

Five essays on Innovation Management through Venturing and Early Internationalization

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ABSTRACT (DEUTSCH)

EINLEITUNG

Die vorliegende Arbeit zeigt auf, wie etablierte Unternehmen, junge Firmen und eine öffentliche Forschungseinrichtung mit Chancen und Herausforderungen umgehen, die sich aus veränderten Marktbedingungen ergeben. Im Besonderen wird verdeutlicht, wie Venturing Aktivitäten und frühe Internationalisierung diesen Organisationen dabei helfen, diese Marktdynamiken für sich zu nutzen.

Marktdynamiken werden durch den stetigen technologischen Wandel und die Diffusion von Innovationen vorangetrieben, was zu Veränderungen von etablierten aber auch zur Herausbildung neuer Geschäftsmodelle führt. Ein Beispiel, das aktuell sowohl von der Politik, als auch der Fachpresse und Industrie-Experten als marktveränderndes Phänomen diskutiert wird, ist die sogenannte „Vierte industrielle Revolution“. Unter diesem Begriff werden Marktveränderungen subsumiert, die durch die Diffusion von Informations- und Kommunikationstechnologien (IKT) und den allgegenwärtigen Zugang zum Breitbandinternet vorangetrieben werden (EESC, 2015; BMBF, 2015, Berger, 2014). Diese Diffusion führt im Besonderen dazu, dass online und offline Dienste z.B. im Produktionsprozess von Gütern miteinander verschmelzen. So werden beispielsweise Lieferketten und Produktionsprozesse miteinander vernetzt, um Herstellungskosten zu senken und Produktionsprozesse effizienter zu gestalten. Ein weiteres Beispiel ist die Virtualisierung von Netzwerkinfrastrukturen im Telekommunikationsbereich, was ebenfalls zu Kosten- und Effizienzvorteilen führt und neue Geschäftsmodelle ermöglicht.

Schlussendlich sind alle Industriezweige und Marktteilnehmer von diesen Veränderungen betroffen. Im Sinne der Innovationsforschung leistet die vorliegende Arbeit einen Beitrag, weil sie das Verständnis dafür schärft, wie etablierte und neue Firmen sowie auch öffentliche Forschungseinrichtungen mit Marktdynamiken umgehen.

ERGEBNISSE

Ausgehend von der Fragestellung, wie etablierte Unternehmen mit sich ändernden Marktbedingungen umgehen, werde ich mich zunächst auf Corporate Venturing fokussieren. Corporate Venturing beschreibt Aktivitäten von etablierten Unternehmen, externe Firmen stärker an sich zu binden (z.B. durch den Kauf von Firmenanteilen oder die Lizenzierung von Patenten) oder interne Abteilungen auszugründen (z.B. um neue Produkte schneller am Markt zu erproben). Aus der Literatur ist bekannt, dass Corporate Venturing dabei helfen kann, die Innovationsgeschwindigkeit von etablierten Unternehmen zu erhöhen. Darüber hinaus ist es ein Weg, um neue Geschäftschancen zu identifizieren, zu evaluieren und schließlich auszuschöpfen (Shane and Venkataraman, 2000).

In der Innovationsforschung hat sich der sogenannte Spin-Along Approach als konkrete Ausgestaltung des Corporate Venturing Ansatzes etabliert. Es werden dabei internes Corporate Venturing (z.B. das Ausgründen eigener Firmen; genannt Spin-Out/Spin-Off Firmen) und externes Corporate Venturing (z.B. das integrieren externer Unternehmen; genannt Spin-In Firmen) miteinander kombiniert (Klarner et al., 2013; Michl et al., 2012; Rohrbeck et al., 2009).

Dieser kombinierte Ansatz aus Spin-In und Spin-Out Aktivitäten unterstützt die Innovationsfähigkeit und die Wachstumsbestrebungen etablierter Unternehmen (Rohrbeck et al., 2009). Ein Beispiel für verbesserte Innovationsfähigkeit ist ein Szenario, in dem eine kleine Firma ausgegründet wird, um Technologien zu vermarkten, die entweder zu radikal sind oder nicht in die strategische Portfolioplanung der Muttergesellschaft passen. Ein Beispiel für die Wachstumsbestrebungen wäre die Integration von externen Firmen und deren alternativen Geschäftsmodellen.

Obwohl dieser Spezialfall des Corporate Venturings bereits in einigen Firmen angewendet wird (z.B. Cisco (Salona et al., 2000), Philips (Michl et al., 2012) und Deutsche Telekom (Rohrbeck, 2009)), haben sich nur wenige Innovationsforscher mit diesem Thema wissenschaftlich auseinandergesetzt. Drei meiner fünf Papiere füllen diese Lücke in der

Innovationsforschung. Im Folgenden werde ich die zentralen Ergebnisse aller meiner fünf Papiere vorstellen, beginnend mit den Beiträgen, die sich konkret auf den Spin-Along Approach fokussieren.

Erstens wird in Fischer (2015) gezeigt, wie Spin-Along Venturing als Strategie verstanden werden kann, die etablierte Firmen dazu befähigt, Chancen aus Marktveränderungen für sich zu nutzen. Um diesen Weg aufzuzeigen, wird der Adaptive Cycle von Miles et al. (1978) exemplarisch aufgegriffen. Konkret bedeutet das, dass die Spin-Along Strategie dabei hilft, die von Miles et al. (1978) postulierten „generic problems“ (entrepreneurial, engeneering, und administrative problem) aufzulösen. Des Weiteren wird in Fischer (2015) ein neues Modell namens Spin-Along Shell Model eingeführt, um Innovationspraktikern ein Werkzeug in die Hand zu geben, mit dem Spin-Along Firmen um die elterliche Organisation herum positioniert werden können. Das Thema Distanz zwischen Muttergesellschaft und Spin-Along Firma, das ich im Schlussteil meiner Dissertation detailliert behandle, wird hier bereits angeschnitten.

Im zweiten Papier, Mahdjour & Fischer (2015), zeigen wir auf, welche spezifischen Fähigkeiten die zentrale Forschungs- und Entwicklungsabteilung der Deutschen Telekom, Telekom Innovation Laboratories (T-Labs), benötigt, um ein Spin-Along Programm aufzusetzen und fortzuführen. Wir haben 13 Fähigkeiten identifiziert, die drei Ebenen zugeordnet wurden: 1) Fähigkeiten, bezogen auf die richtige Unternehmensumgebung (z.B. die Etablierung einer Unternehmenskultur, die das Unternehmertum fördert), 2) Fähigkeiten, die sich auf den Aufbau des Spin-Along Programms beziehen (z.B. Priorisierung von strategisch wichtigen Spin-Along Firmen), und 3) Fähigkeiten, die nötig sind, um neue Spin-Along Firmen zu entwickeln (z.B. Besetzung von Stellen mit den richtigen Ressourcen).

Im dritten Papier, Mahdjour & Fischer (2014), greifen wir wieder den Fall der T-Labs auf um zu zeigen, dass der Spin-Along Approach um das Thema frühe Internationalisierung erweitert werden kann, um Hürden im Innovationsprozess zu überwinden. In der Studie des Spin-Along Programms der T-Labs ist deutlich geworden, dass einige der Spin-Along Firmen früh nach ihrer Gründung in Märkte vordringen wollten, die nicht dem

Heimatmarkt der Deutschen Telekom, Deutschland, entsprachen. In Mahdjour & Fischer (2014) zeigen wir anhand konkreter fallbezogener Beispiele, welche Gründe es für diese frühe Internationalisierung gab. Zum einen erhoffte sich diese Teilmenge des Spin-Along Portfolios der T-labs weniger Konflikte mit der elterlichen Organisation Deutsche Telekom. Frühe Internationalisierung ist demnach eine Maßnahme, um das Risiko zu minimieren, dass die elterliche Organisation den Betrieb einer Spin-Along Firma aufgrund interner Konflikte zu schnell einstellt. Ein Beispiel, das diese frühe Auflösung begründen könnte, ist die Angst der Muttergesellschaft, dass die Spin-Along Firma Teile des Kerngeschäfts kannibalisiert. Dies wäre kein Problem, wenn solche kannibalisierenden Geschäfte in Märkten etabliert werden, in denen die Muttergesellschaft nicht aktiv ist. Zum anderen zeigen die Ergebnisse der Studie, dass Nicht-Heimatmärkte oftmals andere legale Rahmenbedingungen sowie andere Kundenbedürfnisse aufzeigen, die die Entscheidung zur frühen Internationalisierung begünstigen.

Im vierten Papier dieser Dissertation, Wurster et al. (2014), verlassen wir den Corporate Venturing Bereich und konzentrieren uns auf unabhängige Firmen. Basierend auf der Untersuchung von Unternehmen, die sich früh internationalisiert haben (sogenannte Born Globals), stellen wir ein Erfolgsfaktorenmodell auf. Dieses Modell macht deutlich, dass es für die frühe Internationalisierung wichtig ist, dass das Gründerteam eine einzigartige technische Grundlage braucht, die eine hohe internationale Marktnachfrage bedienen kann. Darüber hinaus müssen Firmen eine hohe Vorlaufzeit gegenüber Wettbewerbern haben, um schnell internationale Marktdominanz zu erlangen.

Das fünfte Papier dieser Dissertation, Fischer et al. (2014), untersucht das Venture Portfolio der Fraunhofer Gesellschaft. Wir haben herausgefunden, dass das Überleben von Fraunhofer's Ausgründungen zum großen Teil davon abhängig ist, ob sich Fraunhofer zu Beginn der Firmengründung beteiligt oder erst zu einem späteren Zeitpunkt als Anteilseigner auftritt. Darüber hinaus wurden weitere Faktoren identifiziert, die das Überleben von Fraunhofer Ventures beeinflussen. Zum einen wirkt das Vorhandensein eines privaten institutionellen Investors positiv auf das Überleben. Zum anderen konnte gezeigt werden, dass es ebenfalls wichtig für das Überleben ist, wenn die ausgegründete

Firma Fraunhofer beauftragt, Forschungsarbeit für das Unternehmen zu leisten. Ein weiterer positiver Faktor ist das Lizenzieren von Fraunhofer Patenten. Im Gegensatz dazu ist der Kauf von Fraunhofer Patenten ein Faktor, der das Überleben negativ beeinflusst.

Im letzten Teil meiner Dissertation stelle ich die wichtigsten Ergebnisse aller Papiere in den Fokus, um ein Modell zu entwickeln, das Faktoren aufzeigt, die die Distanz zwischen Tochter- und Mutterfirma bestimmen. Dimensionen, entlang derer sich diese Distanz ausgestalten lässt, sind das Angebot der Spin-Along Firma, die Herkunft des Teams, der Zielmarkt, die genutzten Assets und der Kommunikationsansatz mit der elterlichen Organisation. Ich weise darüber hinaus darauf hin, dass die Anteilseignerstruktur der Tochterfirma Einfluss darauf hat, welche Partei welchen Einfluss auf die Distanzänderung hat. Meine Dissertation endet mit der Diskussion konkreter Implikationen für Praktiker und Wissenschaftler und zeigt zukünftige Forschungsmöglichkeiten auf.

METHODEN UND DATEN

Die Ergebnisse meiner Dissertation basieren auf qualitativen, quantitativen und konzeptionellen Forschungsmethoden.

In Fischer (2015) wurde konzeptionell die Spin-Along Strategie und das Spin-Along Shell Model erarbeitet. Basis dieser Konzeption war ein ausführlicher Spin-Along und Corporate Venturing bezogener Literaturüberblick, der durch angrenzende und relevante Literatur ergänzt wurde.

In den Papieren Mahdjour & Fischer (2014 und 2015) haben wir unsere Ergebnisse aus qualitativen Interviews mit Führungskräften der T-Labs und der Spin-Along Firmen herausgearbeitet. Darüber hinaus wurden unsere Erkenntnisse durch die Recherche interner Dokumente und die Teilnahme an Workshops durch uns validiert.

Im Papier Wurster et al. (2014) haben wir 22 Firmen interviewt und im Sinne des Grounded Theory Ansatzes ein Erfolgsfaktorenmodell aufgebaut, das Faktoren herausstellt, die für junge Firmen wichtig sind, um durch frühe Internationalisierung globale Marktdominanz zu erreichen.

VIII

Im Papier Fischer et al. (2014) haben wir Fraunhofer's Venture Portfolio quantitativ analysiert. Wir haben mithilfe von Lebensstafeln die Überlebensraten von 106 Firmen über einen Zeitraum von mehr als 10 Jahren verdeutlicht. Um Faktoren zu identifizieren, die das Überleben über die Zeit beeinflussen, haben wir Cox' proportional Hazard Modeling angewendet.

IMPLIKATIONEN

Die Ergebnisse meiner Dissertation haben Implikationen für etablierte Unternehmen, junge Firmen aber auch für öffentliche Forschungseinrichtungen. Teile meiner Resultate passen zur etablierten Literaturmeinung, dass Corporate Venturing eine vielversprechende Maßnahme ist um Forschungsergebnisse besser von einer Innovationseinheit in den Mutterkonzern zu transferieren. Ganz besonders ist das der Fall, wenn der Transfer aufgrund interner Barrieren nicht zustande kommt (Riege, 2007).

Die Resultate zeigen, dass spezifische Fähigkeiten nötig sind, um den Spin-Along Ansatz reibungslos umzusetzen. Darüber hinaus konnte meine Arbeit zeigen, dass sogar neue Herausforderungen, die sich erst im Venturing Prozess ergeben, sich durch frühe Internationalisierung überwinden lassen, besonders wenn die Internationalisierung in Märkten durchgeführt wird in denen die ausgründende Einheit keine Marktpräsenz hat.

Für junge Firmen bedeuten meine Resultate, dass es konkrete Erfolgsfaktoren gibt, die dazu führen können, dass frühe Internationalisierung zur globalen Marktdominanz führen kann. Darüber hinaus hat die Untersuchung des Venture Portfolios der Fraunhofer Gesellschaft gezeigt, dass konkrete Faktoren Einfluss auf die Überlebensraten haben, die sich aus der Beziehung von Ventures mit ihrer Muttergesellschaft ergeben (z.B. Lizensieren von Patenten anstatt diese komplett zu kaufen) aber auch mit externen Firmen (z.B. privaten Investoren als Teilhaber der Fraunhofer Ausgründungen).

Durch die Betrachtung meiner Ergebnisse, die sich aus verschiedenen wissenschaftlichen Papieren subsumieren, habe ich ein Framework aufgestellt, das Faktoren verdeutlicht, die die Distanz zwischen Venture und Muttergesellschaft beeinflussen. Dieses Framework

wurde anhand konkreter Szenarien beschrieben und diskutiert. Das Framework stellt einen Beitrag für Praktiker aber auch für Forscher im Innovationsmanagement dar, die die Venture-Muttergesellschaft-Distanz besser verstehen und bestimmen wollen. Meine Arbeit eröffnet die Möglichkeit weitergehender Forschung in diesem Bereich.

ABSTRACT (ENGLISH)

INTRODUCTION

The thesis at hand shows how incumbent firms, young companies and a publicly funded R&D organization cope with changing environmental conditions. Furthermore, it shows how means of venturing and early internationalization help to overcome challenges and exploit opportunities triggered by these changes. It is necessary to explore this subset of innovation research further because markets are ever changing due to technological advancements and new business models. One illustrating example is the widely discussed and trending phenomenon called “the fourth industrial revolution”. It describes the changing market conditions that come from the growing maturity of Information and Communication Technology (ICT) and the diffusion of the internet (EESC, 2015; BMBF, 2015, Berger, 2014). It especially leads to a further integration of online and offline services in manufacturing processes (e.g. a connected supply and production chain in the automotive sector or the virtualization of network infrastructure of telecommunication providers). This trend affects all industry sectors and brings challenges for established firms but also opportunities for entrepreneurs and start-ups alike.

OVERVIEW OF MAIN RESULTS

Starting with the question of how established firms cope with changing environmental conditions, I take corporate venturing as one approach into account. In fact, corporate venturing can help to increase the innovation speed as well as to identify, evaluate and exploit new business opportunities (Shane and Venkataraman, 2000). Through the observation of companies that combine internal and external corporate venturing, scholars have identified a new concept in the corporate venturing domain: the spin-along approach (Klarner et al., 2013; Michl et al., 2012; Rohrbeck et al., 2009). The spin-along approach describes a firm’s activity of jointly spinning-in and spinning-out ventures in order to achieve innovation (e.g. by spinning out ventures as "alternative paths for innovation that

are non-core or radical") and growth (e.g. by "extending and developing new business" through spinning in new ventures) (Rohrbeck et al., 2009).

Today, only a few scientists have dealt with the spin-along approach, although it is applied in different firms already (e.g. Cisco (Salona et al., 2000), Philips (Michl et al., 2012) as well as Deutsche Telekom (Rohrbeck, 2009)). Three of my five papers deal with the spin-along topic. In the following I will give a short overview of my five papers.

Firstly, in Fischer (2015), I show how spin-along venturing can be understood as a strategic attempt that enables incumbent firms to adapt to changing environmental conditions. By explaining how spin-along activities help firms to master the adaptive cycle of Miles et al. (1978), I conceptualized the spin-along strategy as an extension of the spin-along approach. The newly introduced spin-along strategy helps to solve three generic problems (entrepreneurial, engineering, and administrative) every company faces when trying to adapt to changing environmental conditions. Furthermore, I proposed the spin-along shell model as a tool for practitioners to position a venture portfolio around a parental nucleus.

Secondly, in Mahdjour & Fischer (2015), we describe specific measures that were necessary for Telekom Innovation Laboratories (T-Labs), the central R&D organization of Germany's largest telecommunication operator Deutsche Telekom to implement the spin-along approach. The measures were grouped into 13 organizational capabilities, which are situated on three levels: a) capabilities aiming for a suitable corporate environment for spin-along activities (e.g. the establishment of an entrepreneurial culture), b) capabilities to build a comprehensive spin-along programme (e.g. prioritizing strategically relevant spin-along ventures), and c) capabilities to develop new spin-along ventures (e.g. staffing venture teams appropriately).

Thirdly, while conducting the study on T-Labs' spin-along ventures, it became apparent that a subset of the portfolio had the ambition to internationalize early after inception. Starting a business in non-domestic markets was a promising strategy for these ventures to overcome conflicts with the parental organization. In Mahdjour & Fischer (2014), we show that early internationalization helped T-Labs' ventures to avoid termination by its parent.

This risk of termination was fueled by the fear of Deutsche Telekom getting parts of its own business cannibalized in the domestic market. Furthermore, early internationalization enabled the spin-along ventures to collaborate with competitors of Deutsche Telekom in markets where Deutsche Telekom was not active in. In addition, the paper shows that other non-domestic markets had fewer legal restrictions, which accelerated market success. Finally, the market demands in other non-domestic markets were higher for some spin-along venture offerings – an additional good reason to internationalize early after inception.

Fourthly, in Wurster et al. (2014), we left the corporate venturing domain and concentrated on independent firms. We developed a success factor model for Born Global firms to achieve market dominance. We found out that the most important factors that enable young firms to become market dominators are the founders' exceptional technical assets, a high international market demand/pull and a long lead time.

Fifthly, in Fischer et al. (2014), we found out that the public R&D organization Fraunhofer society should rather not invest in their own spin-off companies from year one onwards, since this has been identified as an influencing factor in decreasing the chance of venture survival. Moreover, we found out that the presence of a privately owned company as a shareholder, as well as paying Fraunhofer for conducting research during the lifecycle of a venture, positively influences its survival rate. In contrast, buying patents from Fraunhofer had a negative effect on survival.

Finally, my paper-based findings enabled me to propose a framework that explains the distance between a parental organization and its spin-along ventures with the help of specific dimensions. Dimensions of the distance construct are the venture's offering, team origin, target market, facilitated assets and communication approach with its parent. I will claim that venture ownership influences the power of each shareholder to configure the distance dimensions. As a final point, the discussion of my thesis will end by emphasizing specific implications of my findings as well as future research directions.

METHODS AND DATA

The results of my thesis are based on qualitative, quantitative and conceptual research methods. First, in Fischer (2015), I conducted an extensive review on spin-along related literature and accompanying research on corporate venturing in order to conceptualize the spin-along strategy and to develop the spin-along shell model.

In Mahdjour & Fischer (2014 and 2015), we conducted qualitative interviews with the executives of T-Labs, as well as with executives from T-Labs' spin-along venture portfolio. Additionally, we studied internal reports and participated in relevant workshops with T-Labs' spin-along ventures to foster our interview-based findings.

In Wurster et al. (2014), we analyzed 22 cases in a qualitative approach, using grounded theory to come up with a success factor model, which states how young companies reach global market dominance through early internationalization.

Finally, in Fischer et al. (2014), we analyzed Fraunhofer's venture portfolio quantitatively. We used life tables to describe the survival rates of 106 spin-off companies. Furthermore, by conducting Cox' proportional hazard modeling, we identified factors that influence the survival rates over a time period of more than 10 years.

IMPLICATIONS

The findings of this thesis have implications for established firms, young companies, and universities or publically funded R&D organizations. Generally, I agree with scholars saying that corporate venturing is a promising measure for transferring R&D results from an innovation unit into the parental organization. This holds especially true when the handover cannot materialize due to internal barriers (Riege, 2007).

My findings have shown that specific capabilities need to be in place to assure a smooth spin-along venturing programme that enables companies to benefit from expected profits of this special corporate venturing practice. I also showed that spin-along venturing may

bring up new challenges, which can be mastered through early internationalization in markets where the parental organization is not active.

My findings also have implications for young companies that want to achieve global market dominance. The success factor model has direct practical implications for entrepreneurs and small business owners alike (e.g. building up sales and marketing cooperation and facilitate a partner's complementary assets early on).

Moreover, the research on Fraunhofer's venturing portfolio gives Fraunhofer executives guidance on when to become a shareholder of their ventures. Furthermore, I give specific guidance stating that the survival rate of Fraunhofer's spin-off companies will increase based on the fostering or avoidance of bilateral relationships (e.g. exchange of patents or conducting contract research)

After observing my paper-based findings from a distance, I propose a framework for configuring the distance between a parental organization and its ventures. I take specific sub findings of each of my papers into account to design this framework and to discuss specific trade-offs that appear when deciding in favor of different configurations in specific scenarios. This framework has implications for practitioners dealing with corporate venturing but also for scientists to get a better understanding of the parent-venture relationship and to further explore this research field in future studies.

PUBLICATION AND SUBMISSION RECORD

ESSAY 1: THE SPIN-ALONG STRATEGY – MASTERING ORGANISATIONAL ADAPTATION THROUGH AN EMERGING CONCEPT OF ENTREPRENEURSHIP THEORY

Abstract of Fischer (2015)

This paper enhances an emerging concept of corporate entrepreneurship theory: the spin-along approach. The spin-along approach depicts a unique method that brings together rudiments of internal and external corporate venturing. By taking the spin-along approach into account, I propose the spin-along strategy to be an alternative strategic attempt for organizations, which aim to adapt to changing environmental conditions. I acknowledge the viewpoint of adaptionistic population ecologists, who claim that although incumbency may lead to structural inertia, larger companies can learn from past experiences and take action to change their organization. I will show how the spin-along strategy enables firms to maneuver through the adaptive cycle postulated by Miles et al. (1978). After defining the spin-along strategy, the paper addresses the issue of distance between a spin-along venture and its parental organization with the help of the newly introduced “Spin-Along Shell Model”. Finally, I derive implications for academia and R&D Management practitioners and open up the discussion for future research directions, which have the potential to sharpen the spin-along strategy further.

Essay 1 is written entirely by me. The paper was presented at the DRUID Conference 2015. Furthermore, I presented the essay at the R&D Management Conference 2014.

Reference:

- Fischer, S. (2015). The spin-along strategy – mastering organisational adaptation through an emerging concept of entrepreneurship theory. Presented at DRUID15, Rome, June 15-17, 2015. Working paper available [here](#).
- Fischer, S. (2014). The spin-along strategy – mastering organisational adaptation through an emerging concept of entrepreneurship theory. Presented at R&D Management Conference, Stuttgart, June 3-6, 2014. Book of abstracts available [here](#).

ESSAY 2: IMPLEMENTING THE SPIN-ALONG APPROACH: A CAPABILITY ANALYSIS OF TELEKOM INNOVATION LABORATORIES' CORPORATE VENTURING PROGRAMME

Abstract of Mahdjour & Fischer (2015)

This paper extends an emerging concept of corporate entrepreneurship theory – the spin-along approach. By implementing the spin-along approach, companies combine the benefits of both internal and external corporate venturing. Our research identifies core capabilities for the successful implementation of a spin-along programme. Our findings are based on an analysis of the spin-along programme of Telekom Innovation Laboratories (T-Labs), the central R&D unit of Deutsche Telekom AG. In a 12-month research project we conducted 19 semi-structured interviews along with participant observation methods to identify 13 core capabilities which represent clusters of good practice measures for implementing the spin-along approach in this organisational context. These capabilities focus on the development of a suitable corporate environment, the setup of a comprehensive spin-along programme and the development of new ventures. Our insights create value for practitioners who want to introduce a spin-along programme in their organisation, and also to business researchers by extending knowledge on the spin-along approach.

Essay 2 is co-authored by Sarah Mahdjour. The paper is published in the International Journal of Technology Marketing. Furthermore, it was presented at the Academy of Management Conference 2014 and the Annual Conference of the Leibniz ScienceCampus MaCCI Mannheim Centre for Competition and Innovation 2014.

Reference:

- Mahdjour, S., & Fischer, S. (2015). Implementing the spin-along approach: a capability analysis of Telekom Innovation Laboratories' corporate venturing programme. *International Journal of Technology Marketing*, 10(2), 160-178. <http://doi.org/10.1504/IJTMKT.2015.068590>
- Mahdjour, S., & Fischer, S. (2014). Implementing the Spin-Along Approach: A Capability Analysis. *Academy of Management Proceedings*, 2014(1), 13315–13315. <http://doi.org/10.5465/AMBPP.2014.13315abstract>
- Mahdjour, S. & Fischer, S. (2014). Implementing the Spin-Along Approach: A Capability Analysis. Presented at Annual Conference of the Leibniz ScienceCampus MaCCI Mannheim Centre for Competition and Innovation, Mannheim, March 14-15, 2014. Program available [here](#).

ESSAY 3: INTERNATIONAL CORPORATE ENTREPRENEURSHIP WITH BORN GLOBAL
SPIN-ALONG VENTURES — A CROSS-CASE ANALYSIS OF TELEKOM INNOVATION
LABORATORIES' VENTURE PORTFOLIO

Abstract of Mahdjour & Fischer (2014)

This study investigates a special kind of corporate ventures, so called spin-along ventures, and their motivations to internationalise early. Insights are built from a multiple case study approach, investigating the spin-along programme of Telekom Innovation Laboratories (T-Labs). Our results show that early internationalisation can avoid or reduce challenges that spin-alongs face when entering the domestic market. Four major motivations for early internationalisation could be identified: (1) avoid termination based on the parent's perceived threat of cannibalisation of existing products, (2) enable a venture's collaboration with competitors, (3) overcome restrictions of parental assets in the domestic market, and (4) address markets that offer greater chances for success than the domestic market does. Based on our findings we derive concrete implications for practitioners and academics in the field of innovation management.

Essay 3 is co-authored by Sarah Mahdjour. The paper is published in the International Journal of Innovation Management in 2014. Furthermore, the paper was presented at 6th ISPIM Innovation Symposium 2013.

Reference:

- Mahdjour, S., & Fischer, S. (2014). International Corporate Entrepreneurship with Born Global Spin-along Ventures — A Cross-Case Analysis of Telekom Innovation Laboratories' Venture Portfolio. *International Journal of Innovation Management*, 18(03), 1440007.
<http://doi.org/10.1142/S1363919614400076>
- Mahdjour, S. & Fischer, S. (2013). Born to be Global: Why Spin-Alongs become Born Globals. *Proceedings of the 6th ISPIM Innovation Symposium, Melbourne, December 08-11, 2013*. ISBN 978-952-265-423-6

ESSAY 4: BORN GLOBAL MARKET DOMINATORS: INSIGHT INTO A UNIQUE CLASS OF YOUNG COMPANIES AND THEIR ENVIRONMENT

Abstract of Wurster et al. (2014)

Issues of dominance in the market place, ‘standards wars’ and ‘battles for dominance’ between large companies are frequently addressed by researchers and the business press alike. The existence of companies that could establish internationally dominant solutions to customers’ problems within a few years after their founding is quite unknown and the reasons for their success are hardly investigated so far. Therefore, they are not covered by traditional stage models for the establishment of dominant solutions. Based on 22 cases and a new success factors model, this article shows how young companies can successfully establish their technologies as dominant solutions in the global market.

Essay 4 is co-authored by Simone Wurster and Knut Blind. The paper is published in the International Journal of IT Standards and Standardization Research. Furthermore, the paper was presented at the 8th International Conference on Standardization and Innovation in Information Technology (SIIT) in 2013

Reference:

- Wurster, S., Blind, K., & Fischer, S. (2014). Born Global Market Dominators: Insight into a Unique Class of Young Companies and Their Environment. International Journal of IT Standards and Standardization Research, 12(1), 1–16.
<http://doi.org/10.4018/ijitsr.2014010101>
- Wurster, S., Blind, K., & Fischer, S. (2013). Born Global standard establishers identification of a new research field and contribution to network theory (pp. 1–12). Presented at 8th International Conference on Standardization and Innovation in Information Technology (SIIT), Sophia-Antipolis, September 24-26, 2013.
<http://doi.org/10.1109/SIIT.2013.6774583>

ESSAY 5: SURVIVAL OF RESEARCH-BASED SPIN-OFF VENTURES - SURVIVAL
ANALYSIS OF THE VENTURE PORTFOLIO OF EUROPE'S LARGEST R&D
ORGANIZATION – THE FRAUNHOFER SOCIETY

Abstract of Fischer et al. (2014):

The paper at hand shows results of the analysis of the spin-off portfolio of Fraunhofer Venture, the corporate venture capitalist of Europe's largest R&D organization, Fraunhofer Society. In order to identify factors that influence the survival and death of Fraunhofer's spin-off companies, we conducted a cox proportional hazard model analysis. We found that ventures which have been funded by Fraunhofer from year 1 onwards are more likely to die than ventures that started independently. Furthermore, our extended Cox model let us assume that the presence of a privately owned company as shareholder during the entire lifetime of a venture has a positive effect on survival. Paying Fraunhofer for doing research and paying license fees additionally influence the survival positively. Ventures that buy Fraunhofer patents face a higher risk of dying.

Essay 5 is co-authored by Sebastian Surma and Knut Blind. The paper was accepted for the DRUID Conference 2015. Furthermore, we presented the paper at 2nd International Conference on the Dynamics of Entrepreneurship at the Centre for European Economic Research (ZEW) in 2014.

Reference:

Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014. Program available [here](#).

INTRODUCTION

My thesis explores the research field of innovation management. More specifically, it concentrates on the two domains venturing and early internationalization. With my thesis I aim to answer the question of how established firms, start-ups and public R&D organizations cope with changing environmental conditions and explore opportunities triggered by market dynamics.

Generally, innovation can be studied from two angles: a macro- and a micro-economical viewpoint. When studying innovation from a macro-economical viewpoint, factors like technological shifts, changes in market structures and legislations are brought into consideration. In contrast, my thesis explores the micro-economical dimension because it investigates specific firms and their activities. More precisely, I will take a look at established companies (Fischer, 2015; Mahdjour & Fischer, 2014; Mahdjour & Fischer, 2015), start-ups (Wurster et al., 2014), and university-based ventures (Fischer et al., 2014).

However, in the following section, I will substantiate the importance of my research from a macro-oriented viewpoint because I like to give non-experts an easy and comprehensive introduction before I make a deep dive into the specifics of each of papers.

What is the current trend that triggers the need for firms to innovate? Reading current publications and statements of official organisations like the European Commission, it becomes noticeable that Europe (and other regions, too) is about to transition into a so-called “fourth industrial revolution” (BMBF, 2015). What sounds like another “trendy catchphrase” at first has become a solid phenomenon promoted by public institutions, market researchers and industry experts alike (see for instance EC (2015) & EC (2014)). What constitutes the “fourth industrial revolution”? It describes the phenomenon of digitalizing industry sectors that have not yet taken advantage of the growing maturity of ICT and the diffusion of the internet (BMBF, 2015). In fact, the impact of the diffusion of digital technologies affects both manufacturing and service industries alike (EESC, 2015).

This current trend is being denominated by scholars, practitioners and media alike by terms like “Digitalisation”, “Internet of Things”, or “Industry 4.0” (BMBF, 2015). To name example outcomes of this phenomenon, other industry experts claim, “Machines will communicate with each other and their users, digitally and in real time. Factory processes will become visible and controllable in virtual space. ICT will dominate future business models” (Berger, 2014). For more examples on how the trend of digitalization affects markets, see Porter & Heppelmann (2014) and Lakhani & Iansiti (2014).

The example of the phenomenon named “fourth industrial revolution” was given to claim that research on innovation is today still relevant. In my thesis, I account for this relevance by investigating innovation management practices of firms that react to these changing market conditions (e.g. triggered by the diffusion of ever-increasing ICT and the internet). Finally, the output of this micro viewpoint can then be measured macro-economically. However, that is not the focus of my dissertation.

The following picture illustrates the research questions of each of my five papers and shows whether the focus lies on venturing, early internationalization, or both.

Five essays on Innovation Management through Venturing and Early Internationalization			
	Research Question	Focus	Method
Fischer (2015)	How can the spin-along approach help companies to overcome structural inertia and adapt to environmental changes?	Venturing (spin-along)	Conceptual/ Literature Review
Mahdjour & Fischer (2015)	Which capabilities are necessary for T-Labs to implement the spin-along approach?	Venturing (spin-along)	Qualitative/ Multi-case study
Mahdjour & Fischer (2014)	What motives did T-Labs' ventures have to internationalise early after inception and what internal barriers could be mitigated?	Venturing & Early Internationalization	Qualitative/ Multi-case study
Wurster et al. (2014)	What success factors are relevant for Born Globals to achieve global market dominance?	Early Internationalization	Qualitative/ Multi-case study
Fischer et al. (2014)	To what extent is the relationship of Fraunhofer's spin-off ventures to Fraunhofer (RQ1) / non-Fraunhofer entities (RQ2) influencing their survival?	Venturing (academic)	Quantitative/ Cox regression

Overcoming structural inertia and efficiently adapting to environmental changes, as for instance driven by the “fourth industrial revolution”, can be achieved by a special means of

corporate venturing, the spin-along approach (Rohrbeck et al., 2009). The spin-along approach describes a firm's activity of jointly spinning-in and spinning-out ventures in order to achieve innovation (e.g. by spinning out ventures as an "alternative path for innovation that are non-core or radical") and growth (e.g. by "extending and developing new business" through spinning in new ventures) (Rohrbeck et al., 2009).

In Fischer (2015), I will highlight the strategic aspect of the spin-along approach. I will answer the research question of how the spin-along approach enables companies to overcome structural inertia and to adapt to changing environmental conditions.

Furthermore, in Mahdjour & Fischer (2015), we will answer the question which capabilities are necessary for T-Labs to implement the spin-along approach.

Moreover, in Mahdjour & Fischer (2014), we will answer the question of what motives T-Labs' ventures had to internationalize early after inception and what internal barriers could be mitigated.

In the fourth paper, Wurster et al. (2014), we leave the venturing domain and concentrate on early internationalization of non-corporate start-ups. We will explore success factors that enable new ventures to achieve global market dominance. It is basically fitting the previously mentioned opportunities entrepreneurs can gain from market dynamics, especially in an increasingly connected and globalized environment.

In the fifth paper, Fischer et al. (2014), we concentrate on the venture portfolio of the Fraunhofer Society. We answer the research question to what extent the relationship of Fraunhofer's spin-off ventures to Fraunhofer itself (research question 1) and non-Fraunhofer entities (research question 2) is influencing their survival.

FROM ORGANISATIONAL ADAPTATION TO THE SPIN-ALONG APPROACH

Coping with uncertain market environments is challenging for every firm. It is an established notion that adapting to changing environmental conditions can be described by the term "strategic management" (Chakravarthy, 1982). For instance, Sanchez et al. (2011)

build on other scholars (Child, 1997; Floyd & Lane, 2000; Miles et al., 1978) and state that "the process of strategy is considered a dynamic process, with adaptation being the key aspect needed to achieve competitive advantage in a long-term perspective". Considering that strategic management is a synonym for adaptation, then the question arises what specific measures can be applied to adapt to the environment in the long-run. One aspect to do so is corporate entrepreneurship, which describes a firm's intention to motivate its employees and to ensure the right conditions for entrepreneurial behaviour with the aim to increase the firm's innovative capacity (Ireland et al. 2009). To conclude, corporate entrepreneurship and strategic management are interrelated (Barringer & Bluedorn, 1999; Burgelman, 1983b). To answer the question of how corporate entrepreneurship helps firms to adapt to changing environmental conditions, one needs to understand the concept better. According to Zahra (1995), "Corporate entrepreneurship consists of a company's innovation, strategic renewal and corporate venturing" (p. 227). This leads to the conclusion that large companies can apply corporate venturing to adapt to new market conditions, which helps to commercialize inventions with the help of innovation units called "corporate ventures" (Burgelman, 1983; Keil, 2004; Sharma & Chrisman, 1999).

A vast amount of literature deals with the topic of corporate venturing, which is a concept that has an internal and external perspective (Burgelman, 1983; Keil, 2001; Miles & Covin, 2002; Keil, 2004). By making it one focus of this dissertation, I want to highlight the fact that corporate venturing is about creating new business entities outside or inside an organisation (Sharma & Chrisman, 1999). External corporate venturing describes the activity of "semi-autonomous or autonomous organizational entities that reside outside the existing organizational domain" (Sharma & Chrisman, 1999, p. 19). Practical measures that fit into the external venturing category are, for instance, joint-venturing, alliances, firm acquisitions and corporate venture capital, which all have the aim to contribute to the long-term performance and growth of larger firms (Kotabe et al., 2002; Lee & Beamish, 1995; Williams & Lee, 2009). On the other hand, internal corporate venturing "refers to the corporate venturing activities that result in the creation of organizational entities that

reside within an existing organizational domain” (Sharma & Chrisman, 1999, p. 20). What distinguishes internal corporate ventures from usual business activities is the higher degree of management sponsorship, which should decrease the dependency on daily business to ensure innovative behaviour of these units.

By facilitating corporate venturing, companies can generally decide whether to spin-out their own companies or to spin-in external firms. The observation of the practical phenomenon of combining spin-in and spin-out activities has been “spin-along approach” (Rohrbeck et al., 2007).

Out of this short literature overview it becomes apparent that corporate venturing has a role to play in corporate entrepreneurship, which is a sub entity of strategic management. Finally, strategic management is a synonym for organisational adaptation. Furthermore, scholars (Klarner et al., 2013; Michl et al., 2012; Rohrbeck et al., 2009) claim that the spin-along approach is a specific measure to conduct corporate venturing. Out of the literature review and supported by findings of this dissertation, I conclude that the spin-along approach has the potential to enable firms to reach organisational adaptation capabilities.

