

Dieter De Smet

INNOVATION ECOSYSTEM PERSPECTIVES ON FINANCIAL SERVICES INNOVATION

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Abstract

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The context of financial services has been characterised by changes in the regulatory, technological and societal landscape. Consumers are increasingly interested in mobile payments, crowdfunding and microfinance services, either for themselves or because collaborative consumption is viewed as a more sustainable. Retail branches are re-organised to further meet the expectations of customers, start-ups focusing on technology for financial services (i.e. Fintech) are ever growing and financial services companies reinforce their own innovation practices (e.g. creation of innovation labs or venture capital investment funds).

The innovation ecosystem around financial services companies represents the many actors with whom they can co-create and co-produce innovative new services for their customers (or for themselves). The innovation process is no longer a closed internal effort but needs to include external actors from the innovation ecosystem. This topic is especially interesting in a small and open economy where the financial centre takes a prominent place in the economy. The research question is therefore *“How does the innovation ecosystem influence the innovation process within financial services companies?”*.

The influence of the innovation ecosystem on the innovation process within financial service companies mainly comes from its social capital and value creation efforts. However learning to work and exchange in an innovation ecosystem is also expected to influence the innovation process in place. Realizing the potential of the innovation ecosystem requires sufficient capabilities to manage new information coming from the innovation ecosystem. The professional associations provide the necessary coordination among actors in the innovation ecosystem to co-create and appropriate value, while fostering co-evolution within the innovation ecosystem.

Keywords: Innovation ecosystem; financial services; innovation process; small and open economy; social embeddedness; value co-creation; customer involvement; new service development; organisational capabilities; social capital; resource-based view; RBV.

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Dieter G.S. De Smet
20th of November 2015
Luxembourg

To my wife Sylvia and my parents

for their love, curiosity and encouragement

during my dissertation experience.

“Perfer et obdura, dolor hic tibi proderit olim“

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List of publications

This dissertation is based on the following publications. The rights have been granted by publishers to include the publications in dissertation.

- I. De Smet, D., Mention, A.-L. and Torkkeli, M. (2015). The sources of innovation in Luxembourg financial services providers. *Service Business*. Submitted for publication.
- II. De Smet, D., Mention, A.-L. and Torkkeli, M. (2016). Knowledge sourcing from customers in new financial service development. *International Journal of Technology Marketing*. In press.
- III. De Smet, D., Mention, A.-L. and Torkkeli, M. (2015). Alliances in the financial services sector - Exploring its organisational learning mechanisms. *International Journal of Business Excellence*. 8 (4), pp. 458-470. doi: 10.1504/IJBEX.2015.070315
- IV. De Smet, D. (2012). Exploring the influence of regulation on the innovation process. *International Journal of Entrepreneurship and Innovation Management*. 16 (1/2), pp. 73-97. doi: 10.1504/IJEIM.2012.050444
- V. De Smet, D., Mention, A.-L. and Torkkeli, M. (2014). Co-creating new financial services: Absorbing innovation-related knowledge from customers. *Academy of Management Annual Meeting Proceedings*. Philadelphia: Academy of Management. doi: 10.5465/AMBPP.2014.13590abstract

Author's contribution

Dieter De Smet is the principal author and investigator in all the publications.

Anne-Laure-Mention and Marko Torkkeli provided feedback along the research process, commented on the research results and contributed to the formulation of their implications.

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List of abbreviations

CSSF	Commission de Surveillance du Secteur Financier (Luxembourg Financial Services Regulator)
EBA	European Banking Authority
ECB	European Central Bank
EIOPA	European Insurance and Occupational Pensions Authority
ESA	European Supervisory Authorities
ESFS	European System of Financial Supervision
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk board
EU	European Union
FP	Foundational Premises
G-D	Goods-Dominant
GDP	Gross Domestic Product
HNWI	High-Net-Worth Individuals
KBV	Knowledge-Based View of the firm
LFF	Luxembourg For Finance
NPD	New Product Development
NRBV	Natural-Resource-Based View of the firm
NSD	New Service Development
OECD	Organization for Economic Co-operation and Development
QCA	Qualitative Comparative Analysis
R&D	Research and Development
RBT	Resource-Based Theory of the firm
RBV	Resource-Based View of the firm
RMB	Renminbi Yuan
RQ	Research Question
S-D	Service-Dominant
SME	Small and Medium-sized Enterprise
SRQ	Sub-Research Question
UCITS	Undertakings for Collective Investment in Transferable Securities
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
VRIN	Valuable, Rare, Inimitable and Nonsubstitutable

Part I: Overview of the dissertation

1. Introduction

This section of the dissertation will describe the research context and the motivation for engaging the chosen research topic: Innovation management within financial services companies. The overall knowledge gaps will be discussed to build up the research question and sub-questions of the dissertation. A more detailed discussion of the central concepts and service research stream will be made in section 2 of the dissertation.

