

Helsinki University of Technology
Department of Industrial Engineering and Management
Doctoral Dissertation Series 2009/5
Espoo 2009

SYNDICATION IN VENTURE CAPITAL

Mikko Jääskeläinen

Dissertation for the degree of Doctor of Science in Technology to be presented with due permission of the Department of Industrial Engineering and Management for public examination and debate in Auditorium TU1 at Helsinki University of Technology (Espoo, Finland) on the 9th of June, 2009, at 12 noon.

Helsinki University of Technology
Department of Industrial Engineering and Management
P.O. Box 5500
FIN-02015 TKK, Finland
Tel. + 358-9-451 2846
Fax + 358-9-451 3665
internet <http://tuta.tkk.fi/>
e-mail: mikko.jaaskelainen@tkk.fi

© Mikko Jääskeläinen

ISBN 978-951-22-9906-5 (print)
ISBN 978-951-22-9907-2 (electronic)

ISSN 1797-2507 (print)
ISSN 1797-2515 (electronic)

<http://lib.tkk.fi/Diss/2009/isbn9789512299072/>

All rights reserved. No part of this publication may be reproduced, stored in retrieval systems, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise without permission in writing from the publisher.

Yliopistopaino
Helsinki 2009

ABSTRACT OF DOCTORAL DISSERTATION	HELSINKI UNIVERSITY OF TECHNOLOGY P.O. BOX 1000, FI-02015 TKK http://www.tkk.fi		
Author Mikko Samuel Jääskeläinen			
Name of the dissertation Syndication in venture capital			
Manuscript submitted	27.2.2009	Manuscript revised	13.5.2009
Date of the defence 9.6.2009			
<input type="checkbox"/> Monograph		<input checked="" type="checkbox"/> Article dissertation (summary + original articles)	
Faculty	Information and Natural Sciences		
Department	Industrial Engineering and Management		
Field of research	Venture capital, entrepreneurial growth, renewal of technology-based firms		
Opponent(s)	Professor Mike Wright, Nottingham University		
Supervisor	Professor Markku Maula		
Instructor	Professor Markku Maula		
Abstract			
<p>The syndication of investments is a prevalent and distinctive feature of the venture capital (VC) industry. Motivated by its benefits for the performance of both VC firms and their portfolio companies, active co-operation within and across syndicates creates a multi-layered phenomenon. While prior research has devoted a considerable amount of attention to the topic, significant gaps and areas for contributions remain.</p> <p>This dissertation addresses syndication in venture capital using two complementary approaches. On the one hand, the first paper of the dissertation reviews the extant research to generate an understanding of the state of the existing knowledge and its limits. On the other hand, the dissertation addresses three specific research questions targeting each of the three main levels of syndication. On the deal level, it examines the structuring of profit distribution when the syndicated investment is a venture capital fund. On the VC firm level, it addresses the effects of syndication by examining the optimal portfolio size of VCs and how it is affected by the use of syndication. Finally, on the network level, the dissertation investigates how networks of VC firms, formed through syndicated investments, distribute information on the investment targets and facilitate exits to non-domestic markets.</p> <p>The results of the articles contribute to the research on venture capital and provide insights for policies regarding new venture financing. The conclusions of the literature review demonstrate a lack of understanding of the strategic dimensions of syndication. Accordingly, the results concerning the firm- and network-level effects suggest that the strategic use of syndication and positioning within co-operation networks enhance the performance of VCs and increase opportunities for successful exits. From the policy perspective, the results demonstrate that while the opportunities to attract private sector actors to markets with severe performance gaps using profit distribution are limited, the facilitation of cross-border investments improves the functioning of domestic markets.</p>			
Keywords Venture capital, syndication			
ISBN (printed)	978-951-22-9906-5	ISSN (printed)	1797-2507
ISBN (pdf)	978-951-22-9907-2	ISSN (pdf)	1797-2515
Language	English	Number of pages	27 p. + app. 154 p.
Publisher	TKK		
Print distribution	Industrial Engineering and Management		
<input checked="" type="checkbox"/> The dissertation can be read at http://lib.tkk.fi/Diss/isbn9789512299072/			

VÄITÖSKIRJAN TIIVISTELMÄ	TEKNILLINEN KORKEAKOULU PL 1000, 02015 TKK http://www.tkk.fi
Tekijä Mikko Samuel Jääskeläinen	
Väitöskirjan nimi Syndikointi pääomasijoitustoiminnassa	
Käsi­kirjoituksen päivämäärä 27.2.2009	Korjatun käsi­kirjoituksen päivämäärä 13.5.2009
Väitöstilaisuuden ajankohta 9.6.2009	
<input type="checkbox"/> Monografia	<input checked="" type="checkbox"/> Yhdistelmä­väitöskirja (yhteen­veto + erillis­artikkelit)
Tiedekunta	Informaatio- ja luonnontieteiden tiedekunta
Laitos	Tuotantotalouden laitos
Tutkimusala	Pääomasijoitustoiminta, kasvuyrittäjyys, teknologia­liiketoimintojen uudistaminen
Vastaväittäjä(t)	Prof. Mike Wright, Nottingham University
Työn valvoja	Prof. Markku Maula
Työn ohjaaja	Prof. Markku Maula
<p>Tiivistelmä</p> <p>Pääomasijoittamisen yksi keskeisistä tunnuspiirteistä on laajalti käytetty sijoitusten syndikointi, eli yhteissijoittaminen. Syndikoinnin laajuutta selittää sen positiiviset vaikutukset niin pääomasijoittajien omalle toiminnalle kuin näiden sijoituskohteiden kehitykselle. Syndikoinnin keskeinen asema sijoitustoiminnassa ja pääomasijoittajien yhteistoiminta muodostaa monitasoisen ja haastavan ilmiökentän tutkimukselle.</p> <p>Tämä väitöskirja käsittelee pääomasijoittajien syndikointia kahdella toisiaan täydentävällä tavalla luoden ensin laajan katsauksen aihealueesta ja kohdistuen sen jälkeen huomion aihealueen erityisiin kysymyksiin. Väitöskirjan ensimmäinen tutkimus luo systemaattisen katsauksen aihetta koskevaan tutkimukseen ja muodostaa synteisin nykytietämyksestä ja sen rajoista. Väitöskirjan kolme muuta tutkimusta käsittelevät syndikointia sen kolmella päätasolla: yksittäisissä sijoituksissa, pääomasijoittajien toiminnassa yleensä, sekä yhteissijoittamisen kautta muodostuvissa verkostoissa. Sijoitustasolla väitöskirja tarkastelee syndikoidujen rahastosijoitusten voitonjakorakenteita. Pääomasijoittajien tasolla tutkimus tarkastelee syndikoinnin vaikutuksia pääomasijoittajien portfolion optimaaliseen kokoon. Verkostotasolla väitöskirja tutkii, kuinka syndikoidujen sijoitusten luomat yhteistyösuhteet ja niiden verkostorakenne vaikuttavat tiedon kulkeutumiseen. Tutkimus tarkastelee, kuinka verkostosuhteet levittävät tietoa sijoitusmahdollisuuksista ja vaikuttavat mahdollisuuksiin löytää kohdeyrityksille ulkomaisia sijoittajia irtautumisvaiheessa.</p> <p>Väitöstutkimuksen tulokset tarjoavat näkökulmia sekä pääomasijoitustoimintaan että sitä koskevaan julkiseen päätöksentekoon. Kirjallisuuskatsauksen tulokset osoittavat miten aiempaa tutkimusta on syytä täydentää ymmärryksellä pääomasijoittajien strategisten valintojen merkityksestä syndikoinnille ja sen tuloksille. Pääomasijoittajien portfoliota ja verkostojen vaikutuksia koskevat tulokset valoittavat näitä valintoja tarkastellen kahta mahdollista mekanismia, joilla pääomasijoittajat voivat parantaa tuloksellisuuttaan. Pääomasijoittajien tasolla syndikointi tehostaa sijoittajien toimintaa jakamalla kuormitusta. Verkostojen tasolla tiedon levittyminen parantaa mahdollisuuksia löytää sijoituskohteille uusia omistajia. Julkisen päätöksenteon kannalta tulokset osoittavat, että voitonjakorakenteiden kyky luoda kannusteita yksityisille toimijoille on rajallinen, mutta toisaalta pääomasijoittajien kansainvälisen yhteissijoittamisen helpottaminen luo mahdollisuuksia sijoitustoiminnan kehittymiselle tarjoten uusia irtautumisvaihtoehtoja.</p>	
Asiasanat Pääomasijoittaminen, syndikointi	
ISBN (painettu) 978-951-22-9906-5	ISSN (painettu) 1797-2507
ISBN (pdf) 978-951-22-9907-2	ISSN (pdf) 1797-2515
Kieli Englanti	Sivumäärä 27 s. + liit. 154 s.
Julkaisija TKK	
Painetun väitöskirjan jakelu Tuotantotalouden laitos	
<input checked="" type="checkbox"/> Luettavissa verkossa osoitteessa http://lib.tkk.fi/Diss/ isbn9789512299072/	

ACKNOWLEDGEMENTS

Now it is ready.

