cohen & Levinthal, 1990); consequently, they might be influenced by the firm’s prior endowment of knowledge.

These considerations, coupled with my earlier findings on the impact of knowledge acquired from internationalization on international market development, suggest the following reconceptualization: the knowledge which SMEs gain when operating in international markets helps to create more options for international expansion through market development as well as to increase the firm’s realized absorptive capacity—that is the organizational processes through which new knowledge is transformed and exploited. These processes, in turn, help SMEs to see and take advantage of more ‘proactive’ options for international expansion—that is to expand in dynamic international markets through product and process innovation. This reconceptualization calls for a revision of the research model, which will be illustrated below.
9.4 Revision and extension of the research model

Taken together, the key findings of the study suggest that it is possible to develop a richer knowledge-based understanding of SME growth through internationalization—that is, one that amalgamates insights from the internationalization theories reviewed in this thesis, the KBV, and the literature on organizational learning and absorptive capacity under Penrose’s umbrella ‘theory of the growth of the firm’. However, the study suggests some alterations to the knowledge-based model that I developed by combining the aforementioned theories. Revisions and extensions were suggested in the previous section, along with the discussion of the study’s main findings. The revised and extended model is presented in Figure 9.8. The main changes comprise the following issues:

First, the type of social relationships that characterize SMEs’ international activities should be included in the model. Along with the firm’s prior knowledge, this aspect can be expected to moderate the relationship between SME internationalization and the acquisition of new market and technological knowledge. This is illustrated in the model by the additional construct ‘type of social relationships’.

Second, the new knowledge gained when operating in international markets contributes mainly to growth outcomes in international markets. This is illustrated in the model by linking the new knowledge obtained from internationalization to growth outcomes in international markets, rather than to overall growth outcomes.

Third, rather than assuming that new knowledge acquired from internationalization directly influences all three dimensions of entrepreneurial actions in international markets, a different path is suggested. New knowledge directly enhances entrepreneurial growth stemming from market development strategies—that is, targeting new market segments in international markets and venturing into new international markets. This is illustrated in the model by the direct link between new knowledge and entrepreneurial growth through international market development. The influence of new knowledge on entrepreneurial growth through new product development is not direct: it may be mediated by the organizational processes directed at the transformation and exploitation of knowledge. This is illustrated in the model by the causal path between the following constructs: new knowledge, knowledge processes, and entrepreneurial growth through product/service innovation in international markets.

Fourth, as just mentioned, organizational processes directed at the transformation and exploitation of knowledge are influenced by the new knowledge which SMEs acquire from internationalization. Other causal
influences can be foreseen as well. For instance, a firm’s prior endowment of knowledge is likely to influence these knowledge processes as well. Hence, two causal links are drawn in the model: one between prior knowledge and knowledge processes, and the other between new knowledge and knowledge processes.

Fifth, as it emerged from the correlation analysis, the different growth outcomes I consider in the model are interrelated. Entrepreneurial growth can be expected to affect a firm’s international growth as well as its growth relative to competitors in international markets. Thus, causal links between these constructs need to be taken into account as well. These are illustrated in the model by 1) the causal link between entrepreneurial growth in international markets and international growth, and 2) the causal link between entrepreneurial growth in international markets and firms’ growth relative to competitors in international markets. In addition, different entrepreneurial strategies can be pursued simultaneously: e.g. a firm might launch new product(s)/service(s) in new international market(s). Similarly, international growth and growth relative to competitors in international markets can be expected to be interdependent. Hence, the dotted lines in the model illustrate 1) the correlation between the two dimensions of entrepreneurial growth in international markets, and 2) the correlations between international growth and growth relative to competitors in international markets.

When considering growth as an ongoing development process, the model should be extended by adding feedback loops. Over time, there are several bidirectional links which could be emphasized. Growth outcomes during one period will affect other parts of the model during subsequent periods: i.e., SME’s social relationship, their acquisition of new knowledge resources, and organizational processes for the transformation and exploitation of knowledge. Overall, these feedback loops would give rise to a complex net of links, which is not drawn in the model.
Note: Black arrows show causal relationships; the dotted lines show interrelations.

Figure 9.8 Revised and extended knowledge-based model of growth through internationalization.
9.5 Strengths and weaknesses of the study

The study contains a number of strengths relative to previous research, and inevitably a number of limitations. Some strengths and weaknesses have already been discussed and will not be repeated here. Others deserve additional attention.

As for the study’s strengths, first, the sample of 885 international firms was selected using criteria which approach those of probability sampling procedures. Having a sample which approximates a probability sample helps to overcome some of the generalizability problems inherent in judgment-based samples (Zahra & George, 2002b), which earlier internationalization studies on SMEs have used (George et al., 2005). Second, the inclusion of multiple industries addresses the call by IE scholars for investigations which go beyond high-technology firms (Coviello & Jones, 2004; Zahra & George, 2002b). This, again, enhances the generalizability of the study’s findings.

Third, the longitudinal design of the study overcomes some of the concerns of cross-sectional studies on SME growth through internationalization (Westhead, Wright, & Ucbasaran, 2001; Wright, Westhead, & Ucbasaran, 2007). More specifically, the longitudinal research design allows establishing causal links between downstream/upstream internationalization and the acquisition of knowledge, and between the acquisition of knowledge and different growth outcomes. In addition, the impact of knowledge acquired from internationalization on firm growth is assessed over a period of six years. This responds to the call for investigating firm internationalization and growth over longer periods of time (Davidsson et al., 2006; McDougall & Oviatt, 1996).

Fourth, I work with primary data collected for the specific purpose of analyzing internationalization, learning, and growth issues; and when possible, I combine them with secondary data. This responds to Wright et al.’s (2007, p. 1026) call for “research that uses specifically designed questionnaires administrated over time […] and/or the combination of these instruments with archival data […]”.

A final strength of the study is that it covers both upstream and downstream internationalization. Upstream internationalization has received relatively little attention (Agndal, 2004; Wright et al., 2007), despite the fact that SMEs are international along a broad range of value chain activities (Observatory of European SMEs, 2003).