EXPLORING THE STRATEGIC ASPECT OF SPIN-ALONG VENTURING

In Fischer (2015), I conceptualize the spin-along approach towards a spin-along strategy. I argue that spin-along is a concept that should be steered on a strategic level since it has the potential to enable firms to efficiently adapt to changing environmental market conditions and to stay innovative in the long-run. Why is it necessary to explore this concept further? According to Narayanan et al. (2009), corporate venturing research should focus more on theory building. I claim that the same holds true for the spin-along approach. After conducting an intensive literature review, I concluded that the number of scholars working on the topic of spin-along is still scarce (Klarner et al., 2013; Mahdjour & Fischer, 2014, 2015; Michl et al., 2012; Rohrbeck et al., 2009, 2007). Building on the aforementioned measure of adaptation through corporate venturing, I agree with other scholars (Carrier,

1996; Hitt et al., 2001; Narayanan et al., 2009) who claim that corporate venturing (of which I consider the spin-along approach to be an important sub measure) plays an important role to formulate and execute a firm's strategy. In Fischer (2015), I will end my conceptualization with a proposition of a Spin-Along Shell Model as a tool to keep a spin-along venture portfolio managed and be aware of the current distance between venture and parental organisation.

EXPLORING ORGANIZATIONAL CAPABILITIES FOR SPIN-ALONG VENTURING

Theory building and conceptualization of the spin-along approach have been shown to be valid contributions to scientific literature. After I built the groundwork in Fischer (2015), in which I investigated more on real cases, the question arose of what specific capabilities were needed to implement this concept in an organisation.

To address this, in Mahdjour & Fischer (2015), we investigate the capabilities required to establish a spin-along programme at Telekom Innovation Laboratories. There is a need to explore the spin-along capabilities because we believe this integrated approach requires an alternative set of capabilities, compared to companies that only apply either internal or external corporate venturing separately. Overall we pose three research questions: Firstly, the question how the corporation should frame the spin-along programme best; secondly, what capabilities are required for a sustainable spin-along programme; and thirdly, what are the capabilities for the successful development of spin-along ventures from inception to market success.

EXPLORING EARLY INTERNATIONALIZATION AS AN INFLUENCING FACTOR FOR SPIN-ALONG VENTURING

A key characteristic of the spin-along approach is the maintenance of a relevant stake in spin-along ventures (e.g. through keeping ownership of shares or key assets). Further, these spin-along ventures are constantly kept at a certain distance to regularly decide whether to

spin them off fully or to reintegrate them into the corporation again. In Mahdjour & Fischer (2014), we highlight that this link between a corporate parent and its ventures has the potential to trigger challenges that can be mitigated through early internationalization of these ventures. The concept of early internationalization has been described by scholars in the past under the terms “Born Globals” (Knight & Cavusgil, 1996) or “international new ventures” (Oviatt & McDougall, 1994). I additionally focused on this perspective in Wurster et al. (2014), which I will describe in the next paragraph. However, a first attempt to link one aspect of corporate venturing (internal corporate venturing) and Born Global research was done by Callaway (2008). Callaway (2008) suggested that there is still room for further research on the interrelationship between Born Global and corporate venturing research. In Mahdjour & Fischer (2014), we addressed his proposal by showing how early internationalisation supported the spin-along activities of Telekom Innovation Laboratories.

REACHING GLOBAL MARKET DOMINANCE THROUGH EARLY INTERNATIONALISATION

In the previous paragraph I highlighted the idea of linking the spin-along approach with Born Global research. This paragraph describes the ambition of my fourth paper, Wurster et al. (2014), which takes early internationalization into account for independent young firms to achieve global market dominance. Scholars claim that market dynamics trigger technological selection processes, which result in dominant designs (Clark, 1985; Suarez & Utterback, 1995; Utterback, 1994; Suarez, 2004; Scott, 1994). Examples for dominant designs are the IBM PC, the Microsoft Windows operating system and Sony’s Playstation (see e.g. Suarez, 2004 and van de Kaa, 2009). In Wurster et al. (2014), we will answer the question of what factors influence the successful establishment of a dominant design by Born Global companies. Furthermore, the paper will illustrate characteristics of suitable markets and factors that enable companies to maintain a dominant market position and to stay successful in the long-run.

EXPLORING INFLUENCING FACTORS FOR THE SURVIVAL OF RESEARCH-BASED VENTURES

Measures of corporate venturing can be applied by academic R&D organizations, too. Similar to established firms, universities seek ways to commercialize their research findings, such as through licensing out intellectual property rights or by spinning out new ventures. University ventures are claimed to be a “mechanism” by which governments seek to generate an economic impact from their R&D by transferring technology from the R&D function to a commercial organization” (Roberts & Malone, 1995). A vast amount of literature about the spin-off process from universities into the market domain has emerged by mostly investigating the situation in non-European regions. In Fischer et al. (2014), we agree with scholars that the situation in Europe differs (Rothaermel et al., 2007) and thereby an analysis of this region is a promising research field. With the aim of taking a closer look at the European spin-off process, we investigate the situation in Germany by analyzing the spin-off company portfolio of the Fraunhofer Society, which is one of the four big research organizations in Germany. We believe that the identification of these factors will enable Fraunhofer to optimize their venturing activities.

APPLIED RESEARCH METHODS

My thesis consists of five papers that applied quantitative, qualitative and conceptual research methods.

Firstly, in Fischer (2015), I contributed to the spin-along literature by conceptualizing the spin-along strategy based on an extensive literature review. The literature review enabled me to propose the spin-along strategy as an alternative way to master the adaptive cycle of Miles et al. (1978).

Secondly, in Mahdjour & Fischer (2015), we applied an inductive, qualitative approach to come up with organizational capabilities necessary to implement the spin-along approach at Telekom Innovation Laboratories (T-Labs). We conducted interviews with executives

from spin-along ventures and T-Labs. The cross-case analysis of the spin-along ventures and a deep investigation of the needs of T-Labs have helped to propose capabilities for a structured spin-along programme. As a result of being part of the observed organization ourselves, we were able to benefit from practitioner research principles, which gave us the chance to get richer insights from accessing internal reports, from taking part in workshops and doing project work for several ventures.

Thirdly, in Mahdjour & Fischer (2014), we analysed the motives of five of T-Labs' spin-along ventures to internationalize early after inception. We tried to answer the question of how exactly early internationalization might help to overcome internal barriers in the venturing process. Again, a multiple case study approach was applied since the rather complex questions of "how" and "why" were tackled (as proposed in Yin (2009)).

Fourthly, in Wurster et al. (2014), we again applied a qualitative research approach that builds on a multi-case analysis. Furthermore, the study builds on interviews with start-ups to develop the success factor model. Grounded theory was applied, which means a qualitative text analysis was conducted to identify similarities in the investigated companies' histories.

Fifthly, in Fischer et al. (2014), we quantitatively analysed the venture portfolio of the Fraunhofer Society. On a sample of 106 firms, we applied two basic research methods. Firstly, life tables helped to give descriptive information about the sample development over time, specifically the risk of hazard for each period of observation. Secondly, influencing factors of firm survival were extracted through Cox's proportional hazard modeling. The Cox model is a valid tool when the dependent variable (in this case, firm survival) is not equally distributed and the need to account for censoring (firms which leave the sample during the observation period) exists.

1. THE SPIN-ALONG STRATEGY

MASTERING ORGANISATIONAL ADAPTATION THROUGH AN EMERGING CONCEPT OF ENTREPRENEURSHIP THEORY

This paper enhances an emerging concept of corporate entrepreneurship theory: the spin-along approach. The spin-along approach depicts a unique method that brings together rudiments of internal and external corporate venturing. By taking the spin-along approach into account, I propose the spin-along strategy to be an alternative strategic attempt for organizations, which aim to adapt to changing environmental conditions. I acknowledge the viewpoint of adaptionistic population ecologists, who claim that although incumbency may lead to structural inertia, larger companies can learn from past experiences and take action to change their organization. I will show how the spin-along strategy enables firms to maneuver through the adaptive cycle postulated by Miles et al. (1978). After defining the spin-along strategy, the paper addresses the issue of distance between a spin-along venture and its parental organization with the help of the newly introduced “Spin-Along Shell Model”. Finally, I derive implications for academia and R&D Management practitioners and open up the discussion for future research directions, which have the potential to sharpen the spin-along strategy further.

INTRODUCTION

THE PRACTITIONER’S VIEW: INCUMBENT’S CURSE

Large companies face challenges related to increasing the efficiency of their current business while exploiting new business opportunities to survive in the long run. This phenomenon is called the “incumbent’s curse.” As described by Tellis and Chandy (2000), incumbency paralyzes firms because their outstanding resource and capability base does not necessarily lead to a comprehensive exploitation of their opportunities. The competitive

advantage of incumbency should theoretically enable firms to change their shape by following internal (e.g., own R&D, new product development) and external (e.g., joint ventures, venture capital investments, mergers and acquisitions) innovation strategies (Burgelman, 1983a; Chesbrough, 2000; Lichtenthaler and Ernst, 2006; Miles and Covin, 2002; Roberts and Berry, 1985). However, as population ecologists argue "there are very strong inertial pressures on structure arising from both internal arrangements (for example, internal politics) and from the environment (for example, public legitimization of organizational activity)" (Hannan and Freeman, 1984, 1977, p. 957), which leads to the curse of incumbency.

THE ACADEMIC VIEW: STRUCTURAL INERTIA

This leads to the question how incumbent firms can overcome their structural inertia and change their organizations to better adapt to environmental changes. To answer this question, I highlight Van de Ven and Poole (1995), who proposed four groups of organizational change theories: life-cycle, evolutionary, teleological and dialectical theories. Life-cycle and evolutionary theories describe organizational change as a process that builds on past events; options for change can be determined as a matter of probability (first-order change). In contrast, the latter two groups of theories describe organizational change as an ever-destructing process which does not build on the past, but on emerging events that change the goal setting for an organization's future (second-order-change).

The theory of population ecology is stronger related to the evolutionary theory category and focuses on groups of organizations ("population") and investigates death and birth rates of populations as well as the interaction and comparison of different populations within the same or different environments (Hannan, 1989).

Population ecology scholars argue about two different explanations for firm survival: selection and adaptation (Aldrich and Pfeffer, 1976; Astley and de Ven, 1983; Hannan and Freeman, 1977). They argue that the difference between selection and adaptation relates to

the unit of analysis (Aldrich and Pfeffer, 1976; Hannan and Freeman, 1977). In the “selection viewpoint,” vital rates within populations change not because organizations purposefully change themselves, but because new organizations emerge that are better adapted to changing environmental conditions and outperform established and inert firms. Within this viewpoint organizations face a high level of structural inertia (described as incumbent’s curse above), which hinders them to change at all.

In contrast, the “adaptation viewpoint” acknowledges an organization’s ability to adapt to environmental changes and overcome structural inertia by learning from past experiences (Cyert, 1992; Levitt and March, 1988; Miles et al., 1978). Nevertheless, an increasing presence of structural inertia decreases the influencing power of adaptation towards selection. Hannan and Freeman (1977) argue that “a complete theory of organization and environment would have to consider both adaptation and selection” (p. 930), meaning that the duality between adaptation and selection is considered to frame the discussion of organizational change.

RESEARCH STRATEGY

In the paper at hand I take the viewpoint of adaptation – I investigate how (especially large, incumbent) companies can overcome structural inertia with an emerging measure of corporate venturing – the spin-along approach. Due to the increasing amount of empirical work on the spin-along phenomenon (Klarner et al., 2013; Mahdjour & Fischer, 2015, 2014; Michl et al., 2012; Rohrbeck et al., 2009, 2007; Salona et al., 2000), I agree to the necessity to conceptualize it further. To address this need, I am going to describe the spin-along approach as an alternative strategy to master the cycle of adaptation (Miles et al., 1978). Having done so, I will argue that a spin-along strategy, which incorporates the basic approach of “spinning-along” corporate ventures, shall be understood as an integrative part of corporate strategy. I will further propose the “Spin-Along Shell Model” as a tool to understand the distance between a parental organization and its ventures better.

OVERVIEW OF RELEVANT THEORETICAL CONCEPTS

In the following, I will deduct a chain of concepts relevant for this paper. I will link the concepts of adaptation, strategy, corporate entrepreneurship, corporate venturing and the spin-along approach.

Firstly, by incorporating other scholars (Child, 1997; Floyd and Lane, 2000; Miles et al., 1978), Sánchez et al. (2011) argue "the process of strategy is considered a dynamic process, with adaptation being the key aspect needed to achieve competitive advantage in a long-term perspective" (p. 15). Therefore, adaptation can be understood as a metaphor for Strategic Management (Chakravarthy, 1982).

Secondly, corporate entrepreneurship describes a firm's ambition to nurture entrepreneurial behavior within its organization to increase its innovative capacity (Ireland et al., 2009).

Scholars argue that strategic management and corporate entrepreneurship are related to each other (Barringer and Bluedorn, 1999; Burgelman, 1983b). Barringer and Bluedorn's quantitative analysis showed evidence that corporate entrepreneurship is positively influenced by strategic management practices like scanning intensity, planning flexibility, planning horizon, locus of planning, and control attributes (Barringer and Bluedorn, 1999).

In addition, Zahra (1995) argues that "corporate entrepreneurship consists of a company's innovation, strategic renewal and corporate venturing" (p. 227). What are these three components in a nutshell?

First, an innovation is a new product or service, which is commercialized in a new or existing market. A company becomes innovative when financial and human resources are allocated for innovative projects, and the company will stay that way if this innovation infrastructure can be maintained (Narayanan et al., 2009).

Second, strategic renewal is strongly linked with organizational change, and deals with the process of companies that change their competitive profile, meaning they renew their way of doing business strategically (Narayanan et al., 2009).

The third aspect of corporate entrepreneurship, corporate venturing, is about creating new business inside or outside an organization (Sharma and Chrisman, 1999).

Narayanan et al. (2009) argue that these three components are strongly interlinked, for instance, “innovation could induce renewal” (p. 59). Though similarities between the three components exist, I underline that corporate venturing specifically focuses on the creation and integration of new business.

Within the corporate venturing domain, the spin-along approach is an emerging concept that combines internal and external corporate venturing (Rohrbeck et al., 2007). If the units of analysis are “semi-autonomous or autonomous organizational entities that reside outside the existing organizational domain” (Sharma and Chrisman, 1999, p. 19), then external corporate venturing is meant. Terms in the external venturing domain are for instance joint-venturing, alliances, and firm acquisitions. They all contribute to the long-term performance and growth of larger firms (Kotabe et al., 2002; Lee and Beamish, 1995; Williams and Lee, 2009).

In contrast, internal corporate venturing “refers to the corporate venturing activities that result in the creation of organizational entities that reside within an existing organizational domain” (Sharma and Chrisman, 1999, p. 20). Internal corporate venturing units usually have higher management sponsorship compared to regular business activities, which enables them to act as if they were independent business units.

It becomes clear that the differentiation between these two viewpoints of corporate venturing is rather an either-or perspective: either the venture stays outside or inside the corporate parent. The spin-along approach acknowledges an integrated viewpoint, which is taken by many companies and aims to merge both perspectives (Rohrbeck et al., 2009).

By building on the groundwork of Rohrbeck et al. (2009, 2007), Mahdjour & Fischer (2014) defined the spin-along approach as an organizational means to “build on ideas or R&D results to spin out new ventures as ‘innovation speedboats’ to reduce barriers within the internal innovation process” (p. 2). Furthermore, they underline that “at the core of the spin-along approach is the maintenance of a relevant stake in the new ventures (e.g., via ownership of shares or key assets) to flexibly decide whether to spin them in or off in the future” (p. 2).

RESEARCH GOAL

The academic field of entrepreneurship faces an increased challenge to build and test theory (Zahra, 2007). More specifically Narayanan et al. (2009) argue that corporate venturing research would “benefit greatly from giving more attention to theory building” (p. 69).

Specifically the spin-along approach has recently been addressed by an increasing number of papers; although the total number of scholars dealing with the topic is still scarce (Klarner et al., 2013; Mahdjour & Fischer, 2015, 2014; Michl et al., 2012; Rohrbeck et al., 2009, 2007). I agree with the perception that theoretical and conceptual work is needed to understand the spin-along approach better, especially because they have been applied successfully by different firms such as Cisco (Salona et al., 2000), Philips (Michl et al., 2012) as well as Deutsche Telekom (Mahdjour & Fischer, 2015, 2014; Michl et al., 2012).

As of today, non-financial effects of corporate venturing, e.g., strategic benefits, are under-investigated in scientific literature (Narayanan et al., 2009). As a matter of fact, Ireland et al. (2001) claim that corporate venturing contributes to the corporate strategy of a firm, by building up new capabilities and businesses leading to renewal of the firm, fostering of strategic change and enhancements in profit margins and growth (Narayanan et al., 2009; Zahra and Hayton, 2008). Especially in high technology industries, corporate venturing is an important component of corporate strategy (Narayanan et al., 2009).

The goal of this paper is to conceptualize the spin-along strategy as an alternative way to master the cycle of adaptation. I agree with scholars who state that corporate venturing (and by that the spin-along approach, too) is an important element of corporate strategy (Carrier, 1996; Hitt et al., 2001; Narayanan et al., 2009).

OVERVIEW OF SPIN-ALONG LITERATURE

Rohrbeck et al. (2007) introduced the spin-along approach first, after building on observations from Cisco (Salona et al., 2000) and Deutsche Telekom. They claimed that managerial literature missed an integrated perspective of spin-in and spin-out venturing activities. Subsequently other scholars built on their general idea and enriched the concept (Klarner et al., 2013; Mahdjour & Fischer, 2015, 2014; Michl et al., 2012; Rohrbeck et al., 2009). The following paragraphs will give a brief overview of this research field.

In their two contributions, Rohrbeck et al. (2009, 2007) argue that spin-out activities have two goals: firstly, commercialize R&D results that could not be transferred to an internal business unit and secondly, externalize business that is no longer part of a firm's core business, and where it is expected that the costs of running these activities can be reduced, and business with competitors is possible. In contrast, spin-in activities aim to (completely or partly) internalize external organizational entities to acquire their technological and market know how (Maula et al., 2005).

The spin-along approach is defined as a combination of spin-in and spin-out activities (and in a greater sense a combination of internal and external corporate venturing). It enables firms to find "alternative paths for radical and non-core innovations" and promote business model innovation; innovate "in areas with little synergy with existing business" and innovate closer to the market" (Rohrbeck et al., 2009, p. 48).

Originally, the spin-along approach was framed from the viewpoint of an R&D unit. Therefore, the early understanding of the concept focused on the commercialization of R&D

results with the help of spin-out companies outside the parental firm. Key to this understanding is the maintenance of a certain linkage between parent and venture to keep the door open to re-integrate the spin-along venture later on (Rohrbeck et al., 2009).

Michl et al. (2012) applied the spin-along approach to the concept of ambidexterity. The authors analyzed four cases and defined the spin-along approach as a process, which enables exploitation and exploration capabilities of an ambidextrous organization. The linkage between ambidexterity and corporate venturing has previously been emphasized by Williams & Lee (2009), who called ambidexterity “the learning perspective” of corporate venturing.

Klarner et al. (2013) understand the spin-along approach as a measure to attract, retain and nurture high-performing entrepreneurial-oriented employees. Companies that apply the spin-along approach offer their employees an opportunity to realize own ideas. At the same time, these very employees are in a situation with both high flexibility and high security (“flexicurity”).

Furthermore, Mahdjour & Fischer (2014) linked the spin-along approach with international entrepreneurship theory. They revealed that even spin-along ventures could face too high of internal barriers, even though the basic idea was to build them free from barriers. To overcome those barriers, internationalization into markets where the parental company has only a little or no footprint at all, was proposed as a mitigating strategy. As a result, Mahdjour & Fischer (2014) “suggest that if corporates do not accept that their new ventures cannibalize own business models, engage in business with competitors or may require key parental assets, early internationalization can be an attractive new direction when spinning-out new ventures successfully” (p. 2).

Moreover, in their case study of 10 spin-along ventures of Telekom Innovation Laboratories (T-Labs), Mahdjour & Fischer (2015) identified capabilities and “good practice” measures necessary to implement the spin-along approach with the help of a dedicated spin-along programme. They state, that “the successful implementation of a spin-along programme at

T-Labs required a corporate environment which encouraged entrepreneurial activity, a spin-along programme that generated, managed and guided spin-alongs, and new ventures that were developed with a customer and business orientation and with sufficient access to parental assets” (p. 7). Out of a set of 13 core capabilities and 43 “good practice” measures, Mahdjour & Fischer (2015) specifically highlighted the following capabilities: firstly, management of internal conflicts of interest. In the T-Labs case, this conflict management capability is related to the fact that spin-along ventures challenge established processes of the parental firm and organizational sub-units. Secondly, the access to parental assets and shared services is an important capability of a spin-along programme management.

As I will point out later, the degree of distance between a spin-along venture and its parental unit, which Mahdjour & Fischer (2015) refer to as “post-launch-relationship,” is an important aspect and can be altered by granting or refusing access to parental services or assets.

TOWARDS THE SPIN-ALONG STRATEGY FOR ORGANIZATIONAL ADAPTATION

The previous section gave an overview of past research on the spin-along approach. Since I deducted the spin-along approach to be a measure of organizational adaptation (which itself is a metaphor for strategic management that influences corporate entrepreneurship, which embodies corporate venturing), I will now briefly introduce the adaptive cycle of Miles et al. (1978) and describe their four strategic organizational types in order to propose the spin-along strategy as an alternative.

THE CYCLE OF ADAPTATION

As pointed out by Drejer (2002) and in line with the prior given introduction of population ecology, the adaptive cycle (Miles et al., 1978) is based on three assumptions: First, “organizations can act to create (or choose) their environment”; second, “management’s

strategic choices shape the organization's structure and processes"; and third, "once chosen, structure and process constraints strategy" (Drejer, 2002, p. 87). Furthermore, a company's top management needs to decide on balancing modes to adapt to environmental changes and its decisions how to adapt refer to the "product-market domain, production and distribution technologies, and administrative structure and processes" (Drejer, 2002, p. 87).

The adaptive cycle consists of three problems that every company faces: the entrepreneurial problem, the engineering problem, and the administrative problem. Although these problems do not occur subsequently, but rather simultaneously instead, for the matter of comprehensiveness, the three aspects are described consecutively in the following.

ENTREPRENEURIAL PROBLEM

The first phase of the adaptive cycle, the entrepreneurial problem, is inherent in all organizations, but most visible in smaller and fast growing firms, or firms that face a radical change because they need to overcome a major crisis. Especially in new organizations, the first challenge is to claim the organizational domain. This domain is characterized by the good or service a company intends to offer to a specific target market or market segment. The trigger for this is the so-called "entrepreneurial insight," which naturally is defined only roughly and linked with a high degree of uncertainty. To solve the entrepreneurial problem, a firm's management needs to identify the specific organizational domain (product-market combination) and decide to invest resources to conquer this domain. After this decision phase, objectives are formulated to aim for the new domain and to (re)develop the organizational shape (internally and externally). In mature firms, this very issue is just one part of the entrepreneurial problem. Here, an additional challenge is present: due to the fact that mature firms already have solutions to the engineering and administrative problem, the recognition of entrepreneurial insights and a subsequent reaction to that is harder. This structural inertia increases with age and size of a firm. Established firms tend to focus more on efficiency enhancements rather than in doing new

things. Miles et al. (1978) claim, that although the solution of the entrepreneurial problem stays a top-management challenge, new opportunities have to be recognized by lower management levels (Bower, 1970).

ENGINEERING PROBLEM

After organizations have selected a new organizational domain, decided to put resources into it and started to reshape the own firm, the need arises to create a system which “operationalizes management’s solution to the entrepreneurial problem” (Miles et al., 1978, p. 549). This issue of operationalization via the creation of a system is called the “Engineering Problem.” The engineering problem is constituted by the top management’s need to have a system in place that produces and distributes the earlier defined new products and services. The system also enables the linkage of new information, communication, and control. Miles et al. (1978) argue that the system, which is created to solve the engineering problem, can change over time, while the administrative problem is tackled.

ADMINISTRATIVE PROBLEM

The administrative problem describes the need for organizations to reduce the uncertainty of the new entrepreneurial domain and to optimize the administrative system, which has been shaped during the engineering phase. Miles et al. (1978) argue that it is about “rationalizing and stabilizing those activities that successfully solved problems faced by the organization during the entrepreneurial and engineering phases” (p. 549). They put a stronger emphasis on the fact that the administrative problem is not just about rationalizing the system that has already been developed to reduce uncertainty. More specifically, they argue that management needs to transform the organizational processes in a way that the firm can continue to evolve and stay innovative over time. According to

Miles et al. (1978), this resolution of the administrative problem is vital for the whole cycle of adaptation.

Due to this pivotal character of the administrative problem, the emphasis lies on rationalization and articulation of this very concept: An organization should aim for an administrative system (processes and organizational structure of the firm), which helps to efficiently direct and monitor current activities while also being flexible enough to manage future (innovative) activities. This duality of the administrative system is characterized as the lagging and the leading variable in the adaptation cycle. The lagging variable describes the aim of appropriate structures and processes to achieve the prior composed strategic goals. At the same time, the leading variable is the other side of an administrative system that enables the organization to adapt to new entrepreneurial triggers. All in all, the administrative system needs to have the capacity to flexibly support a firm's management to maneuver through new organizational paths.

FOUR STRATEGIC TYPES OF ADAPTATION

In the following, I will very briefly highlight the four strategic types, which are proposed by Miles et al. (1978) in order to argue for the spin-along strategy as an alternative ("hybrid") method, which incorporates aspects of the four strategic types.

Firstly, a "Defender" is described as an organization, which has control over a rather narrow product portfolio in a small market, where the firm has a strong position. This narrow market domain and strong position require very little adjustments of their technology, structure and methods (Drejer, 2002). The Defender primarily aims at improving the efficiency of ongoing operations.

Secondly, a "Prospector" is an organization, which engages in a pro-active process of scanning the environment for new business opportunities. The intention is to try out new things to respond to emerging opportunities. Furthermore, Prospectors have the ability to set trends and create uncertainty in a market, which forces competitors to react to their

pro-active behavior. With this in mind, it becomes clear that efficiency is not the focus of a Prospector. Moreover, Prospectors are keen to take risks and to encourage their employees to do risky things without needing to fear punishment. As Miller and Friesen (1978) pointed out, these companies can be found in rather competitive environments (Drejer, 2002).

Thirdly, “Analyzers” are positioned between Defenders and Prospectors. Analyzers can concentrate on both, stable ongoing business and changing operations. They tend to improve efficiency in their stable business domain with well-defined processes and structures. For the more changing business domain, Analyzers carefully observe competitors and adapt to their behavior efficiently. As a matter of fact, they enter new business domains only if they are close to their core business. The challenge for these firms’ top-management is to manage both: exploitation and exploration aspects. Today this challenge is researched under the broader umbrella of organizational ambidexterity (O’Reilly and Tushman, 2008).

The last strategic type (“Reactors”) reflects organizations that fail to adapt to environmental changes at all. They lack an efficient strategy-structure relationship and avoid changes in their organizations until the environment forces them to implement them. In the long run, either these companies need to become one of the other strategic types, or they will not survive (Drejer, 2002; Miles et al., 1978).

A NEW STRATEGY FOR ORGANIZATIONAL ADAPTATION: THE SPIN-ALONG STRATEGY

I acknowledge the strategic typology of Miles et al. (1978) by linking their ground work with an emerging concept of corporate venturing: the spin-along approach. My goal is to show that the basic idea of spinning out new ventures to assess a later reintegration (and the other way around) can be understood as a strategic intent to solve the three problems of organizational adaptation. With my analysis, I do not attempt to replace any of the

typologies of Miles et al. (1978). Instead, my contribution should be understood as an alternative strategic maneuver. After my reasoning, I will give a definition of the spin-along strategy and position it as a hybrid method to master organizational adaptation.

Entrepreneurial problem	Explore a new product-market domain: <ul style="list-style-type: none"> • Spread the risk of exploiting new entrepreneurial insights via various spin-along ventures (“speed boats”) that facilitate organizational change through learning mechanisms towards the parental organization • Disperse the identification of new entrepreneurial insights via the spin-along ventures’ teams
Engineering problem	Provide a system for new domains: <ul style="list-style-type: none"> • Define a flexible spin-along pool that enables spinning-in and spinning-out activities
Administrative problem	Reduce uncertainty of the system that was set up for new domains: <ul style="list-style-type: none"> • Implement proper management capabilities to guide the strategic direction of the spin-along pool (e.g., by a market driven R&D and technological foresight) • Regularly adjust distance between parent and spin-along ventures to account for the lagging variable of the administrative system and concentrate on efficiency • Ensure regular flow of new input factors to nurture the spin-along pool and account for the leading variable of the administrative system • Ensure compatibility of administrative systems between parent and its ventures

Table 1: Addressing the three problems of the adaptive cycle with the spin-along strategy

THE SPIN-ALONG APPROACH AND THE ENTREPRENEURIAL PROBLEM

As previously stated, established companies face the challenge to change their existing solutions to the engineering and administrative problem. The spin-along approach tries to overcome this inertia (respectively the incumbent's curse); therefore, it addresses the part of the entrepreneurial problem that especially established organizations face. To solve the issue of reshaping the product-market domain, the spin-along approach helps incumbents to react to the entrepreneurial trigger in a lean way. As pointed out by Miles et al. (1978),

managers need to decide which domain to put resources in. However, the spin-along approach helps to spread the risk by engaging in more than one domain at once. As shown by Mahdjour & Fischer (2015), a company may spread risks and react to more than one entrepreneurial insight at once by spinning-along more than one venture at once. By spinning-out new ventures, an organization's management can experiment in which new organizational domain it should engage in the future. It can spread risks with the help of different parallel "speed boats" (Mahdjour & Fischer, 2015) instead of maneuvering the whole company into an uncertain direction.

Moreover, the linkage between a parental organization and its ventures ensures a flow of information and shared market insights. Parents learn from their ventures and the other way around. Therefore, the spin-along approach helps organizations to reshape. Also, the lower employee level (e.g., the spin-along venture's management) is put in the position to grasp new business opportunities and become the moderator between the parental firm and new emerging entrepreneurial insights and opportunities.

THE SPIN-ALONG APPROACH AND THE ENGINEERING PROBLEM

The next phase starts with an organization that decided to spin-out new ventures and kept them at a distance over time (spinning them along). To operationalize "management's solution to the entrepreneurial problem" (Miles et al., 1978, p. 549) the parental firm has to engineer a system that is able to manage a pool of spin-along ventures (as proposed by Mahdjour & Fischer (2015)) and ensures an efficient bi-directional transfer of knowledge and assets. Furthermore, in line with Miles et al. (1978), the system needs to be flexible to react to both modes of spinning out and spinning in ventures, which reside in a spin-along pool. The system must give management guidance to assess the strategic direction of the spin-along pool and the degree of distance of each venture towards the parent. This fits the ambition of a system emphasized earlier, which enables the linkage of new information, communication, and control (Miles et al., 1978).

THE SPIN-ALONG APPROACH AND THE ADMINISTRATIVE PROBLEM

After solving the entrepreneurial and engineering problem, companies need to reduce the uncertainty of the new entrepreneurial domain. They need to overcome problems that occurred while the entrepreneurial insight was been tackled. Furthermore, the need exists to transform the organization toward the new market domain. The spin-along approach changes the organizational structure already when a company starts to do venturing by initializing a spin-along programme for example.

Furthermore, the administrative system needs to ensure that not just the inside-out perspective (the stage where an entrepreneurial opportunity is investigated with the help of spinning out new ventures), but also the outside-in perspective (where it is about decreasing the distance towards the parent or to (re)integrate a spin-along venture). I claim that the duality of spinning-out and spinning-in can be compared to the duality of the lagging and leading variable of the administrative problem. As I argued previously, lagging and leading can be referred to organizational ambidexterity, which other scholars showed to be achievable with the spin-along approach (Michl et al., 2012).

The lagging variable of the spin-along approach is reflected by a spin-along programme, which embodies spin-along capabilities (Mahdjour & Fischer, 2015), aims for efficiency (e.g., by a cross-venture synergy assessment), seeks for good ideas as input factors and ensures proper knowledge and technology transfer between venture and parent. As a matter of fact, this programme (understood as the administrative system) needs to manage the distance between a parental organization and its spin-along ventures. Since spin-along ventures pass through the cycle of adaptation themselves, both systems of administration (of parent and spin-along venture) need to be compatible with each other.

The leading variable of the spin-along approach, as a solution to the administrative problem, is reflected by the ability to constantly reconfigure the capability set of the spin-along programme. Furthermore, it reflects the ability to constantly spot new opportunities (e.g., emerging technologies and companies) that affect ventures residing in the spin-along

pool. Moreover, a market-oriented R&D that is achieved by means of technological foresight within the parental organization can acknowledge the leading variable.

REFLECTION ON THE ORIGINAL STRATEGIC TYPES

After having emphasized the spin-along approach as a strategic measure to solve problems of organizational adaptation, I will now put the three strategic types Analyzer, Defender and Prospector in context to spin-along. I spare the analysis of the Reactor since it is not a proper strategy to deal with adaptation.

Starting with the Analyzer strategy, I claim that it best suits a company following a spin-along strategy. As described above, a spin-along strategy is a valid measure to concentrate on both increasing the efficiency of a stable business and engaging in new business opportunities with the help of new ventures. Since the Analyzer is considered to be a combination of Prospector and Defender, I claim that also in the spin-along process both strategic types can be found.

One explanation is the character trait of the Defender to protect his ongoing narrow market-domain against competition by making only minor changes but in the most efficient way. As an example, I envision a company that has an incumbent position in a narrow market-domain, but at the same time has managed to set up a pool of spin-along ventures, which engage in market domains similar to the parental one. In this example, the spin-along ventures act closely to the Defender's market domain but have a significant footprint in other business as well. In case a Defender is faced with a new competitor that tends to have a competitive advantage when offering a different and more advanced feature-set, the Defender has the chance to flexibly spin-in one of its spin-along ventures to outperform the new competitor. I claim that a Defender benefits from the spin-in perspective of the spin-along approach.

In addition, the Prospector benefits from the above described spin-along strategy, too. As stated earlier, a Prospector takes a risk by engaging in new market opportunities and aims

to force other market participants to react to its first mover ambitions. I claim that the character trait of the Prospector is emphasized by the spin-out perspective of the spin-along approach. The vehicles to try out new things and gain first mover advantages towards competitors are spin-out companies that operate in very different and emerging market domains; they operate under the Prospector's wings and within its spin-along pool.

DISCUSSION

FROM SPIN-ALONG STRATEGY TO THE "SPIN-ALONG SHELL MODEL"

Based on the reflection on the strategic typology of Miles et al. (1978), I propose the spin-along strategy as an extended scientific concept that builds on the spin-along approach. I claim a spin-along strategy

- to be part of an organization's corporate strategy and by that a responsibility of the top-management (not just of the R&D unit as claimed by Rohrbeck et al. (2009, 2007));
- to enable an organization to set up, manage and nurture a pool of spin-along ventures, which either originate from the parent organization itself (e.g., an internal corporate venture which is granted more independence as a separate organizational entity) or from the external market and are brought into the spin-along pool (e.g., by engaging in joint development of a new product or by sharing certain assets like patents or machinery); and
- to embody a virtual "leach" between a parental organization and an external spin-along venture and the ability to flexibly change the "distance" over time.

I derived the first aspect of the spin-along strategy to be valid because the previous analysis showed that it is an appropriate approach to managing the adaptive cycle. Furthermore, this perception is in line with other scholars that claim the importance of top management

being supportive towards corporate venturing measures in order to facilitate intrapreneurship (entrepreneurial means of internal employees) and to create new business (Antoncic & Hisrich, 2001; Narayanan et al., 2009).

The second aspect is based on the idea that the ability to (re)integrate a former spin-out into the own organization should enable a company to bind external ventures, too. Scholars agree that the knowledge flow between start-up and corporate parent contributes to organizational learning of both parties (Maula et al., 2003; Narayanan et al., 2009). Furthermore, I believe that a staged process of decreasing the distance between a venture and another organization through a spin-along pool offers a better opportunity to internalize knowledge and capabilities of external units.

The third part of the spin-along strategy is the ability to change the distance between a venture and a parental firm. To explain this “distance” I propose the “Spin-Along Shell Model,” which I will now explain briefly.

The focal point of the “Spin-Along Shell Model” is a single organization. However, I claim that around a focal company, there are not just competitors, but also firms, which have a relationship with the focal company. This relationship can be strong or weak; however, one measure to describe it in the sense of a spin-along strategy is to describe the degree of distance. As reflected in Figure 1, the degree of distance can be assessed with a four-tier model.

The first tier is the organization itself, which manages a certain product/service portfolio and can also be structured via different business units. However, every process and structure in this first tier is the core of the focal organization; thereby no venturing-related issues materialize here.

The second tier reflects the internal corporate venturing sphere. As stated earlier, internal corporate ventures are internal organizational units that reside within the organizational boundaries but have more independence from the core business processes and structure. An

example could be a temporarily formed (rather independent) team or project, which investigates a new product or process innovation for the focal firm.

The third tier is the starting point for what I claim to be the spin-along sphere. Internal corporate ventures are externalized into semi-autonomous organizational entities. These spin-outs are understood as spin-along ventures when they are intentionally externalized to reintegrate them or to completely spin them off at a later point in time. I claim that these spin-along ventures can be differentiated according to their level of distance. I distinguish two sub-groups here. First, “close spin-along ventures” (3a) are independent organizational entities that the parent organization has a majority stake in. Its stake can exemplarily be measured by the amount of shares, number of parental employees, relevance of parentally owned assets (like patents or machinery) for the ongoing operation, but also the dependence on the access to the parent’s business network, sales channels or benefits derived from the parent brand power. In this first sub-category, the spin-along ventures’ competitiveness strongly depends on the corporate parent’s willingness to grant access to these factors.

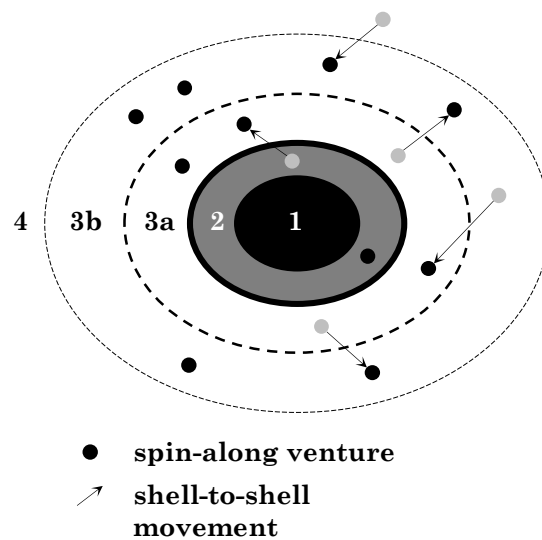


Figure 1: “Spin-Along Shell Model”

The second sub-group reflects “distant spin-alongs” (3b). The just mentioned factors do not play a major role in the performance of the spin-along ventures but are still present. An example could be that these ventures have other majority stakeholders or rely more

strongly on own patents and sales channels, which they developed and controlled on their own. The stake of the parental organization in the spin-along venture is not crucial for the spin-along venture's survival.

The fourth tier of the spin-along shell model reflects the external market. This includes competitors, former spin-offs as well as future spin-along ventures. Taking into account that firms in this tier have a shell sphere around them as well makes it clear that focal companies can share the same ventures around them (e.g., when two companies hold shares of a spin-along venture or form a joint-venture “to develop and/or commercialize new technologies or build various organizational skills such as R&D, marketing or production” (Narayanan et al., 2009, p. 59)).