Before getting to this point, some work had to be done, and a lot of support was needed. The first among those many people who have contributed to this dissertation is my instructor and supervisor, colleague and former fellow student, Professor Markku Maula. His efforts to establish and foster the venture capital research within the Institute of Strategy at TKK have created an environment with longevity that has greatly supported my work. I owe to his unshakable grasp of relevance and methodological skills, which have provided valuable input to all parts of the dissertation. Second only to Markku come Professor Gordon Murray and Dr. Tuukka Seppä, with whom I have had the pleasure to work with on two of the papers. They have had the direct contribution to the research, but have also served as examples of effectiveness and expertise.

I thank the external examiners, professors Sophie Manigart and Douglas Cumming, both for providing comments that enhanced quality of the manuscript and for lending their expertise and authority for the use of the evaluation of the dissertation. In addition to their contributions to the dissertation as a whole, the individual papers have benefited from the comments of the reviewers and editors of Research Policy and Entrepreneurship Theory and Practice as well as the participants of multiple conferences. Especially the comments of Dr. Satu Teerikangas as well as of professors Ari Hyytinen and Miguel Meuleman greatly improved the respective papers.

Financial support from Jenny and Antti Wihuri Foundation, OP Bank Group Research Foundation, and Foundation for Economic Education are gratefully acknowledged. Also, Finnish Funding Agency for Technology and Innovation (TEKES) and Helsinki Institute of Science and Technology Studies (HIST) have financed the multiple projects during which this dissertation was prepared.

While nearly all work could have been done in total isolation, I have been lucky to be a part of the Institute of Strategy. My collective thanks to all who have brought their diverse ideas and interest to the coffee breaks where the most and least productive moments take place. Special thanks go to doctors Henri Schildt, Jan Feller, Juha Mattsson, and Antti Sillanpää whose thirst for knowledge has been a source of continuous inspiration and delight during the post-graduate studies and beyond.

When putting all in the context, the dissertation has provided a generally enjoyable professional challenge, and the greatest teaching of the project has been to keep it a professional challenge. Therefore, I hope that I can now thank my friends, parents Anne and Risto, sister Elina, and especially my dearest ones, Virpi and Nuutti, not for any sacrifices for the dissertation but for simply being there.

LIST OF PUBLICATIONS

The dissertation consists of a summary article and the following papers:

- I. Jääskeläinen M. 2009. Venture capital syndication – a review and synthesis. Helsinki University of Technology, Department of Industrial Engineering and Management, Report 2009/1.

- II. Jääskeläinen M., Maula M., Murray G. 2007. Profit distribution and compensation structures in publicly and privately funded hybrid venture capital funds. *Research Policy* 36(7): 913-929
Contributions: Based on the original idea of Jääskeläinen, Maula, and Murray, the theoretical reasoning and writing were a joint effort of all authors, while Jääskeläinen was responsible for developing the simulation, as well as performing and reporting the analyses.

- III. Jääskeläinen M., Maula M., Seppä T. 2006. Allocation of attention to portfolio companies and the performance of venture capital firms. *Entrepreneurship Theory and Practice* 30(2): 185-206
Contributions: Based on the original idea of Jääskeläinen, Maula, and Seppä, Jääskeläinen had the main responsibility for the development of the theory, statistical analyses, data, and reporting.

- IV. Jääskeläinen M., Maula M. 2009. Do networks of financial intermediaries help reduce local bias? Evidence from cross-border venture capital. Technology, Department of Industrial Engineering and Management, Report 2009/2.
Contributions: The original idea of Jääskeläinen was revised together with Maula. Jääskeläinen had the main responsibility for the formulation of the theoretical contribution, the analyses, and the reporting.

INTRODUCTION TO THE DISSERTATION.....	1
1 BACKGROUND.....	3
2 RESEARCH QUESTIONS.....	6
Research Question 1: What Do We Know about Venture Capital Syndication?	6
Research Question 2: How Effective Are Profit Distribution Structures in Funds Syndicated by Private and Public Actors?	7
Research Question 3: Does Syndication Increase the Optimal Portfolio Size of VCs?.....	7
Research Question 4: How do Syndication Networks Help Mediate Information on Investment Targets?	8
3 KEY RESULTS AND CONTRIBUTIONS.....	9
3.1 Key Results and Contributions to Syndication Literature.....	9
3.1.1 Syndication of VC Investments	9
3.1.2 Extending Perspectives on Syndication beyond Investments	12
3.2 Extending the Results to Other Contexts	15
3.2.1 Contributions to the Literature on Investment Banking Syndicates.....	15
3.2.2 Contribution to the Literature on Inter-Organizational Relationships	16
3.3 Practical Implications.....	17
3.3.1 Implications for Public Policy	17
3.3.2 Implications for Institutional Investors, VC Firms, and Ventures	19
4 LIMITATIONS.....	20
5 CONCLUSIONS AND FUTURE RESEARCH	22
REFERENCES	24

**APPENDIX 1: VENTURE CAPITAL SYNDICATION: SYNTHESIS AND
FUTURE DIRECTIONS**

**APPENDIX 2: PROFIT DISTRIBUTION AND COMPENSATION
STRUCTURES IN PUBLICLY AND PRIVATELY FUNDED
HYBRID VENTURE CAPITAL FUNDS**

**APPENDIX 3: ALLOCATION OF ATTENTION TO PORTFOLIO
COMPANIES AND THE PERFORMANCE OF VENTURE
CAPITAL FIRMS**

**APPENDIX 4: DO NETWORKS OF FINANCIAL INTERMEDIARIES HELP
REDUCE LOCAL BIAS? EVIDENCE FROM CROSS-BORDER
VENTURE CAPITAL**

INTRODUCTION TO THE DISSERTATION

1 BACKGROUND

Venture capital (VC) firms specialize in providing financing to small, high-potential ventures with the goal of profiting from their growth (Sahlman, 1990; Wright & Robbie, 1998). They function as intermediaries, raising funds mainly from pension funds and other institutional investors and channeling them to their investment targets (Amit, Brander, & Zott, 1998; Ueda, 2004; Winton, 2003). An essential feature of venture capital financing is that it is commonly considered to be about more than just the money (Black & Gilson, 1998). In addition to carefully selecting their investment targets, VC firms typically actively monitor and manage their investments in order to increase their value (De Clercq, Sapienza, & Zaheer, 2008b; Macmillan, Kulow, & Khoylian, 1989; Sapienza, Manigart, & Vermier, 1996; Zider, 1998). In selecting and managing investments, VC firms co-operate to such a degree that it is rare for a successful venture capital-financed venture to be financed only by one venture capitalist. In contrast, the majority of VC investments are backed by an investor group, i.e., a syndicate.

The high frequency of co-operation is motivated and conditioned by the benefits and effects it produces on the levels of investments, VC firms, and networks. On the level of investments, syndication combines the resources and expertise of multiple investors to enhance the accuracy of investment decisions and the quality of assistance (Brander, Amit, & Antweiler, 2002; Manigart et al., 2006). The members of syndicates contribute their financial resources, expertise, social capital, and reputation to the development of syndicated ventures. Accordingly, research has found that ventures backed by a syndicate produce higher returns on investment and reach successful exits faster and with a higher probability than non-syndicated ventures (Brander et al., 2002; Cumming & Walz, 2004; De Clercq & Dimov, 2008a; Giot & Schwienbacher, 2007; Hege, Palomino, & Schwienbacher, 2008).

While on the venture level the co-operation of investors offers an opportunity to pool resources, on the level of the VC firm syndication offers a means to manage business and investment risks, to leverage resources, and enhance the quality of decision making (Bygrave, 1987; Lerner, 1994; Lockett & Wright, 2001; Manigart et al., 2006). In particular, the opportunity to use syndication in a contingent manner to leverage and

compensate the resources and opportunities of a VC firm implies that VC financing is also about more than the money for the VC firms themselves. In order to succeed in securing further funds from institutional investors, VC firms have to outperform their competitors. Within this competition for funds, VC firms use syndication as one available mechanism to both increase their performance and reduce the risks of underperformance (De Clercq et al., 2008a; Jääskeläinen, Maula, & Seppä, 2006; Lerner, 1994; Lockett et al., 2001). Therefore, in addition to using syndication to enhance investment performance, VC firms use syndication to enhance their own performance and chances of survival.