As for the limitations, first, the study is based on a Swedish sample. Thus, the results are primarily generalizable to the Swedish context, albeit with some differences. Knowledge management processes are likely to have cultural roots. Selnes, Jaworski, and Kohli (1996), for instance, suggest that Scandinavian organizations should be more likely to exhibit formal and informal arrangements that facilitate contacts and exchange among employees than US organizations. Thus, the study’s focus on Sweden might limit the possibility of generalizing the findings on knowledge processes to other countries. Likewise,
9. Discussion and Conclusions

the limited market size of Sweden might influence SME growth. That is, the results indicating that accumulated experiential knowledge in international markets contributes to a firm’s growth in international markets, but not, or very little, to SME growth in the domestic market, might be specific to countries where the home market is limited. Firms in these markets, indeed, tend to have a higher propensity to grow internationally than those in larger home markets (Benito, Larimo, Narula, & Pedersen, 2003). By contrast, I think that the findings concerning knowledge acquisition from internationalization should hold for many countries; thus, they might be generalizable to SMEs outside Sweden.

A second potential weakness is that primary data were, for the most part, obtained from one source: the firm’s CEO. A problem inherent in self-reported data is that these might inflate the correlations obtained between the variables. Table 7.7 reports the correlations between the independent and dependent variables in the analyses testing Hypotheses 1-6. These correlations range from r=0.02 to r=0.29. Table 8.5 reports the correlations between the independent and dependent variables in the analyses testing Hypotheses 7-12. These correlations range from r=0.04 to r=0.45. In both cases, the correlations are not strong and their size varies noticeably. Had common method bias being driving the results of these analyses, the correlations would most likely have been uniformly stronger. One reason for this apparent lack of common method bias is that self-reported data are more likely to be inflated when the same individual is asked to assess both the independent and dependent variables in the same survey instrument. In the study, data for the independent and the dependent variables were collected through different survey instruments, administered at different points in time. In addition, 48% of the CEOs who responded to the data collections in 2006 were not those who responded to the data collections in 2000 because they had been appointed after 2000.

Third, additional concerns are the self-perceived measures of prior knowledge, knowledge acquisition, knowledge processes, and firm growth. The reasons for choosing these self-perceived measures over objective proxies are discussed in Chapter 6. Here, it is important to note that having chosen these subjective measures creates a problem of external verifiability (Autio et al., 2000).

Finally, there are the problems inherent in the longitudinal design of the study. I have already discussed the problem of attrition and how I attempt to deal with it in Chapters 7 and 8. Yet another serious issue concerns the span of the time lags. The six-month time lag between the collection of the information regarding the firms’ degree of internationalization and the information regarding their acquisition of market and technological knowledge is rather short. Probably, the acquisition of market knowledge from upstream international activities takes longer than six months. Thus, this relationship would have been significant if a longer time period had been studied. By contrast, the choice of a six-year time lag between the collection of the
information regarding the acquisition of market and technological knowledge and the information regarding the different growth outcomes is rather long. Hence, some of the non-significant relationships between knowledge acquired from internationalization and different growth outcomes might be due to the too long time frame. Keller (2001), for instance, argues that a one-year period allows for the time needed for transforming the knowledge into technological innovations. Connected to this is the problem that all the outcome variables might not have had the same optimal period. The impact of the independent variables on some outcome variables might have needed a longer time frame, and on others a shorter one. A potentially inappropriate time lag might also have been used when collecting data on the moderating variables. For instance, the information regarding the processes of knowledge transformation and exploitation was collected at the same point in time as the information regarding the growth variables. Probably, a time lag would have been needed to better discern the role played by knowledge processes in the relationship between knowledge acquired from internationalization and different growth outcomes.

While it is important to keep these limitations in mind when interpreting the study’s findings, they also provide ideas for extensions and future research. These will be presented below.

9.6 Suggestions for future research

Future research appears promising along several lines. First, the limitations discussed above suggest replications of the study in other country settings and with different time frames. As for time frame, ideally the internationalization and growth of the companies would be followed up through periodical, preferably annual, surveys over a long period of time. These longitudinal surveys could be complemented by in-depth studies. These data could be used to triangulate the data obtained from the surveys as well as to focus on research areas which are more ‘qualitative’ in nature. For instance, drawing on Penrose’s (1959/1995) theoretical insights on the entrepreneur’s subjective perception of opportunities, it would be useful to conduct in-depth studies on the interplay between actions and cognitive processes in the internationalization and growth of SMEs.

Second, the present research captures certain dimensions of SME internationalization but not others. Specifically, it focuses on the firms’ international activities from a value chain perspective. The literature, however, maintains that also the mode of internationalization as well as the geographic scope of operations can influence a firm’s learning and its growth prospects (Barkema & Vermeulen, 1998; Zahra et al., 2000). Thus, it would be fruitful to extend my research considering the mode and the geographic scope of SME
9. Discussion and Conclusions

upstream and downstream international operations. SMEs can, indeed, be expected to learn different things when sourcing from a foreign country and when having production facilities in loco. In a similar vein, direct exporting without an overseas base on the one hand, and establishing a sales facility on the other hand can be expected to have different effects on a firm’s ability to gain access to key information and resources (Holm & Sharma, 2006; Wright et al., 2007). And these differences may be further enhanced by the geographic scope of a firm’s operations along with the cultural/institutional distance of the countries where it operates (Xu & Shenkar, 2002; Yeoh, 2004). These intuitively appealing differences require systematic analysis.

Third, as noted previously, it would be important to study SME learning from downstream/upstream internationalization also considering the social relationships that SMEs establish in international markets. Yli-Renko et al.’s (2001) study shows that social interactions and network ties with key international customers enhance knowledge acquisition. Further research may examine how the acquisition of new knowledge is affected by the type of social relationships that SMEs establish and maintain with actors along their international value chain, such as suppliers, distributors, agents, etc. In addition, the current study has focused on the firm’s activities and behaviors. Further research may look at the interaction between the internationalization of the firm, the internationalization of its network, and international knowledge (Hadley & Wilson, 2003). Being part of a network may function as a doubled-edged sword for internationalizing SMEs. On the one hand, SMEs can obtain knowledge and pool resources with other actors in the business network (Chetty & Blankenburg Holm, 2000). On the other hand, SMEs might be too dependent on the knowledge and resources of other firms in the network, reducing the flow of new ideas (Adler & Kwon, 2002) and constraining learning. Additional research is needed to look into these issues.