CONCLUSION

ACADEMIC AND PRACTICAL IMPLICATION

My conceptual work aimed to contribute to the emerging discussion around the spin-along approach as a relevant scientific concept. Furthermore, I addressed research gaps and conceptualized the spin-along strategy as an extended attempt. My argumentation was theory-oriented by design, which I claim to be necessary for a more conceptual and not empirical driven scientific contribution. I am open for other scholars to challenge my ideas around the spin-along strategy and the “Spin-Along Shell Model”. I encourage more scholars to engage in the discussion of these both contributions in more detail. Moreover, it is of interest to the companies in which they are applied, and what are the mechanisms in comparison to other venturing methods. Further, I believe that the logic behind spin-along can be a valid measure to combine selection and adaptation viewpoints of population ecology scholars. Moreover, I claim especially the “Spin-Along Shell Model” to be a practical tool for Management practitioners. It may serve as an alternative tool to position one's own spin-along venture portfolio towards other external companies. In the upcoming paragraph,

I will draft future research directions that will concentrate on theories relevant for spin-along research.

FUTURE RESEARCH DIRECTIONS

Future research should answer the question how to decide when a movement from one shell to another is appropriate, meaning when the change of distance between a venture and its parental organization is promising. Exemplary theories to decide for either expanding or shortening distance are “transaction cost economics,” “organizational relatedness,” “the resource based view,” as well as “organizational learning.”

I claim the spin-along strategy to be a “smoother” way of internalizing external knowledge (embodied in external organizational units) compared to a sudden acquisition of an entirely external firm. A staged process slowly increases the degree of relatedness between a corporate venture and parental organization, which positively influences the parent’s gains (Sorrentino and Williams, 1995; Thornhill and Amit, 2001). Relatedness describes “the extent to which existing capabilities can be used for performing a new activity” (Gulbrandsen et al., 2009, p. 91). As argued before (when talking about “close spin-alongs” and “distant spin-alongs”), dimensions to assess the relatedness are for instance marketing activities, human resources and physical equipment (Narayanan et al., 2009; Sorrentino & Williams, 1995). I claim that the longer a company stays in a spin-along pool/in a specific spin-along-shell of a focal firm, the more the relatedness between the two increases.

Moreover, I claim the “Spin-Along Shell Model” to decrease transaction costs of reintegrating external ventures, whether they have been internal in the past or not. Transaction costs are the costs “for search, negotiating, bargaining, contracting and contract management” (Gulbrandsen et al., 2009, p. 90). In a short-term oriented strategy, lower transaction costs may result when skipping shell phases by integrating an external venture instantly, but in a long-term (strategic) perspective, the expected benefits will certainly be lower, because the integration of the business could not mature over time.

Since firms do not materialize all their knowledge explicitly, I agree to Gulbrandsen et al. (2009), who stated that tacit knowledge makes it harder for a parental (or “buying”) company to learn how to perform an action the venture did in the past.

Additional future research directions shall take the resource based view into account. The resource based view helps to explain performance differences between companies within the same industry (Barney, 1991; Penrose, 1959). In the corporate venturing context, the resource based view helps to explain how the resource base of a corporate parent and a corporate venture influence their relationship (Narayanan et al., 2009). As part of the resource based view, absorptive capacity between ventures and parents plays a role in shell-to-shell movements. Absorptive capacity describes the ability to internalize external knowledge (Cohen & Levinthal, 1990). Moreover Keil et al. (2008) understand internal corporate ventures as capability building agents that share these capabilities with the parental firm. In a spin-along setting, these internal ventures can move outside of the parental unit, but at the same time stay “leached” by the parent (kept at a distance). Following this idea, I claim that the similarity of factors like competences and tacit knowledge will spill-over in a bi-directional manner: Spillovers from corporate parent into the pool of ventures, spill-overs from the ventures back to the parent, but also spill-overs from ventures to other ventures that reside in the spin-along pool. These spill-over effects in the context of spin-along should be investigated further.

This need relates especially to the broader research field of organizational learning. It is an established notion that while conducting corporate venturing over time a corporation accumulates knowledge to optimize its venturing programme – the company learns (Maula et al., 2003). Narayanan et al. (2009) even argue that “one of the critical distinctions between [corporate venturing] as a programme vs. being a set of transactions is the role of learning” (p. 71). However, organizational learning in this outside-in and inside-out movement is still under-researched (Narayanan et al., 2009). I derive from that a clear need to conceptualize the learning perspective of the spin-along strategy further.

REFERENCES

- Aldrich, H.E., Pfeffer, J., 1976. Environments of Organizations. *Annual Review of Sociology* 2, 79–105.
- Antonicic, B., Hisrich, R.D., 2001. Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing* 16, 495–527.
- Astley, W.G., de Ven, A.H.V., 1983. Central Perspectives and Debates in Organization Theory. *Administrative Science Quarterly* 28, 245.
- Barringer, B.R., Bluedorn, A.C., 1999. The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal* 20, 421–444.
- Bower, J.L., 1970. Managing the resource allocation process: a study of corporate planning and investment. Division of Research, Graduate School of Business Administration, Harvard University, Boston.
- Burgelman, R.A., 1983a. A process model of internal corporate venturing in the diversified major firm. *Administrative Science Quarterly* 28, 223–244.
- Burgelman, R.A., 1983b. Corporate Entrepreneurship and Strategic Management: Insights from a Process Study. *Management Science* 29, 1349–1364.
- Carrier, 1996. Intrapreneurship in Small Businesses: An Exploratory Study. *Entrepreneurship, theory and practice* 21, 5–20.
- Chakravarthy, B.S., 1982. Adaptation: A Promising Metaphor for Strategic Management. *Academy of Management Review* 7, 35–44.
- Chesbrough, H., 2000. Designing Corporate Ventures in the Shadow of Private Venture Capital. *California Management Review* 42, 31–46.
- Child, J., 1997. Strategic Choice in the Analysis of Action, Structure, Organizations and Environment: Retrospect and Prospect. *Organization Studies* 18, 43–76.
- Cohen, W.M., Levinthal, D.A., 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly* 35, 128–152.
- Drejer, A., 2002. Strategic management and core competencies: theory and application. Quorum Books, Westport, Conn.
- Floyd, S.W., Lane, P.J., 2000. Strategizing Throughout The Organization: Managing Role Conflict In Strategic Renewal. *Academy of Management Review* 25, 154–177.
- Gulbrandsen, B., Sandvik, K., Haugland, S.A., 2009. Antecedents of vertical integration: Transaction cost economics and resource-based explanations. *Journal of Purchasing and Supply Management* 15, 89–102.
- Hannan, M.T., 1989. Organizational ecology. Harvard University Press, Cambridge, Mass.
- Hannan, M.T., Freeman, J., 1977. The Population Ecology of Organizations. *American Journal of Sociology* 82, 929–964.
- Hannan, M.T., Freeman, J., 1984. Structural Inertia and Organizational Change. *American Sociological Review* 49, 149.
- Hitt, M.A., Ireland, R.D., Camp, S.M., Sexton, D.L., 2001. Strategic entrepreneurship: entrepreneurial strategies for wealth creation. *Strategic Management Journal* 22, 479–491.
- Ireland, D.R., Hitt, M.A., Camp, S.M., Sexton, D.L., 2001. Integrating Entrepreneurship and Strategic Management Actions to Create Firm Wealth. *The Academy of Management Executive* 15, 49–63.
- Ireland, R., Covin, J., Kuratko, D., 2009. Conceptualizing Corporate Entrepreneurship Strategy. *Entrepreneurship Theory and Practice* 33, 19–46.

- Keil, T., McGrath, R.G., Tukiainen, T., 2008. Gems from the Ashes: Capability Creation and Transformation in Internal Corporate Venturing. *Organization Science* 20, 601–620.
- Klärner, P., Treffers, T., Picot, A., 2013. How companies motivate entrepreneurial employees: the case of organizational spin-alongs. *Journal of Business Economics* 83, 319–355.
- Kotabe, M., Srinivasan, S.S., Aulakh, P.S., 2002. Multinationality and Firm Performance: The Moderating Role of R&D and Marketing Capabilities. *Journal of International Business Studies* 33, 79–97.
- Lee, C., Beamish, P.W., 1995. The Characteristics and Performance of Korean Joint Ventures in LDCs. *Journal of International Business Studies* 26, 637–654.
- Lichtenthaler, U., Ernst, H., 2006. Attitudes to externally organising knowledge management tasks: a review, reconsideration and extension of the NIH syndrome. *R and D Management* 36, 367–386.
- Mahdjour, S., & Fischer, S. (2014). International Corporate Entrepreneurship with Born Global Spin-along Ventures — A Cross-Case Analysis of Telekom Innovation Laboratories' Venture Portfolio. *International Journal of Innovation Management*, 18(03), 1440007. <http://doi.org/10.1142/S1363919614400076>.
- Mahdjour, S., & Fischer, S. (2015). Implementing the spin-along approach: a capability analysis of Telekom Innovation Laboratories' corporate venturing programme. *International Journal of Technology Marketing*, 10(2), 160–178. <http://doi.org/10.1504/IJTMKT.2015.068590>
- Maula, M., Keil, T., Zahra, S.A., 2003. Corporate venture capital and recognition of technological discontinuities: position in syndication networks and absorptive capacity. Presented at the AOM conference, Seattle, USA.
- Maula, M.V.J., Autio, E., Murray, G.C., 2005. Corporate Venture Capitalists and Independent Venture Capitalists: What Do They Know, Who Do They Know and Should Entrepreneurs Care? *Venture Capital: An International Journal of Entrepreneurial Finance* 7, 3–21.
- Michl, T., Gold, B., Picot, A., 2012. The spin-along approach: ambidextrous corporate venturing management. *International Journal of Entrepreneurship and Small Business* 15, 39–56.
- Miles, M.P., Covin, J.G., 2002. Exploring the practice of corporate venturing. *Entrepreneurship Theory and Practice* 26, 21–40.
- Miles, R.E., Snow, C.C., Meyer, A.D., Coleman, Henry J., J., 1978. Organizational Strategy, Structure, and Process. *The Academy of Management Review* 3, pp. 546–562.
- Miller, D., Friesen, P.H., 1978. Archetypes of Strategy Formulation. *Management Science* 24, 921–933.
- Narayanan, V., Yang, Y., Zahra, S.A., 2009. Corporate venturing and value creation: A review and proposed framework. *Research Policy* 38, 58–76.
- O'Reilly, C.A., Tushman, M.L., 2008. Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior* 28, 185–206.
- Roberts, E., Berry, C., 1985. Entering New Businesses - Selecting Strategies for Success. *Sloan Management Review* 26, 3–17.
- Rohrbeck, R., Döhler, M., Arnold, H., 2009. Creating growth with externalization of R&D results-the spin-along approach. *Global Business and Organizational Excellence* 28, 44–51.
- Rohrbeck, R., Döhler, M., Arnold, H.M., 2007. Combining spin-out and spin-in activities – the spin-along approach. Presented at the ISPIM-Conference, 2007, Warsaw, Poland, pp. 1–12.
- Salona, G., Spencer, A.M., McJunkin, J., Reynders, T., 2000. Cisco Systems: A

Novel Approach to Structuring Entrepreneurial Ventures.

Sánchez, A., Lago, A., Ferràs, X., Ribera, J., 2011. Innovation Management Practices, Strategic Adaptation, and Business Results: Evidence from the Electronics Industry. *Journal of technology management & innovation* 6, 14–39.

Sharma, P., Chrisman, J.J., 1999. Toward a Reconciliation of the Definitional Issues in the Field of Corporate Entrepreneurship. *Entrepreneurship: theory and Practice* 23, 1–16.

Sorrentino, M., Williams, M.L., 1995. Relatedness and corporate venturing: Does it really matter? *Journal of Business Venturing* 10, 59–73.

Tellis, G.J., Chandy, R.K., 2000. The Incumbent's Curse? Incumbency, Size and Radical Product Innovation. *Journal of Marketing* 64, 1–17.

Thornhill, S., Amit, R., 2001. A dynamic perspective of internal fit in corporate venturing. *Journal of Business Venturing* 16, 25–50.

Van de Ven, A.H., Poole, M.S., 1995. Explaining Development and Change in Organizations. *The Academy of Management Review* 20, 510.

Williams, C., Lee, S.H., 2009. Exploring the internal and external venturing of large R&D-intensive firms. *R&D Management* 39, 231–246.

Zahra, S.A., 1995. Corporate entrepreneurship and financial performance: The case of management leveraged buyouts. *Journal of Business Venturing* 10, 225–247.

Zahra, S.A., 2007. Contextualizing theory building in entrepreneurship research. *Journal of Business Venturing* 22, 443–452.

Zahra, S.A., Hayton, J.C., 2008. The effect of international venturing on firm

performance: The moderating influence of absorptive capacity. *Journal of Business Venturing* 23, 195–220.

Backholm, A. (1999). *Corporate Venturing: An Overview*. Espoo: Helsinki University of Technology.

Burgelman, R. A. (1983). A process model of internal corporate venturing in the diversified major firm. *Administrative*

BRIDGING STATEMENTS

The previous paper highlighted the spin-along approach as a promising strategy for mastering the adaptive cycle of Miles et al. (1978). It was shown that the concept of spin-along is an alternative method to solve the adaptive cycle's three typical problems. Furthermore, setting up, managing and nurturing a pool of spin-along firms is the key organizational frame in this setting. Finally, the spin-along strategy takes the relationship between the corporate parent and their spin-along ventures into account by promoting the ability to flexibly change the distance over time. The proposed Spin-Along Shell-Model has the potential to become a tool to visualize the distance between the corporate parent and ventures residing in a spin-along pool.

After I built the groundwork in Fischer (2015), the question arose of what specific capabilities were needed to implement this concept in an organisation. The following paper, Mahdjour & Fischer (2015), will investigate the capabilities required to establish a spin-along programme at Telekom Innovation Laboratories. Overall we pose three research questions: Firstly, the question how the corporation should frame the spin-along programme best; secondly, what capabilities are required for a sustainable spin-along programme; and thirdly, what are the capabilities for the successful development of spin-along ventures from inception to market success.

2. IMPLEMENTING THE SPIN-ALONG APPROACH

A CAPABILITY ANALYSIS OF TELEKOM INNOVATION LABORATORIES' CORPORATE VENTURING PROGRAMME

This paper extends an emerging concept of corporate entrepreneurship theory – the spin-along approach. By implementing the spin-along approach, companies combine the benefits of both internal and external corporate venturing. Our research identifies core capabilities for the successful implementation of a spin-along programme. Our findings are based on an analysis of the spin-along programme of Telekom Innovation Laboratories (T-Labs), the central R&D unit of Deutsche Telekom AG. In a 12-month research project we conducted 19 semi-structured interviews along with participant observation methods to identify 13 core capabilities which represent clusters of good practice measures for implementing the spin-along approach in this organisational context. These capabilities focus on the development of a suitable corporate environment, the setup of a comprehensive spin-along programme and the development of new ventures. Our insights create value for practitioners who want to introduce a spin-along programme in their organisation, and also to business researchers by extending knowledge on the spin-along approach.

INTRODUCTION

Firms apply corporate venturing as a measure to accelerate innovation speed, identify, evaluate and exploit new business opportunities and cope with challenges in uncertain market environments (Shane and Venkataraman, 2000). Literature on corporate venturing has grown over the last decades and can be differentiated by the venturing focus (Williams and Lee, 2009), namely internal and external venturing (Burgelman, 1983; Keil, 2001; Miles and Covin, 2002; Keil, 2004). In recent years, however, case study researchers explored companies which combine internal and external venturing activity and termed

this type of corporate venturing the spin-along approach (Mahdjour & Fischer, 2014; Klarner, Treffers, and Picot, 2013; Michl, Gold, and Picot, 2012; Rohrbeck, Döhler, and Arnold, 2009). The concept of spin-along unites spin-out and spin-in activities to an integrated entrepreneurial approach. Scholars have underlined the suitability of this approach to overcome challenges of incumbency (Rohrbeck et al., 2009). Although large incumbent companies can build on a strong resource base they tend to be less innovative than small companies – a phenomenon known as the incumbent’s curse (Tellis and Chandy, 2000).

A company can institutionalise a spin-along approach with the help of a structured programme, which we call spin-along programme. In the spin-along approach the objects of investigation are new ventures that become part of a spin-along pool, which is controlled by a spin-along programme management. As proposed by Rohrbeck et al. (2009) these ventures originate from the corporate parent and are placed in this pool with the aim to keep them at a distance over a longer period of time. The degree of distance from the parent can change, e.g. in relation to contractual agreements (e.g. regarding the ownership situation of a venture and intellectual property rights) or by granting access to networks of relevant stakeholders inside or outside of the parental organisation.

Why do companies implement a spin-along approach? Two general scenarios shall illustrate the necessity: firstly, companies that are strong in R&D may not be able to transfer all research results (e.g. prototypes or patents) into the existing product portfolio. Reasons can be strategic and micro-political hurdles based on the lack of alignment of resulting products with the company’s innovation strategy. By pursuing a spin-along approach, such products can be commercialised outside of the corporate boundaries, even if they are not in line with the company’s innovation roadmap. Secondly, companies with very little R&D activity may seek to leverage their innovative capabilities by searching for innovative ideas externally, from individuals or teams looking for resources like money, knowledge or sales channels. A corporate can fill these needs and help to incubate their business.

Past research usually focused on either internal or external corporate venturing. We state that the integrated perspective of the spin-along approach offers potential for further research, because it is more than just the sum of spin-in and spin-out activities. In applying a spin-along approach companies encounter challenges, which differ from those of internal or external venturing. The (so far under-investigated) movement of an internal corporate venture out of the company and into a spin-along pool as well as the movement of an external start-up into the same pool brings up such new challenges. This paper concentrates on internal corporate ventures that move into a spin-along pool and thereby become spin-alongs. Specifically, we believe that following a spin-along approach requires a different set of organisational capabilities: while corporates may be able to successfully build new units as measures of internal corporate venturing, the external commercialisation via spin-alongs creates different challenges. An internal realisation emphasises political skills and the execution of organisational influence. An external commercialisation under real market conditions requires market and business capabilities as well. At the same time, a company that is excellent at investing into external venture teams might not have the right organisational capabilities to integrate teams, ideas and ventures as spin-ins from the outside. The implementation of the spin-along approach through a spin-along programme which steers a pool of spin-along ventures can help to overcome these challenges.

In the first place this paper aims to identify core spin-along capabilities for the case of Telekom Innovation Laboratories (T-Labs), which is the central R&D unit of Deutsche Telekom AG. Our study shall identify which capabilities T-Labs required in order to set up its spin-along programme. The identified set of capabilities shall serve to extend knowledge about the spin-along approach in practice and enhance the theoretical concept with case insights. On the other hand it shall serve to guide practitioners in the process of setting up a spin-along programme in other organisations while taking into account the learnings from T-Labs. While our findings may not be generalisable to strongly differing contexts, our

inductive qualitative approach will have theoretical and practical value building on in-depth cross-case insights (Eisenhardt, 1989).

THEORY

CORPORATE ENTREPRENEURSHIP AND CORPORATE VENTURING

Corporate entrepreneurship is a strategy that a company employs to encourage entrepreneurial behaviour with the goal to enhance the company's innovative capacity (Ireland et al., 2009). According to Zahra (1995, p.227), "corporate entrepreneurship consists of a company's innovation, strategic renewal and corporate venturing", whereas the corporate venturing concept embodies the creation of new internal and external entities (Mes, 2011).

Sharma and Chrisman (1999) differentiate internal and external corporate venturing as follows: External corporate venturing leads to the creation of "semi-autonomous or autonomous organisational entities that reside outside the existing organisational domain" [Sharma and Chrisman, (1999), p.19]. External corporate venturing therefore deals with activities, such as the establishment of joint ventures, spin-offs and venture capital investments. Collaboration with external ventures is promising for incumbent firms, especially when complementary assets between the two parties exist (Rothaermel, 2001). In contrast, the internal corporate venturing perspective "refers to the corporate venturing activities that result in the creation of organisational entities that reside within an existing organisational domain" [Sharma and Chrisman, (1999), p.20]. Internal units are established alongside existing organisational structures and facilitate internal resources (Burgelman, 1983, 1985; Garud and van de Ven, 1992). The aim is to renew the portfolio of businesses of the corporate parent with (semi-) independent internal business units. Internal corporate ventures are treated as new business and are sponsored by higher management levels.

Corporate venturing, whether internally or externally oriented, aims at strategic and financial goals. Strategic goals are for instance the enhancement of a firm's innovation, growth, as well as internal value creation. From a financial viewpoint corporate venturing offers the opportunity to leverage profit and return on investments. The perspectives of innovation and growth are at the core of the spin-along approach (Rohrbeck et al., 2009).

THE SPIN-ALONG APPROACH

Rohrbeck et al. (2007, 2009) proposed the spin-along approach as a novel concept that combines aspects of internal and external corporate venturing. Spin-alongs are created from internal and external sources by an internal team. However, their commercialisation takes place by creating independent companies on the external market. After commercialisation, spin-alongs are granted a high amount of autonomy, allowing them to become established in their markets. This phase of high autonomy is followed by the parent's evaluation and decision for strategic next steps which may involve spinning ventures back into the parent organisation or to sell its stake in them (Rohrbeck et al., 2007).

The approach thereby helps companies to find “alternative paths for radical and non-core innovations”, drive business model innovation, innovate “in areas with little synergy with existing business” and innovate „closer to the market” [Rohrbeck et al., (2009), p.48]

Although the spin-along approach has been applied in various organisations, e.g. Philips, Deutsche Telekom AG, Cisco, (Rohrbeck et al. 2007, 2009; Michl et al., 2012; McJunkin & Reynders, 2000) theoretical work on the concept is still scarce (Michl et al., 2012). To date only few scientific publications have contributed to advancing the spin-along approach as a research concept within the field of corporate venturing (Mahdjour & Fischer, 2014; Klarner et al., 2013; Michl et al., 2012; Rohrbeck et al., 2009, 2007).

Michl et al. (2012) took the work of Rohrbeck et al. (2009) into account and extended the spin-along approach with the perspective of ambidextrous organisations. By analysing four

cases they further elaborated the spin-along process with its influences on exploitation and exploration capabilities of an ambidextrous organisation. In a previous case study of T-Labs' spin-alongs, Mahdjour & Fischer (2014) analysed early internationalisation strategies of spin-alongs, e.g. as a measure to counter internal political barriers. Furthermore, Klarner et al. (2013) propose the spin-along approach to be a valid measure to retain and nurture entrepreneurial and high-performing employees by allowing them to realise their own ideas with the support of the corporate parent. Finally, Fischer (2015) conceptualised a spin-along strategy as an alternative strategic attempt for organisations to master the cycle of adaptation (Miles et al., 1978).

THE SPIN-ALONG APPROACH IN RELATION TO INTERNAL AND EXTERNAL CORPORATE VENTURING

What is new about combining internal and external corporate venturing into the spin-along approach? As described, internal venturing is about building new organisational units that run alongside existing organisational structures to speed up growth and learning capacity of the parental firm. Literature on internal corporate venturing misses the perspective of spinning out these ventures. If internal ventures are non-core or too radical, spinning-out is an appropriate alternative to not exploring the opportunity at all (Rohrbeck et al., 2009). Spinning out internal ventures is a measure to explore opportunities and test new business models in real market environments. Spin-alongs have the chance sell their product to other companies which might also be competitors of the corporate parent. This would not be conceivable with internal corporate venturing under the parental umbrella.

External venturing literature, on the other hand, emphasises the chances of collaborating with start-ups and helps companies to acquire new knowledge at a relatively low level of risk (Keil, 2001, 2004). Nevertheless, collaboration with external start-ups on an operational level has some pitfalls for incumbent firms, e.g. resistance due to not-invented-here perceptions (Lichtenthaler and Ernst, 2006) as well as differences between the mind-

set of the entrepreneurial and corporate teams. Taking this into account, a pool of spin-along ventures can be enriched with external start-ups, their technologies and knowledge. Regardless of whether a venture originated from the external market (internalised start-ups) or from the corporate parent (externalised internal ventures), the spin-along programme management can flexibly decide whether to fully (re-) acquire or to fully spin-off a specific spin-along. From an external corporate venturing perspective, this approach could ease the collaboration on the operational level.

THEORETICAL CONTEXT OF THE SPIN-ALONG APPROACH

In the field of entrepreneurship, theory building and testing is still notably challenging for academics (Zahra, 2007). The following thoughts shall frame the spin-along approach as a novel concept in entrepreneurship literature with the adjoining theoretical concepts of transaction costs and the resource-based view.

Key of the spin-along approach is the flexible out- and inbound movement of ventures. From a supply management perspective the spin-along approach is comparable to insourcing and outsourcing activities, also termed as vertical integration, which is “defined as the degree to which the firms intend to buy services from the vendor in the future or intend to perform the activity in-house” [Gulbrandsen et al., (2009), p.90]. Assuming this similarity, the spin-along approach can be investigated with the help of theories like transaction cost economics (Williamson, 1985, 1991) and the resource-based view (Barney, 1991), because they are important perspectives of vertical integration (Gulbrandsen et al., 2009).

Firms frequently seek new inputs for business operation and by that face different transaction costs like “costs for search, negotiating, bargaining, contracting and contract management” management” [Gulbrandsen et al., (2009), p.90]. Transaction costs can be either internal or external, depending on whether the firm intends to make or buy the operational input. The same holds true for the spin-along approach where a company needs

to decide whether to spin out internal ventures or to internalise external entities. In general, business activity should be performed internally when the “external governance costs (of outsourcing)” are higher than the costs that appear when the activity is performed “in-house and using internal governance structure (insourcing)” (Gulbrandsen et al., 2009: 90).[Gulbrandsen et al., (2009), p.90]. However, the cost level highly depends on the specific transaction situation (Williamson, 1985).

In a spin-along setting transaction costs are considerably lower when (re-)integrating a venture which stayed in a spin-along pool over a longer period of time, because the relatedness with the corporate parent is rather high as compared to independent ventures. Relatedness describes “the extent to which existing capabilities can be used for performing a new activity” [Gulbrandsen et al., (2009), p.91] and consists of closeness to current competences and tacit knowledge. This means that if capabilities of a spin-along venture are similar to the ones of the parent company, costs of re-integration are lower. This holds true if tacit knowledge is at a low level, because tacit knowledge makes it harder for the parental (or ‘buying’) company to learn how to perform an action that the venture did in the past (Gulbrandsen et al., 2009).

Concerning the outbound perspective of the spin-along approach, the question arises when is the right time to spin out ventures. From the resource-based view perspective, the capitalisation of a new venture’s capabilities might be much more effective when it acts outside of the corporate environment as an independent organisational entity. Transaction costs related to internal barriers might be higher than costs of spinning-out. Such a spin-out has then the potential to perform business more efficiently and to be competitive at the same time. As Wu (2010) points out, the resource-based view helps to explain performance differences between firms of the same industry (Zott, 2003). In the spin-along approach a set of resources and skills is combined to build new ventures. The outside-in and inside-out movement of the spin-along approach is strongly affected by both the resource and capability base of the parent, but also of the respective ventures.

Fischer (2015) argued that changing the distance between spin-along venture and corporate parent (e.g. via alteration of the shareholder position) is affected by the absorptive capacity of both parties. In fact, absorptive capacity is about the ability to internalise external knowledge (Cohen and Levinthal, 1990), therefore it is reasonable to assume that knowledge-spillovers between spin-along ventures and the corporate parent are considerably advanced because relatedness between the two parties is higher.

METHODOLOGY

DATA COLLECTION AND ANALYSIS

To explore T-Labs' need for and implementation of spin-along capabilities we applied a case study design, which as a research method is well-suited to generate deep insights into complex topics and their operational links over time (Yin, 2009). While single-case studies provide detailed accounts of events impacting one specific element of analysis multiple-case studies allow broader exploration of the research question and enable theoretical elaboration which typically yields "more robust, generalizable, and testable theory than single-case research" [Eisenhardt and Graebner, (2007), p.27]. Our analysis combines characteristics of both a cross-case analysis and a single-case study. The single-case perspective concerns the origin of all ten spin-alongs from the same parent company. However, the ventures were treated as individual cases, since we regarded them as distinct customers of the programme, each with different requirements and starting positions. The ventures' requirements and the parent's measures to satisfy them were analysed. Thereby a set of capabilities was identified which represent clusters of good practice measures taken at the parent.

Our understanding of capabilities builds on Helfat and Peteraf (2003) who claim that "an organisational capability refers to the ability of an organisation to perform a coordinated set of tasks, utilizing organisational resources, for the purpose of achieving a particular end

result” whereas an organisational resource describes an “asset or input to production (tangible or intangible) that an organisation owns, controls, or has access to on a semi-permanent basis” (p. 999). In addition Eisenhardt and Martin (2000) link capabilities and resources by claiming capabilities as “[A] firm’s processes that use resources –specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.” (p.1107).

In conducting a multiple-case study we followed the process of building theory from case studies as proposed by Eisenhardt (1989).

As the initial step of our approach we defined our research questions:

1. Which capabilities shape an optimal corporate environment for spin-along activities at T-Labs?
2. Which capabilities constitute a sustainable spin-along programme at T-Labs?
3. Which capabilities enable an effective spin-along development at T-Labs?

Our sample consisted of the ten spin-alongs which were under development at T-Labs in 2012. We interviewed management staff of the spin-alongs, as well as key members of T-Labs management staff who had an exceptional overview of the different ventures and their situations, structures and challenges. Data was gathered through 19 formal semi-structured interviews resulting in over 19 hours of recordings and 552 pages of transcriptions (see Tables 1 and 2).

We analysed the resulting data using an inductive approach, drew our conclusions and validated these in repeated discussions with the spin-along leaders and the portfolio management staff. Thus we were able to distinguish more general phenomena from those which were specific to single ventures to develop our constructs. While constructs emerged in an iterative process we compared our findings with theory and further condensed them

to achieve empirical and theoretical saturation. In parallel to data collection we transcribed interview material and coded data using ATLAS.ti software.

Being part of the organisation we benefited from practitioner research principles (McCall and Simmons, 1969) and had the chance to generate longitudinal data and to enhance our understanding with insights from internal reports, workshops and project work done for several ventures. Based on our experiences in previous research projects we noted that our own affiliation with T-Labs was very beneficial to achieve a high level of depth in our interviews with the new ventures. Only few respondents were reluctant to provide us with confidential information and several appreciated the chance to share insights and contribute to improving the programme. These conditions facilitated our research and helped to gain rich insights and a very efficient process of data collection. Our long-term observation of the ventures' operations additionally enabled us to validate statements made within the interviews.

<i>Case names</i>	<i>Interview partner</i>	<i>Transcribed pages</i>	<i>Interview length</i>
InstaSafe	Interviewee 1	32	01:06:26
	Interviewee 2	35	01:06:12
DynaMetrics	Interviewee 3	33	01:14:18
	Interviewee 4	26	01:03:34
VoicePhone	Interviewee 5	35	01:19:58
CloudTop	Interviewee 6	26	01:06:12
	Interviewee 7	30	00:56:53
InfraSens	Interviewee 8	34	01:16:23
	Interviewee 9	29	01:00:01
SafeCrypt	Interviewee 10	18	00:44:10
ProxiMetry	Interviewee 11	27	00:56:55
VirtuPhone	Interviewee 12	32	01:04:07
	Interviewee 13	25	00:56:51
DataSelfControl	Interviewee 14	29	00:52:34
AllSec	Interviewee 15	26	01:03:08

Note: Names have been pseudonomised.

Table 1: Interviews with spin-along leads

<i>Management role</i>	<i>Interview partner</i>	<i>Transcribed pages</i>	<i>Interview length</i>
T-Labs top executive	Interviewee 16	13	00:27:47
T-Labs communication manager	Interviewee 17	16	00:31:40
T-Labs spin-along programme manager	Interviewee 18	43	01:00:32
T-Labs spin-along consultant	Interviewee 19	43	01:37:00

Table 2: Interviews with T-Labs management

SPIN-ALONG CAPABILITIES AT T-LABS

CASE SETTING

In our research we picked up on the case setting of Rohrbeck et al. (2009) who first analysed the spin-along activities of T-Labs from the year 2005 onwards. T-Labs is the central R&D unit of Deutsche Telekom AG, which was initially entrusted with the mission to generate new technology to build future products of the corporation on. T-Labs' core activities therefore included strategic research, as well as the development of prototypes for already existing or market-ready products. T-Labs' organisational setup as a private research institute attached to the Technical University of Berlin provided the unit with highly skilled technical researchers, who worked together with managers of Deutsche Telekom AG. Explorative research conducted at T-Labs was frequently published in academic journals as well as patents and in a few cases even became the base for new business that was established in separate organisational units. These units can be considered T-Labs' first spin-alongs, which resulted as by-products to the actual strategic research agenda.

In 2012, T-Labs set a new strategic course to exploit more venturing opportunities by initiating a formal spin-along programme. The general objective of this programme was to commercialise a larger share of the explorative research results, leading to an additional source of revenue and thereby to gain a more secure position within the corporation.

Promising ideas and results were identified among the pool of ongoing projects, which resulted in ten initial new venture candidates. The T-Labs project office functioned as a portfolio management unit (Project Management Institute, 2006) and controlled all T-Labs projects together with the pool of spin-along ventures.

The shift from rather explorative research to new business creation required transformations in the unit's culture, skillset, orientation and management.

SPIN-ALONG CAPABILITIES

We identified 13 organisational capabilities which T-Labs required for implementing its spin-along approach. They have been grouped in three categories (see Figure 1).

Corporate Environment	Spin-Along Programme		Spin-Along Venture Development
Entrepreneurial Culture	Strategy	Idea Management	Team Composition
Incentives for Participation	Portfolio Management	Funding Sources	Customer Insight
Management of Conflicts of Interest	Post-Launch Relationship	Learning & Improvement	Business Modeling
			Access to Parental Assets & Services

Figure 1: Spin-along capabilities

The development of

- a corporate environment that enables and encourages entrepreneurial activity and supports spin-alongs against conflicts of interest
- a spin-along programme that acts upon a focused strategy, captures and selects promising ideas, builds and exploits synergies from the venture portfolio, facilitates access to internal and external financing sources, establishes well-managed post-launch relationships with founded ventures and deducts organisational learning from past spin-along experiences
- a spin-along venture development that combines the right competencies in venture teams, promotes customer- and business-orientation and capitalises on parental assets and services.

Based on the experiences of spin-alongs and managers at T-Labs, several practices have been identified to implement these capabilities. These will be outlined in the following sections and are presented in Table 3.

Category	#	Capability	Practices
Corporate environment	1	Entrepreneurial culture	<ul style="list-style-type: none">• Spin-along programme implemented with professional change management• Trainings and support provided to employees <ul style="list-style-type: none">• Transparent information policy emphasised• Open communication promoted• Success stories communicated
	2	Incentives for participation	<ul style="list-style-type: none">• Compensation schemes for employees established• Return option provided to internal team members <ul style="list-style-type: none">• Real stock options as employee compensation, secured from diluting through investment rounds
	3	Management of conflicts of interest	<ul style="list-style-type: none">• Motivation to support spin-alongs raised via incentive scheme/target agreements of corporate managers <ul style="list-style-type: none">• Wildcards to overrule politically motivated decisions provided
Spin-along programme	4	Strategy	<ul style="list-style-type: none">• New venture selection strategy formulated• Financing- and exit-strategy formulated• Measures defined to detect need for termination <ul style="list-style-type: none">• Appropriate ambition level for the programme is set• Manifested on all company level target agreements
	5	Idea management	<ul style="list-style-type: none">• Idea management system implemented <ul style="list-style-type: none">• New venture selection strategy applied
	6	Portfolio management	<ul style="list-style-type: none">• Synergies among ventures exploited <ul style="list-style-type: none">• Informal exchange among ventures encouraged
	7	Funding sources	<ul style="list-style-type: none">• Initial project funding provided• Internal financing pool for ad-hoc needs established• Internal funds for seed and early-stage funding available• Investment committee motivated to invest• Spin-along assessment supported by experts <ul style="list-style-type: none">• Funding decision and transparent relationship with external investors managed• Spin-along attractiveness to external investors monitored and externally assessed
	8	Post-launch relationship	<ul style="list-style-type: none">• Co-location of spin-alongs• Contractual agreements defined <ul style="list-style-type: none">• Organisational involvement
	9	Learning and improvement	<ul style="list-style-type: none">• Lessons learned absorbed, documented and communicated• Mandatory trainings / knowledge sharing events conducted <ul style="list-style-type: none">• Employee rotation programmes established
	Spin-along venture development	10	Team composition	• Team internal skillsets account for spin-alongs' needs • Balanced composition of internal/external employees • Needed skills identified and developed
11		Customer insight	<ul style="list-style-type: none">• Agile development practice employed• Market studies individually conducted <ul style="list-style-type: none">• Products developed in collaboration with end users/pilot customers
12		Business planning	<ul style="list-style-type: none">• Business case calculation realistically conducted• Business model supported by team <ul style="list-style-type: none">• Business model exploration encouraged and evolution managed
13		Parental assets and services	<ul style="list-style-type: none">• Access to parent assets provided (e.g., IPR, infrastructure, data, facilities, channels, networks) <ul style="list-style-type: none">• Access to services from horizontal parental units supported (e.g., payroll, legal)

Table 3: Spin-along capabilities and practices

CORPORATE ENVIRONMENT

Before implementing its spin-along programme T-Labs' activities focused on exploration of new technology and conducting basic research. The development of spin-alongs required a different work mode and scope of responsibilities for many employees and transformed the rather experimental mode to activities with stronger focus on tangible and commercially ready results. As one of the interviewees stated: *"Most of our researchers are used to working on strategic, explorative issues. Now they are asked not only to create something that can already work on the market today, but to also follow this idea through and build a new venture on it. They do not have experience with this and it is not what they came to work here for."* In order to ensure that employees were ready and willing to join spin-alongs and support their development, a more **entrepreneurial culture** was therefore needed. As the spin-along programme became a focal aspect of T-Labs' strategy, all employees were asked to consider how previous research results could be transferred to new products which could serve as the base of new ventures. Employees were asked to take an active part in the establishment of these new businesses. To support this cultural transformation, T-Labs employed professional change management, offered internal trainings, fostered open communication and transparent information and presented motivating success stories.

Once employees had accepted the spin-along programme and were informed enough to understand and weigh their personal options in it, some of them considered taking an active part by suggesting and leading potential spin-along projects. However, among T-Labs employees already implemented corporate benefits offered, such as existing benefit packages and job security decreased employees' agility and alertness. Major barriers to becoming actively engaged in a spin-along were first, the fear of giving up the current secure job position for an unsure success in the future. Second, a reluctance to invest more time and effort than they were used to for advancing the venture, and third, a lack of management experience and skills. To reduce barriers of engaging in spin-along activities, **incentives for participation** were under development at the time of our data collection.

Our interviews with T-Labs' spin-alongs identified three suitable measures to enhance willingness to join ventures: the provisioning of a time-limited return option for employees, the development and implementation of specific compensation schemes making up for a higher workload in early stages and participation in ventures' profits through real stock options.

Being new organisational entities without established positions within the periphery of the parent company, the spin-alongs were specifically threatened by internal political conflicts. Several of T-Labs' ventures faced disapprobation from other corporate units which felt threatened by the large number of new business initiatives, as this statement by an internal venture leader shows: *"Of course other units hear about what is happening at T-Labs and some perceive the ventures as threats because they can make existing business units redundant, while being able to operate outside of the complicated internal structures that hinder their own innovative initiatives."* T-Labs needed to execute careful **management of internal conflicts of interest** to ensure that spin-alongs were not terminated due to political motivations. Measures identified as means to manage such conflicts were inclusion in individual target agreements, incentive schemes which motivate managers to contribute to the spin-alongs' achievements of defined milestones or the provision of wild cards at the programme management level which allow overruling politically motivated decisions.