In addition to the venture- and VC firm-level motives and effects, a syndicated investment creates a relationship between the VC firms participating in the syndicate. The multiple connections between VC firms through syndicates accumulate into patterns of inter-organizational ties, often described as syndication networks. These network connections of VC firms both transmit information and reflect inter-organizational hierarchies among VC firms (Podolny, 2001). Therefore, both the immediate partners of a VC firm and the firm's positioning in the network affect the opportunities and performance of VC firms, as well as their investment targets (Echols & Tsai, 2005; Hochberg, Ljungqvist, & Lu, 2007).

The positioning of this dissertation within the field of venture capital syndication can be described by using these three main levels of analysis in syndication research: investments, VC firms, and networks. As the multiple motives, effects, and levels of interests suggest, syndication has attracted a considerable amount of research interest. Despite the attention devoted to the topic, this research effort has been unevenly distributed among the approaches and levels of interest related to venture capital syndication. As suggested by the first paper of the dissertation (Appendix 1), reviewing the existing literature, the research has been dominated by a focus on the decision to syndicate and the effects of syndication on the level of an individual investment target. Adopting perspectives that have received less attention, the three remaining studies focus on specific issues related to syndication. The second paper (Appendix 2) introduces a new perspective on investment-level aspects of syndication by considering syndication and profit distribution in policy-oriented VC funds. The third paper

(Appendix 3) addresses the VC firm-level effects of syndication, addressing the little-researched interaction of VC resources and syndication by investigating the effects of work-sharing on the optimal portfolio size of VC firms. The last paper (Appendix 4) adopts a network-level approach, focusing on the effects of the emergent syndication network on the distribution of information.

This introduction to the dissertation briefly reviews the specific questions addressed by the individual studies, considers their mutual relations, and highlights the key contributions of the dissertation to research, policy, and practice. As each of the studies contains topic-specific discussions on theoretical approaches, methodologies, results, and limitations, I here present the common approaches and contributions that are present in each of the studies and emerge when the studies are considered together. The remainder of this introduction proceeds by first presenting the research question, then addressing the contributions and limitations, and finally concluding with suggestions for future research.

2 RESEARCH QUESTIONS

The research interest that combines the four papers of the dissertation is the objective of contributing to the literature on venture capital syndication by providing perspectives that extend the current literature. For this purpose, I present two types of research questions. First, to identify opportunities for contributions, I ask what we know and still need to learn about venture capital syndication. Second, to address selected areas for further contributions, I present three specific research questions.

Whereas the first paper, providing a review of the literature, addresses syndication on all of its levels, the following three papers address specific topics on each of the levels of syndication. First, on the investment level, I ask how effective profit distribution structures are as policy instruments in the syndicated fund investments of public and private investors. Second, on the VC firm level, I ask how the syndication of investments affects the optimal portfolio size. Finally, on the syndication network level, I ask how the network of connections between VCs facilitates the distribution of information about investments.

Research Question 1: What Do We Know about Venture Capital Syndication?

The first research question is motivated by the need to create an understanding of the extant literature on venture capital syndication. Rather than presenting questions about any specific aspect of syndication, the question asks what is known about VC syndication. Specifically, the paper aims to assess how well the current knowledge is able to answer the questions of how, why, and under what circumstances syndication affects the performance of ventures and VC firms. While there exist a few reviews focusing on a specific topic of syndication, such as contracting (Tykvova, 2007), motivation (e.g. Lockett et al., 2001; Manigart et al., 2006), and the strategic approaches of VC firms (De Clercq & Dimov, Forthcoming), the answers to the questions of how, why, and when are dispersed among individual contributions. Thus, the objective of the paper is to review, synthesize, and assess the literature for the purpose of identifying gaps within the current knowledge and to suggest areas for further research.

Research Question 2: How Effective Are Profit Distribution Structures in Funds Syndicated by Private and Public Actors?

The second paper addresses syndication on the investment level, examining profit distribution structures in hybrid funds with syndicated investments from both private and public sector actors. The paper addresses the policy interest of creating privately managed funds in areas where private market actors are not willing to invest because of the low expected returns (Gilson, 2003). The paper seeks to answer the research question of what the limits are for the existing fund structures with respect to their ability to affect the profit distribution of hybrid funds. The question is motivated by the policy-makers' increasing concern about the lack of risk capital available to new and early-stage entrepreneurial ventures. This has led several governments to set up programs to channel finance to young enterprises through private venture capital funds.

Research Question 3: Does Syndication Increase the Optimal Portfolio Size of VCs?

The third paper addresses the effects of syndication on the VC firm level. The specific research question is how venture capitalist involvement in portfolio firms is related to the performance of the VC firm. This implies two subquestions. First, the paper asks whether there is an optimal average level of attention to be allocated to portfolio ventures; that is, is the performance of the VC firm related to the number of ventures it manages? The second subquestion asks how, if there is an optimal allocation, it is affected by the use of syndication, especially relative to the syndicate role of the VC firm. Should syndication provide a mechanism for work-sharing among syndicate members, then the use of syndication reduces the average workload per syndicate member. Therefore, the more a VC firm syndicates, especially as a non-lead investor, the greater the optimal size of the portfolio. These questions are motivated by gaps in the research on the value of VC involvement in ventures, and on the effects of syndication on the internal operations of VC firms. In both these areas of the literature, research has established that involvement (e.g. Sapienza, 1992) and syndication (e.g. Brander et al., 2002) have positive effects on ventures, but whether and how these translate to the enhanced performance of the VC firm has received less attention.

Research Question 4: How do Syndication Networks Help Mediate Information on Investment Targets?

The fourth paper addresses the effects of syndication networks. The purpose of the paper is to examine how networks of financial intermediaries affect the distribution of information among the network members and across distances. Specifically, the paper answers the question of how the networks of VC firms affect the distribution of information on their investment targets to new investors. On the one hand, the motivation for the question stems from the theoretical literature that focuses on the question of why investors tend to prefer local investment targets (Coval & Moskowitz, 1999; Grinblatt & Keloharju, 2001). On the other hand, from the policy perspective the motivation comes from the need to understand the factors that facilitate exits to non-domestic markets. These opportunities facilitate the functioning of venture capital markets, as the possibility of finding exit routes is crucial for the initial investment decisions (Black et al., 1998).

Figure 1 explicates the relationships between the research questions and the targeted levels of analysis. The first paper addresses syndication as a whole, covering all the levels within its review of the literature. The second paper addresses the topic on the level of syndicated investments. The third paper focuses on the effects on the VC firm level, and finally, the fourth paper addresses the effect of the networks that are formed as a result of the syndication relationships.

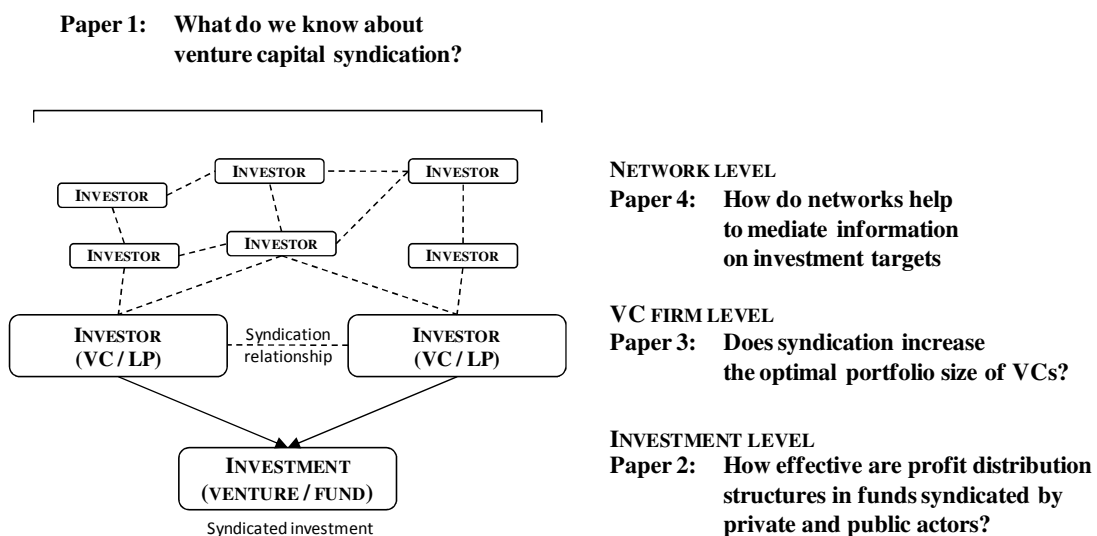


Figure 1 Levels of venture capital and research questions of the dissertation

3 KEY RESULTS AND CONTRIBUTIONS

The contributions of the dissertation are targeted both to the literature on VC syndication and to the more generic literature on inter-organizational relationships. Primarily, the results of the dissertation contribute to two aspects of VC syndication literature. First, the results extend and complement the existing knowledge on the syndication of VC investments, that is, why and with what effects VC investments are syndicated. Second, the results extend the existing perspectives on VC syndication by introducing new variety to the literature with respect to investments, investors, and motives. In addition to these contributions to the VC syndication literature, I discuss below the two most prominent avenues for generalizing the results to contexts beyond venture capital.