Fourth, my study centers on prior knowledge, on the acquisition of new knowledge, and on the knowledge management processes for the transformation and exploitation of knowledge. Less attention is devoted to the assimilation of new knowledge. Although possessing prior knowledge is crucial for assimilating new knowledge (Kim, 1998), the process/capability aspects of knowledge assimilation may be equally important (Lane et al., 2006; McKelvie, 2007). Interesting results may accrue from studies examining the organizational processes and routines that SMEs use to recognize and understand new information emerging from international markets. Equally interesting would be to investigate to what extent and how these processes differ from those used to assimilate information emerging from the domestic market. These studies would contribute to the literature on knowledge management and firm internationalization.

Fifth, although the study considers a number of different growth outcomes, other outcome variables could be investigated as well. It would, for instance, be useful to examine the impact of knowledge acquired from internationalization
on firms’ survival. Equally interesting would be to study the conditions under which the knowledge accumulated in international markets leads to exit from foreign operations. Additional research can also be conducted on the link between learning from internationalization and entrepreneurial behavior. My research shows that the knowledge that SMEs accumulate in international markets helps them to reach new international customers and new markets; yet, it does not support the development of new products/services for domestic or international markets. Future research can extend these findings by examining how the relationship between international knowledge and new product/service innovation is influenced by contingencies such as what stage(s) of the life cycle a firm’s products or services fall into and their market growth. One could, for instance, expect that knowledge acquired from internationalization creates a potential for the development and commercialization of new products, and that such potential is realized only when the company is under pressure, e.g., when its current products/services are losing market share.

A last suggestion concerns the variables capturing the CEO’s and the firm’s demographic characteristics. The CEO demographic variables did not seem to have an effect on the knowledge acquired from internationalization or on the different growth outcomes. Notably, also some firm demographic variables, such as firm age, did not seem to matter. Documenting these effects, and especially the non-effects, is both interesting and important. For instance, much of the interest of entrepreneurship scholars in internationalization concerns time issues. It is even argued that younger firms have a learning advantage over older firms (Autio et al., 2000). Future research should investigate the effect of firm age, as well as that of other demographic variables, on learning from internationalization in more detail.

9.7 Implications for SME managers

A consistent finding of my study is that the actions that SMEs undertake are crucial for their future development. This proposition might, at first, sound tautological. However, it conveys an important message to SME managers: your actions count. In the long run, the development of SMEs is not so much determined by macro-economic or industry forces as it is shaped by the decisions and actions their managers consciously or unconsciously undertake.

For instance, SME managers may be reluctant to increase their firm’s involvement in international operations because these activities draw essential resources from maintaining the current operations. My study shows that there is a flip side to this: the involvement in activities beyond national borders increases a firm’s chances of obtaining scarce resources, such as market and technological know-how. Hence, the involvement in international activities might pay off not only in terms of increased sales or better (and cheaper)
9. Discussion and Conclusions

supplies, but also in terms of an increased (and better qualified) knowledge base.

In addition, the study shows that the stream of international activities undertaken has important consequences for the knowledge base accumulated. Sales and marketing activities completed abroad are sources of market and technological knowledge. This means that SMEs undertaking downstream international activities may gain a broad knowledge base, with insights into how to better sell and market their products/services, improve customer relationships, and develop new methods and tools to better serve their markets. On the other hand, upstream activities, such as purchasing, production, and R&D completed abroad are only sources of technological knowledge. This means that, ceteris paribus, SMEs undertaking upstream international activities mainly gain insight into how to manufacture, engineer, or develop methods/tools needed to serve the market. Notably, a key contingency might alter this. Having staff with expertise in marketing and technology helps SMEs to gain new market insights as well. As the title of a famous article by Cohen and Levinthal (1994) says, ‘fortune favors the prepared firms’: SMEs involved in upstream international activities are better off in terms of learning, if they have already built up a background knowledge base in general and developed their market and technological expertise in particular.

My findings also indicate that the knowledge accumulated in international markets is pivotal for the achievement of an advantage position in the international arena. In addition, it provides the basis for entrepreneurial actions such as venturing into new markets and reaching new international customers. However, the study shows that expansion in international markets might come at the expense of growth in the domestic market. Thus, managers need to be aware of the possible trade-off between international and domestic expansion.

Overall, I hope that my study will inspire SME managers to see their firms as knowledge-based. Such recognition is an important step towards a more general attention to the sources of knowledge, the processes of learning within and across the organization, and the growth options that become available to them.

9.8 Implications for policy makers

How should policy encourage the growth of small businesses? This question has long puzzled researchers and policymakers. The growth of small firms is considered important as it combats unemployment problems and favors a renewal of the economy. Prior research shows that entrepreneurs’ motivation and willingness to grow are more important for the profitable growth of small businesses than capital availability (Davidsson, 1989; Wiklund, 1998) and governmental incentives, such as tax savings, grants, and relaxed compliance
with regulations (McGrath, 2002). My study focuses on and provides insights into the growth of international SMEs: these are firms which have shown some ability and willingness to expand, at least beyond their national borders.

The international expansion of Western firms, especially in the upstream domain, has become a hot issue lately. It is increasingly common to read in the media comments such as the following:

“The globalization of manufacturing has led to a massive redistribution of work around the globe, in the process turning China into the world’s factory. Similar developments are underway in the service sector, with jobs migrating to India, China, and other parts of the developing world” (Chanda, 2004).