SPIN-ALONG PROGRAMME

Early T-Labs spin-alongs were founded before a formal strategy was in place to guide all spin-along activities, leading to a rather unstructured early founding process. These first ventures reported that they received insufficient support from the members of the parent organisation, who were unsure to which extent they were allowed to support them.

AllSec was one of these early spin-alongs. The venture was in the beneficial position that it could attract an internal business unit as its first customer, which helped the team to grow

quickly and improve their technology. However, as the relationship with the business unit intensified it became increasingly involved in the venture's organisational structure and took an active role in its advisory board. When AllSec was ready to approach other (external) customers, the business unit blocked this initiative, because it wished to utilise its product exclusively, avoiding AllSec from growing to the degree that it had the potential to. A comprehensive spin-along **strategy** could have set the rules for collaboration with the business unit and allowed approaching other customers. The following formulation of T-Labs' spin-along strategy included goals about the number of ventures to be created and the amount of revenue to generate. Clear selection criteria for spin-alongs to be founded were also identified as an important strategic aspect, as well as a long-term vision to determine financing and exit strategies of the spin-alongs.

To identify promising spin-along candidates, T-Labs implemented a sophisticated **idea management system**. During the implementation phase of the spin-along programme in 2012, managers were asked to identify promising initiatives in their departments. These initiatives were collected and rated with suitable selection criteria to identify the first spin-along candidates from this list. Later, a web-based early stage idea submission system was introduced which allowed constantly sourcing ideas for new venture candidates.

The large number of spin-alongs that were launched at T-Labs required advanced **portfolio management**. Formal and informal activities facilitated coordination of and exchange among ventures. Among the formal portfolio management activities were performance monitoring and reporting, but also the general coordination of the pool of ventures to derive synergies. For example this coordination resulted in the collaboration of four spin-alongs which jointly developed a solution for an external business customer. To facilitate a constant informal exchange, new ventures were invited to participate in informal after-work meetings in which they had the opportunity to exchange experiences.

To finance spin-alongs in the different phases of their inception and development, internal as well as external **funding sources** were needed. T-Labs financed its ventures during

their project phase (early-stage and seed expenses, along with a flexible budget to respond to ad-hoc needs), to become operational, however, ventures applied for funding from the Telekom Innovation Pool GmbH (TIP GmbH). TIP GmbH's funding was provided following a milestone based approach and was granted for a maximum duration of one year after which the next investing decision would be made. T-Labs ventures that were granted TIP GmbH's funding were 100% subsidiaries of Deutsche Telekom AGs. The source of the granted venture capital is Deutsche Telekom AG's own Venture Capital unit T-Venture. Financing decisions at TIP GmbH were made by an investment committee consisting of six Deutsche Telekom AG managers. To ensure an informed and objective assessment, several interviewees suggested that an internal investment committee should include internal and external experts in the respective technological and market domains. In order to encourage risk-taking it was recommended to let investment committee members participate in funded ventures' successes: *"If it goes wrong, they get in trouble, because they made a wrong investment decision, if it goes well they have no advantage of it personally, because it was not their money."* In cases where internal funding was not provided or to receive follow-up financing, many of the interviewed spin-along managers stated they needed support from T-Labs in accessing external funding sources. A T-Labs manager with venture capital experience pointed out that the attractiveness of the spin-along portfolio for external funding should be regularly assessed by an external unit to determine its ability to raise external capital.

One of the core aspects of the spin-along approach is the establishment and maintenance of a long-term **post-launch relationship** with spun-out ventures. In the past, spin-alongs from T-Labs tended to distance themselves from the parent in an attempt to increase their autonomy. *"It seems to be part of a kind of puberty process to say at a certain point in time 'I won't accept anything from my parent anymore.' This appeared in all spin-outs and it was harmful because at many points they actually needed help. We could have helped, but if we notice it too late we cannot do anything. (...) It must be avoided that they disconnect, even*

spatially. That means they have to stay within walking distance, so that you simply do not lose contact.” This statement by a T-Labs manager highlights the need to define the right degree of long-term connection between a parent and its ventures. Spin-alongs are usually founded as organisationally separate entities, allowing for a certain level of distance to their parent. This distance can have many beneficial effects for the parent, e.g. that from an external viewpoint ventures’ activities are not closely linked to the core business. However, a long distance can deprive ventures of the chance to benefit from the parent’s set of resources and skills. This suggests that a long-term connection between parent and ventures needs to be defined individually. At T-Labs, exchange with spin-alongs is exercised on an informal level, e.g. through personal exchange or co-location, and on a formal level, e.g. specified in contractual agreements or through organisational involvement.

The first group of spin-alongs was created as part of T-Labs’ spin-along programme and operated under specifically difficult conditions, because previous experiences and best-practices in launching a venture were scarce. Venture teams needed to learn for themselves, e.g. which administrative requirements they needed to fulfil, how to approach potential customers and how to enhance chances to receive internal and external funding. *“In a regular start-up, there are no internal regulations that you need to follow. We needed to get in touch with the right administrative people within the company to set up and manage our processes, such as payroll and accounting. (...) Because all of the ventures were launched at once there were no previous experiences that we could follow or build on. So, apart from a few exceptions where one of the other ventures was slightly ahead of us, we had to make our mistakes for ourselves.”* This statement by one of the interviewed venture leaders serves as an example to show the beneficial effects of learning from other ventures’ experiences. A careful collection and dispersion of lessons learned could therefore enable joint **learning and improvement**. Regular status-quo presentations and exchange events served to distribute experiences to all T-Labs employees. The project working mode at T-Labs led to a

rather high level of employee rotation, offering opportunities for informal spreading of past experiences.

SPIN-ALONG VENTURE DEVELOPMENT

Bringing together the right skills in the right balance in spin-along **team compositions** endows ventures with valuable starting conditions. At T-Labs, spin-alongs benefited from access to the parent's pool of internal experts in multiple domains at several levels of specification, as the following quotation from the lead of AllSec shows: *"It is the complexity of the overall project. (...) I need to find and bring together a potpourri of diverse qualifications and very, very high-level specialists. (...) And this applies for about ten different technical domains."* In the early development phases of the spin-alongs' development it needed to be determined which internal experts were available and which needed to be brought in from outside of T-Labs. The recruitment of external experts was considered beneficial when spin-alongs dealt in markets that T-Labs had only little experience in. Being an R&D unit, T-Labs lacked necessary competencies to manage all ventures with internal resources. Management positions of spin-alongs were in many cases filled by external interim managers who were experienced serial entrepreneurs. Internal employees could provide spin-alongs with technical expertise and a detailed understanding of the parental organisation, as the following quote by an interviewee from the venture InfraSens shows: *"(Our internal lead) knows how people think and act in the corporation. This is really a special language with its own rules. (...) Without deep relationships within the corporation and experience with that it would have been much more difficult."* Many of the T-Labs spin-alongs successfully implemented team constellations in which an internal technical project lead managed a venture together with an external manager who was experienced in the target market. In order to realise very specific needs for human resources (HR), sophisticated HR management was needed to realise optimal team compositions combining specialists and generalists, technical and market experts, and internal and external team members.

The majority of technologies commercialised by the T-Labs spin-alongs resulted from explorative internal R&D projects. In order to identify and deliver compelling value propositions, many of the spin-alongs needed to generate **customer insight** to validate the assumptions which product development relied on. The venture CloudTop offered a device that built on the Telekom infrastructure. While the utilisation of this infrastructure allowed for new functionalities, some features that current users of related products expected could not be provided. Since the device could not compete with already existing solutions, a number of pilot customer tests were conducted to explore new application domains. Agile business development practices along with qualitative and quantitative market studies enabled iterative collection and implementation of customer feedback. In other cases an implementation with the parent company as a pilot customer helped to further develop products.

In order to create relevant revenue for a large corporate parent, many of the T-Labs spin-alongs were required to develop scalable business models. DynaMetrics offered a technology-based service to business customers. In the early stages of **business planning** they found that their product could be attractive to a number of small and medium-sized enterprises (SMEs). However, it soon became clear that approaching a large number of small customers meant high administrative efforts without the potential to meet the high revenue goals. By using the parent's network, a high-level business customer could be won. This business relationship required less administrative effort while promising lucrative revenues. Several of the T-Labs ventures changed their business models from addressing consumer- or SME segments, to focusing on large business clients. A challenge that could be observed in this context was the clash of profitability expectations at corporate management levels with the realistically achievable financial goals of small businesses. Several of the T-Labs ventures were challenged to build realistic and yet highly profitable business plans, but struggled with top management expectations to create revenue at a

level that is relevant for a large corporation. This pressure threatened to result in highly scaled business plans with only little chance of realisation.

Spin-alongs can benefit from accessing **parental assets and services** to advance their business. Several of the T-Labs ventures received unlimited exclusive licenses to use parental IPR. However, not all spin-alongs could be provided with sufficient access to the resources they needed, due to their rather low positioning in the corporate hierarchy. The provision of parental resources to ventures may in some cases also serve as the base of a long-term relationship between a parent and its ventures.

DISCUSSION

Our findings suggest that the successful implementation of the spin-along approach at T-Labs required a corporate environment which encouraged entrepreneurial activity, a spin-along programme that generated, managed and guided spin-alongs, and new ventures that were developed with a customer orientation and realistic business planning and sufficient access to parental assets.

While the introduction of major new processes and strategies is always challenging, we noted that some of the capabilities were more challenging to implement than others. The management of internal conflicts of interest is a requirement inherent in the innovation context. Innovation deals with changing existing processes or replacing outdated uncompetitive products. Employees who are attached to these processes or product lines feel threatened, e.g. when a new venture emerges from the company and changes the status quo. Furthermore, it is ever challenging to determine the right amount of access to parental services and assets to grant. From the presented case study we learned that the corporate parent was more likely to provide corporate assets when the topical relatedness to internal activities was high.

Due to spin-alongs' aspirations for more autonomy, the management of the post-launch relationship has been identified as highly challenging, too. On the one hand spin-alongs strive for as much autonomy as possible to stay flexible and agile, but on the other hand the corporate parent sees the necessity to be informed about business activity to purposefully support the new venture. By managing the spin-along pool, corporates can benefit from a productive exchange. The quest for organisational learning is a key motivational factor for implementing a spin-along programme. The traditional modes of spinning-in (gaining control of ventures), spinning-out (spreading risk via diversification) or spinning-off (focusing on financial returns) are integrated and not kept isolated anymore when engaging in spin-along activities.

The presented case study shows how the spin-along programme could be successfully implemented and managed in the specific context of T-Labs. Therefore, the question arises: What would a successful spin-along programme look like in a different case setting? We can only attempt to answer this question by examining the context in which T-Labs operates. T-Labs, as an R&D unit of a large Telco incumbent, is embedded in an organisation of historically grown structures. This inadvertently leads to a high level of opposing personal and professional internal political motivations and historically grown conflicts. This context makes the smooth operation of a spin-along programme difficult, but at the same time all the more necessary. The creation of spin-alongs can help Deutsche Telekom to stay closer to ongoing market developments and react more timely by spinning out new ventures. We assume that younger firms with leaner structures and processes might be missing the necessary incentives for implementing a spin-along approach, even though it would be less challenging in their organisational setup. Factors such as company size, age, industry sector, innovation cycle lengths, regional dynamics and regional availability of venture capital may moderate the motivation for and the effects of implementing a spin-along programme in firms.

By embarking on this venturing initiative, we believe that T-Labs' activities can become an important strategic cornerstone and secure its position within the Deutsche Telekom AG – provided it becomes successful in the long run. As a cost centre, T-Labs are always threatened to fall victim to financial cuts. To survive in the long run, the unit therefore needs to ensure that its activities can directly contribute to the long-term success of the corporation. A successful spin-along programme can make T-Labs an indispensable internal partner, if it enables the large incumbent parent to stay innovative, competitive and close to customer needs in the long run.

What does the future hold for T-Labs' spin-along programme? We believe that a spin-along programme can not only be an engine for direct new revenue but can also benefit a firm in indirect ways, such as building strategic alliances and generating market insights to build future business on. In applying a traditional approach to assessing ventures solely based on short-term financial performance, a threat is imminent that ventures are measured against unrealistic revenue expectations. We therefore emphasise the need to assess not only the direct financial outcomes, but also the indirect effects of a spin-along programme. Moreover partnering may identify complementary assets from T-Labs' R&D activities and assets from external start-ups. Even partnerships of T-Labs' ventures with external business customers might create opportunities for strategic partnerships for Deutsche Telekom AG as a whole. Another promising direction for T-Labs is the initiation of a collaborative spin-along pool with other research intensive companies.

FUTURE RESEARCH

This paper identified core spin-along capabilities needed at T-Labs. While we have validated our results for this context with internal stakeholders, additional analyses are necessary to enhance the validity of our findings in other organisational contexts. A multi-organisational analysis could help to derive generalizable findings and enable benchmarking analyses of companies applying spin-along programmes. A contingency

analysis could provide valuable insights into the context factors that influence the significance of the different capabilities in other contexts.

Time will show if T-Labs' spin-along programme will become a success for Deutsche Telekom AG. We agree with Keil et al. (2008), who highlighted the need to measure the success of corporate ventures. We believe that, also in the spin-along context, measures like business growth and financial performance are not suitable performance indicators. Instead, the goal of the venturing approach should be to build and improve capabilities and enhance organisational learning through trial-and-error. A detailed investigation of the spin-along approach as a measure of organisational learning could provide further insights. Spin-along is not only about externalizing ideas that are already developed and selected within an organisation, but also aims at building and developing the foundation for future technology, product, customer and market insights. Future research could therefore investigate how the spin-along approach enables organisational learning. By contrasting the learning effects of the spin-along approach from those of internal and external corporate venturing, the differences between these approaches could be further highlighted.

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REFERENCES

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| Barney, J. (1991) 'Firm resources and sustained competitive advantage', <i>Journal of Management</i> , Vol. 17, No. 1, pp.99–120. | implications for strategic management', <i>Strategic Management Journal</i> , Vol. 6, No. 1, pp.39–54. |
| Burgelman, R.A. (1983) 'A process model of internal corporate venturing in the diversified major firm', <i>Administrative Science Quarterly</i> , Vol. 28, No. 2, pp.223–244. | Cohen, W.M. and Levinthal, D.A. (1990) 'Absorptive capacity: a new perspective on learning and innovation', <i>Administrative Science Quarterly</i> , March, Vol. 35, No. 1, p.128, ABI/INFORM Global. |
| Burgelman, R.A. (1985) 'Managing the new venture division: Research findings and | Eisenhardt, K.M. (1989) 'Building theories from case study research', <i>The Academy of</i> |

- Management Review, Vol. 14, No. 4, pp.532–550.
- Eisenhardt, K.M. and Graebner, M.E. (2007) 'Theory building from cases: opportunities and challenges', *Academy of Management Journal*, Vol. 50, No. 1, pp.25–32.
- Eisenhardt, K.M. and Martin, J.A. (2000) 'Dynamic capabilities: what are they?', *Strategic Management Journal*, Vol. 21, Nos. 10–11, pp.1105–1121.
- Fischer, S. (2014) 'Towards a spin-along strategy: mastering organisational adaptation through an emerging concept of corporate entrepreneurship theory', Presented at the R&D Management Conference, Stuttgart, Germany.
- Garud, R. and van de Ven, A.H. (1992) 'An empirical evaluation of the corporate venturing process', *Strategic Management Journal*, Special Issue: Strategy Process: Managing Corporate Self-Renewal, Summer, Vol. 13, pp.93–109.
- Gulbrandsen, B., Sandvik, K. and Haugland, S.A. (2009) 'Antecedents of vertical integration: transaction cost economics and resource-based explanations', *Journal of Purchasing and Supply Management*, Vol. 15, No. 2, pp.89–102.
- Helfat, C.E. and Peteraf, M.A. (2003) 'The dynamic resource-based view: capability lifecycles', *Strategic Management Journal*, Vol. 24, No. 10, pp.997–1010.
- Ireland, R., Covin, J. and Kuratko, D. (2009) 'Conceptualizing corporate entrepreneurship strategy', *Entrepreneurship Theory and Practice*, Vol. 33, No. 1, pp.19–46.
- Keil, T. (2001) *Building External Corporate Venturing Capability: Initial Conditions, Learning Processes and Knowledge Management*, Working paper, Institute of Strategy and International Business Series 2001/3.
- Keil, T. (2004) 'Building external corporate venturing capability', *Journal of Management Studies*, Vol. 41, No. 5, pp.799–825.
- Keil, T., McGrath, R.G. and Tukiainen, T. (2008) 'Gems from the ashes: capability creation and transformation in internal corporate venturing', *Organization Science*, Vol. 20, No. 3, pp.601–620.
- Klärner, P., Treffers, T. and Picot, A. (2013) 'How companies motivate entrepreneurial employees: the case of organizational spin-alongs', *Journal of Business Economics*, Vol. 83, No. 4, pp.319–355.
- Lichtenthaler, U. and Ernst, H. (2006) 'Attitudes to externally organising knowledge management tasks: a review, reconsideration and extension of the NIH syndrome', *R&D Management*, Vol. 36, No. 4, pp.367–386.
- Mahdjour, S. and Fischer, S. (2014) 'International corporate entrepreneurship with born global spin-along ventures – a cross-case analysis of Telekom Innovation Laboratories' venture portfolio', *International Journal of Innovation Management*, Vol. 18, No. 3, p.1440007.
- McCall, G.J. and Simmons, J.L. (1969) *Issues in Participant Observation: A Text and Reader*, Random House, New York.
- McJunkin, J. and Reynders, T. (2000) *Cisco Systems: A novel approach to structuring entrepreneurial ventures*. Graduate School of Business, Stanford University Case Number EC-15 (February 2000)
- Mes, F. (2011) *Internal Corporate Venturing zur Steigerung der Innovationsfähigkeit etablierter Unternehmen*, Gabler Verlag, Wiesbaden, Wuppertal.
- Michl, T., Gold, B. and Picot, A. (2012) 'The spin-along approach: ambidextrous corporate venturing management', *International Journal of Entrepreneurship and Small Business*, Vol. 15, No. 1, pp.39–56.
- Miles, M.P. and Covin, J.G. (2002) 'Exploring the practice of corporate venturing', *Entrepreneurship Theory and Practice*, Vol. 26, No. 3, pp.21–40.
- Miles, R.E., Snow, C.C., Meyer, A.D. and Coleman, H.J.J. (1978) 'Organizational strategy, structure, and process', *The Academy of Management Review*, Vol. 3, No. 3, pp.546–562.
- Project Management Institute (2006) *The Standard for Program Management*, The Institute, Newtown Square, PA.

- Rohrbeck, R., Döhler, M. and Arnold, H. (2009) 'Creating growth with externalization of R&D results-the spin-along approach', *Global Business and Organizational Excellence*, Vol. 28, No. 4, pp.44–51.
- Rohrbeck, R., Döhler, M. and Arnold, H.M. (2007) 'Combining spin-out and spin-in activities – the spin-along approach', Presented at the ISPIM-Conference, Warsaw, Poland, pp.1–12.
- Rothaermel, F.T. (2001) 'Complementary assets, strategic alliances, and the incumbent's advantage: an empirical study of industry and firm effects in the biopharmaceutical industry', *Research Policy*, Vol. 30, No. 8, pp.1235–1251.
- Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, Vol. 25, No. 1, pp.217–226.
- Sharma, P. and Chrisman, J.J. (1999) 'Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship', *Entrepreneurship Theory and Practice*, Vol. 23, No. 3, pp.1–16.
- Tellis, G.J. and Chandy, R.K. (2000) 'The incumbent's curse? Incumbency, size and radical product innovation', *Journal of Marketing*, Vol. 64, No. 3, pp.1–17.
- Williams, C. and Lee, S.H. (2009) 'Exploring the internal and external venturing of large R&D-intensive firms', *R&D Management*, Vol. 39, No. 3, pp.231–246.
- Williamson, O.E. (1985) *The Economic Institutions Of Capitalism: Firms, Markets, Relational Contracting*, Free Press, New York, NY.
- Williamson, O.E. (1991) 'Comparative economic organization: the analysis of discrete structural alternatives', *Administrative Science Quarterly*, Vol. 36, No. 2, p.269.
- Wu, L-Y. (2010) 'Applicability of the resource-based and dynamic-capability views under environmental volatility', *Journal of Business Research*, Vol. 63, No. 1, pp.27–31.
- Yin, R.K. (2009) *Case Study Research: Design and Methods*, edited by L. Bickman and D.J. Rog, Sage Publications, Thousand Oaks.
- Zahra, S.A. (1995) 'Corporate entrepreneurship and financial performance: the case of management leveraged buyouts', *Journal of Business Venturing*, Vol. 10, No. 3, pp.225–247.
- Zahra, S.A. (2007) 'Contextualizing theory building in entrepreneurship research', *Journal of Business Venturing*, Vol. 22, No. 3, pp.443–452.
- Zott, C. (2003) 'Dynamic capabilities and the emergence of intraindustry differential firm performance: insights from a simulation study', *Strategic Management Journal*, Vol. 24, No. 2, pp.97–125.

BRIDGING STATEMENTS

The previous paper showed 13 organizational capabilities T-Labs required for implementing the spin-along approach. It became apparent that one key characteristic of the spin-along approach is the maintenance of a relevant stake in spin-along ventures (e.g. through keeping ownership of shares or key assets). Further, these spin-along ventures are constantly kept at a certain distance to regularly decide whether to spin them off fully or to reintegrate them into the corporation again.

The following paper will highlight that this link between a corporate parent and its ventures has the potential to trigger challenges that can be mitigated through early internationalization of these ventures. The upcoming essay addresses this proposal by showing how early internationalisation supported the spin-along activities of Telekom Innovation Laboratories.

3. INTERNATIONAL CORPORATE ENTREPRENEURSHIP WITH BORN GLOBAL SPIN-ALONG VENTURES

A CROSS-CASE ANALYSIS OF TELEKOM INNOVATION LABORATORIES' VENTURE PORTFOLIO

This study investigates a special kind of corporate ventures, so called spin-along ventures, and their motivations to internationalise early. Insights are built from a multiple case study approach, investigating the spin-along programme of Telekom Innovation Laboratories (T-Labs). Our results show that early internationalisation can avoid or reduce challenges that spin-alongs face when entering the domestic market. Four major motivations for early internationalisation could be identified: (1) avoid termination based on the parent's perceived threat of cannibalisation of existing products, (2) enable a venture's collaboration with competitors, (3) overcome restrictions of parental assets in the domestic market, and (4) address markets that offer greater chances for success than the domestic market does. Based on our findings we derive concrete implications for practitioners and academics in the field of innovation management.

INTRODUCTION

In order to secure their long-term competitiveness, established companies are challenged to continuously stay innovative. Literature on the incumbent's curse has revealed that incumbency can lead firms to assume a lower level of market pressure which decreases innovation incentives. With this in mind, large companies apply corporate venturing to commercialise inventions by establishing new either internal or external units (Burgelman, 1983; Keil, 2004; Sharma & Chrisman, 1999). If the transfer of R&D results into the parental organisation is accompanied by high internal barriers (Riege, 2007), then the

creation of independent organisational units can become an attractive alternative path. Companies can decide whether to create own ventures from the inside out or to acquire external start-ups from the outside in. In recent years, practitioners as well as scholars have identified organisations that consolidate both internal and external venturing activities and called this phenomenon the “spin-along approach” (Rohrbeck et al., 2007). Companies that follow a spin-along approach build on ideas or R&D results to spin out new ventures as “innovation speedboats” to reduce barriers within the internal innovation process. At the core of the spin-along approach is the maintenance of a relevant stake in the new ventures (e.g., via ownership of shares or key assets) to flexibly decide whether to spin them in or off in the future.

Ventures that internationalise early after inception are called “Born Globals” (Knight & Cavusgil, 1996) or “international new ventures” (Oviatt & McDougall, 1994). Callaway (2008) linked Born Global research with the concept of internal corporate venturing (ICV) and presented “global corporate ventures” as measures to quickly internationalise internal corporate ventures.

In this paper, we will highlight early internationalisation as a strategy of spin-alongs to avoid internal and external barriers of domestic commercialisation. We build our insights on an explorative multiple case study of five ventures from the spin-along programme of Telekom Innovation Laboratories (T-Labs) that aimed for a launch in non-domestic markets early after their inception and present potential to become Born Globals. We will thereby link the spin-along approach with the concept of international entrepreneurship. Our results suggest that if corporates do not accept that their new ventures cannibalise own business models, engage in business with competitors or may require key parental assets, early internationalisation can be an attractive new direction when spinning-out new ventures successfully.

RELATED LITERATURE

THE SPIN-ALONG APPROACH

In 2007, Rohrbeck et al. first introduced the *spin-along approach* as a novel concept of corporate venturing. Previously, literature on corporate venturing emphasised two major foci: While *ICV* deals with the creation of new business within an established company, *external corporate venturing* focusses on sourcing ideas and concepts that are already in the market (Burgelman, 1983; Keil, 2004; Sharma & Chrisman, 1999). Corporate venturing allows companies to create new business, achieve growth, and diversify their product portfolio. Indirect benefits can include the development of new competencies and technologies, the promotion of an innovative corporate culture and the opportunity to learn through exploration (Backholm, 1999).

Companies applying the spin-along approach source promising ideas or generate new technology via internal R&D and commercialise them as spin-outs in separate new business organisations. A novel aspect of the concept is a close linkage and monitoring of these spin-alongs after their market launch, followed by a regular evaluation and decision to either reintegrate them, keep them at a distance or to reduce ownership of shares completely (Rohrbeck et al., 2009). In this context it is important to differentiate the terms spin-off, spin-in and spin-out: *Spin-offs* are completely separated from the corporate parent, although the parent might be a partner or customer of the new company. *Spin-ins* are external ventures that are acquired and integrated into an organisational structure. Spin-along ventures are *spun out* (not “off”) by their corporate parent in order to keep them at a distance over a longer period of time (Rohrbeck et al., 2009).

While several case study-based publications have presented the relevance of the spin-along approach in management practice (Mahdjour & Fischer, forthcoming; Klarner et al., 2013; Michl et al., 2012; Rohrbeck et al., 2009, 2007), the number of publications exploring and sharpening the concept to date is scarce (Michl et al., 2012). Especially the detailed

characteristics that distinguish the approach from other existing theoretical concepts in the area of corporate venturing need to be further investigated.

BORN GLOBALS

Born Globals or *international new ventures* are young companies that internationalise early after their inception (Knight & Cavusgil, 1996; Oviatt & McDougall, 1994). They challenge the widely established notion that internationalisation measures are only relevant for large established firms that seek to enhance their existing business with opportunities in international markets (Chang, 1995; Johanson & Vahlne, 1977; Vernon, 1966). Different definitions of the term *Born Global* have been proposed in management literature (e.g., Knight & Cavusgil, 1996; Knight, 1997; McDougall & Oviatt, 2000; Wright & Ricks, 1994; Wurster, 2011). By taking previous definitions into account, Wurster (2011) proposed that “*Born Globals are companies that operate in international markets from the earliest days of their establishment and derive a substantial proportion of their revenues from sales in these markets.*” (Wurster, 2011, p. 41). To identify Born Globals, Holtbrügge & Enßlinger (2005) and Holtbrügge & Wessely (2007) proposed the following criteria: First, a Born Global makes a first attempt towards internationalisation within the first three years of its lifecycle and a second attempt within the following three years, and second, the internationalisation activities take place in five or more countries, two different cultural clusters or two different geographic regions. In order to enter new markets, Born Globals exploit various opportunities to access networks, partners and build strategic alliances, e.g., via licensing, joint ventures or franchising. Key success factors of Born Globals are an entrepreneurial orientation, the ability to enter international markets early, to protect intangible assets and to penetrate market niches (Wurster, 2011).

GLOBAL CORPORATE VENTURES

The interest in linking international business research with entrepreneurship is growing (McDougall & Oviatt, 2000; Young et al., 2003). Moreover internationalisation plays an

increasingly important role in corporate entrepreneurship (Hoskisson et al., 2011). Callaway (2008) linked the concept of Born Globals with ICV. By presenting examples of ING Direct and HSBC Direct he showed how two large financial service companies were able to create international ventures via internal corporate venturing. He introduced the concept of *global corporate ventures* as vehicles to quickly bring new products to the international market place. Innovations introduced by global corporate ventures are often niche products or platform technologies which require a global reach to be successful. Internal ventures may internationalise early, regardless of the degree of internationalization of the corporate parent and can therefore, become a vehicle to internationalise the parent itself (Callaway, 2008). Furthermore, global corporate ventures face a trade-off between independence and access to parental resources. The more independently a venture acts, the lower is the likelihood of receiving proper access to corporate resources and vice versa. However, more access to resources is linked with stronger parental monitoring which hinders entrepreneurial freedom of the venture (Callaway, 2008). This notion is in line with Burgelman's (1984) assessment that ICV top management "*should learn to assess better the strategic importance of ICV projects to corporate development and their degree of relatedness to core corporate capabilities*" (p. 44). Additionally high-technology ventures in the ICT industry can specifically benefit from network effects. Global corporate ventures that are able to scoop network effects and achieve technological lock-ins have the chance to increase internationalisation speed (Callaway, 2008) and thereby set de-facto standards (Wurster, 2011).

RESEARCH QUESTIONS

We follow Callaway's (2008) suggestion to enhance research on global corporate ventures and to extend it to sectors outside of the financial services industry. Moreover, we agree with the need to identify motivations for corporations to internationalise their ventures. Additionally, Callaway underlines the need for richer case studies to test his propositions and develop new ones.

As opposed to Callaway's research in which he focusses on chances of early internationalisation for internal corporate ventures, we aim to reveal challenges of spin-alongs that trigger early internationalisation. By analysing motivations and benefits of five early internationalising spin-alongs in the ICT industry, the following research questions will be addressed:

1. What were the motives of the T-Labs' spin-along ventures to aim for early internationalisation?
2. How did early internationalisation help the spin-along ventures of T-Labs to overcome internal barriers?

METHODOLOGY

Case studies are a suitable method to answer complex "how" and "why" questions and can serve to explore "*holistic and meaningful characteristics of real-life events*" (Yin, 2009, p. 4). Furthermore, multiple case studies analyse and compare a set of cases and can therefore set a suitable level of abstraction with greater generalisability (Eisenhardt & Graebner, 2007). To answer our research questions we conducted a multiple case study with five of T-Labs' spin-along ventures.

DATA COLLECTION

The sample for our analysis consists of five ventures from T-Labs' spin-along programme, which were under development in 2013 and aimed for early internationalisation.

Semi-structured qualitative expert interviews were conducted in 2013, with eight members of the management staff of these spin-alongs (240 transcribed pages) and with four T-Labs managers (115 transcribed pages). Being members of the parental organisation ourselves, we had the chance to benefit from practitioner research (Jupp, 2006), and could include our observations of the spin-alongs' activities over a 12-month period into our research project. To ensure objectivity of this study, internal documents (e.g., guidance documents of the spin-along programme, target pictures, success metrics, and plan versus reality

comparisons), as well as public documents (e.g., press releases and websites of the ventures) were also collected and analysed.

SAMPLE

The following paragraphs will provide a short overview of the five spin-along ventures. For the purpose of this publication the ventures' names have been changed to maintain confidentiality and to provide a descriptive title.

IPcall offers an internet protocol-based communication solution. As IPcall provides a technology that has the potential to cannibalise the parental core business it had to deal with low levels of trust internally.

SECphone delivers a security solution for mobile phones. A highly complex architecture of the product requires close collaboration of several highly-specialised individuals at the parent company. Since, thematically, SECphone was close to the parental core business, a business unit of the parent became its first customer.

TrafficNET offers a technology that enhances transparency of network utilisation. The underlying idea arose from the parent's own needs which it could address with the technology. TrafficNET commercialises this technology and builds on highly sensitive parental assets making a close collaboration with the parent necessary.

JinglePhone offers a mobile entertainment application which enables users to enrich phone calls with specific sounds. The idea resulted from a prior ideation project. Although it appeared trivial at first, it soon became apparent that the technological realisation is highly complex and requires access to sensitive parental assets.

InfoSense offers an analytics service based on complex data sources. Data is the core parental asset which InfoSense requires to run its business. InfoSense is challenged to fulfil strict legal requirements in the domestic market which limits its business potential.

DATA ANALYSIS

Literature recommends the construction of category systems to analyse and interpret qualitative data. These categories can be built either deductively, based on existing theory, or inductively, constructed from the collected data (Saunders et al., 2007). To analyse our data, the following steps based on Eisenhardt (1989) were taken:

1. Following an inductive approach the transcribed interview data was reduced by coding all instances that reveal contexts and motivations for early internationalisation. In order to manage the large data volume Atlas.ti was used as coding software. In an iterative manner, the resulting categories were regrouped to receive a comprehensive set of codes to categorise the identified motivations.
2. From this first analysis step we shaped hypotheses about our research object. These were reviewed and validated in interviews with representatives of T-Labs' spin-along programme.
3. The resulting set of categories was reviewed with reference to similar and diverging findings in existing literature, until theoretical saturation was achieved.

EARLY INTERNATIONALISATION MOTIVES OF T-LABS' SPIN-ALONG VENTURES

Spin-along executives are regularly confronted with challenges related to the fact that they need to manage their venture's positioning in the external market (moving from being an internal corporate venture to becoming a spin-along venture) and at the same time facing pressure to satisfy the goals and expectations of the parent firm. The continuous endorsement of the parent can be crucial to ensure the availability of sufficient support and financing. If a venture fails to manage this balancing act well, conflicting goals and activities can cause an untimely termination of ventures, regardless of their chances for success. Additionally, parent organizations are not always able to provide all of their

ventures with the resources they need to run their business successfully, and detrimental domestic market conditions can hinder the profitable commercialisation of a venture's offer.

Many of T-Labs' spin-alongs faced these challenges when developing their business strategy. Our study focusses on the subset of spin-alongs that chose early internationalisation as a proper balancing mode (Table 1).

<i>Motives</i>	<i>Effects</i>	<i>Reference Cases</i>
Avoidance of cannibalisation	<ul style="list-style-type: none"> • Reduction or avoidance of competition with parental offerings in currently served market 	<ul style="list-style-type: none"> • <i>IPcall</i>
Business with competitors	<ul style="list-style-type: none"> • Provision of offer to competitors in other markets 	<ul style="list-style-type: none"> • <i>TrafficNET</i> • <i>SECphone</i>
Access to assets	<ul style="list-style-type: none"> • Faster utilisation of assets from subsidiaries in other markets 	<ul style="list-style-type: none"> • <i>JinglePhone</i>
Market selection	<ul style="list-style-type: none"> • Selection of markets that provide beneficial conditions for successful launch 	<ul style="list-style-type: none"> • <i>InfoSense</i> • <i>TrafficNET</i>

Table 1: Motives for early internationalisation

AVOIDANCE OF CANNIBALIZATION

IPcall developed a technical solution that had the potential to cannibalize the parental core business of traditional mobile telephony. When applying for internal funding the spin-along faced much internal resistance. From the parent's point of view the offering was too close to the current business and therefore, too risky. With this in mind, great chances were seen in commercialising IPcall's technology in markets in which the parent had only a weak footprint. This allowed building on already established resources, e.g., sales channels, as well as partner and customer networks in the target market, without threatening existing core revenue sources. At the point in time when our study was conducted, IPcall had not brought its offering to the market yet. The consideration of an early internationalisation approach, however, offered the team a promising chance to avoid complete termination based on fears of cannibalisation, and allowed them to develop their product further.

The case of IPcall shows that spin-alongs, which commercialise technology from their parent's own R&D portfolio, may develop products that are rather strongly related to

current parental products. This strong relatedness can raise corporate fears of disrupting currently stable revenue sources. Early internationalisation can offer chances for launching spin-alongs successfully, without cannibalising current parental business and can thereby, enable the parent to invest in promising initiatives while securing current business.

BUSINESS WITH COMPETITORS

TrafficNET initially started as an internal development project. It was based on the parent's own need of receiving high-quality information on its network utilisation. The team realised that the technology would also meet a strong demand in the external market. However, other companies that had a demand for this solution would be current competitors of the parent in the domestic market. In order to avoid critical conflicts at the management level, which risk termination of the venture, the team approached international customers who operated in markets where the parent had no footprint with the affected product. Thereby, TrafficNET could offer its service to foreign competitors of the parent while avoiding internal conflicts. If internationalisation would not have been identified as a suitable strategy, the venture might have never been started.

Furthermore, an early internationalisation can help to avoid parental lock-in effects that are not favoured from a venture's perspective. **SECphone** was one of the first ventures to be created as part of T-Labs' spin-along programme. It benefitted from the chance to work closely with a parental business unit that provided it with its valuable distribution channels. The utilisation of these channels allowed attracting large business customers, however, the close collaboration with the internal partner also created barriers for SECphone. Since, the business unit assumed an important role in the venture's business activity and organisational structure, it was able to block aspirations of approaching other external customers in the domestic or international markets in which the business unit had an established footprint. Due to the exclusive focus on the parent as an internal customer, SECphone was not able to realise its whole business potential at the time when our study

was conducted. While the early affiliation with the parental business unit helped to leverage SECphone's business, an early internationalisation could have taken place in parallel to avoid the creation of barriers and retain SECphone's independence. We believe that an expansion to other markets in which the business unit currently has no footprint may still be a feasible approach at this point.

Spin-along ventures that originate from internal development projects may solve problems with which the corporate parent is itself concerned. In this case a pilot implementation at the parent can help ventures to deliver a proof-of-concept which may be a prerequisite for attracting prospective external customers. The early integration with the parent can also create organisational linkages which restrict the venture's approach of other target customers. This can especially hold true in cases where other potential customers to the solution could be current competitors of the parent. An early internationalisation can circumvent perceived threats of collaboration with competitors by serving these customers in markets where the parent currently has no footprint.

To reach a relevant market size, it is not advisable for spin-alongs to exclusively focus on internal customers but to also address external customers which in some cases may be competitors of the parent. Early internationalisation in markets where the parent organisation is not active is a valid approach to overcome resulting conflicts. However, in today's globalised world, distances between separated markets decrease constantly, which should be monitored and managed to avoid future conflicts. The European telecommunications industry is a rather specific example as it is shaped by a rather constant number of network operators in each country.

ACCESS TO ASSETS

JinglePhone commercialised a technology that required utilisation of one of the parental core assets: the mobile telephony network. It soon became apparent to the team that the venture was too small to be granted the needed resources from the parent. The team looked

for other countries in which the parent was active, to explore possibilities for partnerships with national network providers of the parent. By intensifying contacts to an international subsidiary of the parent, JinglePhone could gain access to the needed resources more easily. An adjustment of the business model to the specifications of the target market (e.g., pricing) was needed to create an offer that accounted for the local conditions.

In comparison to independent start-ups, corporate ventures can build on the assets of a large company. Needed assets may be tangible and intangible properties, such as IT infrastructure, sales channels, partner and customer networks and data, intellectual property rights, and also brand and market power. In a broader sense parental assets are resources that are needed to fulfil current business activity. Many of the T-Labs spin-alongs were built on parental assets, but in order to ensure continuous operation, the parent needed to carefully weigh its decisions of which ventures to grant its resources to and which not to. Despite their strategic importance, spin-alongs were not always considered high-priority candidates for receiving access to corporate assets. They needed to compete for resources with internal units and projects that already had established revenue streams and were therefore, often prioritised. In our research we found that international offices of the corporate parent were in some cases more willing to share their assets with new spin-along ventures. Due to the smaller size and stronger market orientation, these subsidiaries have a stronger resemblance to the structures of new ventures, making collaboration easier. Furthermore, spin-alongs can build on experiences of international offices and may in many cases be prioritised higher there.