3.1 KEY RESULTS AND CONTRIBUTIONS TO SYNDICATION LITERATURE

3.1.1 Syndication of VC Investments

To illustrate the positioning and contributions of the papers within the literature on venture capital syndication, Table I presents a categorization of the extant literature with respect to the level of analysis. The categorization is based on the three levels of syndication – investment, firm, and network – corresponding to the research questions of the dissertation.

The first of the studies (Appendix 1) contributes to the literature on venture capital syndication by reviewing the published research and selected working papers on the topic. To answer the research question of how well the existing knowledge is able to answer the questions of how, why, and under what circumstances syndication affects performance, the paper adopts two points of view through which the literature is reviewed and synthesized. First, I propose that viewing syndication from the functional and strategic perspectives helps distinguish the defining antecedents of syndication: VCs' role as financial intermediaries and the strategic actions VCs undertake within their role. Second, I categorize the literature on the basis of the schematic structure of the syndication, that is, I divide the literature into three categories depending on whether it addresses: a) a syndication decision; b) the structuring of syndicates, or c) the outcomes of syndication.

Table I Levels of analysis in the existing body of knowledge regarding VC syndication

Level of analysis	Existing research	Contributions of dissertation
Reviews	Origins (Michie, 1981) Motivations (Lockett & Wright, 1999; Lockett et al., 2001; Manigart et al., 2006) VC strategy (De Clercq et al., Forthcoming)	Paper 1: <i>Review and synthesis</i> of antecedents and outcomes of syndication
Investment	Contracting Agency problems & Asymmetric information (Admati & Pfleiderer, 1994; Casamatta & Haritchabalet, 2007; Schmidt, 2003), Commitment to liquidation (Huang & Xu, 2003) Security-type selection (Cumming, 2005) Governance & Involvement (Kaplan & Stromberg, 2003, , 2004) Decisions, motives, & effects Syndication decision (Cumming, 2006a; Cumming, Fleming, & Schwienbacher, 2006; Dimov & Milanov, 2009; Lerner, 1994) Governance (Filatotchev, Chahine, Wright, & Arberk, 2005; Filatotchev, Wright, & Arberk, 2006) Target internationalization (Mäkelä & Maula, 2005) Performance (Birmingham, Busenitz, & Arthurs, 2003; Brander et al., 2002; Dimov & De Clercq, 2006; Fleming, 2004; Giot et al., 2007; Guler, 2007; Mason & Harrison, 2002)	Paper 2: Structuring of profit distribution in fund <i>investments</i> among heterogeneous fund investors.
Firm	Use and effects Use of syndication (De Clercq & Dimov, 2004) Effect on Involvement (Bottazzi, Da Rin, & Hellmann, 2008; De Clercq et al., 2008b; Elango, Fried, Hisrich, & Polonchek, 1995) Deal flow generation (Jungwirth & Moog, 2004) Portfolio size (Cumming, 2006b) Performance (De Clercq et al., 2008a; Hill, Maula, Birkinshaw, & Murray, 2009)	Paper 3: Effects of syndication on optimal portfolio size of <i>VC firms</i>
Network	Dyads and syndicates Partner selection and formation (Hopp, 2008; Sorenson & Stuart, 2008; Sorenson & Stuart, 2001; Trapido, 2007; Tykvová, 2007) Syndicate structure & composition (Cumming, Fleming, & Schwienbacher, 2005; Hellmann, 2002; Makela & Maula, 2008; Wright & Lockett, 2003) Commitment & group processes (Birmingham et al., 2003; Dimov et al., 2006; Ferrary, 2003; Guler, 2007; Makela & Maula, 2006) Performance effects (De Clercq et al., 2008a; Giot et al., 2007) Structure & effects Network structure and formation (Bygrave, 1987, , 1988; Castilla, Hwang, Granovetter, & Granovetter, 2000; Fund, Pollock, Baker, & Wowak, 2008; Keil, Maula, & Wilson, Forthcoming; Kogut, Urso, & Walker, 2007) Information distribution (Podolny, 2001; Walker, 2008) Effects of social position (Dimov, Shepherd, & Sutcliffe, 2007) Performance effects (Abell & Nisar, 2007; Echols et al., 2005; Hochberg et al., 2007)	Paper 4: Effects of VCs' <i>network</i> contacts on exits from ventures

When the literature is approached from these two perspectives, it becomes evident that while research has devoted considerable attention to the syndication of venture capital investments, the focus of the earlier research has predominantly been on the investment-level motives and outcomes. Accordingly, the literature on the strategic dimension of syndication is underdeveloped. That is, one of the main aspects of syndication that we do not know about is how the use of syndication relates to the overall strategy of VC firms, and whether this strategic dimension has consequences for the decisions and outcomes of syndication. On the basis of the synthesis, the paper proposes that future research should pay more attention to the strategies of VC firms, as well as seeking rationales for whether and how syndication creates performance differences among VC firms.

Contributing to this gap regarding the performance effects, the third (Appendix 3) and fourth papers (Appendix 4) provide two mechanisms through which syndication may affect performance. The third paper examines longitudinal data on a sample of 94 leading U.S. VC firms, addressing the research questions of whether there is an optimal portfolio size and how it is affected by syndication. The results indicate that VCs' involvement in their ventures is valuable, and allocating their attention to too many portfolio companies has adverse effects on performance. However, syndication, especially syndication in the role of a non-lead investor, moderated this optimum positively. This suggests that syndication functions as an effective work-sharing mechanism. With respect to both the conclusions of the first paper and the performance effect addressed in the extant research, this result introduces a potential mechanism through which syndication may translate into a difference in performance between VC firms, namely, through leveraging existing resources with co-operation. This provides a novel contribution to the extant research. While earlier research has addressed the use of syndication on the firm level (De Clercq et al., 2004), as well as its effects on portfolio size (Cumming, 2006b) and performance (De Clercq et al., 2008a; Echols et al., 2005; Hill et al., 2009), the link between syndication, personnel resources, and performance has not been addressed.

In a similar vein, the results of the fourth paper (Appendix 4), based on the analysis of data from 1431 European venture capital-backed ventures and their exits, suggest

another mechanism for performance effects. This paper examines the effect of direct and indirect ties to non-domestic markets on the probability of finding new investors from those markets when a VC exits from an investment. The paper suggests that the networks of venture capitalists function as conduits of information regarding investment targets. The results show that the more connected a portfolio company was to non-domestic markets, the more likely an exit to these markets was. Additionally, direct and indirect ties were found to have differing effects regarding the mediated information. Direct ties provide a rich channel that both mediates information and supports its credibility, while indirect ties mediate simpler information, facilitating the recognition of investment targets. For VC firms and portfolio companies, this implies that those VCs with good connections to other markets may enjoy extended opportunities to exit from their investments, thus suggesting a source of enhanced performance. This complements the existing research on syndication networks by suggesting a network-level mechanism for performance effects.

3.1.2 Extending Perspectives on Syndication beyond Investments

In addition to contributing to the understanding of the antecedents and outcomes of the syndication of venture capital investments, the dissertation contributes to the literature by extending the focus on syndication beyond ventures and homogenous VC firms. The second paper (Appendix 2) provides two extensions to the perspectives of the existing literature. First, it adopts a novel approach and addresses syndication at the fund level. Investigating the effects of profit distribution, the paper examines a situation in which limited partners, usually considered only as a passive source of financing for funds, jointly invest in a fund, effectively forming a syndicate. Second, it introduces a case where these syndication partners have differing goals for the investment, which creates a need to structure the profit distribution. While there exist a few studies examining hybrid syndicates in VC (Hellmann, 2002), loans (Dennis & Mullineaux, 2000), and investment banking (Song, 2004), the altered profit distribution stemming from the non-profit-oriented goals of public investors introduces a new dimension to the literature. The results of the study suggest that while the profit distribution structures of VC funds can be organized to meet the interests of both parties, they are limited with respect to

their effectiveness in directing private sector actors to markets with significant opportunity costs.

Together, the four studies of the dissertation contribute to the syndication literature by identifying the need to diversify perspectives on syndication and contribute to the understanding of different levels of syndication. In particular, the studies draw attention to the strategic perspective of syndication, that is, VC firm-level factors that affect the decision and outcomes of syndication. The first paper identifies this as one of the most prominent areas for further research, the third and fourth papers propose mechanisms for the effects of syndication and the second paper addresses the incorporation of differing strategic interests into the structure of syndicates. These views complement and support the existing research, which has addressed topics such as strategic positioning (Echols et al., 2005), the role of opportunities (Dimov et al., 2009), and the knowledge acquisition (De Clercq et al., 2008a) of VC firms.