Critics of globalization claim that increased internationalization—especially of production and purchasing activities—is shifting employment to countries with cheaper labor and lower labor standards (Harrison & McMillan, 2006). Proponents of globalization are less worried. They argue that developed economies will eventually create new and better jobs, leaving less desirable ones behind (Foroohar & Emerson, 2004). An influential magazine, The Economist, argues: “The OECD’s Employment Outlook this week [July 2, 2005] concluded that only a tiny fraction of job losses in Western Europe can be attributed to trade liberalisation” (2005).

Based on my findings, I can contribute to this debate with a two-fold consideration. On the one hand, SMEs doing business overseas do not necessarily create more jobs at home. As I explained earlier, my analysis highlights a trade-off between international expansion and domestic expansion. In addition, the know-how accumulated through internationalization is mainly used to continue expanding in international markets. On the other hand, foreign expansion is likely to bring long-term benefits to international SMEs. The learning taking place in overseas operations gives SMEs a competitive edge in international markets, which in turn might lead to more secure jobs at home.

Since “the world is flattening, at different speeds and magnitudes across the globe and within countries” (Svejenova, 2006, p. 82), the challenge for policy makers is to well equip businesses, especially smaller ones, for competing in this flattening world. Of course internationalization cannot be forced on small firms. However, much can be done for those SMEs that do want to grow beyond their national borders. As said earlier, having a staff with market and technological expertise enhances SMEs’ learning, which in turn increases their growth prospects overseas. Therefore, policies can be designed to offer these firms subsidized training programs directed at developing the competences and skills of their staff. An important role, for instance, may be played by local...
9. Discussion and Conclusions

universities. These can provide small firms in their regions not only with education and training suited to their needs, but also with a pool of skilled workers.
References


References


References


References


Europe’s new protectionism. The Economist, 30 June 2005.


References


Hitt, M. A., Bierman, L., Uhlenbruck, K., & Shimizu, K. (2006). The importance of resources in the internationalization of professional
References

service firms: The good, the bad, and the ugly. *Academy of Management Journal, 49*(6), 1137-1157.


References


References


References


References


References


References


References


Appendix 1: Non-response analysis relative to the sample used in Chapter 7

Only 236 out of the 885 international SMEs selected for the study provided complete information for the analyses carried out in Chapter 7. This frequency of missing data poses a potentially serious concern. Missing data can have a significant impact on multivariate analyses (Hair et al., 2006) and there is no simple decision rule for dealing with them (Schafer & Graham, 2002).

In the analyses carried out in Chapter 7 several variables are multiple-item scales. As illustrated in Chapter 6, for each multiple-item scale, I create a summated scale by taking the average of the items in the scale. If one respondent has missing values for one or more items, it seems more reasonable to average the items that remain rather than report missing value for the entire scale (Schafer & Graham, 2002). Though this practice is very common, it does not have a well-recognized name. The term ‘ipsative mean imputation’ has been suggested “ because it is equivalent to substituting the mean of a participant’s own observed items for each of his or her missing items” (Schafer & Graham, 2002, p. 158). The Schafer and Graham maintain that this technique, despite its theoretical problems, “may be a reasonable choice especially if the reliability is high (say, $\alpha > .70$) and each group of items to be averaged seems to form a single, well-defined domain” (p.158). The multiple scales I use in the analysis have high reliability; confirmatory factor analysis shows that, for each scale, the items well represent a single construct (see Chapter 6). Therefore, when there are non-responses internal to a multiple-item scale, I average the remaining items rather than reporting a missing value for the entire scale.

Ipsative mean imputation is limited to missing values internal to multiple-item scales and, thereby, involves a small frequency of data. This means that I still need to decide on a more general method for dealing with missing cases. The literature suggests several methods. A common method, known as complete case or listwise deletion, uses only the cases with complete information. Another method, known as all-available or pairwise deletion, omits cases which do not have data on the variables used in the current calculation. There are also various imputation methods to fill in the missing data, with mean substitution, multiple regression and expectation maximization (EM) being the most commonly used in regression analysis (Afifi, Clark, & May, 2004). The mean substitution method replaces missing values on one variable with the mean value for that variable. The multiple regression method predicts and imputes the missing values of a variable based on its relationship with the other variables in the dataset. The EM method utilizes maximum
likelihood to converge iteratively on estimates of missing values and impute missing data (Afifi et al., 2004; Hair et al., 2006).

Each method has advantages and disadvantages (Hair et al., 2006). The complete case approach is justifiable when non-response cases are a random sample of the original random sample of the population of interests (Bernaards & Sijtsma, 2000), Little and Rubin (1987) label these missing data as missing completely at random (MCAR). The consequences of a complete case approach when missing cases are completely at random, is that the complete dataset is smaller than the original dataset, and as a result, statistical estimates are less accurate, but unbiased (Bernard, 2004). Similarly, the available case approach assumes that missing values are MCAR. Yet, this method is not recommended unless combined with other methods as a check (Afifi et al., 2004). Concerning imputation methods, there are general as well as method-specific pros and cons. The general advantage of imputation methods is that they allow for a complete dataset. Yet, imputation methods are not recommended for replacing missing cases on dependent variables, as they may lead to an artificial increase in the relationships with the independent variables (Hair et al. 2006). Considering each single imputation method, mean substitution has the advantage of being computationally easy, but it provides biased estimates (Afifi et al., 2004); multiple regression imputation has the appeal of using existing relationships in the sample, but at the same time it reinforces such relationships; the EM method has been found to be generally more efficient than other imputation methods, though it still shares with multiple regression the problem of overcorrection. Further explanations of each method can be found in Hair et al. (2006) and Schafer and Graham (2002).