To conclude, an early internationalisation can enable ventures to profit from access to resources of parental subsidiaries in other markets. Even if the corporate parent has no internationalisation experiences, building on other key partners' assets can serve as a competitive strategy of Born Global spin-alongs.

MARKET SELECTION

Technology-push oriented ventures may trade highly specialised solutions. In many cases such specialised solutions are offered to narrow niche markets which can have a very small volume on a national scale, but may be large internationally. **TrafficNET** delivered a solution to a problem which only participants of a very narrow niche market had. In order to reach a relevant market size, the venture considered an international market launch and engaged in an early exchange with other market participants in international markets. An international market launch could, therefore, extend the size of the addressed market and create a promising outlook for future financial returns. Early internationalisation was a rational decision for TrafficNET, because it was the only way to commercialise the very specific invention in a rather narrow but international niche market.

InfoSense offered a service that was difficult to deliver in the domestic market due to strictly regulated legal conditions. The spin-along therefore, decided to launch a limited version of its offer in the domestic market with the intention to soon expand to an international market with less restrictive legal conditions. Internationalisation, thereby, provided a plan B for launching the product even though it was not in line with domestic legal restrictions.

In the two above-mentioned cases, an early internationalisation strategy was pursued because of the beneficial conditions or higher level of opportunities in foreign markets. Most of T-Labs' spin-alongs originated from a technology-push orientation, therefore, only few were based on a strong identified market demand. In fact, the fit of developed technologies with domestic market conditions was explored at a rather late stage. The capability to identify and select the right market can be vital for spin-along ventures. Foreign markets can serve as trial, where a spin-along can learn and sharpen its product offering. Markets generally differ from one another and products always need to be adapted to specific market conditions, however, early internationalisation can improve chances for success and enable a staged roll-out into different attractive markets. After all, the effort it takes to

alter their own business model to local needs may be much lower than the effort it takes to overcome barriers which are in place in the domestic market.

DISCUSSION

POSITIONING OF T-LABS' BORN GLOBAL SPIN-ALONG VENTURES

In this section we will analyse how the envisaged internationalisation strategies of the five aspiring Born Global spin-alongs differ from one another. Recalling the definition of Wurster (2011), we identify Born Globals as firms that operate internationally from their earliest days on and generate a large share of their revenues from these international markets.

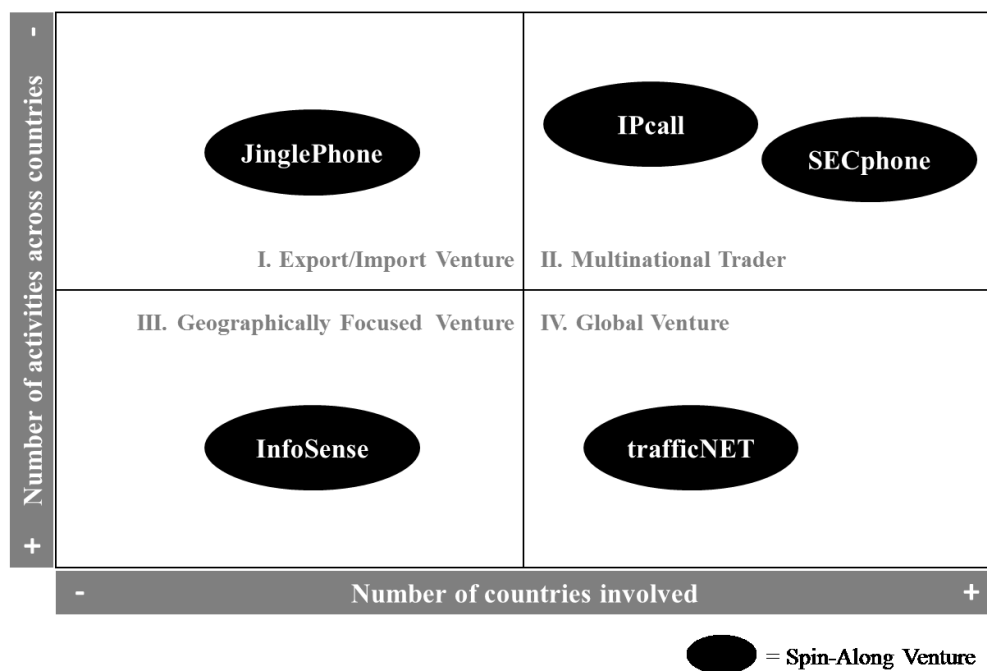


Figure 1: Types of Born Global spin-along ventures (adapted from Oviatt & McDougall, 1994)

In Figure 1 we adapted the 4-field matrix of types of international new ventures by Oviatt & McDougall (1994). It was modified to reflect the context of corporate venturing and we positioned the five ventures along the dimensions “number of activities across countries” and “number of countries involved.” Since the analysed T-Labs ventures were only started in 2012, it is still open how they will evolve and if they are really going to become Born Globals by executing the internationalisation strategies that have been defined during their development. Their positioning within the matrix is therefore, based on the strategies that their leaders envisioned at the time when our research was conducted.

TrafficNET’s sophisticated product can be used by all kinds of telecommunication companies over the world. If the venture launches internationally, not only sales activities take place on an international level but also customer specific software implementation at the local telecommunication service provider’s infrastructure. In our matrix, this places TrafficNET in the category **Global Venture**. According to Oviatt & McDougall (1994), ventures in this category have the potential to derive *“significant competitive advantage from extensive coordination among multiple organizational activities, the locations of which are geographically unlimited”* (p. 59).

JinglePhone’s and InfoSense’s business models are also designed to conduct most of their business activities across different countries, nevertheless, both ventures’ geographical reach is focused on countries in which their corporate parent has an already established footprint. This is based on the fact that both ventures build strongly on parental assets which need to be in place continuously in each country that they want to operate in. In the long run they may have the opportunity to decouple their business from parental assets and open up for other enabling assets. However, JinglePhone and InfoSense differ from each other in the amount of cross country operating business activities.

JinglePhone is based on a technology that is not expected to need to adapt extensively to specific local conditions in foreign markets (e.g., domestic legal regulations or enabling technical infrastructures) and may therefore be classified as an **Export/Import Venture**

with only few activities dispersed across countries. A long-term competitive advantage of international new ventures in this category depends on “(1) *unusual abilities to spot and act on (...), emerging opportunities (...), (2) knowledge of markets and suppliers, and (3) the ability to attract and maintain a loyal network of business associates*” (Oviatt & McDougall, 1994 p. 58)

Due to the different national regulations for procession and commerce with data (the core business of InfoSense), we expect that InfoSense will need to adapt more strongly to local conditions in foreign markets than JinglePhone does and may therefore, need to conduct more activities in its target markets, classifying it as a **Geographically Focussed Venture**. This type of international new ventures may secure its advantages by “*a close and exclusive network of alliances in the geographical area served*” (Oviatt & McDougall, 1994 p. 59).

IPcall and SECphone can operate in many different countries as they are not restricted to countries in which their parent already has a footprint. As they are also not expected to be required to adapt their activities strongly to local contexts in the target markets, their activities in foreign markets may be limited (e.g., to sales activities). IPcall and SECphone can be categorised as **Multinational Traders**, who operate mostly from their domestic market and reach into many different markets.

REFLECTION ON THEORY

Callaway (2008) proposes that if a corporate parent has strong international experiences and a widely established footprint in global markets, global corporate ventures may exploit this and internationalise faster than more independent and decoupled ventures. Our analysis underlined that this does not always hold true. Especially for spin-along ventures, a more nuanced viewpoint should be taken. Spin-along ventures that commercialise parental assets and have the ability to cannibalise the parental business should, under specific circumstances, avoid commercialisation in parental markets. Although, a

willingness to cannibalise has been named in management literature as a key success factor for remaining innovative (Nijssen, Hillebrand & Vermeulen, 2005), its realisation in management practice is difficult when the fulfilment of ongoing contracts and target agreements is at risk. This also holds true when a venture's business with parental competitors is necessary to generate sufficient revenue. Spin-along ventures need to find the right (niche) market to develop their products and to scale the business up from there. Compared to Callaway's findings, our research does not primarily focus on faster internationalisation, but gives antecedents for how a venture can be spun-out despite internal barriers.

Furthermore, we agree with Callaway that the degree of a venture's independence is directly related to the support given by the parent, and that a high level of support (e.g., granting access to resources) is coupled with more monitoring and guidance. When it comes to business with competitors it seems that only less integrated ventures are likely to attract customers that are competitors of the corporate parent. This is not only the case because customers may want more independent spin-alongs, but also because the parental unit may prohibit business with competitors if the level of integration, and by that, influencing power is high. Nevertheless, we suggest that the importance of parental assets may decrease over time. At the beginning, parental assets build a competitive advantage compared to independent start-ups, however a Born Global spin-along should aim for building own distinct assets and capabilities to increase independence from the corporate parent in the long run. In this regard, the selection of the right market plays a key role. Our findings are in line with Jolly et al. (1992) by saying that for a few new ventures internationalisation is the only way to start a business based on high initial investments in R&D. Furthermore, we agree with scholars that new ventures, which satisfy a need of a niche market need to internationalise early after inception, because the domestic market is too small to gain significant revenues (Hordes, Clancy & Baddaley, 1995). From the perspective of the spin-along approach, internationalisation measures do not primarily aim for returning R&D

investments, but rather for expanding into global niche markets to make commercialisation generally possible.

Teece (1986) claims that *“in almost all cases, the successful commercialization of an innovation requires that the know-how in question be utilized in conjunction with other capabilities or assets”* (p. 288). This means that the single invention is not enough to successfully turn it into an innovation. For T-Labs’ spin-along ventures complementary assets like the parental brand reputation, sales channels, funding capacities, network embeddedness, and also knowledgeable and experienced staff and shared services from the corporate parent may leverage their success. But in general, how can a corporate judge the suitability of an invention to be commercialised by a corporate venture? One explanation can be the above-mentioned degree of dependence on complementary assets. One can assume (and our study showed evidence for that), that if an innovation needs complementary assets which (only) the corporate parent can offer, then a new venture has a significant competitive advantage in the market, in case it is granted exclusive access to these assets.

CONCLUSION

With our research questions we sought to identify what motivations T-Labs’ spin-alongs had to aim for early internationalisation and how this approach helped to overcome internal barriers. By analysing the experiences of five new ventures of T-Labs, we could narrow down the core motivations for internationalisation and could identify early internationalisation as a strategy that can circumvent specific challenges.

Four major motivations for early internationalisation could be identified: (1) to avoid termination based on the parent’s perceived threat of cannibalisation of existing products, (2) to enable a venture’s collaboration with competitors, (3) to overcome restrictions of parental assets in the domestic market, and (4) to address markets that offer greater

chances for success than the domestic market does. We thereby identify that internationalisation can serve as

1. a measure taken to avoid or reduce conflicts with the corporate parent,
2. an approach to increase likelihood of access to parental assets by sourcing from international subsidiaries, and
3. a measure to select and address those markets in which the offer had the greatest chances to succeed.

Our research aims to enhance literature on the spin-along approach and provides the research community with cases that serve to further analyse the concept and its challenges. Moreover, it highlights the legacy of the spin-along approach as a distinctive approach of corporate venturing. By linking the spin-along approach with Born Global theory, potentials could be identified that current literature has not yet focussed on.

LIMITATIONS AND FUTURE RESEARCH

Our study focussed on the benefits that early internationalisation offers to corporate spin-alongs of T-Labs, reflecting cases in the ICT industry. The ICT industry, and especially the telecommunication service provider market, is exceptional. High-technology ventures rely on profit from advancements in communication speed and reach as well as low diffusion costs and the chance to achieve lock-in effects due to network effects. Additionally, telecommunication providers, have a rather constant footprint in several markets. To build or buy a telecommunication network infrastructure or to acquire a whole operator, requires high investments and takes place only occasionally. Other industries might face much more dynamic international activities and case studies in those fields may show other characteristics.

Moreover, our study is limited in a sense that it incorporates the findings of only a small number of cases, however we aimed to show deep insights from multiple cases and did not

aim for generalisable findings. Last, it should be noted that the T-Labs spin-along programme was still at an early stage of its implementation at the time when this study was conducted. Therefore, it is still too early to draw conclusions from the effects of the early internationalisation aspirations and the realisation of respective strategies in the long run. Future research should therefore, include long-term effects of early internationalisation on spin-alongs.

Our study aimed to broaden the scope of the spin-along approach by linking it with another theoretical concept – Born Globals. Future studies may aim at deepening the spin-along approach by explaining its foundation with the help of theories like resource-based view or transaction cost economics. Mahdjour & Fischer (2015) took a first step in that direction.

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REFERENCES

- Backholm, A. (1999). *Corporate Venturing: An Overview*. Espoo: Helsinki University of Technology.
- Burgelman, R. A. (1983). A process model of internal corporate venturing in the diversified major firm. *Administrative Science Quarterly*, 28(2), 223–244.
- Burgelman, R. A. (1984). Managing the Internal Corporate Venturing Process. *Sloan Management Review*, 25(2), 33–48.
- Callaway, S. K. (2008). Global Corporate Ventures: A New Trend of International Corporate Entrepreneurship. *Multinational Business Review*, 16(3), 1–22.
- Chang, J. (1995). International expansion strategy of Japanese firms: Capability building through sequential entry. *Academy of Management Journal*, 38(2), 383–407.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532–550.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50(1), 25–32.
- Holtbrügge, D., & Enßlinger, B. (2005). *Initialkräfte und Erfolgsfaktoren von Born Global Firms* (Working Paper No. 2/2005). University of Erlangen-Nürnberg.

- Holtbrügge, D., & Wessely, B. (2007). Initialkräfte und Erfolgsfaktoren von Born Global Firms. In M.-J. Oesterle (Ed.), *Internationales Management im Umbruch*, Deutscher Universitätsverlag, 169–205.
- Hordes, M. W., Clancy, J. A., & Baddaley, J. (1995). A primer for global start-ups. *Academy of Management Perspectives*, 9(2), 7–11.
- Hoskisson, R. E., Covin, J., Volberda, H. W., & Johnson, R. A. (2011). Revitalizing Entrepreneurship: The Search for New Research Opportunities. *Journal of Management Studies*, 48(6), 1141–1168.
- Johanson, J., & Vahlne, J.-E. (1977). The Internationalization Process of the Firm - A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of International Business Studies*, 8(1), 23–32.
- Jolly, V. K., Alahuhta, M., & Jeannet, J.-P. (1992). Challenging the incumbents: How high technology start-ups compete globally. *Strategic Change*, 1(2), 71–82.
- Jupp, V. (2006). *The SAGE dictionary of social research methods*. London; Thousand Oaks, Calif.: SAGE Publications.
- Keil, T. (2004). Building External Corporate Venturing Capability. *Journal of Management Studies*, 41(5), 799–825.
- Klarner, P., Treffers, T., & Picot, A. (2013). How companies motivate entrepreneurial employees: the case of organizational spin-alongs. *Journal of Business Economics*, 83(4), 319–355.
- Knight, G. A. (1997). *Emerging Paradigm for International Marketing: The Born Global Firm*. University Microfilms International Dissertation Service.
- Knight, G. A., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, (8), 11–26.
- Mahdjour, S. & Fischer, S. (forthcoming). Implementing the Spin-Along Approach - A Capability Analysis of Telekom Innovation Laboratories' Corporate Venturing Program. *International Journal of Technology Marketing*.
- McDougall, P. P., & Oviatt, B. M. (2000). International Entrepreneurship: The intersection of two research paths. *Academy of Management Journal*, 43(5), 902–906.
- Michl, T., Gold, B., & Picot, A. (2012). The spin-along approach: ambidextrous corporate venturing management. *International Journal of Entrepreneurship and Small Business*, 15(1), 39–56.
- Nijssen, E. J., Hillebrand, B., & Vermeulen, P. A. M. (2005). Unravelling willingness to cannibalize: A closer look at the barrier to radical innovation. *Technovation*, 25(12), 1400–1409.
- Oviatt, B. M., & McDougall, P. P. (1994). Toward a Theory of International New Ventures. *Journal of International Business Studies*, 25(1), 45–64.
- Riege, A. (2007). Actions to overcome knowledge transfer barriers in MNCs. *Journal of Knowledge Management*, 11(1), 48–67.
- Rohrbeck, R., Döhler, M., & Arnold, H. (2009). Creating growth with externalization of R&D results – the spin-along approach. *Global Business and Organizational Excellence*, 28(4), 44–51.
- Rohrbeck, R., Döhler, M., & Arnold, H. M. (2007). Combining spin-out and spin-in activities – the spin-along approach. Presented at the ISPIM-Conference, 2007, Warsaw, Poland, 1–12.
- Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research Methods for Business Students*. Pearson Education Limited.
- Sharma, P., & Chrisman, J. J. (1999). Toward a Reconciliation of the Definitional Issues in the Field of Corporate Entrepreneurship. *Entrepreneurship: Theory and Practice*, 23(3), 1–16.
- Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15(6), 285–305.
- Vernon, R. (1966). International investment and international trade in the product cycle. *The International Executive*, 8(4), 190–207.
- Wright, R. W., & Ricks, D. A. (1994). Trends in International Business Research: Twenty-Five Years Later. *Journal of International Business Studies*, 25(4), 687–701.

Wurster, S. (2011). Born Global Standard Establishers: Einfluss- und Erfolgsfaktoren für die internationale Standardsetzung und -erhaltung. Gabler.

Yin, R. K. 2009. Case Study Research: Design and Methods. (L. Bickman & D. Je. Rog, Eds.). Sage Publications.

Young, S., Dimitratos, P., & Dana, L.-P. (2003). International Entrepreneurship Research: What Scope for International Business Theories? *Journal of International Entrepreneurship*, 1(1), 31–42.

BRIDGING STATEMENTS

During the observation of the spin-along programme of Telekom Innovation Laboratories, we came across the phenomenon that some of T-Labs' spin-along ventures aimed for starting their business in non-domestic markets. The previous paper has shown that motives for early internationalization of spin-along firms in the case of Deutsche Telekom were: First, the decreased probability of termination of the venture due to the parent's impression of getting part of their business cannibalized through the spin-along venture's activities. Secondly, early internationalization makes it easy to partner with parental competitors in markets that the parental organization has no presence in. Thirdly, early internationalization may simplify the access to parental assets in markets where only smaller subsidiaries of the parental organization exist. Fourthly, non-domestic markets may have beneficial characteristics (e.g. higher demand, less legal restrictions) compared to the parental home market, which accelerates venture growth and performance in early years.

The following paper will take leave the spin-along and corporate venturing domain by taking early internationalization into account for independent young firms to achieve global market dominance. The paper aims at answering the question of what factors influence the successful establishment of a dominant design by Born Global companies. Furthermore, the paper will illustrate characteristics of suitable markets and factors that enable companies to maintain a dominant market position and to stay successful in the long-run.

4. BORN GLOBAL MARKET DOMINATORS

INSIGHT INTO A UNIQUE CLASS OF YOUNG COMPANIES AND THEIR ENVIRONMENT

Issues of dominance in the market place, ‘standards wars’ and ‘battles for dominance’ between large companies are frequently addressed by researchers and the business press alike. The existence of companies that could establish internationally dominant solutions to customers’ problems within a few years after their founding is quite unknown and the reasons for their success are hardly investigated so far. Therefore, they are not covered by traditional stage models for the establishment of dominant solutions. Based on 22 cases and a new success factors model, this article shows how young companies can successfully establish their technologies as dominant solutions in the global market.

INTRODUCTION

Dominance in the market place is frequently discussed by researchers and the business press alike (see Gallagher, 2007 as well as Suarez, 2004). According to Gallagher (2007) dominance is an attribute of ‘the industry’s (favourite) product’. More precisely, it has what he calls the ‘dominant design.’ Scholars agree that dominant designs are specific technologies that were capable of passing competitive selection processes in the market (Clark, 1985; Suarez & Utterback, 1995; Utterback, 1994; Suarez, 2004; Scott, 1994). The term ‘the industry’s product’ is equivalent to the definition of ‘a single winning standard’ as a de-facto standard which results from ‘the dynamic in the market that gives rise to network effects and switching costs that tip the competition to (the relevant solution)’ (Gallagher, 2007). David & Greenstein (1990) distinguish between unsponsored and sponsored standards. Considerations regarding similarities to the dominant design concept concern sponsored standards which are characterized by one or more sponsoring entities having property rights to the standard. According to Lee et al. (1995) and Swann (1987, 2000) the concepts of ‘dominant designs’ and ‘de facto standards’ are mutually

interchangeable. In contrast, Gallagher (2007) explains in detail the difference between various products and designs and gives an extensive overview of the relevant literature. He argues that compatibility standards in contrast to dominant designs can be controlled by a single firm, which may use them to accrue proprietary rents. More specifically, ‘standards can apply to a (single) firm which owns (them)’. Van de Kaa et al. (2007) combine both concepts into the distinctive way of providing a generic service or function’ (van de Kaa et al., 2007, p. 6).

In principle, Gallagher’s (2007) description of differences between ‘dominant designs’ and ‘de facto standards’ focuses more on the ‘design’ aspect, while there is no question that a company’s product can dominate the market (see e.g. the examples in Suarez, 2004). Therefore, a new dominance concept with a wider object-oriented perspective is needed.

The concepts ‘dominant design’ and ‘de facto standard’ refer to hardware and software products like the IBM PC, the Windows operating system; the Playstation etc. (see e.g. Suarez, 2004 and van de Kaa, 2009). Therefore, dominant hardware products and dominant software need to be parts of the new concept. Furthermore, due to Gallagher’s (2007) mentioning of compatibility standards such de facto standards as well as interfaces (see van de Kaa et al., 2011 for their relevance in this context) have to be included into the new concept, too. In addition, the new concept has to be extended by cases in which a company grants licences for a product or solution that reaches dominance in the market (see e.g. Suarez, 2004). We unite all concepts in the umbrella ‘dominant solution’ (see figure 1). In a last step, we include dominant technological designs themselves into the concept, too.

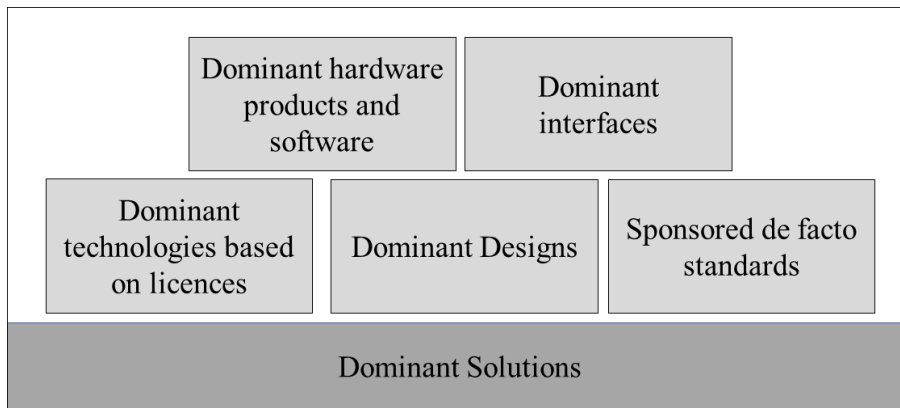


Figure 1: Overview of dominant solutions

Like Anderson & Tushman (1990) and Suarez (2004), who offer a definition for dominant designs, we define a dominant solution as a hardware product, technology, software, interface or design that acquires more than 50% market share for several years and whose history is shaped by one or both of the following events: (a) there is a clear sign that the most closely competing alternative solution has abandoned the active battle, thus acknowledging defeat directly or indirectly; (b) the solution has achieved a clear market share advantage over alternative solutions and recent market trends unanimously suggest that this advantage is increasing. Following van de Kaa et al. (2011) we will make use of literature that uses the terms (de facto) standards or dominant designs for our concept.

In 1995, Netscape Communications, an almost two-year-old technology company, took the world's attention. At the time of its outstanding IPO with a market capitalization of 2.2 billion, the company reached an 80% world market share in the market for internet browsers with the Netscape Navigator. The company showed great potential to establish a dominant position in the market. A short time later, Microsoft introduced the Internet Explorer as a competing product and began intense competition measures, which are regarded as the beginning of a standards war. In the following year Netscape continuously lost market share and in 1997 it recorded losses of hundreds of millions U.S. dollars. Shaped by high losses in market share and budget the company was bought by AOL in 1998 (see AOL, 1998). Netscape's example shows the attractiveness, but also risks that establishing dominance imposes on new businesses. This article proposes the establishment of success factors and an integrative framework to better understand the process through

which a young company's technology achieves dominance. Scholten et al. (2013) describe the research gap in this area as follows: 'Most of the research on technology dominance focuses on large firms and considers the large resource base of the established firm as important to be successful in early stages of technology dominance.' Blind & Mangelsdorf (2013) analyse the decisions of small- and medium-sized enterprises (SMEs) to participate in official standard setting alliances as well as knowledge spillovers in such co-operation. Although their focus is on small firms, young companies are not specifically considered. According to Scholten et al. (2013), the existence of companies that could establish an internationally dominant solution within a few years after their founding is quite unknown and the reasons for their success are hardly investigated so far: 'Little empirical research has investigated how new entrepreneurial firms develop strategies over time to enter an emerging market and develop market dominance.' Referencing several additional sources, they continue: 'Understanding the factors influencing the predominant design period for start-ups will help practitioners in building more resilient start-ups' (Scholten et al., 2013). Potential benefits young companies could reap by establishing a dominant product or, more precisely, a de facto standard were also described by Wurster (2011) and Wurster & Blind (2011a, b).

At the time of their founding, a lack of influence and financial resources is characteristic for companies. They have no established position in business networks and are rather unknown to the marketplace. In addition, the literature describes many dominant products that resulted from 'standards wars' and 'battles for dominance' and one would assume that young companies lack the strength for such battles. Companies that internationalize at or near the time of their founding are called 'Born Globals' (BGs) or 'International New Ventures' (INVs) (see e.g. McDougall & Oviatt, 2003 and Knight et al., 2004). We identified a unique class of BGs whose solutions achieved global dominance within a short period of time and analysed the reasons for their success. This article makes a contribution to technology management and international entrepreneurship (IE) research by providing an application of Suarez' (2004) framework for young companies. It also addresses Zettinig & Benson-Rea's (2008) calls for IE research on how companies that internationalize early

survive in a sustainable manner as well as for investigations of performance antecedents and outcomes relevant in IE.

RESEARCH GAP

Technology management research builds on industrial economics and strategic management to explain the establishment of dominant designs. Industrial economists focus on the demand side of the market and market-based framework conditions for the relevant players like network externalities (Katz & Shapiro, 1985), lock-in effects as well as switching costs (Arthur, 1989; Katz & Shapiro, 1985; Suarez, 2004) in this context. Strategic management research uses constructs like complementary assets (Teece, 1986, 1997) such as a company's reputation, credibility and financial resources to explain the outcome of such processes (see also Scholten et al., 2013 for a summary).

Jones et al. (2011) analysed 323 research papers in IE research, but they did not find research on de facto standardization and technological dominance. Vice versa there has been hardly any linkage between dominant design topics on the one hand and the IE research field on the other hand (see Wurster, 2011 and Wurster & Blind, 2011a). An early approach to link entrepreneurship research and research on dominant designs is presented by Scholten et al. (2013). The authors investigate start-up firm networking in the pre dominance design stage. This article goes a step further. It investigates young firms who a) establish and b) maintain a dominant position themselves. The second aspect addresses an additional research gap: Jones et al. (2011) compiled a comprehensive overview of the state of the art in IE research and identified areas of potential research. One remaining question is related to Zettinig & Benson-Rea's (2008) call for research which was described above. With regard to the time horizon, empirical research on the long-term success of BGs is missing (Oviatt & McDougall, 1997; Autio, 2005; Wurster, 2011 and Wurster & Blind 2011a).

Based on two meta-analyses of 103 and 127 research articles, van de Kaa et al. (2007) and van de Kaa (2009) determined 31 success factors for the establishment of dominant

solutions. Important success factors are, for example, financial strength, brand reputation and credibility (Grindley, 1995) technical superiority (Rosenbloom & Cusumano, 1997), entry time (Grindley, 1995; Rosenbloom & Cusumano, 1997), pricing (Besen & Farrell, 1994; Katz & Shapiro, 1985; Shapiro & Varian, 1999a, b), alliances (Grindley, 1995; Shapiro & Varian, 1999a), complementary assets (Suarez, 2004), network effects, expectations and an appropriate expectation management (Shapiro & Varian, 1999a), lock-in effects as well as switching costs (Arthur, 1989; Katz & Shapiro, 1985; Suarez, 2004). Suarez (2004) relates success factors to specific stages in the establishment process of a dominant solution. He proposes an integrative framework to describe the process by which a technology achieves dominance. The framework consists of five key phases in the process and related key firm- and environment-level factors that affect the outcome of each stage, see table 1.

Factor typ	Dominance Factor	Stage 1 (R&D Build Up)	Stage 2 (Technical Feasibility)	Stage 3 (Creating the Market)	Stage 4 (Decisive Battle)	Stage 5 (Post Dominance)
Firm-level	Technological superiority		***			
	Credibility/complementary assets	***			***	
	Installed base				***	***
	Strategic maneuvering			***		
Environ-mental level	Regulation		***			
	Network effects & switching costs				***	***
	Regime of appropriability	***				
	Characteristics of the technological field	***				

Table 1: Success factors and stages in Suarez (2004)

A firm's 'strategic maneuvering' and 'characteristics in the technological field' are meta factors. The first one comprises the factors entry timing, pricing, licensing and relationships with complementors as well as marketing & PR to manage expectations. Characteristics in the technological field include the number of actors and the level of cooperation versus competition. Traditionally, large, established companies have a head start in these processes. Due to their reputation and market impact, it is quite easy for large companies and their technology concept to be perceived as an attractive partner. In contrast, young companies face three challenges: the 'liability of newness', the 'liability of

smallness' (Stinchcombe, 1965) and the liability of foreignness (Zahra, 2005). Zahra (2005) describes this cluster of obstacles as follows: '(BGs) usually experience three types of liability. The first relates to their newness and inexperience, which limits their access to resources and existing networks. Newness raises questions in the minds of other stakeholders about (their credibility and potential viability. The second liability stems from their size, as many (BGs) are small. This limits the (...) resources of BGs and, as a result, their ability to withstand the challenges of internationalization. The third and final liability arises from the foreignness of (BGs), which means that they have to work hard to overcome barriers to entry, build links to their customers and suppliers, and gain the acceptance of potential customers. Any of these liabilities can increase the risk of (BGs') potential failure.'



























Selected Success Factors in Born Global Research and Research on Market Dominance (MD) and De-facto Standards (DfS)			
Factor	Research on		Sources (examples)
	BG	MD/DfS	
Technological Advantages			BG: Oviatt & McDougall (1994), MD/DfS: Suarez (2004)
Financial strength			BG: Zahra (2005), MD/DfS: Grindley (1995), van de Kaa et al. (2007)
Brand reputation/ credibility			BG: Zahra (2005), MD/DfS: Grindley (1995), van de Kaa et al. (2007)
Markt power			BG: Zahra (2005); MD/DfS: Suarez (2004)
Networks, network effects			BG: Oviatt & McDougall (1995), MD/DfS: Shapiro & Varian (1999a)
Alliances, number of allies			BG: Zahra (2005), MD/DfS: Shapiro & Varian (1999a)
Penetration pricing			BG: Cavusgil & Knight (2009) – use of differentiation strategies instead, MD/DfS: Katz & Shapiro (1985)
Internationalization			BG: Autio (2005): necessary condition for survival, MD/DfS: -
Key persons			BG: Oviatt & McDougall (1995), MD/DfS: -
Early market entry			BG: Oviatt & McDougall (1995), MD/DfS: Schewe (1992)
Market niches			BG: Cavusgil & Knight (2009), MD/DfS: Suarez (2004): (small) new market as frame condition
Legend  Important/Success factor  Problem  Variation  Research gap			

Figure 2: Success factors in Born Global research and research on technological dominance and de facto standards

The relevance of these problems regarding the fast establishment of a dominant position in the market is emphasized by Wurster (2011) and Scholten et al. (2013). Reflecting the privileged role of large, established companies regarding their opportunities to establish

dominant solutions in the market, a detailed comparison of the state of the art in IE and BG research and the research on de facto standards and technological dominance unveils many differences (see figure 2). For example, the success factors financial strength, brand reputation and credibility as well as (penetration) pricing are not covered in BG literature so far.

Figure 2 shows that the recent findings of the two research streams do not offer appropriate explanations for the establishment of dominant solutions or de facto standards by BGs (Wurster, 2011; Wurster & Blind, 2011a). Therefore, specific research is needed.

RESEARCH QUESTIONS AND DESIGN

The previous chapter showed the research gap regarding the establishment of dominant solution by BGs in detail. To close this gap, a qualitative, case-based research approach was chosen. Qualitative research methodologies and case studies are very important to explore new research fields (Yin, 2003). Our article is built on three research questions. As shown before, IE research and the literature on technological dominance both do not consider successful young international market dominators and corresponding success factors specifically. Therefore, question 1 is: Which success factors characterize the successful establishment of a dominant solution by BGs?

Van de Kaa et al. (2007) and van de Kaa (2009) identified research gaps that are related to the establishment of dominant solutions regarding the characteristics of the competition. In addition, relevant authors like Suarez (2004) do not analyse the role of the demand side in the domination process. In particular, initial market characteristics have been almost not investigated. Zahra (2005) shows that research gaps regarding external success factors exist in the BG research, too. With regard to the establishment and maintenance of a dominant position these BGs contextual elements have particular importance, since both activities require the achieving and maintaining of high market shares. Therefore, question 2 can be deduced: What characteristics does a suitable market have?

When considering dominance, not only the immediate success is relevant, but also the long-term preservation. So far long-term success is rarely discussed throughout IE research (Oviatt & McDougall, 1997; Autio, 2005 & Zettinig & Benson-Rea, 2008). Therefore, question 3 refers to internal and external contributions for long-term success: What is important to maintain dominance and to stay successful?

As shown before, literature on dominant designs and de facto standards on the one hand and literature on BGs on the other hand provide two sets of factors which contradict each other in several ways. According to technology management theories, it is nearly impossible for young companies to dominate the market in a very short time. To unveil the specific reason for the success of young market dominators, Grounded Theory (GT) principles were chosen. Based on qualitative text analyses, similarities in the companies' histories and the interviewees' descriptions were identified and enabled the formulation of success factors.

According to Strauss & Corbin (1996) a GT consists of five elements (causal conditions, phenomenon, context, action or interaction strategies and consequences. To answer the research questions an application of the model was developed (see figure 3).

The stage of causal condition (CC) refers to the time when the idea for a technology or product emerges which later reaches dominance. Concerning young market dominators this incident is often the foundation for the establishment of the company. The stage has similarities with Suarez' first stage, but has a broader focus.

The phenomenon represents the domination process itself while the context consists of the market, the competition and other relevant actors and characteristics of the environment. Based on stage two to four of Suarez' (2004) framework, the phenomenon is divided into three stages: the R&D stage (R&D), the stage of becoming the market leader (BML) and the stage of reaching dominance (SDC). Compared to Suarez' fourth stage, it has a broader focus and does not necessarily require the involvement of the young company in a battle.

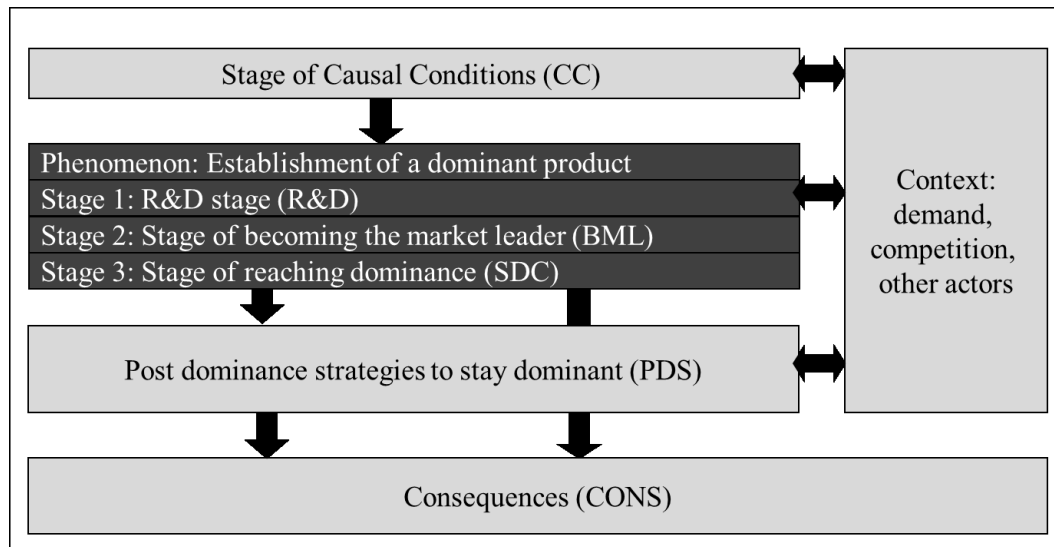


Figure 3: Application of the Grounded Theory model for the study

According to Suarez (2004) and Christensen et al. (1998) a market share above 50% for three years is a criteria for a design to be considered as dominant (Suarez, 2004). In addition Suarez (2004) claims that an above 50% market share is only a valid measure if on the one hand the competing design has lost or abandoned the ‘standard battle’ and on the other hand market trends suggest that the winning design is further advancing (Suarez, 2004). ‘Consequences’ (CONS) describes the nature of the dominance and its effects on the company and its environment. After reaching dominance, specific strategies are necessary to keep on sustaining competitive advantages. Similar to Suarez’ fifth stage, the stage of maintaining dominance (PDS) ends with the establishment of a new dominating product that replaces the old one. Case studies were completed to collect data. Three criteria were used to identify a BG:

- first international activities within three years after the foundation of the company (Rennie, 1993; McDougall & Oviatt, 2000),
- entry into a second international market less than three years later (Lindqvist, 1991; Autio et al. 2000; McNaughton, 2000; Stray et al., 2001; Holtbruegge & Wessely, 2009),
- activities in at least five countries and two cultural/global clusters (Holtbruegge & Wessely, 2009).

The focus was on BGs which established a dominant solution not later than by the age of 18 years. The requirement was operationalized by a market share of at least 50% for at least three years, reflecting the criteria from Suarez (2004). Sources to identify potential cases were the company lists of German and U.S. stock exchanges and several international trade fairs. More companies were identified by screening the literature on technological dominance, de facto standardisation and BG literature, by following advice from industry experts and additional internet research. Altogether, sixty-two companies were identified. One hundred and one persons in different leadership positions and promoters were contacted via e-mail. According to table 2 22 companies (13 from North America, 8 from Europe, 1 from Asia) remained and were analysed by case study research. Thirty-seven people agreed on interviews: 17 CEOs and ex-CEOs, 3 Senior Vice Presidents of Corporate Marketing/heads of marketing, 17 other (particularly co-founders, 1 Executive VP, 1 Vice President, 1 COO, 1 CFO, 1 CRO, 1 CTO as well as an advisor and a co-developer of the relevant software).