Furthermore, a contribution present in all the studies is the examination of heterogeneous syndication partners. The differentiation between public/private, lead/non-lead, and domestic/foreign syndication partners offers tools to explicate the formation, dynamics, and effects of syndicates. The extant research has predominantly addressed syndication among homogenous VCs within domestic markets. This has reduced the sources of differences among VCs to the differences in their experience and resources. Consequently, as is evident from the review of the first paper, little attention has been addressed to how the characteristics and interests of different types of investors might affect investment outcomes and dynamics. Accordingly, the three papers focusing on specific topics within syndicates contribute to the understanding of the effects of distinguishing the roles of public and private investors (Appendix 2), lead and non-lead investors (Appendix 3), and foreign and domestic investors (Appendix 4).

Table II summarizes the main contributions of the papers with the research questions and design.

Table II Summary of the research questions, research design, key results, and contributions of the papers

	Paper 1	Paper 2	Paper 3	Paper 4
Title	Venture capital syndication: synthesis and future directions	Profit distribution and compensation structures in publicly and privately funded hybrid venture capital funds	Allocation of attention and performance of the venture capitalist	Do networks of financial intermediaries help reduce local bias? Evidence from cross-border venture capital
Key question about syndication	What do we know about venture capital syndication?	How can fund syndication between private and public actors be structured?	Does syndication increase the optimal portfolio size of VCs?	How do syndication networks affect exits from investments?
Specific research question	How well does the research answer the questions of how, why, and when syndication affects performance?	What are the limits for hybrid fund structures to incentivize private investors?	How does VC involvement in portfolio companies affect VC performance?	How do inter-organizational networks mediate information on investment targets?
Level of analysis	All	Investment	VC firm	Industry network
Syndicate roles	All	Private-Public	Lead - non-lead	Domestic - Foreign
Research design	Literature review	Stochastic simulation	Empirical, quantitative , longitudinal	Empirical, quantitative, cross-sectional
Data source	---	---	VentureXpert, New Issues, and Mergers and Acquisitions databases Pratt's Guides to Venture Capital Sources	VentureXpert, New Issues, and Mergers and Acquisitions databases
Key results and insights	<ol style="list-style-type: none"> 1. Extant research has focused on venture-level effects and motives of syndication; the VC firm level requires future research 2. Syndication is not solely targeted for the benefit of portfolio companies 3. Syndication may not have a direct performance effect, but serves as a moderating factor 	The usability of profit-sharing structures is limited to markets where the gap to returns from functioning market segments is modest	Results confirm the value of VC involvement and suggest that syndication enhances performance through work-sharing	<ol style="list-style-type: none"> 1. Direct and indirect ties to non-domestic markets increase the likelihood of attracting non-domestic investors 2. Preference for local investment is mitigated by social networks with geographical reach 3. Facilitating the networking of VCs extends the size of potential exit markets

3.2 EXTENDING THE RESULTS TO OTHER CONTEXTS

3.2.1 Contributions to the Literature on Investment Banking Syndicates

While the dissertation focuses on syndication specifically in the context of venture capital, its results can also be extended to syndication in other sectors of financial intermediation. Syndicates are common in primary markets for securities, that is, in loan markets and debt and equity issues, and accordingly, research has paid attention to the drivers and effects of syndicates of investment and commercial banks. The single most prominent contribution of this dissertation that can be extended to these contexts is the view that emphasizes the strategic factors that affect the use and the outcomes of syndication. In broad terms, the approaches of research to syndication in investment banking can be characterized as either functional or structural. On one hand, the functional stream is the dominant approach of financially-oriented studies of syndication. Within this stream, the motives identified for syndication include concerns about information production (e.g. Corwin & Schultz, 2005; Pichler & Wilhelm, 2001) and its nature as public good (e.g. Anand & Galetovic, 2000; Barzel, Habib, & Johnsen, 2006), and the effects of syndication on certification, service enhancement, client retention, market-making, and analyst coverage (Corwin et al., 2005; Song, 2004). On the other hand, the structural stream has used security issues and investment banking as an empirical context for sociologically motivated studies, focusing mainly on the structure of co-operation and resulting networks (e.g. Baum, Shipilov, & Rowley, 2003; Chung, Singh, & Lee, 2000; Jensen, 2003; Podolny, 1993; Shipilov & Li, 2008).

While functional and structural aspects have significant explanatory force within both venture capital and other contexts of financial intermediation, these perspectives can be fruitfully complemented by the inclusion of a strategic aspect, i.e., considering syndication as the contingent response of heterogeneous actors to their respective contextual factors. That is, while investment and commercial banks are at the heart of financial intermediation, they are nevertheless diverse firms with strategic interests. It should be noted, however, that while VC and investment banking syndicates share the aspects of information production, joint decision making, and risk-sharing, the syndicates formed around securities offerings are significantly different from venture capital syndication. Most importantly, investment banking syndicates essentially focus

on short-term information and liquidity production and thus lack one of the defining issues of venture capital syndication, that is, long-term value creation. Nevertheless, while the two contexts differ in terms of specifics, strategic issues such as resource leverage and responses to inter-organizational positioning can be expected to enrich the research when also adopted for the research on investment banking syndicates.

3.2.2 Contribution to the Literature on Inter-Organizational Relationships

From a broad perspective, syndicates are a form of inter-firm co-operation, horizontal alliances among financial intermediaries organized around the provision or arrangement of financing for firms with a financial deficit. Accordingly, from this perspective, the question regarding the contributions of the dissertation is to what extent these results can be generalized to all inter-organizational relationships and what their contribution is within this abstracted context.

Instead of directly generalizable results, the main contribution of the dissertation is the dissection of venture capital syndication that is conducted in the four studies. VC syndication has drawn increasing attention from research that aims to provide theoretical contributions, using venture capital as the empirical context. The pervasive co-operation and well-documented syndication relationships offer a rich context for examining both dyadic co-operation relationships and the networks that these dyads create. To illustrate the extant research, Table III provides a categorization of the studies that use syndication as an empirical context for generalized results, classified with respect to level of analysis.

Table III Extant research using syndication of VC investments as empirical context

	Published research	Current working papers
Dyads	Formation (Hopp, 2008; Meuleman, Wright, Manigart, & Lockett, 2009; Sorenson et al., 2008; Sorenson et al., 2001; Trapido, 2007) Gift exchange (Ferrary, 2003)	Formation (Meuleman, Manigart, Lockett, & Wright, 2008; Piskorski & Anand, 2004)
Network	Ego network formation (Fund et al., 2008; Keil et al., Forthcoming) Industry network formation (Kogut et al., 2007) Composition (Castilla et al., 2000) Information on the network (Podolny, 2001) Social position within network (Dimov et al., 2007) Performance effect (Hochberg et al., 2007)(Abell et al., 2007; Echols et al., 2005) Information distribution (Walker, 2008)	Network as entry barriers (Hochberg, Ljungqvist, & Lu, 2006) Social position within network (Milanov & Shepherd, 2008) Information distribution (Jääskeläinen & Maula, 2009) Technological discontinuity recognition (Maula, Keil, & Zahra, 2003) Performance effect (Bothner, Kang, & Lee, 2008; Bothner, Kim, & Lee, 2008; Jääskeläinen, Maula, & Pynnä, 2008) Investment valuation (Meuleman & Wright, 2006)

The review and analysis of venture capital syndication on its multiple levels serves as a basis to assess both the usability of venture capital syndication as an empirical context and the validity of generalization from VC syndication to other instances of inter-organizational relationships. The results of the dissertation, especially those of the review (Paper 1), suggest that care should be taken when generalizing the results from the VC syndicate as: 1) there are significant gaps in terms of understanding the antecedents, motives, and contingencies of syndication decisions and thus the basis on which the dyads and networks are formed, and, 2) the strong functional antecedent of syndication suggests that syndication is largely a response to information and agency concerns, which are perhaps defining characteristics in financial intermediation more than in other contexts.

3.3 PRACTICAL IMPLICATIONS

3.3.1 Implications for Public Policy

The practical relevance of the results is targeted towards public policy and limited partners. The relevance of the dissertations to public policy stems from the understanding that the results provide in terms of the sources of performance effects and their implications for public policy. The foremost implication of the third paper

(Appendix 3) is that the attention of VCs is valuable to the portfolio companies. If they merely pick and choose investment targets, the outcomes of the portfolio companies would be independent and the observed U-shaped relationship would not exist. This contributes to the motivation to use private sector VCs to channel funds to market segments that are considered to require public intervention. Given the premise that the inclusion of private VCs enhances the effectiveness of such interventions, the second paper (Appendix 2) then examines how to engineer the profit distribution structures of the funds used for policy interventions in a way that attracts VCs and private LPs to participate. The results in the paper imply that while multiple structures have been used in such programs, their capability to enhance the incentives is moderate. To illustrate, in 2004 the average internal rate of return for all European private equity and venture capital investments was 9.5%, while the corresponding figure for early-stage investments was 0.2%. In comparison, the most extreme enhancement to the returns of private LPs that the structures examined were able to produce was approximately 7 percentage units. That is, none of the structures would have been effective in providing equal incentives for private investors to invest at an early stage, should their opportunity cost match the average returns of industry.