1.1 Research context and motivations

The setting of the research topic will be introduced by taking a top down view, moving from the international level to the sectoral level and finally to the company level itself. More attention will also be paid to the importance of services in developed economies and financial services in particular. Furthermore the relevance of the innovation ecosystem perspective for financial services innovation will be discussed. The particularities of the empirical setting, an open and small economy (i.e. Grand Duchy of Luxembourg), will be discussed in section 3.

1.1.1 International attention to innovation

Innovation is recognized as one of the main policy objectives within the European Union since it is considered to be the central driver of the economic growth in Member States' economies. The outcomes of innovation are not solely economic and isolated at the level of a company (e.g. increased competitiveness, enhanced productivity or creating new jobs) but also include societal benefits such as dealing with the impacts of global warming through greener transportation and smarter urban areas. Therefore innovation is included in the Europe 2020 strategy which aims to create sustainable and inclusive growth among the Member States. This strategy has a dedicated action package, Innovation Union initiative, to boost the innovation performance of the European Union as a whole, and reinforce the realization of these beneficial impacts (European Commission, 2013a). In order to implement the Innovation Union initiative, the Horizon 2020 Research and Innovation programme was recently launched. It is a financial framework considered to be the biggest research and innovation programme ever in the European Union (European Commission, 2014b). Innovation and R&D activities are hence relevant and viewed as one of the measures to get national

economies back on track and recover from the economic crisis (OECD, 2010; European Commission, 2014b). Member States who decided to invest more, on average, in R&D and innovation before and during the crisis, have been found to be the most resilient during the economic downturn (Ciriaci et al., 2013).

1.1.2 Importance of innovation from a sector perspective

Not only policy makers are interested in innovation but the various economic sectors and the individual companies operating within it pay particular attention to innovation. The set of policies, skills, professions and other measures aimed at supporting innovation within a country, often referred to as the national innovation system (OECD, 1997), are important for realizing the systemic nature of innovation (Edquist, 2005) itself and reaps the benefits of increased competitiveness and growth. This innovation system is also present in specific sectors of economic activity and is relevant since sectors evolve over time, through learning, creating new businesses and generators of national wealth and employment (Malerba, 2002). The diversity of companies within a given sector of the economy is considered as one of the driving factors of innovation for the national economy (Metcalf, 2006). These differences can be attributable to the sets of resources and decision rules that companies use and their subsequent adaptation to meet competitive pressures (Woerter, 2009). Research produces various possible classifications of sectors (Pavitt, 1984; Tidd et al., 2005; Greenhalgh and Rogers, 2006) which aim at improving understanding the organisation of innovation activities and the possible structural characteristics of innovation that differentiate between sectors. Due to the focus on sectorial classifications, the individual company is not always sufficiently considered. Yet this level of analysis explains differences in sectorial innovation performance due to the individual strategies of companies towards innovation (de Jong and Marsili, 2006).

1.1.3 Importance of innovation from a company perspective

Innovation is described as the driver for companies' growth, allowing them to prosper and sustain their profitability (Drucker, 1985). Therefore innovation is paramount for increasing the competitive advantage of the company (Porter, 1985), its business performance and productivity (Tidd, 2001; Cainelli et al., 2006). Innovation is strategically important because it needs to create value for the customer through its set of resources and partnerships, often referred to as its business model. (Chesbrough, 2010; Teece, 2010). This requires more

collaboration with partners that are external to the company, rather than focusing solely on internal efforts to produce new products or services (Laursen and Salter, 2014). However the correct resources and their configuration into capabilities are necessary (Teece, 1996), for example it requires an alliance building capability to engage with external partners for innovation or the capability to acquire and assimilate information from external sources (Cohen and Levinthal, 1990). Companies can choose to organise their innovation activities by using a (dedicated) process to create new products or services (de Brentani, 1991; Cooper and Kleinschmidt, 1995; de Brentani and Ragot, 1996). These elements are not sufficient for realizing innovation, strategic choices and initiatives also need to be taken if a company hopes to capture competitive advantage from its innovation activities (DeSarbo et al., 2006). Hence innovation management is a key element of a company's strategy (Keupp et al., 2012) and companies that do not innovate will eventually disappear from the market (Tidd and Bessant, 2011).

1.1.4 The services economy and financial services

Overall the structure of the economy has been changing, moving from more product oriented industries (often referred to as manufacturing) to more service oriented industries. This trend has been observed for quite a while and especially in knowledge intensive businesses, such as financial services (Schricke et al., 2012). The importance of manufacturing has been falling back to less than 20% GDP in certain OECD economies whilst the contribution of services has been increasing to more than 70% GDP. Therefore it is arguable that services are occupying a central and leading role in more developed economies (OECD, 2000). In 2010 it was found that the services sector represented about 2/3 of the global gross domestic product and around 39% of global employment. The economies with the largest share of employment in services were also found to be the wealthiest (UNCTAD, 2014). The economic crisis and globalization have further stimulated the importance of investing in service based R&D and innovation activities (OECD, 2012).