Com- pany	Country	Industry	Com- pany	Country	Industry	Com- pany	Country	Industry	Com- pany	Country	Industry
1	USA	S	7	USA	CH	13	USA	S	18	D	B
2	USA	S	8	D	B	14	USA	S	19	USA	I
3	USA	S	9	USA	I	15	D	B	20	FIN	I
4	AUS / USA	B	10	D	B	16	USA	S	21	USA	CH, S
5	D	B	11	CH	B	17	D	B	22	F/USA	I
6	IL	I	12	USA	S						

Industries: B = biotechnology, I = internet, CH = computer hardware, S = software

Table 2: Overview of the case study firms

According to the principles of the grounded theory (Strauss & Corbin, 1996) data collection and data analysis were linked. Additional literature review enriched the process. All interviews were transcribed and coded with Atlas.TI. The coding procedure consisted of two activities: coding success factors and coding process stages based on the model which was defined beforehand. A table showing the success factors' frequency in the case studies was produced. The next step was the identification of dominant success factors which appeared in more than half of the case studies. Co-occurrence analyses between the success factors and the seven elements of the created grounded theory model followed. The grounded

theory element with the highest co-occurrence number was identified for each of the success factors.

RESULTS AND INTERPRETATION

Due to the large number of analysed cases, merely one shall be presented here. Autodesk (company 2) was chosen for that. Its history is presented in table 3. Although Autodesk realized \$ 117 Million in sales in its 7th year of business it was not the fastest growing company in our study. Five companies reached sales revenues of more than \$ 400 Million in their seventh year of operation.

For Autodesk, the stage of causal conditions began in the year 1981 when the IBM PC was introduced to the international market and the need for IBM-compatible PC software was aroused tremendously. Just one year later, Autodesk was founded in the U.S. and seized the opportunity to present a prototype of the first CAD program for the PC at a domestic trade show. After this R&D driven phase, Autodesk set off on its way to become a market leader over the next four years and launched their product AutoCAD.

Stage	Description
CC	1981: The introduction of the IBM PC leads to the development of a market for complementary products. A great need for IBM-compatible PC software arises which Mr. Walker, one of Autodesk's future founders recognizes.
R&D	1982: Autodesk is founded in the U.S. by 16 people from four countries. Autodesk presents a prototype of its software AutoCAD at the trade show Comdex. It is the world's first CAD program for the PC. Computer manufacturers and distributors crowd Autodesk's booth to learn more about the software.
BML	<p>12/1982: AutoCAD is launched. From the beginning the product has a wide focus. Autodesk starts collaboration with hundreds of merchants. It works closely with the Press. AutoCAD appears on the cover of the well-known magazine 'PC World'. During this early period, 40% of sales are made in Europe. Without these, Autodesk would not have survived. In combination with third-party products, individual solutions are offered. From the start, AutoCAD is the market leader in the PC-based CAD market. Already the first license includes AutoCAD's DXF format. It allows extensions and data exchange with other programs. Potential channel partners contact Autodesk of their own accord.</p> <p>1985: Autodesk makes its' initial public offering. It positions itself as a provider of a platform on which other companies can implement their solutions. Thereby the platform becomes the center of an entire ecosystem.</p> <p>1986: A programming function is added to AutoCAD's toolkit.</p> <p>Initially, the competition consists primarily of software companies. In the first two years, there are two main competitors. One of them offers a superior solution but uses a relatively antiquated operating system. The second competitor is late in recognizing the importance of the new demand and launches new software 18 months after the introduction of AutoCAD. Both competitors soon become negligible. One competitor is even acquired and its CEO is hired by Autodesk.</p>
SDC	<p>1986: AutoCAD's market share exceeds 50 %. Several major CAD companies, primarily in the hardware field, introduce similar products, but they are reluctant to cannibalize their previous products.</p> <p>1990: The software allows the direct development of programs using the programming language C. This is an important basis for the future success of AutoCAD.</p> <p>1992: At a lower price, the competitive software Visio is introduced by the company Shapeware.</p> <p>1997: The market value of Autodesk exceeds the value of the company Computer Vision (which had dominated the CAD market previous to Autodesk for twelve years) by 90 Million US\$. Seven of the ten largest CAD companies are not profitable any more, some exit the market.</p> <p>1998: Computer Vision is acquired by Parametric Technology Corp.</p> <p>External market participants develop complementary products for AutoCAD.</p>
PDC	<p>2000: Microsoft buys Visio. An attempt to displace Autodesk fails because Visio offers no ecosystem of companies offering corresponding solutions.</p> <p>2012++: Autodesk has 7,500 employees and generates \$ 2.2 billion in sales.</p> <p>AutoCAD is the core of an ecosystem with uncountable applications provided by several hundred companies for corporate customers in 60 industries. Key success factors are: the continuous provision of innovative products, sensitivity regarding potential competitors who enter the market with new business models as well as an appropriate use of innovative distribution models.</p>

Table 3: Dominance process of Autodesk

Starting with a promotional feature in a well-known print magazine, Autodesk began to deliver a platform for other companies to implement their own CAD solutions. This was the focal point for the whole AutoCAD ecosystem.

In 1986 Autodesk's market share exceeded 50% and over the next years Autodesk's market value rose to exceed the value of the former CAD market dominator Computer Vision by 90 Million US\$ in 1997. Thereby, Autodesk was able to finally win the 'battle for dominance'. The dominance of Autodesk is reinforced by Microsoft's failed attempt to replace AutoCAD with its own solution Visio. The core reason of the failed attempt was the missing ecosystem around Visio. AutoCAD is now the core of an ecosystem dispersed all over the world with countless implementations and applying companies.

As described earlier, 'Autodesk' is part of a series of 22 case studies. Based on the case analyses, 189 interview transcripts and external sources were collected and analysed. 28 firm-specific and 10 context-specific factors were important in at least 50% of the samples (see table 4). The results of the analysis of the co-occurrence of the success factors and the fundamental elements of the grounded theory are also shown in table 4. The factors 'high added value' and 'international product/solution' occurred in all 22 case studies. Together with an international market, they are regarded as the basis of the model. The results also show the importance of a strong need in the market, technical superiority based on outstanding technical assets of the founders, sales and marketing cooperation as well as an early positioning in lead markets. To illustrate the importance of a strong need in the market as a key pre-condition for early market dominance an interviewee from company 3 says:

“I doubt that you would ever have a quick standard in an industry unless
there was a long unmet need” (company 3).

The success factor 'outstanding technical assets of the founders' is reflected mainly in their outstanding technical expertise. A corresponding reputation and a related scientific degree can represent additional characteristics. High technical expertise means for example that a

member of the founding team of company 8 received a Nobel Prize and that the founder of company 5 became a professor. The founder of company 1 and 12 came from Xerox PARC and MIT. Overall, the founders of nine companies have doctorates. For several companies, the doctoral thesis of the founders formed the basis of the company's activities. However, technical expertise is not necessarily reflected by a degree. The co-founder of company 22 developed the relevant product at the age of 17.

Technical expertise is related to another success factor which becomes relevant later: technical superiority. In many cases the considered products are based on disruptive technologies. The co-founder of company 1 describes the importance of this aspect as follows:

“(It) was a - if you will a disruptive technology, so I think that is a key component that it provided capabilities that there just were not there before.”

He also explains the role of complementary products:

“There were three or four other companies out there that had similar ideas at just about the same time and then the majority of those failed and I could have predicted it. (...) (If) we tried to do it all ourselves, in other words build all the applications (and) all the hardware (...), we would have failed.”

Area/SF*	Company in General																
All cases N=22	Early Internationalisation	Early in Lead Market	Sales & Marketing Cooperation	Outstanding Techn. Assets Founders	Entry Time	Intens. Communication & Market Education	Economic Assets Founders	Market Sensibility	Market Leader	Financial Resources	IPO	Specific Management Know-how BML+**	Price	Growth Management	Intensive Sales Activities	Penetration Orientation	Large Partners
	21	20	19	17	17	17	16	16	16	16	15	12	12	12	12	11	11
	95%	91%	86%	77%	77%	77%	73%	73%	73%	73%	68%	55%	55%	55%	55%	50%	50%
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17
*) Success factor; **) = Specific know-how to become a market leader and to establish dominance																	

Co-occurrence																					
Stage/Area		Company																Prod./Tech.			
factor no.		C4	C7	C8	C2	C6	C5	C3	C1	C13	C11	C12	C10	C15	C14	C17	C16	C9		P1	P2
CC		15	15	12	10	4	2	2	2	1	0	2	2	0	0	0	0	0		8	1
R&D		5	4	5	2	16	4	2	3	5	0	2	3	1	0	1	0	0		19	19
BML		4	3	6	8	9	21	19	16	11	11	10	10	10	9	7	7	0		19	16
SDC		2	0	1	0	2	6	6	4	5	3	3	0	2	4	1	3	13		8	1
CONS		0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3		2	0
PDS		0	0	0	0	0	3	2	1	1	1	0	0	1	1	0	0	5		1	0
Stage/Area		Product/Technology								Demand							Competition				
factor no.		P3	P6	P7	P8	P9	P10	P11	P4	P5	D2	D6	D1	D5	D4	D7	D3	CO3	CO1	CO4	CO2
CC		3	2	1	0	2	0	0	0	0	14	12	1	1	4	4	0	0	3	2	2
R&D		16	3	1	2	3	1	1	1	0	7	2	0	2	1	1	0	10	1	3	1
BML		13	11	9	8	8	5	3	6	2	12	11	12	11	7	7	4	10	11	8	5
SDC		6	6	6	7	1	4	10	10	4	4	4	0	1	3	0	4	5	6	3	4
CONS		0	0	3	1	0	1	3	10	1	0	0	0	0	0	0	6	0	0	0	0
PDS		4	1	3	3	1	0	0	3	7	2	3	1	2	1	1	2	1	1	1	1

Area/SF	Product/Technology											Demand							Competition			
	High Added Value	International Product/ Solution	Technical Superiority/ Leadership	Self-preservation & Lock-in	Advancement	Openness, Open Elements	Complementary Products, Features	Quality	Technical Leading Environment/Platform	Balanced IP Strategy	Optimization IP Strategy	International Market	Strong Need	Trust & Loyalty	New	International Market Pull	Niche Market	Growing Market	Technical Disadvantage	Exit Competitors	Long Lead Time	Innovator's Dilemma
Total*	22	22	17	17	16	15	15	15	13	11	11	20	19	14	12	12	12	11	17	12	12	11
Ratio	100%	100%	77%	77%	73%	68%	68%	68%	59%	50%	50%	91%	86%	64%	55%	55%	55%	50%	77%	55%	55%	50%
No. Factor	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	D1	D2	D3	D4	D5	D6	D7	CO1	CO2	CO3	CO4

*) All Cases: N=22

Table 4: Success factors and their linkage to the Grounded Theory elements

Many companies have a specific penetration orientation. An interviewee from company 14 describes the concept as follows:

“(M)y opinion is (that) establishing growth (is) more important than profit. I was saying that gaining market shares and market recognition would be of greater value going forward because the market place is very huge (...). We had still only sold a fraction of it. So, by building our reputation and dominance in the market place, we have time to make money later. (...)”

He continued by giving an example of another company:

“For many years of its early growth didn’t make any money at all. But they grew. (...) They grew like crazy. (...) They were sure that that’s the only way to be able to establish market dominance. There will be time to make money later.”

The following quotation illustrates the importance of specific communication activities:

“We went on this massive market education saying we are the market leaders, and we were successful in doing that, and then we signed up channel partners to sell our products, and we were able to (...) hand them this IDC study saying we are the market leader, so (...) we are the safest way to go (...) because you also want to buy the leading product, right? So, we are the leading product. So, that is really the first thing we did, and it took us about at least a half a year to a year to really establish recognition that we were the market leader.”

(case 6)

In addition, an appropriate growth management and IPOs are important for young market dominators. Interviewees from company 2 und 3 describe this in detail

“If you are looking at products that become industry standards early – I think you probably going to be looking at high growth companies” (company 3).

“Our biggest worry (was) that eventually all of the big vendors were going to end up realizing that they had to have a product, that we were taking away the low end of the market (...) and so the primary reason that we went public was because we knew that we needed to have the money that we believed would be necessary to respond when the big companies jumped into our market” (company 2).

An important factor with regard to competition was the long lead time. The interviews yielded very lively descriptions.

“How lucky we have been! I can think of almost no parallel in the history of the microcomputer business where one company had the only product in a major market for over a year. Had we entered a market like word processing, BASIC compilers, or spread sheets, we would have long ago been blown away by better organized and capitalised competition” (company 2).

In addition, the interviewees described differences to the company Netscape which was mentioned in the beginning:

“If you compare for example Netscape versus (our company), in the case of Netscape, they had a well-funded competitor in Microsoft (...) that was very able to understand what makes a good browser” (company 3).

“We did not become successful as the result of understanding competition and figuring out how to beat the competition because there really effectively wasn’t a lot of competition.” (company 12).

“Do you know how long it took for Microsoft to get caught up to what (our company) was doing? Ten years” (company 16).

Many success factors for the introduction of the products into the market can only be taken into account if they have already been developed in the R&D phase. It is particularly

important to implement a technically superior product with a high customer value and to ensure international applicability. The important realization of a pioneering role is also influenced by an appropriate execution of the R&D phase and the speed of related activities. The relevance of the success factors in the different stages will be discussed in the next section.

DISCUSSION AND CONCLUSIONS

Based on qualitative research, a success factors model for the establishment and maintaining of dominating solutions by BGs was created. It helps to overcome the lack of BG and entrepreneurship topics in technology management research focussing on market dominance and standardization research which was illustrated by Wurster (2011), Wurster & Blind (2011a) and Scholten et al. (2013). It also makes a contribution to closing the gap of studies concerning the long-term success of BGs shown by Oviatt & McDougall (1997) and Autio (2005).

Suarez (2004) offered an advanced multi-dimensional model to describe processes to reach dominance in the market. However, the methodology to derive the findings remained unclear. The definition of the different success factors was enriched by examples but their development and linkage to the different process stages was not grounded in empirical work. In addition, the conditions of young companies as well as the demand side were not considered. Scholten et al. (2013) analysed the specific behaviour of young companies in the pre-dominance stages. Grounded in rich empirical data, this article offers a model for young companies which pass the next stages successfully, too.

The model shows that the establishment of a dominant position by BGs does not only depend on specific entrepreneurial skills, but that it is strongly influenced by its environment, the behaviour of external actors, mistakes made by competitors and the behaviour of the target group as well. More precisely, the uncovered success factors are related to technology, the management, the demand and the competition. Technology-related factors include for example technical superiority and high added value. Factors

related to management comprise outstanding technical assets of the founders, penetration orientation as well as specific management know-how concerning activities after becoming the market leader. Important environmental factors include for example a high demand, an international market pull and, with regard to the competitors, a long lead time.

As described before, we defined ‘dominant designs’ as a sub-concept of ‘dominant solutions’. This allows a direct comparison with the current state in this field. We will make it by comparing our results with the summary of the state of research described by Suarez (2004). Since we used a new stage model for the entrepreneurship context, this comparison requires specific preparation. For simplicity’s sake we summarize the stages of Suarez’ process model into four phases: 1.) R&D and Technical Visibility stage which finishes with the availability of a marketable solution (‘R&D’), 2.) the emergence of a market leader, 3.) the establishment of a dominant market position and 4.) a post-dominance stage.

Similarly we combine our stage of causal condition and our R&D stage to a broader R&D stage. Like Suarez’ next two stages, our following stages show the emergence of a market leader and the establishment of a dominant market position. Our next stage deals with post dominance. It has similarities with Suarez’ last stage, but we focus on specific strategies of the BG. In summary, our comparison focusses four stages: R&D, the emergence of a market leader, the establishment of a dominant market position and post-dominance.

According to Suarez (2004), five factors which include, for example, technical superiority, complementary assets and the characteristics of the technical field are important in the first stage. Based on our findings, technical superiority is key for BG market dominance as well. Additional factors are outstanding technical assets of the founders who should be skilled inventors and a high demand in the market. The technical field is shaped by a long lead time or the absence of relevant competitors.

The stage that leads to the emergence of a market leader in Suarez’ model comprises only company-related factors. Important company-related factors in our study include the early internationalisation of the company as well as cooperation in the fields of sales and marketing enabling the use of partners’ complementary assets. In addition, the demand-

related factor ‘international market pull’ and the competition-related factor ‘long lead time’ were important.

Our key factors in the next stage consist of lock-in effects which can be regarded as synonyms to the switching costs in Suarez’ (2004) model (see Wurster, 2011). In addition, the companies profit from the fact that key competitors exited the market in the previous stage and therefore cannot challenge the company any more.

With regard to the next stage, Suarez identified the relevance of the installed base and switching cost. Similarly, our study showed the importance of lock-ins and trust. Furthermore, the importance of product advancement to stay competitive in the market became apparent. Table 5 summarizes the contribution of this article. Grounded in empirical work and based on the data of 22 case studies, it specifically considers the domination process of young market dominators. It covers the whole process and unveils new success factors with regard to the demand side.

Article/Characteristics	Suarez (2004)	Scholten et al. (2013)	This article
Consideration of young market dominators	0	✓	✓
Empirical work	0	✓	✓
Cases included	parts of several cases	✓ (1)	✓ (22)
Coverage of the whole dominance process	✓	0	✓
Coverage of the demand side	0	0	✓

Table 5: Comparison of the findings with Suarez (2004) and Scholten et al. (2013)

The most important additional success factors of BG market dominators in comparison to large firms are outstanding technical assets of the founders, a high demand in the market, an international market pull and a long lead time.

LIMITATIONS

Our research was based on 22 cases and covered selected industries only. To increase the validity of the model and respective conclusions, it is important to analyse more companies

and sources and to test the model in other industries and future contexts. Given the fact that BG market dominators reflect BG topics and technology management topics, common research of scholars from both research fields is recommended.

REFERENCES

- Anderson, P. C., Tushman, M. L. (1990). Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change. *Administrative Science Quarterly*, 35, 604-633.
- AOL (1998). America Online, Inc. to Acquire Netscape Communications Corporation in Stock Transaction Valued at \$4.2 Billion. http://www.timewarner.com/newsroom/press-releases/1998/11/America_Online_Inc_to_Acquire_Netscape_Communications_11-24-1998.php.
- Arthur, W. B. (1989). Competing Technologies, Increasing Returns, and Lock-in by Historical Events. *Economic Journal*, 99(394), 116-131.
- Autio, E. (2005). Creative tension: the significance of Ben Oviatt's and Patricia McDougall's article 'toward a theory of international new ventures'. *Journal of International Business Studies*, 36, 9-19.
- Autio, E., Sapienza, H. J., Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal*, 43(5), 909-924.
- Besen, S. M., Farrell, J. (1994). Choosing How to Compete: Strategies and Tactics in Standardization. *Journal of Economic Perspectives*. American Economic Association, 8(2), 117-31.
- Blind, K., Mangelsdorf, A. (2013). Alliance Formation of SMEs: Empirical Evidence from Standardization Committees. *IEEE Transactions on Engineering Management*, 60(1), 148-156.
- Cavusgil, S. T., Knight, G. (2009). *Born Global Firms: A New International Enterprise*. New York 2009.
- Christensen, C. M., Suarez, F. F., Utterback, J. M. (1998). Strategies for Survival in Fast-Changing Industries. *Management Science*, 44(12), 207-220.
- David, P. A., Greenstein, S. (1990). The economics of compatibility standards: An introduction to recent research. *Economics of innovation and new technology*, 1990(1), 3-41.
- Gallagher, S. (2007). The complementary role of dominant designs and industry standards. *IEEE Transactions on Engineering Management*, 54(2), 371-88.
- Grindley, P. (1995). *Standards, Strategy and Policy*. New York 1995.
- Holtbruegge, D., Wessely, B. (2009). Initiating forces and success factors of born global firms. *European Journal of International Management*, 2009, 3(2), 232 - 260.
- Jones, M., Coviello, N., Tang, Y. K. (2011). International entrepreneurship research (1989-2009): A domain ontology and thematic analysis. *Journal of Business Venturing*, 26, 632-659.
- Katz, M. L., Shapiro, C. (1985). Network Externalities, Competition, and Compatibility. *American Economic Review*, 75(3), 424-440.
- Knight, G., Madsen, T. K., Servais, P. (2004). An inquiry into born-global firms in Europe and the USA. *International Marketing Review*, 21(6), 645-665.
- Lee, J., O'Neal, D. E., Pruett, M. W., Thomas, H. (1995). Planning for Dominance: a Strategic Perspective on the Emergence of a Dominant Design. *R&D Management*, 25, 3-15.
- Lindqvist, M. (1991). *Infant multinationals. The internationalisation of young, technology-based Swedish firms*. Dissertation, Stockholm School of Economics, 1991.
- McDougall, P. P., Oviatt, B. M. (2000). International entrepreneurship: the intersection of two research paths. *Academy of Management journal*, 43(5), 902-906.

- McDougall, P. P., Oviatt, B. M. (2003). Some Fundamental Issues in International Entrepreneurship. *Entrepreneurship Theory & Practice*, July 2003.
- McNaughton, R. B. (2000). Determinants of time-span to foreign market entry. *Journal of Euromarketing*, 9(2), 99-112.
- NASDAQ (2008). Company List. Retrieved September 16, 2013.
- <http://www.nasdaq.com/asp/symbols.asp?exchange=Q>.
- Oviatt, B. M., McDougall, P. P. (1994). Toward a Theory of International New Ventures. *Journal of International Business Studies*, 25(1), 45-64.
- Oviatt, B. M., McDougall, P. P. (1997). Challenges for internationalization process theory: the case of international new ventures. *Management International Review*, Special Issue 2, 85-99.
- Rennie, M. W. (1993). Global competitiveness. Born global. *The McKinsey Quarterly*, 3 (1993), 45-52.
- Rosenbloom, R. S., Cusumano, M. A. (1987). Technological Pioneering and Competitive Advantage: The Birth of the VCR Industry. *California Management Review*, 29, 51-76.
- Scholten, V., van de Kaa, G., Trott, P. (2013). Riding the waves: Developing theory on start-up firm networking in the pre dominance design stage, Porto Alegre 2013.
- Schewe, G. (1992). Imitationsmanagement. Stuttgart 1992.
- Scott, W. (1994). Institutional analysis: variance and process theory approaches. In: Scott, W., Meyer, J. [ed.]. *Institutional Environments and Organisations: Structural Complexity and Individualism*. Thousand Oaks 1994, 1-8.
- Shapiro, C., Varian, H. R. (1999a). Art of Standard Wars. *California Management Review*, 41(2), 8-32.
- Shapiro, C., Varian, H. R. (1999b). *Information Rules: A Strategic Guide to the Network Economy*. Cambridge 1999.
- Stinchcombe, A. L. (1965). Social structure and organizations. In: March, J.G. (ed.). *Handbook of organizations*. Chicago 1965.
- Strauss, A., Corbin, J. (1996). *Basics of Qualitative Research*, Newbury Park, London, New Dehli 1990.
- Stray, S., Bridgewater, S., Murray, G. (2001). The internationalization process of small, technology-based firms. Market selection, mode choice and degree of internationalization. *Journal of Global Marketing*, 25 (1), 7-29.
- Suarez, F. F. (2004). Battles for technological dominance: an integrative framework. *Research Policy*, 33, 271-286.
- Suarez, F. F., Utterback, J. M. (1995). Dominant Designs and the Survival of the Firms, *Strategic Management Journal*, 16, 415-430.
- Swann, G. P. (1987). Industry Standard Microprocessors and the Strategy of Second Source Production. In: Gabel, H. L. [ed.]. *Product Standardization and Competitive Strategy*. Amsterdam 1987, 239-262.
- Swann, P. (2000). The Economics of standardization. Final Report for Standards and Technical Regulations Directorate Department of Trade and Industry. Manchester 2000.
- Teece, D. J. (1986). Profiting from technological innovation: implications for integration, collaboration, licensing, and public policy. *Research Policy*, 15(6), 285-305.
- Teece, D. J. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- van de Kaa, G. (2009). Standards Battles for Complex Systems. Empirical Research on the Home Network. ERIM PhD Series Research in Management. Rotterdam 2009.
- van de Kaa, G., de Vries, H. J., van Heck, E., Van den Ende, J. (2007). The Emergence of Standards: a Meta-analysis. Proceedings of the 40th Hawaii International Conference on Systems Sciences (HICSS'07).
- van de Kaa, G., Van den Ende, J., de Vries, H.J., Van Heck, E. (2011). Factors for winning interface format battles: a review and synthesis of the literature.

Technological Forecasting & Social Change, 78, 1397-411.

Wurster, S. (2011). Leaders, Servants, Independence. A Dynamic Success Factors Model for the Establishment of De-facto Standards by Born Global Firms and Technical Clusters. *International Journal on GSTF Business Review*, 1(2), 172-179.

Wurster, S., Blind, K. (2011a). Towards a Dynamic Success Factor Model for the Establishment of De-facto-Standards by Born Global Firms and Technical Clusters. GSTF Best Paper Award, Singapore, July 2011.

Wurster, S., Blind, K. (2011b). The Role of Standardization and Standards in the Context of Entrepreneurship: Conceptional Model and Insights from Case Studies. Proceedings of the 6th European Conference on Innovation and Entrepreneurship. Aberdeen, September 2011, 861-874.

Yin, R. K. (2003). Case study research, design and methods, 3. ed., Newbury Park 2003.

Zahra, S. A. (2005). A Theory on International New Ventures: A Decade of Research. *Journal of International Business Studies*, 36, 20–28.

Zettinig, P., Benson-Rea, M. (2008). What becomes of international new ventures? A co-evolutionary approach. *European Management Journal*, 26(6), 354–365.

BRIDGING STATEMENTS

The previous paper showed how early internationalization can facilitate global market dominance of young independent companies. Accordingly specific success factors play a role in different phases that result in a dominant market position. Firstly, within the R&D phase the ground work for technological superiority is built. Building outstanding technological assets is important for Born Global companies while the technical field is shaped by a long lead time and while relevant competitors are absent. Secondly we identified early internationalization as a key decision for companies searching for market dominance. It became clear that partnering with companies that offer complementary assets is a fostering factor. Moreover, joint sales and marketing activities help to satisfy the demand more efficiently. Thirdly, the actual establishment of a dominant market position is achieved through building up lock-in effects and increasing switching costs. Finally, Born Global market dominators need to keep their lock-in effects, build trust through reliable solutions and stay competitive through constant product improvements.

The next paper will show that measures of corporate venturing can be applied by academic R&D organizations, too. Similar to established firms, universities seek ways to commercialize their research findings, such as through licensing out intellectual property rights or by spinning out new ventures. With the aim of taking a closer look at the European spin-off process, we investigate the situation in Germany by analyzing the spin-off company portfolio of the Fraunhofer Society, which is one of the four big research organizations in Germany. We believe that the identification of these factors will enable Fraunhofer to optimize their venturing activities.

5. SURVIVAL OF RESEARCH-BASED SPIN-OFF VENTURES

SURVIVAL ANALYSIS OF THE VENTURE PORTFOLIO OF EUROPE'S LARGEST R&D ORGANIZATION – THE FRAUNHOFER SOCIETY

The paper at hand shows results of the analysis of the spin-off portfolio of Fraunhofer Venture, the corporate venture capitalist of Europe's largest R&D organization, Fraunhofer Society. In order to identify factors that influence the survival and death of Fraunhofer's spin-off companies, we conducted a cox proportional hazard model analysis. We found that ventures which have been funded by Fraunhofer from year 1 onwards are more likely to die than ventures that started independently. Furthermore, our extended Cox model let us assume that the presence of a privately owned company as shareholder during the entire lifetime of a venture has a positive effect on survival. Paying Fraunhofer for doing research and paying license fees additionally influence the survival positively. Ventures that buy Fraunhofer patents face a higher risk of dying.

INTRODUCTION

The year 1980 was a turning point in university venturing (Djokovic & Souitaris, 2008). Before that time, incentive structures were underdeveloped to promote entrepreneurial behavior of academic staff. In fact, in 1980, the Bayh–Dole-Act provided incentives to academic institutions in the USA to commercialize university knowledge supported by federal funding (Shane, 2004). Rothaermel et al. (2007) agree and acknowledge this policy change in the U.S. as an important milestone in university venturing (see also Bozeman, 2000). As of today, it is becoming apparent that since 1980 the advancements in the technology transfer policy have been adapted by other regions, such as Europe (Rothwell & Dodgson, 1992).

Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014.

However, there exists a difference between Europe and the U.S. when it comes to the maturity of universities' technology transfer activities (Rotharmel et al., 2007). While U.S. universities have “greatly increased their entrepreneurial activities along many dimensions: patenting and licensing, creating incubators, science parks, and university spin-outs, and investing equity in start-ups” (Rotharmel et al., 2007, p. 692 based on Mowery et al., 2004; Siegel, 2006), European universities still lag behind, mostly because of the different regulations in European countries. However, the European Union tackled this issue and established a system driven by public funding to support start-ups and especially research-based spin-offs (European Commission, 1996; Klofsten & Dylan, 2000).

To sum it up, today the approach of giving universities more freedom in commercializing research results by cooperating with existing firms (e.g. via licensing out patents) or spinning off new firms is widely adapted by research institutes all over the world (Anderson et al, 2007).

Djokovic & Souitaris (2008) highlighted that in the U.K. as well as in the U.S., the number of universities spinning out firms increased significantly, hence the interest of scholars exploring the topic further increased as well. However, the empirical research dealing with the survival of research-based spin-off firms is still underdeveloped and gives room for further research (Conceição & Faria, 2014, Nerkar & Shane, 2003). We agree with Djokovic & Souitaris (2008), who claim that “in general, qualitative and longitudinal process studies on university spinouts are useful and welcome since they explore the new phenomenon in detail, identify constructs, spot relationships and open avenues for further confirmatory quantitative work” (p. 227). Furthermore, we agree with their statement that “it is important to keep in mind that the spinout phenomenon is relatively new for the majority of the universities especially in Europe” (p. 238).

To address the just described need for further research on research-based spin-offs, we will investigate factors that influence the survival of the ventures originating from the

Fraunhofer Society. Fraunhofer Society is a public R&D organization in Germany that gets
 Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014.

a significant portion of its funding from the private sector. It is active in plenty of relevant high-tech industry sectors and regularly spins out new ventures on its own.

In the following, a short overview of the most relevant literature on spin-off survival and influencing factors is provided. The selection of literature builds on the well-performed literature reviews of Rothaermel et al. (2007), Djokovic & Souitaris (2008) and Conceição & Faria (2014). We will build our research questions respectively and continue with the methodological approach of how we aimed to answer them. After we show the results of the survival analysis of Fraunhofer's venture portfolio, we will discuss our findings and conclude with implications and future research directions.

THEORY

DEFINITION OF RESEARCH BASED SPIN-OFFS (RBSO)

The term spin-off can be defined in different ways. According Nicolaou & Birley (2003), it is “a company composed by individuals who were former employees of the parent organization, and where the technology and the academic inventors may spin off both from the institution, or where the technology spins out from the institution but the academic inventor is employed in the university, or finally where only the technology spins out while the academic inventor does not maintain relationships with the new firm but may have equity”. Furthermore, Bigliardi et al. (2013) claim that “academic spin-offs, also called university spin-offs (USOs), are very special start-up companies, and are not fully comparable to other companies such as collegiate start-ups or technology-based start-ups in general”.

In the following, we will use the term “research-based spin-offs” (RBSOs). According to Conceição & Faria (2014), RBSOs are new ventures, “whose creation is based on the formal and informal transfer of technology or knowledge generated by public research organizations” (p.2) (Mustar et al. 2006; Djokovic and Souitaris 2008). Such RBSO's are an

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important source of wealth and job creation in the economy (Djokovic & Souitaris, 2008; Birley, 2002). Scholars claim that firms originating from public research organizations have a competitive advantage toward independent ventures in the same industry, which leads to lower risks of hazard (Mustar 1997; Callan 2001; Smith and Ho 2006). This holds true for both the USA and European countries (AUTM, 2002; Degroof & Roberts, 2004; UNICO, 2001; Djokovic & Souitaris, 2008). In addition, Rogers et al. (2001) say that these companies may originate from governmental R&D laboratories, universities and their research centers, as well as private R&D units (Bigliardi u. a., 2013).

SURVIVAL OF RESEARCH-BASED SPIN-OFFS

Different factors influence firm survival in general. For instance, Buddelmeyer et al. (2009) named the following (not spin-off specific) factors: firm age (Agarwal & Gort, 2002), initial asset endowments (Agarwal & Gort, 2002; Dunne u. a., 1988), prior experience of the founding team (Bruderl et al, 1992; Klepper & Simons, 1997; Klepper, 2002; Thompson, 2005), role of a parental organization (Carroll et al, 2007), as well as firm-level heterogeneity (Audretsch, 1995; Caves, 1998).

When it comes to the specifics of RBSOs, it is apparent that an increasing amount of literature has investigated factors that specifically influence their survival and growth. Scholars agree that, for instance, the founders' qualifications and firm size play a role (Argawal & Audretsch 2001; Geroski et al. 2010; Gimmon & Levie 2010; Honjo et al. 2013; Agarwal & Gort 2002; Conceição & Faria, 2014). Interestingly, although the initial skill combination of the founding team plays a role in the later spin-off survival (Colombo and Piva, 2012), holding a PhD is not necessarily an important factor since it does not translate into the presence of market- and business-related know-how of the founders (Heirman and Clarysse 2004; Mustar et al. 2006; Astebro et al. 2012; Conceição & Faria, 2014).

Other scholars have concentrated on the question of whether the parental organization itself influences the likelihood of success of its ventures by factors like reputation or size. In

fact, the reputation of the organization that externalizes ventures influences the likelihood of survival of the spin-off companies. Scholars name “reputation, size, access to formal and even tacit knowledge, as well as financial resources and network capabilities” (Conceição & Faria, 2014, p. 4) as important factors (Klepper and Sleeper 2005; Eriksson and Kuhn 2006; Thompson 2007; Klepper and Thompson 2010; Andersson et al. 2012). In fact, spin-off ventures that originate from highly ranked universities have a higher survival probability (Di Gregorio & Shane 2003; Link & Scott 2005; Powers & McDougall 2005; Conceição & Faria 2014). However, this notion could not always be supported (Conceição & Faria, 2014).

FOCUS ON THE FRAUNHOFER SOCIETY IN GERMANY

Relating back to the previously mentioned role of the parental organization, we want to introduce our object of observation, Fraunhofer Society in Germany, and argue why we believe it is worth exploring. After this short introduction, we will continue our literature overview to develop our two research questions.

Generally, we believe it is worth taking a closer look at Europe, reemphasizing the previously mentioned perception that differences in technology transfer conditions and performance between the U.S. and Europe exist. The German situation seems especially promising to analyze because it has a broad landscape of different specialized publicly and privately (or a mix of both) funded research organizations (e.g. Deutsche Forschungsgemeinschaft, Max-Planck-Gesellschaft, Fraunhofer-Gesellschaft, Helmholtz-Gemeinschaft, Leibniz-Gemeinschaft).

A very special example for that kind of organization is the Fraunhofer Society, which is funded by the government but earns a significant proportion of its funding from conducting contract research for the private sector. With that specialty, it is neither a pure university nor a simple private R&D unit. Although the phenomenon of industry-universities cooperation is elaborated by some scholars, we believe that the present body of research could benefit from our research. According to Motohashi (2005), the collaboration between

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universities and industry nurtures the spin-off activities. Collaboration materializes, for instance, in “joint R&D projects with spinout companies or universities, technology consulting and contract research to technology purchases” (Djokovic & Souitaris, 2008, p. 236).

In general, all German research organizations aim to increase output (e.g. patents) of their R&D activities for the sake of societal welfare by enhancing innovation in the economy. It needs to be mentioned, however, that there is a significant difference between publicly and privately funded R&D units. According to Bell (1993), there are differences in intentions between academia and industry. Academia aims at a contribution to societal benefits, achieving financial security and accessing industrial assets. In contrast, industrial stakeholders want to keep a competitive advantage in their technological domains by accessing suitable research and in the long run save R&D time and costs by affiliating with academic partners. Taking only this example difference between a public and a private funded research organization into account, we highlight that Fraunhofer Society (as being partly funded by the government and partly by private bodies) is an interesting research subject.

HOW THE PARENT-VENTURE RELATIONSHIP INFLUENCES SURVIVAL

The relationship between the research-based spin-off and its parental organization play a role in survival. However it is not necessarily the geographical proximity but more the cultural, organizational and relational distance that plays a role (Helmers and Rogers 2011). Conceição & Faria (2014) agree with the notion that instead of the geographical proximity to the parent, the spin-off's survival is more influenced by whether it is placed in areas where other high-tech firms are active, which supports the findings of Magrini & Galliano (2012).

Keeping a relationship with the parental organization RBSOs can maintain access to tangible as well as intangible assets. E.g. Steffensen et al. (2000) underline tangible

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resources like facilities and equipment. Moreover Rappert et al. (1999) highlight intangibles like the access to human capital as well as scientific and business knowledge (Djokovic & Souitaris, 2008). Access to such assets is important because the relationship between a parental organization and its spin-offs is considerably influenced by the degree of initial technology transfer (Autio, 1994).

The question arises how the access to intangible and tangible assets can be maintained. In this regard, scholars speak of strong or weak ties between parental organization and the spin-off firm. In fact, the degree of established social ties to the parental organization enables spin-off firms to access parental knowledge and resources better (Audretsch et al. 2005; Rasmussen & Borch 2010; Heblich & Slavtchev 2013). Furthermore, according to Rothaermel & Thursby (2005), strong ties with the parental organization are beneficial for survival. Moreover, the beneficial situation of having the exclusive right to commercialize a parental patent positively influences the venture survival. In contrast, the presence of weak ties to the parent (e.g. informal interaction with faculty) did not show an effect on firm survival or time until success (Rothaermel & Thursby, 2005). It becomes apparent that strong ties are better than weak ties. The notion of Johansson et al. (2005) underlines and extends this assumption because they found out that it is beneficial for spin-off ventures to keep a small number of strong ties to its parental organization. These ties lead to a high degree of trust and informality, which enables the transfer of complex knowledge between the units. However, due to the small amount of key ties, Johansson et al. (2005) claim that the dependency on them increases in order to get continuous support for basic research.

To sum it up, scholars have provided empirical evidence that suggests the relationship between the parent organization and its spin-off firms influence the survival of these ventures. In addition, scholars have identified that universities nowadays engage more often in venture ownership in exchange for commercializing university-based knowledge (e.g. patents) (Feldman et al., 2002, Djokovic & Souitaris, 2008). In the past, only a few universities took over shareholdership of their spin-off firms (Brown, 1985). Referring back

to our case, Fraunhofer has a specific venturing department that takes over minority shares of the spin-off firms. With that in mind, we present our first research question:

Research question 1:

To what extent is the relationship between Fraunhofer and its spin-off ventures influencing their survival rates?

HOW THE INDUSTRY-VENTURE RELATIONSHIP INFLUENCES SURVIVAL

By referring to Birley (1985), Djokovic & Souitaris (2008) claim that “interaction with industry is essential in order to gather relevant information about the new business, to find external support and services, to access external re-sources not available in-house, to promote the new company, and to look for business advice” (p. 240). According to Van de Ven et al. (1984), this interaction with the industry positively affects new venture success and growth. Besides partners, competitors and customers, RBSOs also interact with venture capital investors during their lifecycle. These investors could either be the university itself, the founding team, or third party investors. Shane & Stuart (2002) found out that a founding team which has a relationship to investors has a higher chance that its venture does not fail. Furthermore, experiences in the specific industry sector as well as the effectiveness of commercialized patents positively influence the funding rate of investors.