An alternative approach to direct policy interventions is to facilitate the legal and institutional context for venture capital investing. From this perspective, the results of the fourth paper (Appendix 4) suggest that the cross-border co-operation of venture capitalists creates networks that may facilitate the expansion of exit opportunities. Non-domestic exit opportunities are particularly relevant for small open economies such as Finland, Sweden, Israel, or Ireland. The functioning of the exit market and the opportunities to divest investments are vital for the venture capitalists' ability to realize profits (Black et al., 1998; Sahlman, 1990). Consequently, limited opportunities for divestments translate to limited interest in venture capital investing in the first place, thus hindering investment in science and technology. In the light of our results, policies should target the creation of an investment environment that facilitates cross-border investments, as, in addition to the direct benefits of expertise and financing, the direct and indirect connections to foreign investors enhance exit opportunities and thereby the functioning of VC markets.

3.3.2 Implications for Institutional Investors, VC Firms, and Ventures

In addition to public policy, the results of the dissertation have implications for institutional investors, VC firms, and portfolio companies. For each of these stakeholders, the performance implications are of interest. The effects of portfolio size and network contacts suggest that well-connected VCs with manageable portfolios enjoy enhanced performance. Accordingly, as both the LPs selecting funds to invest in and the ventures seeking financing are interested in the expected performance and contributions of the VC, our results suggest two criteria that can be used when comparing VCs.

For ventures, the effects of portfolio size examined in the second paper suggest that entrepreneurs seeking financing should consider the limitations that their investors face. While the results provide evidence that venture capitalists add value to ventures beyond the capital they provide, the level of involvement a VC firm contributes to an individual portfolio company depends on the size of its portfolio. Those VC firms that have large portfolios relative to their capacity divide their attention between numerous investments, thus reducing the amount of involvement in individual ventures. This also highlights the notion that is present in the literature review of the first paper, that is, that the interests of VC firms are not perfectly aligned with those of their investors or portfolio companies. As VCs aim to maximize the performance of their portfolios as a whole, they are likely to contribute less attention to any individual portfolio company than what would maximize its performance.

4 LIMITATIONS

The review of syndication (Appendix 1) identifies two limitations within existing research that also have consequences for the empirical studies of the dissertation. First, partly as a result of the quantitative approach that is dominant within VC syndication research and partly as a result of the broader gap in the research concerning the behavior of venture capitalists, the empirical studies of the dissertation treat the behavior and actions of VCs largely as a black box. This has two consequences. On one hand, in the second paper, (Appendix 2), regarding profit distribution structures, the examination of the effects of incentive structures is limited to the *ex ante* choice of VC firms to participate or not. As the paper uses a simulation approach to examine the effectiveness of the fund structures in creating incentives to private actors to participate, the behavior of VC firms has to be explicitly modeled. This modeling is limited to determining the rational and calculative choice between the structure examined and its opportunity cost, partly as a result of the technical constraints, and partly as a result of the lack of evidence and understanding of VC behavior. Therefore, the highly interesting question of what would happen if an initially attractive compensation structure later lost its appeal because of a market downturn lies outside the scope of this study. On the other hand, because of the same lack of understanding of VC firms' behavior, the third and fourth paper (Appendix 3 and 4) are based on very plausible, but nevertheless assumed aspects of VC firms' actions regarding the roles and interactions of VC firms in syndicates. In Paper 3, it is assumed that the role as lead investor correlates with the size of the investment, and the analysis in Paper 4 assumes that syndicates facilitate communication and information-sharing between participating VC firms. Accordingly, to verify the correctness of these assumptions and to provide further insights into the actions of VC firms in the management of their investments and their funds, more qualitatively oriented research on syndication is called for.

The second source of limitations suggested by the review is the measurement of performance. Papers 3 and 4 use successful exits from investments, i.e., IPOs and acquisitions, as a measure for performance. While this approach is both widely used in the studies addressing the performance effects of syndication and highly reasonable as these exit methods generate the largest profits (e.g. Bygrave & Timmons, 1992;

Cochrane, 2005), it nevertheless limits both the details of the studies and the conclusions from the results. While participation in a successful exit is a plausible proxy for a successful investment, it lacks the power to analyze the distribution of profits between syndicate members, e.g. as a result of differences in the entry rounds of investors. This leaves open the question of whether some VC firms benefit more from syndication than others. This, in turn, limits the strength with which the two suggested performance mechanisms of syndication, work-sharing and information distribution, can be concluded to have a positive impact on the performance of VC firms. Thus, results are conditional on the role of the IPO and acquisitions in the profits of VCs and further research on the distribution of profits from investments is needed.

In addition to the two limitations implied by the results of the literature review, a third source of limitations is the data used in the empirical studies, Papers 3 and 4. On one hand, to examine the effect of syndication on optimal portfolio size, the third paper uses data on the largest US VC firms, which may limit the generalizability of the results to smaller VC firms in smaller VC markets. On the other hand, Paper 4 examines the effect of VC syndication networks on the likelihood of non-domestic exits using data on European VC investments. Although the database used, VentureXpert, presents the most extensive source of data available on European VC investments, it only covers on average approximately 30-40% of the investments made by European VC firms. The bias is likely to be towards the larger investments of large VC firms, potentially limiting the generalizability of the results.

5 CONCLUSIONS AND FUTURE RESEARCH

This research has addressed venture capital syndication by synthesizing existing research and focusing on three specific syndication-related questions on the level of investments, VC firms, and networks. On the basis of an extensive review of the literature, the first paper drew attention to the lack of research on VC firm-level aspects of syndication. This led to the conclusion that there is a need for further research from the perspectives of VC firms and LPs in terms of performance effects, benefits, and strategies. Accordingly, the second paper investigated the limits of incorporating the interests of private and public LPs into hybrid funds, and the third and fourth papers examined two potential mechanisms for enhanced performance through syndication, work-sharing, and syndication networks. The second paper found that while hybrid funds with asymmetric profit distribution do incorporate the policy interest of public investors with a level of profit that satisfies private investors, their ability to target market segments with significantly lower return expectations is limited. The third found that syndication increases the number of portfolio companies VC firms are able to manage effectively, thus providing a mechanism to leverage VCs' internal resources with co-operation. Finally, the fourth paper, investigating information mediation in syndication networks, found that the direct and indirect contacts of VCs distribute information across distances, and thereby increase the likelihood of finding foreign exit routes from the investments.

Although the potential directions for future research are abundant, there are two themes that appear as the most significant. First, while each of the individual studies suggests approaches for deepening the understanding of their respective areas, a common theme present in each of them is the need to deepen the knowledge on the strategic interests incorporated in syndication. Specifically, the main direction suggested for future research in the first paper is the need to understand syndication as an aspect of VC firms' overall strategy. For the second paper, this theme is present in the need to expand the literature in future by considering how the post-investment goals of actors affect the outcomes of hybrid funds. The third and fourth papers, then, open up directions for future research by showing how two aspects of syndication can enhance performance.

The question here is that, given the benefits, what is the room for VC firms to optimize their performance by intentionally structuring their operations and networks?

The second theme strongly present in all the four studies is the heterogeneity of syndicate partners. While complementary assets have been found to form one of the dominant drivers for the motivations and benefits of inter-organizational relationships in general (Ahuja, 2000; Eisenhardt & Schoonhoven, 1996; Lavie, 2007; Stuart, 2000), the syndication literature has directed only limited attention to the heterogeneity of syndicate partners. In addition to the studies presented in this dissertation, Mäkelä and Maula (2008; 2005) consider the benefits of cross-border syndication, and Hellman addresses syndicates with banks and corporate investors (2002; Hellmann, Lindsey, & Puri, 2008). In addition to this apparent level of heterogeneity (e.g. public/private, bank/VC), there is a need for further research with respect to the resource heterogeneity of otherwise apparently homogeneous VCs. So far, aspects such as experience and specialized expertise have received modest attention (e.g. De Clercq et al., 2004; Du, 2008), but the interplay between the complementary resources of syndicate partners lacks contributions. This lack of research has partly contributed to the fact that current research presents no evidence for whether and how the composition of syndicates affects syndicated investments. Therefore, more research is needed in terms of what different types of investors bring to syndicates, how these complementary assets interact, and what their effects on the investments are.