Prior to deciding on any of the above methods for dealing with missing data, it is important to examine the magnitude of missing data. If missing cases are sufficiently few (5 % or below), any approach for dealing with them is appropriate (Hair et al., 2006). Table A1 contains the descriptive statistics and missing values for each original metric variable, including missing cases and the percentage of missing cases on each multiple-item scale, constructed by averaging the available items. Table A2 contains the information on missing values for each original non-metric variable.
### Table A1 Summary statistics of missing data for original metric variables and scales

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>Missing cases per item</th>
<th>Missing cases per scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>missing cases per item</td>
<td>N</td>
<td>Percent</td>
<td></td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>CEO age</td>
<td>884</td>
<td>48.64</td>
<td>7.95</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Firm age</td>
<td>856</td>
<td>27.55</td>
<td>21.34</td>
<td>29</td>
<td>3.3</td>
</tr>
<tr>
<td>Past growth relative to competitors-item1</td>
<td>852</td>
<td>3.46</td>
<td>0.93</td>
<td>33</td>
<td>3.7</td>
</tr>
<tr>
<td>Past growth relative to competitors-item2</td>
<td>861</td>
<td>3.62</td>
<td>0.86</td>
<td>24</td>
<td>2.7</td>
</tr>
<tr>
<td>Past growth relative to competitors-item3</td>
<td>825</td>
<td>3.50</td>
<td>0.85</td>
<td>60</td>
<td>6.8</td>
</tr>
<tr>
<td>Past growth relative to competitors-item4</td>
<td>841</td>
<td>3.68</td>
<td>0.83</td>
<td>44</td>
<td>5.0</td>
</tr>
<tr>
<td>Heterogeneity-item1</td>
<td>577</td>
<td>4.47</td>
<td>1.55</td>
<td>308</td>
<td>34.8</td>
</tr>
<tr>
<td>Heterogeneity-item2</td>
<td>574</td>
<td>4.60</td>
<td>1.48</td>
<td>311</td>
<td>35.1</td>
</tr>
<tr>
<td>Heterogeneity-item3</td>
<td>571</td>
<td>4.25</td>
<td>1.45</td>
<td>314</td>
<td>35.5</td>
</tr>
<tr>
<td>Downstream internationalization-item1</td>
<td>869</td>
<td>22.37</td>
<td>28.46</td>
<td>16</td>
<td>1.8</td>
</tr>
<tr>
<td>Upstream internationalization-item1</td>
<td>846</td>
<td>19.29</td>
<td>26.92</td>
<td>39</td>
<td>4.4</td>
</tr>
<tr>
<td>Upstream internationalization-item2</td>
<td>877</td>
<td>4.78</td>
<td>16.84</td>
<td>8</td>
<td>0.9</td>
</tr>
<tr>
<td>Market knowledge-item1</td>
<td>321</td>
<td>2.38</td>
<td>1.26</td>
<td>564</td>
<td>63.7</td>
</tr>
<tr>
<td>Market knowledge-item2</td>
<td>314</td>
<td>2.19</td>
<td>1.16</td>
<td>571</td>
<td>64.5</td>
</tr>
<tr>
<td>Market knowledge-item3</td>
<td>314</td>
<td>1.92</td>
<td>0.98</td>
<td>571</td>
<td>64.5</td>
</tr>
<tr>
<td>Market knowledge-item4</td>
<td>316</td>
<td>2.15</td>
<td>1.09</td>
<td>569</td>
<td>64.3</td>
</tr>
<tr>
<td>Market knowledge-item5</td>
<td>321</td>
<td>2.41</td>
<td>1.15</td>
<td>564</td>
<td>63.7</td>
</tr>
<tr>
<td>Market knowledge-item6</td>
<td>319</td>
<td>2.42</td>
<td>1.11</td>
<td>566</td>
<td>64.0</td>
</tr>
<tr>
<td>Market knowledge-item7</td>
<td>314</td>
<td>2.31</td>
<td>1.13</td>
<td>571</td>
<td>64.5</td>
</tr>
<tr>
<td>Market knowledge-item8</td>
<td>320</td>
<td>2.66</td>
<td>1.19</td>
<td>565</td>
<td>63.8</td>
</tr>
<tr>
<td>Prior knowledge-item1</td>
<td>581</td>
<td>5.22</td>
<td>0.95</td>
<td>304</td>
<td>34.4</td>
</tr>
<tr>
<td>Prior knowledge-item2</td>
<td>578</td>
<td>4.80</td>
<td>1.07</td>
<td>307</td>
<td>34.7</td>
</tr>
<tr>
<td>Prior knowledge-item3</td>
<td>578</td>
<td>4.80</td>
<td>1.11</td>
<td>307</td>
<td>34.7</td>
</tr>
<tr>
<td>Prior knowledge-item4</td>
<td>579</td>
<td>4.20</td>
<td>1.22</td>
<td>306</td>
<td>34.6</td>
</tr>
<tr>
<td>Prior knowledge-item5</td>
<td>578</td>
<td>4.73</td>
<td>0.95</td>
<td>307</td>
<td>34.7</td>
</tr>
<tr>
<td>Prior knowledge-item6</td>
<td>578</td>
<td>4.43</td>
<td>1.00</td>
<td>307</td>
<td>34.7</td>
</tr>
<tr>
<td>Prior knowledge-item7</td>
<td>577</td>
<td>4.66</td>
<td>0.97</td>
<td>308</td>
<td>34.8</td>
</tr>
<tr>
<td>Prior knowledge-item8</td>
<td>580</td>
<td>4.37</td>
<td>1.07</td>
<td>305</td>
<td>34.5</td>
</tr>
<tr>
<td>Prior knowledge-item9</td>
<td>576</td>
<td>4.48</td>
<td>0.99</td>
<td>309</td>
<td>34.9</td>
</tr>
<tr>
<td>Prior knowledge-item10</td>
<td>579</td>
<td>4.64</td>
<td>0.93</td>
<td>306</td>
<td>34.6</td>
</tr>
<tr>
<td>Prior knowledge-item11</td>
<td>578</td>
<td>4.60</td>
<td>0.98</td>
<td>307</td>
<td>34.7</td>
</tr>
</tbody>
</table>
Table A2 Summary statistics of missing data for original non-metric variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO gender</td>
<td>883</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>CEO formal education in business administration</td>
<td>882</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>CEO prior management experience</td>
<td>882</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>CEO prior experience from the same industry</td>
<td>883</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>CEO prior experience from other industries</td>
<td>884</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Industry group</td>
<td>885</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Size class</td>
<td>885</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Independent</td>
<td>885</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

As shown in Table A1, the items making up the scale for downstream internationalization (export share and share of advertising abroad) and items making up the scale for upstream internationalization (import share, share of production abroad, and share of R&D abroad) have a small amount of missing data (below 5%). In addition, when constructing the scales by averaging the available items, there are only 2 missing cases for downstream internationalization (0.2%) and no missing cases for upstream internationalization. Also, firm age and the items making up the past growth relative to competitors scale have relatively low levels of missing cases (below 5%) and are thus acceptable. In addition, all non-metric variables exhibit a very small amount of missing data (Table A2). On the other hand, the items making up the scale for acquisition of market knowledge and for acquisition of technological knowledge have the largest amount of missing data, also using ipsative mean imputation. In addition, there are substantial missing cases for the items comprising the scale for heterogeneity and the scale for prior knowledge (Table A1).