To sum it up, the relationship between a spin-off, its parental organization and other outside entities plays a crucial role for acquiring competencies in the technological domain. From that, we deduce our second research question:

Research question 2:

To what extent is the relationship of Fraunhofer’s spin-off ventures to non-Fraunhofer entities influencing their survival rates?

METHOD

The analysis of the survival of research-based high-tech spin-off companies presents a substantial challenge to researchers. A systematic and professional approach toward spinning new ventures out of research institutions is something that – at least in Europe – does not look back on a long and excessively successful history. This is all the more true if we search for technology transfer offices that look back at a 10-plus year long history of incorporating new spin-off companies, equipping these ventures with equity capital, managing a portfolio of high-tech spin-offs, initiating and retaining a mutually beneficial exchange of goods and services between young spin-off companies and their parent organization, etc.

Hence, for our study we used the Fraunhofer Venture Database to identify a sufficiently large sample of spin-off companies with a closely monitored linkage to their parent organization.

In doing so, we focused our attention on past data toward three specific criteria:

- overall shareholder structure and equity position of parent organization,
- technology related contracts and agreements with parent organization,
- exchange of goods and services with parent organization.

Within the Fraunhofer Venture Database, we identified a sample of 106 companies that met the criterion of having had or still having Fraunhofer as an active equity shareholder. For this set of companies, we also found an abundant source of information about technology-related contracts and agreements that had been signed between a spin-off and Fraunhofer, as well as a detailed account on the exchange of goods and services between both parties.

The indicator for company age is counted in calendar years in which the company was existent for at least one day. We counted the incorporation day / the day the company was enlisted in the trade register as the first day of its existence. The last day of a company's existence was measured as the day on which one of the following three events occurred:

- bankruptcy / insolvency: the company filed for bankruptcy / insolvency at the responsible bankruptcy court,
- acquisition: the sale/acquisition of the company was registered in the trade register,
- end of observation period: 31st December 2013, 11:59:59 PM.

In our present analysis, we took a selection of variables per venture, which we were able to cross check with other data sources and thereby claim reliability. A short overview of these variables is given in the following:

- *FHG from year 1*: is true when Fraunhofer funded a venture from its inception onwards.
- *Shareholder_PrivateCompany*: is true when a venture was or is funded by a privately owned company (as opposed to a private individual or state owned organization).
- *Contract_PatentAssignment*: is true when Fraunhofer and the venture signed a contract for the purchasing of a Fraunhofer owned patent.
- *Contract_Licensing*: is true when a contract between Fraunhofer and the venture controls the usage of Fraunhofer owned patents by the venture. It implicitly reflects a long term, technology driven relationship between the venture and Fraunhofer.
- *Contract_Cooperation*: is true when Fraunhofer and the venture signed a contract that controls the long-term cooperation between both parties.
- *FHGEarnings_RandD*: is true when Fraunhofer receives money from the venture for conducting contract based research for that venture
- *FHGEarnings_Licenses*: is true when the venture pays Fraunhofer for using their intellectual property.

- *FHGExpenses*: is true when Fraunhofer has expenses related to the venture. For instance, Fraunhofer pays the venture to do research for Fraunhofer or to produce a certain good on a larger scale.

SURVIVAL ANALYSIS

To investigate the influencing factors of the survival of companies within the venture portfolio of Fraunhofer, we apply different “survival analysis” related methods. Companies within our sample did not all start at the same time, and therefore the basis for our analyses is not the specific year a company survived or died, but rather the respective age when the event took place. Besides the information about death and survival within a specific year, companies can leave the sample due to other factors. Such cases are expressed as “censored”. In our observation, censoring takes place when a company leaves the venture portfolio of Fraunhofer, e.g. because the company is acquired by an external company. Therefore censoring does not mean the same as hazard. We will in the following start our methodological excursion with descriptive life tables and a survival chart. Afterwards, we will explain the Cox model (also termed the proportional hazard/regression model). We build our reasoning on the useful insights of Hill (2006).

LIFE TABLES

A life table gives detailed information about the amount of entities (Fraunhofer’s ventures in our case) entering a certain period. Besides the amount of survived, censored or terminated entities, the life table represents descriptive indicators such as surviving proportion, probability density and hazard rate for each period.

The number of companies exposed to the risk of dying at a certain age (represented by the rows in a life table) equals the number of cases that have reached a specific age, subtracted from half the number of cases that died or were censored at that age. Dividing the sum by

two is explained by the assumption that the exact censoring or terminal event (death) is equally distributed throughout one period.

Furthermore, a life table shows the proportion of companies that die at a specific age, as well as the proportion that survived. Moreover, the life table shows the cumulative proportion of the companies that survive a certain age, which is termed survival function. When T is the survival time of one of the companies in the sample and t reflects one specific time point, then the survival function $S(t)$ equals $P(T \geq t)$.

In addition, a life table shows the probability density, which reflects the estimated probability of a company to die at a certain age i . If P_i is the estimated cumulative proportion of a company that reached a certain age (survived), then the probability density F_i equals $(P_i - P_{i+1}) / h_i$. The factor h_i reflects the size of the interval examined, in our case 1 (year). The hazard rate describes the risk of a company to fail within a specific year. We calculate the hazard rate $\lambda(t)$ as $F(t) / S(t)$.

COX PROPORTIONAL HAZARD MODEL

Life tables give an overview of the sample of Fraunhofer's venture portfolio. Additionally, we will apply a proportional regression analysis to investigate the influencing factors that determine venture survival.

In survival analysis, one cannot simply apply multiple regressions because the dependent variable (death vs. survival) is usually not equally distributed, which is one of the key conditions of multiple regression. As described above, the problem of censoring, which cannot be captured with multiple regressions, needs to be kept in mind.

Instead, one proper approach to investigate the influencing power of different factors on survival is Cox's proportional hazard model. When assuming that specific factors do influence the hazard of our sample, the hazard function changes to the following shape $\lambda(t | X) = \lambda_0(t) * \exp(\beta'X)$. Here, X represents covariates (influencing factors), which we

know for each company, and β represents the unknown factors. Finally $\lambda_0(t)$ is the baseline hazard function, where X equals zero. One important (pre)-assumption of the standard Cox hazard model is that covariates (influencing factors) do not change over time and are present from the beginning.

RESULTS

We calculated the following results with SPSS Software. Table 1 represents the life table of the whole venture portfolio of Fraunhofer. Each row in the table stands for the age, starting by zero and ending by 29. It becomes clear that only one company reached the age of 29, while all other companies died or were censored before the age of 18. From the whole sample of 106 ventures, 22 ventures died (79.20 %) and 84 companies were censored (left the sample or are still alive when observation period ended) during time of observation.

TABLE 1 - Life Table

Interval Start Time	Number Entering Interval	Number Withdrawing during Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Std. Error of Cum. Proportion Surviving at End of Interval	Probability Density	Std. Error of Probability Density	Hazard Rate	Std. Error of Hazard Rate
0	106	0	106	0	0	1	1	0	0	0	0	0
1	106	2	105	1	0.01	0.99	0.99	0.01	0.01	0.009	0.01	0.01
2	103	4	101	0	0	1	0.99	0.01	0	0	0	0
3	99	5	96.5	0	0	1	0.99	0.01	0	0	0	0
4	94	10	89	0	0	1	0.99	0.01	0	0	0	0
5	84	10	79	5	0.06	0.94	0.93	0.03	0.063	0.027	0.07	0.03
6	69	6	66	4	0.06	0.94	0.87	0.04	0.056	0.027	0.06	0.03
7	59	12	53	4	0.08	0.92	0.81	0.05	0.066	0.032	0.08	0.04
8	43	3	41.5	1	0.02	0.98	0.79	0.05	0.019	0.019	0.02	0.02
9	39	2	38	2	0.05	0.95	0.74	0.06	0.041	0.029	0.05	0.04
10	35	3	33.5	2	0.06	0.94	0.7	0.06	0.044	0.031	0.06	0.04
11	30	3	28.5	0	0	1	0.7	0.06	0	0	0	0
12	27	4	25	0	0	1	0.7	0.06	0	0	0	0
13	23	4	21	3	0.14	0.86	0.6	0.07	0.1	0.054	0.15	0.09
14	16	7	12.5	0	0	1	0.6	0.07	0	0	0	0
15	9	4	7	0	0	1	0.6	0.07	0	0	0	0
16	5	0	5	0	0	1	0.6	0.07	0	0	0	0
17	5	4	3	0	0	1	0.6	0.07	0	0	0	0
18	1	0	1	0	0	1	0.6	0.07	0	0	0	0
...
29	1	1	0.5	0	0	1	0.6	0.07	0	0	0	0

TABLE 2a - Life Table (FHG Shareholder From Year 1)

FHG from year 1	Interval Start Time	Number Entering Interval	Number Withdrawing during Interval	Number Exposed to Risk	Number of Terminal Events	Pro- portion Termi- nating	Pro- portion Sur- viving	Cumulative Proportion Surviving at End of Interval	Std. Error of Cumulative Proportion Surviving at End of Interval	Pro- bability Density	Std. Error of Pro- bability Density	Hazard Rate	Std. Error of Hazard Rate
yes	0	72	0	72	0	0	1	1	0	0	0	0	0
yes	1	72	2	71	1	0.01	0.99	0.99	0.01	0.014	0.014	0.01	0.01
yes	2	69	3	67.5	0	0	1	0.99	0.01	0	0	0	0
yes	3	66	5	63.5	0	0	1	0.99	0.01	0	0	0	0
yes	4	61	7	57.5	0	0	1	0.99	0.01	0	0	0	0
yes	5	54	7	50.5	3	0.06	0.94	0.93	0.04	0.059	0.033	0.06	0.04
yes	6	44	6	41	4	0.1	0.9	0.84	0.05	0.09	0.043	0.1	0.05
yes	7	34	2	33	4	0.12	0.88	0.74	0.07	0.101	0.048	0.13	0.06
yes	8	28	1	27.5	1	0.04	0.96	0.71	0.07	0.027	0.026	0.04	0.04
yes	9	26	2	25	1	0.04	0.96	0.68	0.07	0.028	0.028	0.04	0.04
yes	10	23	2	22	2	0.09	0.91	0.62	0.08	0.062	0.042	0.1	0.07
yes	11	19	1	18.5	0	0	1	0.62	0.08	0	0	0	0
yes	12	18	3	16.5	0	0	1	0.62	0.08	0	0	0	0
yes	13	15	3	13.5	3	0.22	0.78	0.48	0.09	0.137	0.072	0.25	0.14
yes	14	9	4	7	0	0	1	0.48	0.09	0	0	0	0
yes	15	5	3	3.5	0	0	1	0.48	0.09	0	0	0	0
yes	16	2	0	2	0	0	1	0.48	0.09	0	0	0	0
yes	17	2	2	1	0	0	1	0.48	0.09	0	0	0	0

TABLE 2b – Life Table (FHG Not Shareholder From Year 1)

FHG from year 1	Interval Start Time	Number Entering Interval	Number Withdrawing during Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Std. Error of Cum. Proportion Surviving at End of Interval	Probability Density	Std. Error of Probability Density	Hazard Rate	Std. Error of Hazard Rate
no	0	34	0	34	0	0	1	1	0	0	0	0	0
no	1	34	0	34	0	0	1	1	0	0	0	0	0
no	2	34	1	33.5	0	0	1	1	0	0	0	0	0
no	3	33	0	33	0	0	1	1	0	0	0	0	0
no	4	33	3	31.5	0	0	1	1	0	0	0	0	0
no	5	30	3	28.5	2	0.07	0.93	0.93	0.05	0.07	0.048	0.07	0.05
no	6	25	0	25	0	0	1	0.93	0.05	0	0	0	0
no	7	25	10	20	0	0	1	0.93	0.05	0	0	0	0
no	8	15	2	14	0	0	1	0.93	0.05	0	0	0	0
no	9	13	0	13	1	0.08	0.92	0.86	0.08	0.072	0.069	0.08	0.08
no	10	12	1	11.5	0	0	1	0.86	0.08	0	0	0	0
no	11	11	2	10	0	0	1	0.86	0.08	0	0	0	0
no	12	9	1	8.5	0	0	1	0.86	0.08	0	0	0	0
no	13	8	1	7.5	0	0	1	0.86	0.08	0	0	0	0
no	14	7	3	5.5	0	0	1	0.86	0.08	0	0	0	0
no	15	4	1	3.5	0	0	1	0.86	0.08	0	0	0	0
no	16	3	0	3	0	0	1	0.86	0.08	0	0	0	0
no	17	3	2	2	0	0	1	0.86	0.08	0	0	0	0
no	18	1	0	1	0	0	1	0.86	0.08	0	0	0	0
no	...	...	...	...	...	...	...	...	...	...	...	...	...
no	29	1	1	0.5	0	0	1	0.6	0.07	0	0	0	0

TABLE 3
Descriptive Hazard Summary
Case Processing Summary

FHG from year 1	N Total	N Death	N Censored	Percent
0	34	3	31	91.20%
1	72	19	53	73.60%
Overall	106	22	84	79.20%

TABLE 4
Overall Comparison
FHG Shareholder from year one (yes vs. no)
Overall Comparisons*

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	5.16	1	0.023
Breslow (Generalized Wilcoxon)	3.623	1	0.057
Tarone-Ware	4.437	1	0.035
* Test of equality of survival distributions for cases where FHG is Shareholder at year 1 or not.			

Recalling from the previous paragraph, we calculated the survival and hazard function and probability density for each age. It becomes apparent that the highest risk of dying is at age 13 (hazard rate = 15%). Although there are other age levels where more ventures died in total (e.g. age 6 and 7), in relation to the still existing ventures, surviving the age of 13 is least probable (survival rate of 86 %).

As an additional analysis, we split our sample into two groups: a) ventures that are funded by Fraunhofer since their incorporation (Table 2a) and b) ventures that got funding from Fraunhofer when they were more mature (Table 2b). Table 3 shows the proportion of these two groups.

Tables 2a and 2b show that the relative proportion of surviving is higher when Fraunhofer is not funding a venture from its inception onwards. The maximum risk to die for group b) is only 8% (at age 9). In group a) the maximum risk amounts to 25% at the age of 13.

Figure 1 shows a graphical representation of the two different survival functions.

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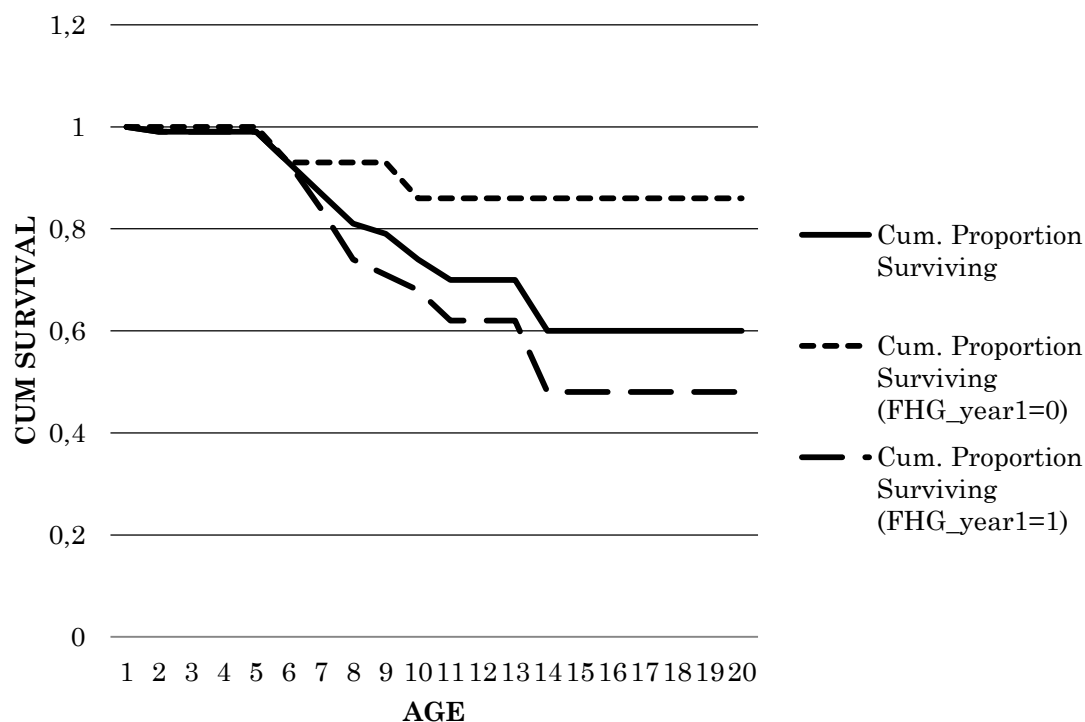


Figure 1: Survival functions

To test whether these two groups are significantly different from each other, we performed a test of equality (the Log Rank and Tarone-Ware tests show significant results), which is shown in Table 4.

The next step is to see whether the Boolean variable “Venture is funded by Fraunhofer at year one” influences the survival rate of our sample.

TABLE 5a
Cox Proportional Hazard Model (1)
One Covariate: FHG Shareholder from year one (yes vs. no)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
169.609	4.922	1	0.027	5.73	1	0.017	5.73	1	0.017

Variables in the Equation								
	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
FHG from year 1	1.289	0.622	4.298	1	0.038	3.63	1.073	12.284

As one can see in Table 5a, a funding by Fraunhofer Venture in year 1 has a significant negative influence on survival. As Exp(B) shows, ventures that are funded by Fraunhofer from inception onwards are exposed to risk of failure three times more than ventures that were funded later during their lifetime. This finding is significant ($p=0.038$; $\text{Exp}(B)=3.63$).

In the following, we will show another Cox model with other covariates. As it has been described before, the Cox model generally shows the influencing power of covariates present from the start and throughout the whole time of the observation. The following model takes Boolean variables into account that do not need to exist from day one. One example shall illustrate that: The Boolean variable “Shareholder_PrivateOrganization” is true if a Fraunhofer venture has ever had a privately owned company as one of its shareholders – independent from the specific time, duration and amount of shares. This simplification may decrease the credibility of our model.

TABLE 5b
Cox Proportional Hazard Model (2)
Covariates at least once present in lifetime. Optimized model.

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
152.191	23.78	7	0.001	23.148	7	0.002	23.148	7	0.002

Variables in the Equation									
	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)		
							Lower	Upper	
Shareholder_PrivateCompany	-1.302	0.461	7.983	1	0.005	0.272	0.11	0.671	
Contract_PatentAssignment	2.681	1.25	4.6	1	0.032	14.597	1.26	169.159	
Contract_Licensing	0.909	0.503	3.263	1	0.071	2.481	0.926	6.651	
Contract_Cooperation	1.194	0.636	3.521	1	0.061	3.3	0.948	11.484	
FHGEarnings_RandD	-1.233	0.6	4.226	1	0.04	0.291	0.09	0.944	
FHGEarnings_Licenses	-1.701	0.608	7.831	1	0.005	0.182	0.055	0.601	
FHGExpenses	-0.629	0.514	1.499	1	0.221	0.533	0.195	1.46	

The Cox Model, which is reflected by Table 5b, takes seven different covariates into account, of which four show a significant influence on survival of Fraunhofer's ventures.

Firstly, it becomes clear that the presence of a privately owned organization (as opposed to a private individual) has a significant negative influence on hazard. Exp(B) shows that ventures which had a privately owned organization as one of their shareholders during their lifetime are 27.2 % (p=0.005) less exposed to risk of hazard compared to the ventures that never had a privately owned organization as one of their shareholders.

Secondly, the presence of a contract between Fraunhofer and a venture about the assignment of a patent from Fraunhofer to the venture has a significantly positive influence on the hazard rate. Exp(B) shows that ventures which take ownership of a Fraunhofer patent during their lifetime are 14,5 times more exposed to the risk of death than ventures that do not sign such a contract.

Thirdly, a venture that pays Fraunhofer to do research and development (so Fraunhofer receives earnings) has a negative influence on hazard. Ventures that engage in R&D

projects with Fraunhofer and pay for that are 29 % (p=0.04) less exposed to hazard than the Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014.

ventures that do not have such a relationship once in their lifetime. Fourth, the payment of license costs from a venture to Fraunhofer lowers the risk of death significantly. Using a Fraunhofer owned patent and paying for it lowers the probability of dying by 18% ($p=0.005$).

DISCUSSION

ANSWERING THE RESEARCH QUESTIONS

Before discussing our findings, a short summary of our insights is given. Firstly, ventures that have been funded by Fraunhofer from year 1 onwards are more likely to die than ventures that started independently. Furthermore, our extended Cox model let us assume that the presence of a privately owned company as shareholder during the lifetime of a venture has a positive effect on survival. Paying Fraunhofer for doing research and paying license fees positively influences the chances for survival. Ventures that buy Fraunhofer patents within their lifetime face a higher risk of dying.

How do these findings relate to our previously formulated research questions? Firstly, we intended to understand how the relationship between Fraunhofer and its ventures influences spin-off survival. We measured the degree of parent-venture relationship with the question of whether or not Fraunhofer was shareholder from year 1 onwards. Furthermore, we determined parent-venture relationships by the fact that a spin-off venture keeps a relationship with Fraunhofer through hiring them to do research for them as well as the fact that the venture pays licensee fees to Fraunhofer. These factors suit the findings of other scholars that ties to the parent are important for spin-off survival to get access to tangible and intangible assets (Steffensen et al., 2000; Rappert et al., 1999; Audretsch et al. 2005; Rasmussen & Borch 2010; Heblich & Slavtchev 2013). Instead of buying a patent from Fraunhofer, which would translate into a non-permanent relation to the parent, licensing and contracting keeps these crucial ties alive. However, it is

astonishing that the timing for investing in spin-off firms was crucial in the case of Fraunhofer. We will discuss this and all other findings in the subchapter.

With our second research question, we wanted to find out to what extend the relationship of Fraunhofer's spin-off ventures to non-Fraunhofer entities influences their survival rates. To measure the relationship of Fraunhofer's RBSOs and other third parties, we checked whether a private investor holds shares in Fraunhofer's ventures at least once during their lifetime and whether this had an effect on survival. We could confirm the academically established notion that interaction with third parties, such as venture capital investors, has a positive effect on spin-off survival (Shane & Stuart, 2002).

DISCUSSING THE KEY FINDINGS

In our study, we analyzed data on 106 companies, trying to identify factors that influence the survival or death of research based high-tech spin-off companies.

The first of our findings appears to be contrary to conventional wisdom as well as contrary to the predominant opinion in research (Rothaermel et al., 2007; Gubeli & Doloreux, 2005): spin-off companies that are incorporated with Fraunhofer as an initial supporter and shareholder are less likely to survive than companies that are founded without an equity position of their parent organization (in our case, Fraunhofer).

What seems to be rather strange at first sight has some interesting and insightful implications. We found four reasons that explain this effect:

1. Having Fraunhofer on board as an initial shareholder and supporter potentially results in a situation where the spin-off company gets enough aid money and public grants that it is not forced to take part in the free competition for customers, revenue and profits. We believe that companies, which from the very beginning of their existence lack this rather positive and constructive pressure to succeed, are

more likely to end up being subsidy dependent and thereby operationally less stable.

2. Spin-off companies that start up rather independently are streamlined and focused on exploiting business opportunities without relying on grants and subsidies. Due to being constantly exposed to a competitive market environment, these companies tend to have efficient operations and clearly defined objectives and demands. Adding Fraunhofer to their list of shareholders after an independent startup phase is a clearly elaborated and strategically motivated decision aimed at a mutually beneficial partnership. The positive signaling effect Fraunhofer has on other partners and customers of the spin-off when becoming a shareholder seems to strengthen the survival probability of these ventures. This supports the established notion of other scholars that the reputation of the parental firm has a positive effect on spin-off survival (Klepper & Sleeper, 2005; Eriksson & Kuhn, 2006; Thompson, 2007; Klepper & Thompson, 2010; Andersson et al., 2012).
3. Fraunhofer scientists who intend to establish a spin-off company get supported by Fraunhofer Venture, the internal department for technology commercialization. In this kind of constellation, the start-up of a new company is an all internal affair aimed at transferring research results to the market that otherwise might not be commercially exploitable. This is a setting where a less forceful due diligence of the spin-off projects quality is likely.
4. At Fraunhofer, it is not unusual that scientists who intend to establish a spin-off company together with Fraunhofer are not only supported in preparing and incorporating the new venture, but are also equipped with a special employment agreement. This agreement enables the researchers, who became entrepreneurs, to partly work for their new venture and partly for Fraunhofer and / or provides the scientists with the right to completely return to their old job within a timeframe of up to two years. This practice may potentially hamper the power of endurance of

founder teams. Furthermore, it goes in the same direction as other scholars have claimed by saying that holding a PhD does not guarantee venturing success, since it does not tell anything about the founders' market and business-related know-how (Heirman and Clarysse, 2004; Mustar et al., 2006; Astebro et al., 2012; Conceição & Faria, 2014).

Another finding of our research is the positive effect on spin-off survival that comes from the presence of a privately owned company being a shareholder of a venture. For this effect we give credit to the following reasons:

1. A commercially oriented company that acts as an investor adds a tremendous amount of professionalism and managerial pressure to an otherwise rather research-oriented and purely technology-driven spin-off. In doing so, it acts as a watchdog for commercial efficiency.
2. Most companies that act as investors have a clearly defined and effective process of identifying and auditing a potential investment opportunity. A spin-off that passes this rigid and consistent due diligence process is by definition a rather promising company.
3. Among privately owned companies that invest into spin-off ventures are numerous enterprises which invest for strategic reasons – e.g. in order to have a testing ground for new products and services. It might be less likely that such an investor would allow a spin-off company to file for insolvency or bankruptcy (and thus allow it to die) and lose control. We believe that under these circumstances the investor would rather acquire and integrate the spin-off for a relatively tiny amount of money and thereby save it from ending as a dead spin-off.

Furthermore, we observed that it positively influences the likelihood of survival if a spin-off is paying Fraunhofer for conducting research and additionally paying license fees. We explain this effect as follows:

1. A spin-off company that has a permanent and stable customer relationship to Fraunhofer disposes of first-class access to new technologies, solutions and insights that potentially lead to considerable business opportunities. This precisely reflects Gubeli and Doloreux (2005), who emphasized the positive effect of keeping strong ties to the parental organization.
2. Using Fraunhofer as a license-based technology supplier gives spin-off companies an edge over their competitors. This is not only due to technical advantages, but it is even more important that as a licensor Fraunhofer handles all capital intense issues connected to patent protection and litigating patent infringements. Thereby, Fraunhofer is capable of providing an extensive scope of patent protection, something that Nekar & Shane (2003) found to be beneficial for spin-off survival.
3. The combination of being equipped with valuable tailor-made solutions and the option to finance it to the biggest part by steadily paying comparably small license fees empowers spin-off companies to get their hands on sophisticated technology while at the same time safeguarding their limited funds.

Finally, we discovered that spin-off companies which buy Fraunhofer patents instead of just licensing them face a higher risk of death. This, in our opinion, is due to four reasons:

1. Spin-off ventures that buy patents do not enter a lasting relationship with Fraunhofer. In doing so, they seem to lose the option of having a reliable technology partner for permanently exchanging thoughts and opinions on technologies, solutions and insights. This is something that, as we mentioned before, potentially leads to new ideas and consequently new business opportunities.
2. Patents are expensive, especially since Fraunhofer is generally determined to hold as many patents as possible and work with license agreements instead of patent sales. Therefore, it takes a spin-off company of a huge portion of its capital to buy a patent, which is something that might eventually lead to a fatal capital shortage.

3. Patents are not only expensive when being bought. The cost of maintaining the patent protection and pursuing patent infringements is also substantial and can easily surpass the financial capabilities of a spin-off company.
4. Since Fraunhofer is strongly interested in owning as many commercially relevant patents as possible, it is conceivable that it only sells those patents where the commercial potential is marginal. In other words, Fraunhofer might just sell patents that are a rather bad foundation for a successful and lasting business.

CONCLUSION

SCIENTIFIC AND PRACTICAL IMPLICATIONS

We believe that the findings of our study are of importance to several groups of stakeholders interested in the exploitation of European research and innovation results:

First, policy makers interested in successful and enduring technology transfer from research to the market by means of spin-off companies are provided with a deeper understanding of the mechanisms behind the survival or death of these newly founded companies. The knowledge of strong positive factors contributing to a lasting success of young companies and of decisive negative factors with the potential of limiting a spin-off's likelihood for survival helps to introduce legislative measures that are beneficial for European spin-offs in particular and the start-up ecosystem in general.

Secondly, research organizations benefit from our findings by gaining a clear understanding about how to positively influence the likelihood of the survival of their spin-off companies. This understanding might lead to processes and internal promotional programs that improve the chances for successfully commercializing research results by spinning-off companies out of research entities. This knowledge eventually contributes to strengthening the entrepreneurial culture in research organizations of all kinds.

Thirdly, European technology transfer professionals, whose primary role it is to successfully transfer research finding to a broad market adoption, are equipped with further know-how on how to effectively fulfill this task. Comprehensively broken down along a spin-off's complete life-cycle, our findings provide this group with a precise outline of factors of decisive impact on the probability of survival or death.

Fourthly, researchers with the ambition to exploit their research results by founding a spin-off company and switching over to being entrepreneurs directly profit from our findings. Utilizing our results enables these researchers who became entrepreneurs to omit errors and to concentrate their resources on factors that have a directly positive influence on building a spin-off that is likely to be successful and lasting.

Fifthly, by using our findings, investors get access to an instrument giving them the possibility to improve their present due diligence practice toward European high-tech spin-off companies. This gives them more confidence in getting to the right investment decision, which could eventually lead to more venture capital flowing into companies that were spun out of research organizations.

FUTURE RESEARCH DIRECTIONS

We see the necessity to do further research on the given database of the venture portfolio of Fraunhofer. From literature, we know that more factors than those we mentioned will determine the survival of ventures. For example, Audretsch (1991) claims that the dimensions technology and market are crucial factors to explain firm survival across different industries. Future research should therefore look at measures like market size and intensity (number of firms, entries and exits over time) or current economic situation (measured by growth in GDP). Furthermore, future research should capture some more micro-oriented factors like the location where a spin-off company works. For instance, Vedovello (1997) found out that ventures situated in science parks have more informal links with other important firms and people that positively influences their venture progress.

Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014.

Close to Bigliardi et al.'s (2013) categorization of factors that influence firm survival, the following dimensions should be covered in doing further research on Fraunhofer's venture portfolio: 1) market related factors, 2) factors related to the relationship to the parental organization, 3) factors that determine technological preferences of a ventures, 4) the venture's team and 5) its financial situation. It becomes clear that in our sample factors in categories 1, 4 and 5 are yet missing.

REFERENCES

- Agarwal, R., & Gort, M. (2002). Firm and Product Life Cycles and Firm Survival. *American Economic Review*, 92(2), 184–190.
- Anderson, T. R., Daim, T. U., & Lavoie, F. F. (2007). Measuring the efficiency of university technology transfer. *Technovation*, 27(5), 306–318.
- Audretsch, D. B. (1991). New-Firm Survival and the Technological Regime. *The Review of Economics and Statistics*, 73(3), 441–50.
- Audretsch, D. B. (1995). New firm survival: new results using a hazard function.
- Autio, E. (1994). New, technology-based firms as agents of R&D and innovation: an empirical study.
- Bell, E. R. . (1993). Some current issues in technology transfer and academic-industrial relations: a review: Practitioners' forum. *Technology Analysis & Strategic Management*, 5(3), 307–322.
- Bigliardi, B., Galati, F., & Verbano, C. (2013). Evaluating Performance of University Spin-Off Companies: Lessons from Italy. *Journal of technology management & innovation*, 8(2), 29–30.
- Bruderl, J. P., Preisendorfer, P., & Ziegler, R. (1992). Survival chances of newly founded business organizations, (57), 227–242.
- Buddelmeyer, H., Jensen, P. H., & Webster, E. (2009). Innovation and the determinants of company survival. *Oxford Economic Papers*, 62(2), 261–285.
- Carroll, G. R., Bigelow, L. S., Seidel, M.-D. L., & Tsai, L. B. (2007). The fates of De Novo and De Alio producers in the American Automobile Industry 1885–1981. *Strategic Management Journal*, 17(S1), 117–137.
- Caves, R. E. (1998). Industrial Organization and New Findings on the Turnover and Mobility of Firms. *Journal of Economic Literature*, 36(4), 1947–1982.
- Dimitras, A. I., Zanakis, S. H., & Zopounidis, C. (1996). A survey of business failures with an emphasis on prediction methods and industrial applications. *European Journal of Operational Research*, 90(3), 487–513.
- Dunne, T., Roberts, M. J., & Samuelson, L. (1988). Patterns of Firm Entry and Exit in U.S. Manufacturing Industries. *RAND Journal of Economics*, 19(4), 495–515.
- Geroski, P. A., Mata, J., & Portugal, P. (2009). Founding conditions and the survival of new firms. *Strategic Management Journal*, n/a–n/a.
- Gübeli, M. H., & Doloreux, D. (2005). An empirical study of university spin-off development. *European Journal of Innovation Management*, 8(3), 269–282.
- Hill, T. (2006). *Statistics: methods and applications: a comprehensive reference for science, industry, and data mining*. Tulsa, OK: StatSoft.
- Klepper, S. (2002). Firm Survival and the Evolution of Oligopoly. *RAND Journal of Economics*, 33(1), 37–61.
- Klepper, S., & Simons, K. L. (1997). Technological Extinctions of Industrial Firms: An Inquiry into their Nature and Causes. *Industrial and Corporate Change*, 6(2), 379–460.
- Nerkar, A., & Shane, S. (2003). When do start-ups that exploit patented academic knowledge survive? *International Journal of Industrial Organization*, 21(9), 1391–1410.
- Nicolaou, N., & Birley, S. (2003). Academic networks in a trichotomous categorisation of university spinouts. *Journal of Business Venturing*, 18(3), 333–359.
- Owen-Smith, J., Riccaboni, M., Pammolli, F., & Powell, W. W. (2002). A Comparison of U.S. and European University-Industry Relations in the Life Sciences. *Management Science*, 48(1), 24–43.

Roberts, E. B. (1991). The technological base of the new enterprise. *Research Policy*, 20(4), 283–298.

Roberts, E. B., & Malone, D. E. (1995). Policies and structures for spinning off new companies from research and development organizations (Working papers No. 3804-95.). Massachusetts Institute of Technology (MIT), Sloan School of Management. Retrieved from <http://ideas.repec.org/p/mit/sloanp/2569.html>

Rogers, E. M., Takegami, S., & Yin, J. (2001). Lessons learned about technology transfer. *Technovation*, 21(4), 253–261.

Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change*, 16(4), 691–791.

Rothaermel, F. T., & Thursby, M. (2005). Incubator firm failure or graduation?: The role of university linkages. *Research Policy*, 34(7), 1076–1090.

Shane, S., & Stuart, T. (2002). Organizational Endowments and the Performance of University Start-ups. *Management Science*, 48(1), 154–170.

Thompson, P. (2005). Selection and Firm Survival: Evidence from the Shipbuilding Industry, 1825–1914. *Review of Economics and Statistics*, 87(1), 26–36.

Thompson, P., & Klepper, S. (2003). Submarkets and the Evolution of Market Structure (Working Papers No. 0303). Florida International University, Department of Economics. Retrieved from <http://ideas.repec.org/p/fiu/wpaper/0303.html>

Vedovello, C. (1997). Science parks and university-industry interaction: Geographical proximity between the agents as a driving force. *Technovation*, 17(9), 491–531.

CONCLUSION

As I described in the introduction, market trends like the “fourth industrial revolution” trigger established firms, entrepreneurs and public R&D organizations to constantly adapt to new environmental settings such as market demands, technological shifts or regulatory frame conditions.

In the following, I will briefly summarize the five main findings, which have been deducted from the five scientific papers that form the basis of my thesis. Consequently I will take a step ahead and argue that the central aspect of my thesis is actually the management of distance between a parental organization and its ventures, because four of my five papers directly deal with this issue of distance. However, as I will show later on, all papers significantly contributed to the proposed framework of how to manage this distance. In the framework I will show that distance between a venture and the parental firm has certain sub-categories with two separate extremes to choose from. The design of distance, meaning the combination of different preferences in the sub-categories, is determined by both the parental organization and venture alike. Both entities’ actions influence the distance and both face certain trade-offs when distance-changing decisions are made.

THE SPIN-ALONG STRATEGY IS A SUITABLE MEASURE TO ENABLE ORGANIZATIONAL ADAPTATION

In Fischer (2015), I highlighted the spin-along approach as a promising strategy for mastering the adaptive cycle of Miles et al. (1978). The adaptive cycle is a holistic model that describes the dynamic process of companies which adapt to market dynamics. Miles et al. (1978) claim that while recognizing opportunities and engaging in risky organizational change, every firm faces three typical problems: the entrepreneurial, the engineering and the administrative problem. I used the concept of spin-along as an alternative method to

solve these three typical problems. As a result, I found out that the spin-along strategy should be part of the overall corporate strategy and therefore should become a top-executive responsibility. Furthermore, setting up, managing and nurturing a pool of spin-along firms is the key organizational frame in this setting. This pool is the flexible space where ventures from the outside (e.g. by engaging in joint development of a new product or by sharing certain assets like patents or machinery) or the inside (e.g. an internal corporate venture which is granted more independence as a separate organizational entity) reside. Finally, the spin-along strategy takes the relationship between the corporate parent and their spin-along ventures into account by promoting the ability to flexibly change the distance over time. The proposed Spin-Along Shell-Model has the potential to become a tool to visualize the distance between the corporate parent and ventures residing in a spin-along pool.

SPECIFIC CAPABILITIES ARE NECESSARY FOR THE SUCCESSFUL IMPLEMENTATION OF A SPIN-ALONG PROGRAMME

In Mahdjour & Fischer (2015) we identified 13 organizational capabilities T-Labs required for implementing the spin-along approach. Firstly, spin-along ventures need to be shielded against conflicts of interest and the corporate parent needs to establish an environment that encourages entrepreneurial activity amongst its employees. Furthermore, the spin-along approach is operationalized through a dedicated programme, which is guided by a focused strategy and steers the process of capturing and selecting promising ideas. In addition, the spin-along programme management needs to have the ability to build and exploit synergies between ventures in the spin-along portfolio, as well as to offer access to internal and external funding sources. The final obligation of the spin-along programme shall be establishing a well-managed post-launch relationship which aims at deducting organizational learning that builds on past experience of spin-along ventures. The third group of capabilities is an efficient spin-along venture development, meaning a combination

of the right competencies within a dedicated venture team. In addition, spin-along ventures need to maintain a customer- and business-orientation while developing their business model, which ideally builds on parental assets and services.

EARLY INTERNATIONALIZATION HELPS SPIN-ALONG VENTURES TO OVERCOME INTERNAL BARRIERS

During the observation of the spin-along programme of Telekom Innovation Laboratories, we came across the phenomenon that some of T-Labs' spin-along ventures aimed for starting their business in non-domestic markets. We have shown in Mahdjour & Fischer (2014) that motives for early internationalization of spin-along firms in the case of Deutsche Telekom were: First, the decreased probability of termination of the venture due to the parent's impression of getting part of their business cannibalized through the spin-along venture's activities. Secondly, early internationalization makes it easy to partner with parental competitors in markets that the parental organization has no presence in. Thirdly, early internationalization may simplify the access to parental assets in markets where only smaller subsidiaries of the parental organization exist. Fourthly, non-domestic markets may have beneficial characteristics (e.g. higher demand, less legal restrictions) compared to the parental home market, which accelerates venture growth and performance in early years.