REFERENCES

- Abell, P., & Nisar, T. M. 2007. Performance effects of venture capital firm networks. *Management Decision*, 45(5): 923-936.
- Admati, A. R., & Pfleiderer, P. 1994. Robust Financial Contracting and the Role of Venture Capitalists. *Journal of Finance*, 49(2): 371-402.
- Ahuja, G. 2000. Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly*, 45(3): 425-455.
- Amit, R., Brander, J., & Zott, C. 1998. Why do venture capital firms exist? Theory and Canadian evidence. *Journal of Business Venturing*, 13(6): 441-466.
- Anand, B. N., & Galetovic, A. 2000. Information, nonexcludability, and financial market structure. *Journal of Business*, 73(3): 357-402.
- Barzel, Y., Habib, M. A., & Johnsen, D. B. 2006. Prevention is better than cure: The role of IPO syndicates in precluding information acquisition. *Journal of Business*, 79(6): 2911-2923.
- Baum, J. A. C., Shipilov, A. V., & Rowley, T. J. 2003. Where do small worlds come from? *Industrial and Corporate Change*, 12(4): 697-725.
- Birmingham, C., Busenitz, L. W., & Arthurs, J. D. 2003. The escalation of commitment by venture capitalists in reinvestment decisions. *Venture Capital*, 5(3): 217-230.
- Black, B. S., & Gilson, R. J. 1998. Venture capital and the structure of capital markets: banks versus stock markets. *Journal of Financial Economics*, 47(3): 243-277.
- Bothner, M., Kang, J.-H., & Lee, W. 2008. Status Volatility and Organizational Growth in the U.S. Venture Capital Industry: University of Chicago.
- Bothner, M., Kim, Y.-K., & Lee, W. 2008. Primary Status, Complementary Status, and Capital Acquisition in the U.S. Venture Capital Industry: University of Chicago.
- Bottazzi, L., Da Rin, M., & Hellmann, T. 2008. Who are the active investors? Evidence from venture capital. *Journal of Financial Economics*, 89(3): 488-512.
- Brander, J. A., Amit, R., & Antweiler, W. 2002. Venture-capital syndication: Improved venture selection vs. the value-added hypothesis. *Journal of Economics & Management Strategy*, 11(3): 423-452.
- Bygrave, W., & Timmons, J. A. 1992. *Venture capital at the crossroads*. Boston, MA: Harvard Business School Press.
- Bygrave, W. D. 1987. Syndicated Investments by Venture Capital Firms - a Networking Perspective. *Journal of Business Venturing*, 2(2): 139-154.
- Bygrave, W. D. 1988. The Structure of the Investment Networks of Venture Capital Firms. *Journal of Business Venturing*, 3(2): 137-157.
- Casamatta, C., & Haritchabalet, C. 2007. Experience, screening and syndication in venture capital investments. *Journal of Financial Intermediation*, 16: 368-398.
- Castilla, E. J., Hwang, H., Granovetter, E., & Granovetter, M. 2000. Social Networks in Silicon Valley. In C.-M. Lee, W. F. Miller, M.-G. Hancock, & H. Rowen (Eds.), *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship*: 218-247.
- Chung, S., Singh, H., & Lee, K. 2000. Complementarity, status similarity and social capital as drivers of alliance formation. *Strategic Management Journal*, 21(1): 1-22.
- Cochrane, J. H. 2005. The risk and return of venture capital. *Journal of Financial Economics*, 75(1): 3-52.
- Corwin, S. A., & Schultz, P. 2005. The role of IPO underwriting syndicates: Pricing, information production, and underwriter competition. *Journal of Finance*, 60(1): 443-486.
- Coval, J. D., & Moskowitz, T. J. 1999. Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance*, 54(6): 2045-2073.
- Cumming, D. 2006a. Adverse selection and capital structure: Evidence from venture capital. *Entrepreneurship Theory and Practice*, 30(2): 155-183.
- Cumming, D., Fleming, G., & Schwienbacher, A. 2005. Liquidity risk and venture capital finance. *Financial Management*, 34(4): 77-105.
- Cumming, D., Fleming, G., & Schwienbacher, A. 2006. Legality and venture capital exits. *Journal of Corporate Finance*, 12(2): 214-245.
- Cumming, D., & Walz, U. 2004. *Private Equity Returns and Disclosure Around the World*. Paper presented at the EFA 2004 Maastricht Meetings Paper No. 4233.

- Cumming, D. J. 2005. Agency costs, institutions, learning, and taxation in venture capital contracting. *Journal of Business Venturing*, 20(5): 573-622.
- Cumming, D. J. 2006b. The determinants of venture capital portfolio size: Empirical evidence. *Journal of Business*, 79(3): 1083-1126.
- De Clercq, D., & Dimov, D. 2004. Explaining venture capital firms' syndication behaviour: a longitudinal study. *Venture Capital*, 6(4): 243-256.
- De Clercq, D., & Dimov, D. 2008a. Internal Knowledge Development and External Knowledge Access in Venture Capital Investment Performance. *Journal of Management Studies*, 45(3): 585-612.
- De Clercq, D., & Dimov, D. Forthcoming. Doing it not alone: Antecedents, Dynamics and Outcomes of Venture Capital Syndication. In D. J. Cumming (Ed.), *Companion to Venture Capital*: Wiley.
- De Clercq, D., Sapienza, H. J., & Zaheer, A. 2008b. Firm and group influences on venture capital firms' involvement in new ventures. *Journal of Management Studies*, 45(7): 1169-1194.
- Dennis, S. A., & Mullineaux, D. J. 2000. Syndicated loans. *Journal of Financial Intermediation*, 9(4): 404-426.
- Dimov, D., & De Clercq, D. 2006. Venture capital investment strategy and portfolio failure rate: A longitudinal study. *Entrepreneurship Theory and Practice*, 30(2): 207-223.
- Dimov, D., & Milanov, H. 2009. The interplay of need and opportunity in venture capital investment syndication. *Journal of Business Venturing*, Forthcoming.
- Dimov, D., Shepherd, D. A., & Sutcliffe, K. M. 2007. Requisite expertise, firm reputation, and status in venture capital investment allocation decisions. *Journal of Business Venturing*: 481-502.
- Du, Q. 2008. Birds of a Feather or Celebrating Differences? The Formation and Impact of Venture Capital Syndication: Sauder School of Business, University of British Columbia.
- Echols, A., & Tsai, W. 2005. Niche and performance: The moderating role of network embeddedness. *Strategic Management Journal*, 26(3): 219-238.
- Eisenhardt, K. M., & Schoonhoven, C. B. 1996. Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *Organization Science*, 7(2): 136-150.
- Elango, B., Fried, V. H., Hisrich, R. D., & Polonchek, A. 1995. How Venture Capital Firms Differ. *Journal of Business Venturing*, 10(2): 157-179.
- Ferrary, M. 2003. The gift exchange in the social networks of Silicon Valley. *California Management Review*, 45(4): 120-138.
- Filatovchev, I., Chahine, S., Wright, M., & Arberk, M. 2005. Founders' characteristics, venture capital syndication and governance in entrepreneurial IPOs. *International Entrepreneurship and Management Journal*, 1: 419-439.
- Filatovchev, I., Wright, M., & Arberk, M. 2006. Venture capitalists, syndication and governance in initial public offerings. *Small Business Economics*, 26(4): 337-350.
- Fleming, G. 2004. Venture capital returns in Australia. *Venture Capital*, 6(1): 23-45.
- Fund, B. R., Pollock, T. G., Baker, T., & Wowak, A. J. 2008. Who's the New Kid? The Process of Developing Centrality in Venture Capitalist Deal Networks. *Network Strategy*, 25: 563-593.
- Gilson, R. J. 2003. Engineering a venture capital market: Lessons from the American experience. *Stanford Law Review*, 55(4): 1067-1103.
- Giot, P., & Schwienbacher, A. 2007. IPOs, trade sales and liquidations: Modelling venture capital exits using survival analysis. *Journal of Banking & Finance*, 31(3): 679-702.
- Grinblatt, M., & Keloharju, M. 2001. How distance, language, and culture influence stockholdings and trades. *Journal of Finance*, 56(3): 1053-1073.
- Guler, I. 2007. Throwing good money after bad? Political and institutional influences on sequential decision making in the venture capital industry. *Administrative Science Quarterly*, 52(2): 248-285.
- Hege, U., Palomino, F., & Schwienbacher, A. 2008. Venture Capital Performance: The Disparity between Europe and the United States: Available at SSRN: <http://ssrn.com/abstract=482322>.
- Hellmann, T. 2002. A theory of strategic venture investing. *Journal of Financial Economics*, 64(2): 285-314.
- Hellmann, T., Lindsey, L., & Puri, M. 2008. Building Relationships Early: Banks in Venture Capital. *Review of Financial Studies*, 21: 513-541.
- Hill, S. A., Maula, M., Birkinshaw, J., & Murray, G. 2009. Transferability of the venture capital model to the corporate context: Implications for the performance of corporate venture units. *Strategic Entrepreneurship Journal*, Forthcoming.
- Hochberg, Y., Ljungqvist, A., & Lu, Y. 2006. Networking as a Barrier to Entry and the Competitive Supply of Venture Capital: Available at SSRN: <http://ssrn.com/abstract=923824>.