It is therefore important, especially for the variables with substantial missing values, to examine the distribution of missing data across cases and variables (Hair et al., 2006). As already mentioned, missing data that are MCAR allow for a wider range of remedies (Bernaards & Sijtsma, 2000). Hair et al. (2006) recommend two tests for assessing randomness. The first test compares observations with and without missing data for each variable on the other variables (Hair et al., 2006). For instance, observations with missing values on the scale ‘acquisition of market knowledge’ are placed in one group and the observations with complete information are placed in the other group. Then these two groups are compared to identify any differences on the other metric variables. These comparisons are carried out for all the other variables with substantial missing cases (above 5%). This analysis, which cannot be reported here due to space limitations, shows that the only noticeable pattern of
significant t-values occurs for two variables: acquisition of market knowledge
and acquisition of technological knowledge. As concerns acquisition of market
knowledge, three of the seven comparisons (those with downstream
internationalization, upstream internationalization, and acquisition of
 technological knowledge) find significant differences between the two groups.
As concerns acquisition of technological knowledge, three of the seven
comparisons (those with downstream internationalization, upstream
internationalization, and acquisition of market knowledge) find significant
differences between the two groups. Thus, this analysis shows that the missing
cases are distributed randomly across cases for all metric variables but two:
acquisition of market knowledge and acquisition of technological knowledge.

The second test, Little’s MCAR test, is an overall test of missing data for
being MCAR (Hair et al., 2006). Specifically, “the test makes a comparison of
the actual pattern of missing data with what would be expected if the missing
data were totally randomly distributed. The MCAR missing data process is
indicated by a nonsignificant statistical level (e.g. greater than 0.05), showing
that the observed pattern does not differ from a random pattern” (Hair et al.,
2006, p. 68). In the case of my variables, Little’s MCAR test has a significant
level of 0.213, indicating a nonsignificant difference between the observed
missing data pattern in the reduced sample and a random sample. This analysis
and the one carried out earlier seem to suggest that the missing data can be
considered MCAR.

MCAR missing data, as said above, allow for the use of any method for
dealing with missing data (Hair et al., 2006). For the analyses carried out in
Chapter 7, I chose the complete case method. When using this method, the
complete dataset is smaller than the original dataset. Yet it is the most
understandable; it is the simplest to do; and, given the MCAR pattern of
missing data, it leads to unbiased results (Afifi et al., 2004). In addition, the two
scales with the largest amount of missing data are acquisition of market
knowledge and acquisition of technological knowledge. These are dependent
variables in the analysis. Thus, there would be no advantage of using other
methods to fill in or impute missing data on these variables (Afifi et al., 2004).
Furthermore, imputing missing data on both independent and control variables
would create a complete dataset and invalidate the Heckit procedure for
assessing and controlling for sample attrition bias.
Appendix 2: Non-response case analysis relative to the sample used in Chapter 8

For the analyses carried out in Chapter 8, full information is available for 131 SMEs out of the 885 SMEs which were selected for the study. This amount of missing data poses a potentially serious concern. Any decision on how to deal with these missing data needs to be made in the light of the magnitude and patterns of non-response cases (Hair et al., 2006). A more general introduction to the analyses and methods available for handling missing data is provided in Appendix 1 and will not be repeated here. I will proceed with the assessment of the magnitude and patterns of non-response cases and illustrate the methods I intend to use to deal with them.

Table A3 contains the descriptive statistics and missing values for each original metric variable. It also includes the frequency and the percentage of missing cases on each multiple item scale. Table A4 contains the descriptive statistics and missing values for each non-metric variable. The overall impression conveyed by the data displayed in these tables is that there is a high frequency of missing data (above 50%) for all metric variables. Remedies for missing data need to be evaluated.

Prior to deciding on how to deal with missing values, it is important to examine the distribution of missing data across cases and variables (Hair et al., 2006). As illustrated in Appendix 1, I use the two tests for assessing the randomness of the missing cases. The first test compares observations with and without missing data for each variable on the other variables (Hair et al., 2006). This analysis, which cannot be reported here due to space limitations, shows that noticeable patterns of significant t-values occur mainly for the following variables: overall growth relative to competitors, international growth relative to competitors, sales from new international customers, sales from new products/services in international markets and sales from new international markets. These results indicate that the missing cases are distributed randomly across cases for all control and independent variables, but not for most dependent variables. The second test, Little’s MCAR test, has a significant level of 0.216, indicating a non-significant difference between the observed missing data patterns in the reduced sample and a random sample.
### Table A3 Summary statistics of missing data for metric variables and scales