EARLY INTERNATIONALIZATION ENABLES MARKET DOMINANCE FOR START-UPS

Leaving the spin-along research field aside, we highlighted in Wurster et al. (2014) how early internationalization can facilitate global market dominance of young independent companies. In fact, Born Globals' ability to establish a dominant market position depends on specific entrepreneurial skills on the one hand but also on environmental factors like competitors' mistakes and the behavior of the target audience on the other. In Wurster et al. (2014), we found out that specific success factors play a role in different phases that

result in a dominant market position. Firstly, within the R&D phase the ground work for technological superiority is built. Building outstanding technological assets is important for Born Global companies while the technical field is shaped by a long lead time and while relevant competitors are absent. Secondly we identified early internationalization as a key decision for companies searching for market dominance. It became clear that partnering with companies that offer complementary assets is a fostering factor. Moreover, joint sales and marketing activities help to satisfy the demand more efficiently. Thirdly, the actual establishment of a dominant market position is achieved through building up lock-in effects and increasing switching costs. Finally, Born Global market dominators need to keep their lock-in effects, build trust through reliable solutions and stay competitive through constant product improvements.

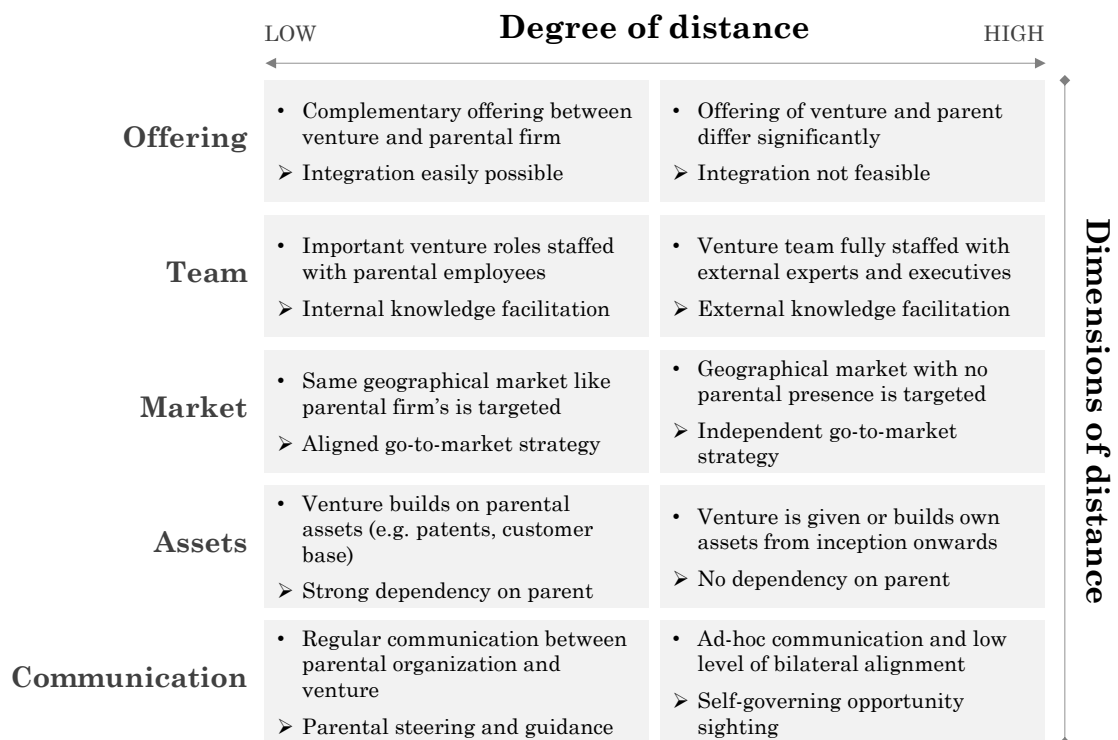
THE TIMING FOR INVESTING IN SPIN-OFFS IS CRUCIAL FOR FRAUNHOFER'S VENTURING PERFORMANCE

As described earlier in this thesis, not only companies but public R&D units apply venturing measures to transfer their inventions into the market. The question arises how to conduct academic venturing in a way that the rate of spin-off firm survival is as high as possible. The quantitative analysis, which we did in Fischer et al. (2014), has led to the conclusion that: firstly, spin-off companies in which Fraunhofer was shareholder from their inception onwards were more likely to be terminated compared to ventures where Fraunhofer took over shareholdership in a later period of their life-cycle. Secondly, the appearance of a privately owned company being a shareholder at some point in the life time of a venture positively influences the survival probability of Fraunhofer's ventures. Thirdly, paying Fraunhofer to use its intellectual properties as well as contracting Fraunhofer for doing research for the venture positively influences the survival of the spin-off companies. Finally, our analysis has shown that the ventures which bought patents from Fraunhofer were more likely to be terminated compared to ventures that did not buy patents. These

findings highlight that the parental organization, Fraunhofer Society, can take specific actions to influence the survival of its spin-off firms and that the parent-venture relationship is important for venture survival.

A FRAMEWORK FOR MANAGING DISTANCE BETWEEN PARENTAL FIRM AND ITS VENTURES

At the beginning of the conclusion I explained how my different papers are related to each other. Additionally, I have summarized the main findings of each of them. Now, when looking at my findings, I come to the conclusion that the actual contribution of my thesis as a whole is a better understanding of the distance between a parental organization and its ventures. The following figure shows that the construct “distance” is determined by at least five different sub categories. The decision to choose either one pole leads to certain trade-offs, which I will briefly explain in the following. Before stating implications, limitations and future research directions, I will briefly link my framework with literature on distance, which was well assembled by Hartig (2011).



In Fischer (2015), I addressed the aspect of distance while explaining the Spin-Along Shell Model. I differentiated between ventures that reside close to a corporate parent and ventures that are more distant. However, I did not yet explain the determinants of distance in detail. Fortunately, the capability model of Mahdjour & Fischer (2015) embodied some aspects of the distance construct already, such as “team composition”, “access to parental assets and services”, “portfolio management” and “post-launch relationship”. However, we related these aspects to organizational capabilities a parental firm needs to have to implement the spin-along approach through a structured spin-along programme. I did not yet mention these capabilities as dimensions to measure distance. Moreover, in Wurster et al. (2014), we found out that early internationalization is an important aspect to achieve market dominance. Translating this finding into the spin-along domain, we highlighted in Mahdjour & Fischer (2014) that the selection of the right geographic market is an important decision in the venturing process. I realized this aspect to be an important determinant of distance between parental organisation and its ventures. Additionally, our findings in Fischer et al. (2014) contribute to the discussion of distance, e.g. when it comes to the way to deal with parental assets (e.g. patents). Moreover, the importance of shareholdership that determines the influencing power of parent, venture and third parties (e.g. third investors) to configure each sub category of the distance construct is addressed.

In the following, I will explain each subcategory of the distance framework from two viewpoints: the parental organisation and the spin-along venture. It will become clear that different category configurations embody certain trade-offs. The scenarios I build to explain this framework are only examples. I am aware of the fact that the following explanations do not cover all possible aspects of distance. Therefore, this newly proposed framework of managing distance will lead to the final discussion of future research directions at the end of my thesis.

Starting with the first aspect of distance, it is reasonable from a parental point of view to spin-out a venture that has a similar offering (similar product or service as parental

organization) when, for instance, time to market is important. Acknowledging the fact that the time from new product development to market roll out is usually longer in bigger firms compared to small ventures, it is beneficial to build up a spin-along venture as an innovation speed boat. In case the expected market demand was satisfied by the venture's offering, the parental organization can easily integrate the venture. This approach might be beneficial when the spin-along venture conducts a proof of concept under real market conditions, while the corporate parent scales up the business after reintegrating the venture through penetrating its existing sales channels and utilizing its brand power. In contrast, from a venture firm point of view there might be the need to achieve independence from the parental organization by offering a product or service that has little to do with the parental product/service portfolio. This may lead to the beneficial situation that the risk is lower for a venture to get reintegrated after a successful proof of concept phase. However, if a spin-along venture is successful in a market where the parental organisation does not want to be active in the long-run, the probability increases that it will get fully externalized. This may lead to a change in shareholder structure, which may either lead to the situation that the venture gains even more self-control (e.g. in case the venture team takes over ownership) or that third party investors take over the steering of the venture.

The second dimension of distance is the venture's team origin. In the two extreme scenarios, a venture team can be fully staffed with either internal or external employees. If a venture team is fully staffed with experts originating from the parental organisation, then the venture can build on existing internal knowledge (e.g. when a technology is commercialized, then the inventor becomes part of the venture team). If the team is solely staffed externally, then knowledge from the external market comes into play. The ratio of venture staff originating from internal and external positions strongly depends on the other dimensions of distance. For instance, if the offering of the venture is barely related to the parental offering, external knowledge might be necessary to achieve venturing success because knowledge of a non-parental industry sector might be necessary. The same holds

true if the offering is closely related to the parental offering; then only specialised internal knowledge and access to market domain experts is necessary.

The third aspect of distance is the geographic position of the target market. As we showed in Wurster et al. (2014) and Mahdjour & Fischer (2014), the targeted market (in this case the geographic location, not industry sector) is an important determinant of venturing success. Due to the high maturity of information and communication technologies and an ever-globalizing world, it is possible to place ventures in different geographic regions and have them closely aligned at the same time. The aspect of targeted markets therefore concentrates on the question whether the parental organization is already active in a non-domestic market. If a venture is placed in a region with no parental presence, then there is no need for alignment between parent and venture (e.g. alignment of a go-to-market strategy). However, this also has the side effect that the venture cannot build on assets of the parental firm, such as an established customer base, sales network or brand appearance.

This leads to the fourth dimension of distance: “assets”. This subcategory is strongly linked to the previously mentioned aspects of the targeted market. If the parent organisation has full control over the venture, then its willingness to share assets like intellectual property rights, customer bases, sales channels or other kinds of assets is high. However, as we found out in Fischer et al. (2014), buying the right to use patents is sometimes more beneficial compared to purchasing them totally. An example scenario could be a spin-along venture that has the obligation to market yet untapped company assets (e.g. building a new product based on a patent, which is not yet part of a product of the parental organization). However, the dependency on parental assets leads to the situation that the venture depends on the parent’s decision to grant these assets. Requesting access to parental assets makes negotiations with the parental firm necessary, which can be time consuming for both sides and delay product roll outs. Building on parental assets from inception onwards may also lead to a competitive edge over independent ventures (which are not backed with

existing assets, like pre-products). However, there is a risk that a venture equipped with parental assets from inception does not concentrate hard enough to build their own competitive assets, which increase the probability of an independent venture to outperform spin-along ventures in the long-run. If a venture does not build on parental assets, these problems do not appear. However, if the venture is able to build up own competitive assets quickly enough and at the same time keep a low distance to the parental firm (in the other categories) it might lead to a promising situation for both sides.

The last aspect of distance I want to highlight in my framework is communication. Communication means the exchange of tacit knowledge between the venture team and the parental firm. A regular communication and close alignment can lead to the situation that both parent and venture benefit from each other's networks and share recognized opportunities. On the other hand, communication is a continuous process that does not always immediately lead to benefits and can be understood from a venture point of view as being too much of an overhead activity. The discussion of the right level of communication is also related to the actual shareholder structure of the spin-along venture. The owner of a venture aims for a regular reporting and information flow to control target achievement and venture progress. This reflects only a one-directional information flow from the venture to the parent on a regular basis. However, the communication aspect I highlight here shall be understood as more informal communication between parental firm and venture team on the operational level.

Finally, we found out in Fischer et al. (2014) that the shareholder structure is an important aspect for venturing survival, too. The point of their first engagement in a venture as a shareholder had a significant influence on Fraunhofer's ventures' survival. I claim shareholder structure of a venture to be an important factor in determining the actual configuration of distance. Therefore, it is not a subcategory of distance but should be understood as moderator. In a scenario where one hundred percent of a venture is owned by the parental firm, all aspects of distance can be configured by the parental organisation

because it is the most powerful party in the parent-venture relationship. In case the team itself owns parts of the venture, it has a much better position to negotiate for a distance configuration more in the venture's favour.

To conclude I came to a better understanding of how to define and shape the distance between the parental organisation and its ventures. Eventually, the decision to either have a low or high level of distance influences the likelihood of success of the whole venturing initiative in general and more specifically the viability of venture firms themselves. The distance aspect should be kept in mind from the start. Furthermore, ownership is an important aspect, too, because the ownership of a venture determines the influencing power of the parental firm, the venture team or third parties.

REFLECTION ON DISTANCE LITERATURE

Hartig (2011) has investigated how distant relationships between firms influence learning and innovation. In her literature review, Hartig comes up with six distance categories, which I will briefly explain in order to link them to my specific dimensions. It becomes apparent that literature on distance mainly focuses on independent firms and only little on corporate venturing specifics. Hartig differentiates geographic, institutional, organisational, strategic, technological and relational distance.

Geographic distance, as understood by other scholars, suits best the market dimension of my distance framework. Scholars agree that geographic distance can be measured in two different ways: either as absolute meters or in relative distance understood as the costs and time an interaction between two organisations "consumes". (Torre & Rallet, 2005; Bouba-Olga & Grossetti, 2005; Gilly & Wallet, 2002; Hartig, 2011). Due to advancements in ICT, companies, which have a high absolute distance, could have a low relative distance between each other. Relative distance is defined by the ratio of costs and time which reflects the effort of communication. For example, when firms are in the same time zone and

communicate via video-based conference systems, the absolute distance might be high, although the relative distance stays low.

Another kind of distance, as assembled by Hartig (2011), is strategic distance, which I consider to be linked with the market and assets aspect of my framework. Hartig (2011) defines strategic distance as “the (actual or perceived) absence of a direct or indirect tie to a current or potential future competitor” (p. 101). In Mahdjour & Fischer (2014) we highlighted the possibility of ventures to become active in markets where the parental firm is not present, which brings the opportunity to engage with parental competitors. At the same time, the venture can build on parental assets (e.g. patents) but also on assets of parental competitors. This aspects suite the idea of co-opetition as termed by Brandenburger and Nalebuff (1996) meaning the combined approach of cooperating and competing.

Furthermore, institutional distance is the degree of how similar the frame conditions for individuals, firms and governmental bodies are in different geographic regions (Hartig, 2011). My framework of distance between a corporate parent and its ventures does not cover this aspect directly. However, the institutional framework highly depends on the location a firm is active in. Furthermore, the concept is closely related to the concepts of “National Systems of Innovation” (Nelson, 1993; Lundvall, 1992; Freeman, 1987) and “Regional Systems of Innovation” (Cooke, 2005; Cooke et al., 1997).

Moreover, organizational distance is the opposite of organisational proximity, which can be defined as “the extent to which organisations have adopted similar mental maps, organisational routines, corporate culture, and management styles” (in Hartig, 2011, p. 92 referring to Wuyts et al., 2005, p. 291). It becomes apparent, that organizational distance is the distance aspect, I underlined within my framework, too. I claim, that the dimensions of my framework influence the organisational distance as understood by Wuyts et al. (2005) of the parental firm and its ventures.

The aspect of the venture team in my framework and the question whether it is staffed by parental or external experts can be related to the aspect of technological distance, as proposed by Hartig (2011). Technological distance describes “people (which are) sharing the same knowledge base and expertise” (Boschma, 2005, p. 63). Compared to other distances measured, the focus lies on the individual level, since knowledge is located in people’s heads (Amin & Cohendet, 2004). The degree of sharing a common knowledge base depends on the absorptive capacity of the firm in which individuals are working. In this regard, Hartig (2011) refers to the work of Cohen and Levinthal (1990) citing that “an organisations absorptive capacity will depend on the absorptive capacity of its employees” (p. 131). However the knowledge base and with that the absorptive capacity “is not resident in any single individual but depends on the links across a mosaic of individual capabilities” (Cohen and Levinthal, 1990, p. 133 in Hartig, 2011, p. 110).

In my framework of parent-venture distance, I claimed communication to be an important dimension. Communication is linked to the relational distance aspect in Hartig (2011). Accordingly, relational distance is the opposite of relational proximity, which is defined as the “...socially embedded relationships between agents at the micro-level. Relations between actors are socially embedded when they involve trust based on friendships, kinship and experience” (Boschma, 2005, p. 66 in Hartig, 2011, p. 120). This distance measure underlines the fact that individuals are actors of a social network and interact and depend on other individuals. They communicate with each other, on a formal and informal basis. The degree of interaction is influenced by the perceived value (e.g. strengthening of friendship) of exchanges in a social relationship. This inter-individual distance can lead to beneficial but also constraining behaviour of individuals (Hartig, 2011).

IMPLICATIONS

In the following, I will highlight the implications my findings have for scholars and practitioners alike. I will base the next paragraph on the five main findings of this thesis,

which basically reflect my five scientific papers. Afterwards, I will claim that my work is limited to a certain extent. Furthermore, I will open up the discussion on new research directions, which I mainly build on the just discussed issue of parent-venture distance.

I want to reemphasise that the current literature focusses mainly on either internal or external corporate venturing while the integrated approach of spin-along venturing brings a new perspective into the scientific discussion. My research thereby enhances the literature on the spin-along approach and adds insightful case-based findings.

In fact, I propose the spin-along strategy as a measure to solve the entrepreneurial, engineering and administrative problem of Miles et al.'s (1978) holistic adaptive cycle model. I furthermore propose the Spin-Along Shell Model as a tool to position a spin-along venture portfolio around a parental organization and with that introduce the discussion of parent-venture distance. I see strong practical relevance of these findings since companies get specific guidance on how to achieve benefits from the spin-along approach. Furthermore, by taking a spin-along pool into consideration, my research makes clear that challenges appear when moving into this pool either from the outside or the inside, which make specific organizational capabilities to deal with these challenges necessary.

These capabilities were made visible in the work of Mahdjour & Fischer (2015). Moreover, I stated that early internationalization is a measure for spin-along ventures to overcome barriers in the relationship with their corporate parent.

Besides managers of incumbent firms, my research also has implications for entrepreneurs and start-ups who exploit the opportunity to internationalize their business early after inception. I made clear that executives of Born Globals shall try to focus on specific success factors. The need to investigate these success factors was addressed by Oviatt & McDougall (1997) and Autio (2005), who argued that long-term oriented success factors of Born Globals to establish a dominant market position were yet missing. Furthermore, my findings help to overcome the lack of Born Global and entrepreneurship issues in technology management research. Those research domains dealing with market dominance and

standardization (e.g. Wurster (2011), Wurster & Blind (2011a) and Scholten et al. (2013)) benefit the most.

Besides established firms, young start-ups and entrepreneurs, my thesis also has implications for policy makers and public research organisations. Policy makers constantly search for insights from research, which enables them to alter the regulatory framework to make the technology transfer from research to the market more efficient. By taking the influencing factors I explored in Fischer et al. (2014) into account, policy makers can adapt the regulatory framework accordingly. Furthermore, research organization gains insights on one specific situation in Germany and can adapt their relationship to their spin-off companies in a way that the overall chances of successful R&D commercialization through spin-off ventures increase. Additionally, my findings have implications for technology transfer professionals who decide for the best timing when to engage in a venture. Engaging in a spin-off venture as parental organisation from inception onwards, in the case of Fraunhofer, has been shown as an activity that negatively influences spin-off survival. From a more general perspective, I claim that researchers aiming at setting up their own spin-off firms can gain insights to consider known factors in the venture survival when leading their own company. Finally, investors can improve their due diligence with the findings of Fischer et al. (2014). They are given practical decision supporting insights, which help them to make better investment decisions. This could eventually lead to more investments into research-based spin-offs, which could result in a higher welfare for the whole society.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

In the following, I will highlight some limitations, which were addressed in each of my papers. Afterwards I will concentrate on future research directions that build on the previously introduced discussion of the parent-venture distance.

I reemphasize that the majority of my findings were based on qualitative case-based research, which misses a reliable generalizability. However, especially when observing new research fields such as the spin-along approach or Born Global research, it was more important to start with deep investigations of a smaller sample of cases. Such new research fields can subsequently be tested quantitatively with a bigger sample. For example, Mahdjour & Fischer (2014) and (2015) can be the basis to formulate hypotheses that could be tested with the help of a standardized survey, which tests the assumption of spin-along venturing having a positive effect on a company's ability to adapt to market dynamics. Furthermore, this quantitative approach could also take into account firms that are not active in the ICT sector, but are in other domains.

The conceptual work in Fischer (2015) has, per definition the limitation, that no empirical evidence is shown. In fact, it should be explored further, whether other companies apply the spin-along strategy and whether the described preferences suit their understanding of a spin-along. Furthermore, the proposed Spin-Along Shell Model and the discussion of shell-to-shell movement and respective determining factors should be explored empirically. Here both a qualitative and a quantitative approach are feasible. What could be of value is also to link the Spin-Along Shell Model with the parent-venture distance framework I introduced in the thesis at hand.

Moreover, the analysis of the 22 cases in Wurster et al. (2014) aimed for exploring a new research phenomenon with concrete case insights. To increase the validity of the success factor model, more companies in other industry sectors could be analysed and additionally a quantitative analysis could validate the model. In fact, we recommended that both technology management scholars and scholars dealing with Born Global and standardization research should engage into this emerging and interdisciplinary research field.

Speaking of the limitation and future research directions of Fischer et al. (2014), it becomes clear that the analysis of Fraunhofer's venturing performance can actually just bring

insights relevant for Fraunhofer itself. An analysis of the other big German research organisation (Max-Planck-Gesellschaft, Leibnitz-Gemeinschaft, Helmholtz-Gemeinschaft) could lead to a better understanding of the actual factors influencing venturing performance of publically funded R&D organisations in Germany. Besides the question of observed entities, there is also room for analysing more factors. For instance, by looking at the dimension of Bigliardi et al. (2013), it becomes clear that Fischer et al. (2014) missed the influencing power of the venture's team characteristics, market related factors, and the specific financial situation and performance of Fraunhofer's spin-off ventures during their lifecycle.

Coming to the previously introduced framework of parent-venture distance, I see a vast amount of new research directions. Firstly, future research should explore the relationship between parent and venture to investigate whether there are even more dimensions that determine distance. Additionally, the question should be answered whether the distance dimensions influence each other and in which way they do so. It could be, for instance, the case that a closely related offering of parent and venture relate with a venture team that originates from the parental organisation. This assumption could be tested by looking at more firms that apply spin-along venturing and their ventures.

By doing so, I see additional room for identifying the most beneficial distance configuration patterns. At the same time, I propose that certain market conditions provoke specific configurations of distance. For instance, when a venture offers a service or product that only addresses the need of a specific niche market, which is locally limited, then early internationalization might not be chosen. In addition, I see room for future research when it comes to the influencing power of different parties (e.g. parent, venture team, third investors, and government) on the parent-venture relationship.

Speaking of methodological approaches to answer the proposed research directions, I want to differentiate between qualitative and quantitative approaches. Firstly, in a qualitative study, future researchers should analyse different parental firms and their venturing

activities with the aim to understand how distance changes over time and what actually influences specific configurations. At the same time, the ventures of these parental firms should be analysed with the aim to identify distance configuration, which are most promising in specific phases of their lifecycle. It might be the case that a specific distance configuration reflects an equilibrium in the parent-venture relationship, which is triggered to change in case external factors (such as changing shareholder structure, market dynamics or changed legislations) come up.

On the other hand, a quantitative analysis of a broader sample of venture firms should lead to a more robust assessment of the parent-venture relationship and of how it influences venture viability. It seems feasible to analyse the shareholder structure of existing corporate ventures over time. This data could be enriched with information about the presence of these ventures in non-domestic markets. Furthermore, I see the possibility to enrich this sample with information about the actual patent base of the venture or whether it licenses parental assets. Additionally, one could look for the use of the parental brand or sales channels (e.g. when a venture's offering is sold through the parental website). The just described factors should be enriched with information about time-specific market conditions, such as yearly growth of GDP, unemployment rates or changes of the legislative framework conditions of targeted markets.

REFERENCES

ABSTRACT, INTRODUCTION & CONCLUSION

- Amin, A. & Cohendet, P. (2004). *Architectures of Knowledge, Firms, Capabilities, and Communities*. Oxford, NY: Oxford University Press.
- Anderson, T. R., Daim, T. U., & Lavoie, F. F. (2007). Measuring the efficiency of university technology transfer. *Technovation*, 27(5), 306–318.
- Autio, E., Sapienza, H. J., Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal*, 43(5), 909–924.
- Autio, E. (2005). Creative tension: the significance of Ben Oviatt's and Patricia McDougall's article 'toward a theory of international new ventures'. *Journal of International Business Studies*, 36, 9–19.
- Barringer, B.R., Bluedorn, A.C., 1999. The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal* 20, 421–444.
- Berger, R. (2014) - Are You Ready For the Fourth Great Industrial Revolution? Retrieved from http://www.huffingtonpost.ca/roland-berger/industrial-revolution_b_5629985.html
- Bigliardi, B., Galati, F., & Verbano, C. (2013). Evaluating Performance of University Spin-Off Companies: Lessons from Italy. *Journal of technology management & innovation*, 8(2), 29–30.
- BMBF (2015) – Project of the Future: Industry 4.0; Retrieved from <http://www.bmbf.de/en/19955.php>
- Boschma, R. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, 39(1), 61–74.
- Bouba-Olga, O. & Grossetti, M. (2005). Une (ré)definition des notions de proximité. CRIEF Working Paper T2007-02.
- Brandenburger, A. M. & Nalebuff, B. J. (1996). *Co-opetition: A Revolution Mindset That Combines Competition and Cooperation : The Game Theory Strategy That's Changing the Game of Business*. New York, NY: Currency Doubleday.
- Burgelman, R.A. (1983) 'A process model of internal corporate venturing in the diversified major firm', *Administrative Science Quarterly*, Vol. 28, No. 2, pp.223–244.
- Burgelman, R.A., 1983b. Corporate Entrepreneurship and Strategic Management: Insights from a Process Study. *Management Science* 29, 1349–1364.
- Callaway, S. K. (2008). Global Corporate Ventures: A New Trend of International Corporate Entrepreneurship. *Multinational Business Review*, 16(3), 1–22.
- Carayannis, E., Barth, T., & Campbell, D. 2012. The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, 1(1): 2.
- Carrier, 1996. Intrapreneurship in Small Businesses: An Exploratory Study. *Entrepreneurship, theory and practice* 21, 5–20.
- Chakravorthy, B.S., 1982. Adaptation: A Promising Metaphor for Strategic Management. *Academy of Management Review* 7, 35–44.
- Child, J., 1997. Strategic Choice in the Analysis of Action, Structure, Organizations and Environment: Retrospect and Prospect. *Organization Studies* 18, 43–76.
- Clark, K. B. (1985). The interaction of the design hierarchies and market concepts in technological evolution. *Research Policy*, 14, 235–251.
- Cohen, W. M. & Levinthal, D. A. (1990). Absorptive capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35, 128–152.
- Cooke, P., Uranga, M. G., Etxebarria, G. (1997). Regional innovation systems: Intuitional and organisational dimensions. *Technovation*, 26, 475–491.

- Cooke, P. (2008). Biotechnology dynamics at the global scale. In H. Patzelt & T. Brenner (Eds.), *Handbook of Bioentrepreneurship*. Berlin: Springer Verlag.
- EESC (2015) - Effects of digitalisation on service industries and employment (own-initiative opinion); Retrieved from <http://www.eesc.europa.eu/?i=portal.en.ccmi-opinions.34826>
- EC (2014) - ICT Innovation in Horizon 2020; Retrieved from <http://ec.europa.eu/digital-agenda/en/ict-innovation-horizon-2020>
- EC (2015) – Digital Agenda for Europe; Retrieved from <http://ec.europa.eu/digital-agenda/>
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50(1), 25–32.
- Fischer, S., Surma, S., & Blind, K. (2014). Survival of Research-Based Spin-Off Ventures - Survival analysis of the venture portfolio of Europe's largest R&D organization – the Fraunhofer Society. Presented at the 2nd International Conference on the Dynamics of Entrepreneurship. Centre for European Economic Research (ZEW), Mannheim, May 22-23, 2014. Program available [here](#).
- Fischer, S. (2015). The spin-along strategy – mastering organisational adaptation through an emerging concept of entrepreneurship theory. Paper to be presented at DRUID15, Rome, June 15-17, 2015. Working paper available [here](#).
- Floyd, S.W., Lane, P.J., 2000. Strategizing Throughout The Organization: Managing Role Conflict In Strategic Renewal. *Academy of Management Review* 25, 154–177.
- Freemann, C. (1987). *Technology Policy and Economic Performance*. London: Pinter.
- Gallagher, S. (2007). The complementary role of dominant designs and industry standards. *IEEE Transactions on Engineering Management*, 54(2), 371-88.
- Gilly, J.-P. & Wallet, F. (2002). Forms of proximity, local governance, and the dynamics of local economic spaces: The case of industrial conversion processes. *International Journal of Urban and Regional Research*, 25: 3, 553-570.
- Hannan, M.T., Freeman, J., 1984. Structural Inertia and Organizational Change. *American Sociological Review* 49, 149.
- Hartig, J. (2011). Learning and innovation at a distance: an empirical investigation into the benefits and liabilities of different forms of distance on interactive learning and novelty creation in German biotechnology SMEs (1. ed). Wiesbaden: Gabler.
- Hitt, M.A., Ireland, R.D., Camp, S.M., Sexton, D.L., 2001. Strategic entrepreneurship: entrepreneurial strategies for wealth creation. *Strategic Management Journal* 22, 479–491.
- Holtbruegge, D., Wessely, B. (2009). Initiating forces and success factors of born global firms. *European Journal of International Management*, 2009, 3(2), 232 – 260.
- Iansiti, M., Lakhani, K. R. (2014). Digital Ubiquity: How Connections, Sensors, and Data Are Revolutionizing Business. *Havard Business Review*, November 2014, 91-99.
- Ireland, D.R., Hitt, M.A., Camp, S.M., Sexton, D.L., 2001. Integrating Entrepreneurship and Strategic Management Actions to Create Firm Wealth. *The Academy of Management Executive* 15, 49–63.
- Keil, T. (2001) Building External Corporate Venturing Capability: Initial Conditions, Learning Processes and Knowledge Management, Working paper, Institute of Strategy and International Business Series 2001/3.
- Keil, T. (2004) 'Building external corporate venturing capability', *Journal of Management Studies*, Vol. 41, No. 5, pp.799–825.
- Klarner, P., Treffers, T., Picot, A., 2013. How companies motivate entrepreneurial employees: the case of organizational spin-alongs. *Journal of Business Economics* 83, 319–355.

- Knight, G. A., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, (8), 11-26.
- Kotabe, M., Srinivasan, S.S., Aulakh, P.S., 2002. Multinationality and Firm Performance: The Moderating Role of R&D and Marketing Capabilities. *Journal of International Business Studies* 33, 79–97.
- Lee, J., O'Neal, D. E., Pruett, M. W., Thomas, H. (1995). Planning for Dominance: a Strategic Perspective on the Emergence of a Dominant Design. *R&D Management*, 25, 3-15.
- Lindqvist, M. (1991). Infant multinationals. The internationalisation of young, technology-based Swedish firms. Dissertation, Stockholm School of Economics, 1991.
- Lundvall, B.-A. (1992). User-producer relationships, national systems of innovation and internationalisation. In B.-A. Lundvall (Eds.), *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning* (pp. 45-67). London, UK: Printer Publishers.
- Mahdjour, S., & Fischer, S. (2014). International Corporate Entrepreneurship with Born Global Spin-along Ventures — A Cross-Case Analysis of Telekom Innovation Laboratories' Venture Portfolio. *International Journal of Innovation Management*, 18(03), 1440007. <http://doi.org/10.1142/S1363919614400076>
- Mahdjour, S., & Fischer, S. (2015). Implementing the spin-along approach: a capability analysis of Telekom Innovation Laboratories' corporate venturing programme. *International Journal of Technology Marketing*, 10(2), 160. <http://doi.org/10.1504/IJTMKT.2015.068590>
- Michl, T., Gold, B., Picot, A., 2012. The spin-along approach: ambidextrous corporate venturing management. *International Journal of Entrepreneurship and Small Business* 15, 39–56.
- McDougall, P. P., Oviatt, B. M. (2000). International entrepreneurship: the intersection of two research paths. *Academy of Management journal*, 43(5), 902-906.
- McNaughton, R. B. (2000). Determinants of time-span to foreign market entry. *Journal of Euromarketing*, 9(2), 99-112.
- Miles, R.E., Snow, C.C., Meyer, A.D., Coleman, Henry J., J., 1978. Organizational Strategy, Structure, and Process. *The Academy of Management Review* 3, pp. 546–562.
- Miles, M.P. and Covin, J.G. (2002) 'Exploring the practice of corporate venturing', *Entrepreneurship Theory and Practice*, Vol. 26, No. 3, pp.21–40.
- Narayanan, V., Yang, Y., Zahra, S.A., 2009. Corporate venturing and value creation: A review and proposed framework. *Research Policy* 38, 58–76.
- Nelson, R. (1993). *National Innovation Systems*. Oxford, NY: Oxford University Press.
- Notebloom (2009). *A Cognitive Theory of the Firm: Learning, governance and dynamic capabilities*. Cheltenham, IK: Edward Elgar Publishing Limited.
- Oviatt, B. M., & McDougall, P. P. (1994). Toward a Theory of International New Ventures. *Journal of International Business Studies*, 25(1), 45–64.
- Oviatt, B. M., McDougall, P. P. (1997). Challenges for internationalization process theory: the case of international new ventures. *Management International Review*, Special Issue 2, 85-99.
- Porter, M. E., Heppelmann, J. E. (2014). How Smart, Connected Products Are Transforming Competition. *Harvard Business Review*, November 2014, 66-88.
- Rennie, M. W. (1993). Global competitiveness. Born global. *The McKinsey Quarterly*, 3 (1993), 45-52.
- Riege, A. (2007). Actions to overcome knowledge transfer barriers in MNCs. *Journal of Knowledge Management*, 11(1), 48–67.
- Roberts, E. B., & Malone, D. E. (1995). Policies and structures for spinning off new companies from research and development organizations (Working papers No. 3804-95.). Massachusetts Institute of Technology (MIT), Sloan School of Management. Retrieved from

<http://ideas.repec.org/p/mit/sloanp/2569.html>

Rohrbeck, R., Döhler, M., Arnold, H.M., 2007. Combining spin-out and spin-in activities – the spin-along approach. Presented at the ISPIM-Conference, 2007, Warsaw, Poland, pp. 1–12.

Rohrbeck, R., Döhler, M., Arnold, H., 2009. Creating growth with externalization of R&D results-the spin-along approach. *Global Business and Organizational Excellence* 28, 44–51.

Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change*, 16(4), 691–791.

Sánchez, A., Lago, A., Ferràs, X., Ribera, J., 2011. Innovation Management Practices, Strategic Adaptation, and Business Results: Evidence from the Electronics Industry. *Journal of technology management & innovation* 6, 14–39.

Schneider, S. C. & Barsoux, J.-L. (2003). *Managing across cultures*. Harlow, UK: Pearson Education Limited, 2nd edition.

Scholten, V., van de Kaa, G., Trott, P. (2013). *Riding the waves: Developing theory on start-up firm networking in the pre dominance design stage*, Porto Alegre 2013.

Scott, W. (1994). Institutional analysis: variance and process theory approaches. In: Scott, W., Meyer, J. [ed.]. *Institutional Environments and Organisations: Structural Complexity and Individualism*. Thousand Oaks 1994, 1-8.

Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, Vol. 25, No. 1, pp.217–226.

Sharma, P., Chrisman, J.J., 1999. Toward a Reconciliation of the Definitional Issues in the Field of Corporate Entrepreneurship. *Entrepreneurship: theory and Practice* 23, 1–16.

Salona, G., Spencer, A.M., McJunkin, J., Reynders, T., 2000. Cisco Systems: A Novel Approach to Structuring Entrepreneurial Ventures.

Stray, S., Bridgewater, S., Murray, G. (2001). The internationalization process of

small, technology-based firms. Market selection, mode choice and degree of internationalization. *Journal of Global Marketing*, 25 (1), 7-29.

Suarez, F. F., Utterback, J. M. (1995). Dominant Designs and the Survival of the Firms, *Strategic Management Journal*, 16, 415-430.

Suarez, F. F. (2004). Battles for technological dominance: an integrative framework. *Research Policy*, 33, 271-286.

Swann, G. P. (1987). Industry Standard Microprocessors and the Strategy of Second Source Production. In: Gabel, H. L. [ed.]. *Product Standardization and Competitive Strategy*. Amsterdam 1987, 239-262.

Swann, P. (2000). The Economics of standardization. Final Report for Standards and Technical Regulations Directorate Department of Trade and Industry. Manchester 2000.

Tellis, G.J., Chandy, R.K., 2000. The Incumbent's Curse? Incumbency, Size and Radical Product Innovation. *Journal of Marketing* 64, 1–17.

Torry, A. & Rallet, A. (2005). Proximity and localization. *Regional Studies*, 39: 1, 47-59.

Utterback, J. M., 1994. *Mastering the Dynamics of Innovation: How Companies Can Seize Opportunities in the Face of Technological Change*. Boston, MA 1994.

van de Kaa, G. (2009). *Standards Battles for Complex Systems. Empirical Research on the Home Network*. ERIM PhD Series Research in Management. Rotterdam 2009.

Williams, C., Lee, S.H., 2009. Exploring the internal and external venturing of large R&D-intensive firms. *R&D Management* 39, 231–246.

Wurster, S. (2011). Leaders, Servants, Independence. A Dynamic Success Factors Model for the Establishment of De-facto Standards by Born Global Firms and Technical Clusters. *International Journal on GSTF Business Review*, 1(2), 172-179.

Wurster, S., Blind, K. (2011a). Towards a Dynamic Success Factor Model for the Establishment of De-facto-Standards by Born Global Firms and Technical Clusters.

GSTF Best Paper Award, Singapore, July 2011.

Wurster, S., Blind, K., & Fischer, S. (2014). Born Global Market Dominators: Insight into a Unique Class of Young Companies and Their Environment. *International Journal of IT Standards and Standardization Research*, 12(1), 1–16. <http://doi.org/10.4018/ijitsr.2014010101>

Wuyts, S., Colombo, M. G., Dutta, S., & Notebloom, B. (2005). Empirical tests of optimal cognitive distance. *Journal of Economic Behavior & Organisation*, 58, 277-302.

Yin, R. K. 2009. *Case Study Research: Design and Methods*. (L. Bickman & D. Je. Rog, Eds.). Sage Publications.

Zahra, S.A., 1995. Corporate entrepreneurship and financial performance: The case of management leveraged buyouts. *Journal of Business Venturing* 10, 225–247.

Zahra, S.A., 2007. Contextualizing theory building in entrepreneurship research. *Journal of Business Venturing* 22, 443–452.

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Berlin, den

Sebastian Fischer

FESTSTELLUNG ZUR KOAUTORENSCHAFT

Vier der in dieser Dissertation enthaltenen Artikel wurden in Koautorenschaft angefertigt.

Im Folgenden werden die Beiträge der Autoren beschrieben:

“Implementing the spin-along approach: a capability analysis of Telekom Innovation Laboratories’ corporate venturing programme”

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| 1. Autor: Sarah Mahdjour | Anteil: 50% |
| 2. Autor: Sebastian Fischer | Anteil: 50% |

„International Corporate Entrepreneurship with Born Global Spin-along Ventures — A Cross-Case Analysis of Telekom Innovation Laboratories’ Venture Portfolio”

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