- Hochberg, Y. V., Ljungqvist, A., & Lu, Y. 2007. Whom you know matters: Venture capital networks and investment performance. *Journal of Finance*, 62(1): 251-301.
- Hopp, C. 2008. Are firms reluctant to engage in inter-organizational exchange relationships with competitors? *Economics Letters*, 100(3): 348-350.
- Huang, H. Z., & Xu, C. G. 2003. Financial syndication and R&D. *Economics Letters*, 80(2): 141-146.
- Jensen, M. 2003. The role of network resources in market entry: Commercial banks' entry investment banking, 1991-1997. *Administrative Science Quarterly*, 48(3): 466-497.
- Jungwirth, C., & Moog, P. 2004. Closing the Gap or Enlarging the Pool: How Venture Capitalists Differ in Their Syndication Motives: University of Zurich.
- Jääskeläinen, M., & Maula, M. 2009. Do networks of financial intermediaries help reduce local bias? Evidence from cross-border venture capital: Helsinki University of Technology.
- Jääskeläinen, M., Maula, M., & Pynnä, J. 2008. Syndication strategies and financial performance in venture capital: The moderating effect of investor status: Helsinki University of Technology.
- Jääskeläinen, M., Maula, M., & Seppä, T. 2006. Allocation of attention to portfolio companies and the performance of venture capital firms. *Entrepreneurship Theory and Practice*, 30(2): 185-206.
- Kaplan, S. N., & Stromberg, P. 2003. Financial contracting theory meets the real world: An empirical analysis of venture capital contracts. *Review of Economic Studies*, 70(2): 281-315.
- Kaplan, S. N., & Stromberg, P. 2004. Characteristics, contracts, and actions: Evidence from venture capitalist analyses. *Journal of Finance*, 59(5): 2177-2210.
- Keil, T., Maula, M. V. J., & Wilson, C. Forthcoming. Unique resources of corporate venture capitalists as a key to entry into rigid venture capital syndication networks. *Entrepreneurship Theory and Practice*.
- Kogut, B., Urso, P., & Walker, G. 2007. Emergent properties of a new financial market: American venture capital syndication, 1960-2005. *Management Science*, 53(7): 1181-1198.
- Lavie, D. 2007. Alliance portfolios and firm performance: A study of value creation and appropriation in the US software industry. *Strategic Management Journal*, 28(12): 1187-1212.
- Lerner, J. 1994. The Syndication of Venture Capital Investments. *Financial Management*, 23(3): 16-27.
- Lockett, A., & Wright, M. 1999. The syndication of private equity: evidence from the UK. *Venture Capital*, 1(4): 303-324.
- Lockett, A., & Wright, M. 2001. The syndication of venture capital investments. *Omega-International Journal of Management Science*, 29(5): 375-390.
- Macmillan, I. C., Kulow, D. M., & Khojlian, R. 1989. Venture Capitalists Involvement in Their Investments - Extent and Performance. *Journal of Business Venturing*, 4(1): 27-47.
- Makela, M. M., & Maula, M. V. J. 2006. Interorganizational commitment in syndicated cross-border venture capital investments. *Entrepreneurship Theory and Practice*, 30(2): 273-298.
- Makela, M. M., & Maula, M. V. J. 2008. Attracting cross-border venture capital: the role of a local investor. *Entrepreneurship and Regional Development*, 20(3): 237-257.
- Manigart, S., Lockett, A., Meuleman, M., Wright, M., Landstrom, H., Bruining, H., Desbrieres, P., & Hommel, U. 2006. Venture capitalists' decision to syndicate. *Entrepreneurship Theory and Practice*, 30(2): 131-153.
- Mason, C. M., & Harrison, R. T. 2002. Is it worth it? The rates of return from informal venture capital investments. *Journal of Business Venturing*, 17(3): 211-236.
- Maula, M., Keil, T., & Zahra, S. A. 2003. *Corporate venture capital and recognition of technological discontinuities*. Paper presented at the Academy of Management Annual Meeting, Seattle, WA.
- Meuleman, M., Manigart, S., Lockett, A., & Wright, M. 2008. Working with unfamiliar partners: Relational embeddedness and partner selection in private equity syndicates.: Vlerick Gent Leuven Management School.
- Meuleman, M., & Wright, M. 2006. Industry Concentration, Syndication Networks and the Price UK Private Equity Investors Pay to Acquire Buyout Targets: Available at SSRN: <http://ssrn.com/abstract=960420>.
- Meuleman, M., Wright, M., Manigart, S., & Lockett, A. 2009. Private equity syndication: Agency costs, reputation and collaboration. *Journal of Business Finance & Accounting*, Forthcoming.
- Michie, R. C. 1981. Options, Concessions, Syndicates, and the Provision of Venture Capital, 1880-1913. *Business History*, 23(2): 147-164.
- Milanov, H., & Shepherd, D. 2008. *"One Is Known By The Company One Keeps": Imprinting Effects Of A Firm's Network Entry On Its Future Status*. Wellesley, MA: Babson College.
- Mäkelä, M. M., & Maula, M. V. J. 2005. Cross-Border Venture Capital and New Venture Internationalization: An Isomorphism Perspective. *Venture Capital*, 7(3): 227-257.

- Pichler, P., & Wilhelm, W. 2001. A theory of the syndicate: Form follows function. *Journal of Finance*, 56(6): 2237-2264.
- Piskorski, M. J., & Anand, B. 2004. Resource, power and prestige: Formation of structural inequality in social exchange networks: Harvard University.
- Podolny, J. M. 1993. A Status-based Model of Market Competition. *American Journal of Sociology*, 98(4): 829-872.
- Podolny, J. M. 2001. Networks as the pipes and prisms of the market. *American Journal of Sociology*, 107(1): 33-60.
- Sahlman, W. A. 1990. The Structure and Governance of Venture-Capital Organizations. *Journal of Financial Economics*, 27(2): 473-521.
- Sapienza, H. J. 1992. When Do Venture Capitalists Add Value. *Journal of Business Venturing*, 7(1): 9-27.
- Sapienza, H. J., Manigart, S., & Vermier, W. 1996. Venture capitalist governance and value added in four countries. *Journal of Business Venturing*, 11(6): 439-469.
- Schmidt, K. M. 2003. Convertible securities and venture capital finance. *Journal of Finance*, 58(3): 1139-1166.
- Shipilov, A. V., & Li, S. X. 2008. Can you have your cake and eat it too? Structural holes' influence on status accumulation and market performance in collaborative networks. *Administrative Science Quarterly*, 53(1): 73-108.
- Song, W. L. 2004. Competition and coalition among underwriters: The decision to join a syndicate. *Journal of Finance*, 59(5): 2421-2444.
- Sorenson, O., & Stuart, T. 2008. Bringing the Context Back In: Settings and the Search for Syndicate Partners in Venture Capital Investment Networks. *Administrative Science Quarterly*, 53: 266-294.
- Sorenson, O., & Stuart, T. E. 2001. Syndication networks and the spatial distribution of venture capital investments. *American Journal of Sociology*, 106(6): 1546-1588.
- Stuart, T. E. 2000. Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry. *Strategic Management Journal*, 21(8): 791-811.
- Trapido, D. 2007. Competitive embeddedness and the emergence of interfirm cooperation. *Social Forces*, 86(1): 165-191.
- Tykvova, T. 2007. What do economists tell us about venture capital contracts? *Journal of Economic Surveys*, 21(1): 65-89.
- Tykvová, T. 2007. Who chooses whom? Syndication, skills and reputation. *Review of Financial Economics*, 16: 5-28.
- Ueda, M. 2004. Banks versus venture capital: Project evaluation, screening, and expropriation. *Journal of Finance*, 59(2): 601-621.
- Walker, G. 2008. The Rise of Ecommerce as an Epidemic in the Small World of Venture Capital. *Network Strategy*, 25: 3-29.
- Winton, A. 2003. Institutional liquidity needs and the structure of monitored finance. *Review of Financial Studies*, 16(4): 1273-1313.
- Wright, M., & Lockett, A. 2003. The structure and management of alliances: Syndication in the venture capital industry. *Journal of Management Studies*, 40(8): 2073-2102.
- Wright, M., & Robbie, K. 1998. Venture Capital and Private Equity: A Review and Synthesis. *Journal of Business Finance and Accounting*, 25(5-6): 521-570.
- Zider, B. 1998. How venture capital works. *Harvard Business Review*, 76(6): 131-139.