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std.</th>
<th>Missing cases per item</th>
<th>Missing cases per scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO age (2000)</td>
<td>884</td>
<td>50.84</td>
<td>8.35</td>
<td>1</td>
<td>0.11</td>
</tr>
<tr>
<td>Firm size (2000)</td>
<td>841</td>
<td>74.32</td>
<td>88.83</td>
<td>44</td>
<td>4.97</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 1 (2000)</td>
<td>321</td>
<td>2.38</td>
<td>1.27</td>
<td>564</td>
<td>63.73</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 2 (2000)</td>
<td>314</td>
<td>2.18</td>
<td>1.16</td>
<td>571</td>
<td>64.52</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 3 (2000)</td>
<td>314</td>
<td>1.91</td>
<td>0.99</td>
<td>57</td>
<td>64.52</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 4 (2000)</td>
<td>316</td>
<td>2.16</td>
<td>1.10</td>
<td>569</td>
<td>64.29</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 5 (2000)</td>
<td>321</td>
<td>2.44</td>
<td>1.15</td>
<td>564</td>
<td>63.73</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 6 (2000)</td>
<td>319</td>
<td>2.44</td>
<td>1.11</td>
<td>566</td>
<td>63.95</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 7 (2000)</td>
<td>314</td>
<td>2.33</td>
<td>1.13</td>
<td>571</td>
<td>64.52</td>
</tr>
<tr>
<td>Knowledge acquired from internationalization-item 8 (2000)</td>
<td>320</td>
<td>2.67</td>
<td>1.18</td>
<td>565</td>
<td>63.84</td>
</tr>
<tr>
<td>Knowledge processes-item 1 (2006)</td>
<td>291</td>
<td>2.77</td>
<td>1.08</td>
<td>594</td>
<td>67.12</td>
</tr>
<tr>
<td>Knowledge processes-item 2 (2006)</td>
<td>292</td>
<td>2.79</td>
<td>1.08</td>
<td>593</td>
<td>67.01</td>
</tr>
<tr>
<td>Knowledge processes-item 3 (2006)</td>
<td>292</td>
<td>3.03</td>
<td>1.06</td>
<td>593</td>
<td>67.01</td>
</tr>
<tr>
<td>Knowledge processes-item 4 (2006)</td>
<td>292</td>
<td>2.99</td>
<td>1.15</td>
<td>593</td>
<td>67.01</td>
</tr>
<tr>
<td>Knowledge processes-item 5 (2006)</td>
<td>292</td>
<td>2.74</td>
<td>1.24</td>
<td>593</td>
<td>67.01</td>
</tr>
<tr>
<td>Knowledge processes-item 6 (2006)</td>
<td>292</td>
<td>2.77</td>
<td>1.14</td>
<td>593</td>
<td>67.01</td>
</tr>
</tbody>
</table>
Table A3 Cont’d

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std.</th>
<th>Missing cases per item</th>
<th>Missing cases per scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge processes-item 7 (2006)</td>
<td>292</td>
<td>2.71</td>
<td>1.06</td>
<td>593</td>
<td>67.01</td>
</tr>
<tr>
<td>Overall growth relative to competitors-item 1 (2006)</td>
<td>299</td>
<td>3.37</td>
<td>0.89</td>
<td>586</td>
<td>66.21</td>
</tr>
<tr>
<td>Overall growth relative to competitors-item 2 (2006)</td>
<td>300</td>
<td>3.41</td>
<td>0.85</td>
<td>585</td>
<td>66.10</td>
</tr>
<tr>
<td>Overall growth relative to competitors-item 3 (2006)</td>
<td>300</td>
<td>3.35</td>
<td>0.86</td>
<td>585</td>
<td>66.10</td>
</tr>
<tr>
<td>Overall growth relative to competitors-item 4 (2006)</td>
<td>298</td>
<td>3.49</td>
<td>0.89</td>
<td>587</td>
<td>66.33</td>
</tr>
<tr>
<td>International growth relative to competitors-item 1 (2006)</td>
<td>278</td>
<td>3.00</td>
<td>0.97</td>
<td>607</td>
<td>68.59</td>
</tr>
<tr>
<td>International growth relative to competitors-item 2 (2006)</td>
<td>278</td>
<td>3.08</td>
<td>1.25</td>
<td>607</td>
<td>68.59</td>
</tr>
<tr>
<td>International growth-export share (2006)</td>
<td>555</td>
<td>0.25</td>
<td>0.29</td>
<td>330</td>
<td>37.29</td>
</tr>
<tr>
<td>International growth-share of profits from international operations (2006)</td>
<td>296</td>
<td>0.24</td>
<td>0.37</td>
<td>589</td>
<td>66.55</td>
</tr>
<tr>
<td>Share of sales from new customers (Sweden) (2006)</td>
<td>309</td>
<td>0.13</td>
<td>0.15</td>
<td>576</td>
<td>65.08</td>
</tr>
<tr>
<td>Share of sales from new customers (International) (2006)</td>
<td>309</td>
<td>0.06</td>
<td>0.10</td>
<td>576</td>
<td>65.08</td>
</tr>
<tr>
<td>Share of sales from new products/service (Sweden) (2006)</td>
<td>302</td>
<td>0.11</td>
<td>0.15</td>
<td>583</td>
<td>65.88</td>
</tr>
<tr>
<td>Share of sales from new products/service (International) (2006)</td>
<td>303</td>
<td>0.04</td>
<td>0.09</td>
<td>582</td>
<td>65.76</td>
</tr>
<tr>
<td>Share of sales from new markets (Sweden) (2006)</td>
<td>310</td>
<td>0.06</td>
<td>0.11</td>
<td>575</td>
<td>64.97</td>
</tr>
<tr>
<td>Share of sales from new markets (International) (2006)</td>
<td>311</td>
<td>0.05</td>
<td>0.10</td>
<td>574</td>
<td>64.86</td>
</tr>
</tbody>
</table>

270
Table A4 Summary statistics of missing data for original non-metric variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Missing cases per item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>CEO gender (2000)</td>
<td>884</td>
<td>1.00</td>
</tr>
<tr>
<td>CEO formal education in business administration (2000)</td>
<td>882</td>
<td>3.00</td>
</tr>
<tr>
<td>CEO prior management experience (2000)</td>
<td>883</td>
<td>2.00</td>
</tr>
<tr>
<td>CEO prior experience from the same industry (2000)</td>
<td>883</td>
<td>2.00</td>
</tr>
<tr>
<td>CEO prior experience from other industries (2000)</td>
<td>884</td>
<td>1.00</td>
</tr>
<tr>
<td>Industry group (2000)</td>
<td>885</td>
<td>0</td>
</tr>
<tr>
<td>Independent (2000)</td>
<td>672</td>
<td>213.00</td>
</tr>
</tbody>
</table>

Little’s MCAR test seems to suggest that missing cases are for the most part distributed at MCAR. These results, coupled with the results from the first test, indicate that, if there are minimal non-random patterns of missing data, they involve some of the dependent variables. Like for the analysis carried out in Chapter 7, I will use the complete case method. There would be no advantage in using other methods to fill in or impute missing data on both independent and dependent variables (Afifi et al., 2004). In addition, imputing missing cases on both independent and dependent variables would create a complete dataset and invalidate the Heckit procedure to assess and control for sample attrition bias. Furthermore, given the large number of missing cases on the dependent variables, filling in missing cases only in the independent and control variables would not increase the number of cases with complete information.
JIBS Dissertation Series


No. 002 Marmefelt, Thomas: *Bank-industry networks and economic evolution – An institutional-evolutionary approach*, 1998 (Economics)

No. 003 Wiklund, Johan: *Small firm growth and performance – Entrepreneurship and beyond*, 1998 (Business Administration)

No. 004 Braunerhjelm, Pontus: *Knowledge capital, firm performance and network production*, 1999 (Economics),

No. 005 Frankelius, Per: *Företagande över tid – Kontextuellt perspektiv och visuellt beskrivningspråk*, 1999 (Business Administration)

No. 006 Klaesson, Johan: *A study of localisation economies and the transport sector*, 2001 (Economics)


No. 008 Alhager, Eleonor: *Mervärdesskatt vid omstruktureringar*, Iustus förlag AB, 2001 (Commercial Law)

No. 009 Hugoson, Peter: *Interregional Business Travel and the Economics of Business Interaction*, 2001 (Economics)

No. 010 Pettersson, Lars: *Location, Housing and Premises in a Dynamic Perspective*, 2002 (Economics)


No. 012 Brundin, Ethel: *Emotions in Motion – The Strategic Leader in a Radical Change Process*, 2002 (Business Administration)


No. 014 Florin Samuelsson, Emilia: *Accountability and Family Business Contexts - An Interpretive Approach to Accounting and Control Practices*, 2002 (Business Administration)


No. 016 Olsson, Michael: *Studies of Commuting and Labour Market Integration*, 2002 (Economics)
No. 017  Wigren, Caroline: The Spirit of Gnosjö – The Grand Narrative and Beyond, 2003 (Business Administration)

No. 018  Hall, Annika: Strategising in the context of genuine relations: An interpretative study of strategic renewal through family interactions, 2003 (Business Administration)

No. 019  Nilsson, Ulf: Product costing in interorganizational relationships – A supplier’s perspective, 2003 (Business Administration)

No. 020  Samuelsson, Mikael: Creating new ventures: A longitudinal investigation of the nascent venturing process, 2004 (Business Administration)

No. 021  Bruns, Volker: Who receives bank loans? A study of lending officers’ assessments of loans to growing small and medium-sized enterprises, 2004 (Business Administration)

No. 022  Gustafsson, Veronica: Entrepreneurial Decision-Making: Individuals, tasks and cognitions, 2004 (Business Administration)

No. 023  Agndal, Henrik: Internationalisation as a Process of Strategy and Change – A Study of 16 Swedish Industrial SMEs, 2004 (Business Administration)

No. 024  Ejermo, Olof: Perspectives on Regional and Industrial Dynamics of Innovation, 2004 (Economics)

No. 025  Barenfeld, Jesper: Taxation of Cross-Border Partnerships: Double-Tax Relief in Hybrid and Reverse Hybrid Situations, 2005 (Law)

No. 026  Hilling, Maria: Free Movement and Tax Treaties in the Internal Market, 2005 (Law)

No. 027  Brunninge, Olof: Organisational self-understanding and the strategy process, 2005 (Business Administration)

No. 028  Blombäck, Anna: Supplier brand image – a catalyst for choice: Expanding the B2B brand discourse by studying the role corporate brand image plays in the selection of subcontractors, 2005 (Business Administration)

No. 029  Nordqvist, Mattias: Understanding the role of ownership in strategizing: a study of family firms, 2005 (Business Administration)

No. 030  Karlsson, Tomas: Business Plans in New Ventures: An Institutional Perspective, 2005 (Business Administration)

No. 031  Johnson, Andreas: Host Country Effects of Foreign Direct Investment: The Case of Developing and Transition Economies, 2005 (Economics)

No. 032  Nyström, Kristina: Entry and Exit in Swedish Industrial Sectors, 2006 (Economics)

No. 034 Gräsjö, Urban: Spatial Spillovers of Knowledge Production – An Accessibility Approach, 2006 (Economics)


No. 036 Andersson, Martin: Disentangling Trade Flows – firms, geography and technology, 2007 (Economics)

No. 037 Nilsson, Désirée: Essays on Trade Flows, Demand Structure and Income Distribution, 2007 (Economics)

No. 038 McKelvie, Alexander: Innovation in New Firms: Examining the role of knowledge and growth willingness, 2007 (Business Administration)

No. 039 Garvi, Miriam: Venture Capital for the Future - Implications of Founding Visions in the Venture Capital Setting, 2007 (Business Administration)

No. 040 Rosander, Ulrika: Generalklausul mot skatteflykt, 2007 (Law)

No. 041 Hultman, Jens: Rethinking adoption – Information and communications technology interaction processes within the Swedish automobile industry, 2007 (Business Administration)


No. 043 Sjölander, Pär: Simulation-Based Approaches in Financial Econometrics, 2007 (Economics)

No. 044 Hang, Min: Media Business Venturing: A Study on the Choice of Organizational Mode, 2007 (Business Administration)

No. 045 Lövstål, Eva: Management Control Systems in Entrepreneurial Organisations – A Balancing Challenge, 2008 (Business Administration)

No. 046 Fridriksson, Helgi-Valur: Learning processes in an inter-organizational context – A study of krAft project, 2008 (Business Administration)

No. 047 Naldi, Lucia: Growth through Internationalization: a Knowledge Perspective on SMEs, 2008 (Business Administration)