The service economy was also found to be prominent in most EU Member States, since it accounts for almost 2/3 of total value added, almost 80% of the real value added growth (in the decade to 2005) and for as much as 3/4 of the inter-country differences in economic growth among Member States. Additionally the services sector's employment growth generally exceeds the manufacturing sectors' growth (Uppenberg and Strauss, 2010). Financial

services are a pillar element of the economy's infrastructure since it contributes to output growth and ultimately a country's development. This type of service facilitates an efficient resource allocation, facilitates the exchange of goods and other services, fosters better capital allocations by producing *ex ante* information and increases investors' willingness to finance new projects (UNCTAD, 2014).

Within the services industry, particular attention will go to the financial services sector because of its central role in the economy and its contributions to businesses, public organisations and consumers. The importance of this sector in the overall economy is undeniable and well documented (Levine, 2005). Financial services permit a flow of assets for investments (e.g. in start-ups, in established companies, in thematic projects supporting social or environmental objectives) made available by collecting these assets through savings or direct investment. It facilitates the exchange of goods and services through the payments it accommodates (Merton, 1995). These functions create the necessary conduit for economic growth and development (World Economic Forum, 2013).

However the financial services industry has undergone turbulences due to the 2007-2008 subprime crisis, associated with the most severe shock in post-war economic history (European Commission, 2009). The subsequent waves of consolidation in this sector in the years before the crisis (also referred to as financial integration, universal banking or *bancassurance*) created large providers of financial services covering almost any customer need, going from savings and investments to loans and insurances. These mergers, acquisitions or consolidations are inspired by the realization of economies of scope and scale, leading to operational efficiencies through product and process innovations. On the other hand this integration can also create coordination issues due to an increased complexity of its operations, different risk management practices and possibly the emergence of conflicts of interest (Skipper, 2001). These coordination risks and opaqueness were also elements that aggravated the most recent financial crisis, coupled with an increased interconnectivity of national economies (i.e. globalization) resulted in an economic slump, which has still not fully recovered in several countries. The "too big to fail" financial institutions were confronted with substantial public support to mitigate their impacts on society. This also stimulated the establishment of new financial regulations and especially enhanced supervision of this sector to reinforce the trust that society has in financial services (World Economic Forum, 2013). In the wake of these turbulences

and because the financial services sector is so important in our economy, financial education, consumer protection and sustainability objectives have also been more emphasised (Grifoni and Messy, 2012; Lewis and Messy, 2012).

As another consequence, new regulatory initiatives are taken in nearly all affected countries and on a European level, the European System of Financial Supervision (ESFS) was created. It comprises three European Supervisory Authorities (ESA), the European banking Authority (EBA), the European Insurance and Occupational Pensions Authority (EIOPA) and the European Securities and Markets Authority (ESMA), and the European Systemic Risk board (ESRB) were established in 2011 (European Commission, 2014c). These initiatives are complementary with the elaboration of the Banking Union for members of the Eurozone, to have a unified rule book, supervisory mechanisms from the European Central Bank (ECB) and a bail out mechanism for failing banks (European Commission, 2014a).

1.1.5 Innovation ecosystems and financial services

The business environment is being altered by our society, entering a digitized era where ideas and insights are abundant, more easily accessible (e.g. through crowds, contests, communities and collaborators) and hence serving as (potential) co-creators of new services. There is an increasing acceptance in society that sustainability is important, that its implications for business models and services offers to society need to be considered more (Stead and Stead, 2013). This change in the expectation pattern of the company's stakeholders enhances the attention to collaborative consumption such as crowdfunding, carsharing or peer-to-peer lending. This is especially the case for the services industries where technology is an omnipresent catalyst for producing and delivering the service itself (Belk, 2014).

These two trends coalesce into the notion of the "sharing economy", where underutilized resources are offered and shared between stakeholders at a large scale, co-creating an innovative service which offers monetary and non-monetary benefits to all the stakeholders (Botsman and Rogers, 2010). This co-creation is made possible by the overall increased connectivity between the stakeholders, facilitating the combination of different sets of resources. Therefore these services can offer a solution that ultimately addresses societal challenges in an economy, which is increasingly being characterised by commoditization and de-monetization.

The fact that stakeholders (consisting of several communities of actors) need to collaborate to co-create new services that meet ever increasing customer expectations, while sharing parts of the benefits of this new service and competing with each other on other areas, is a typical characteristic of an innovation ecosystem (Moore, 1993; Moore, 1996; Moore, 2006; Autio and Thomas, 2014). A representation of the innovation ecosystem for financial services can be found in Figure 1.

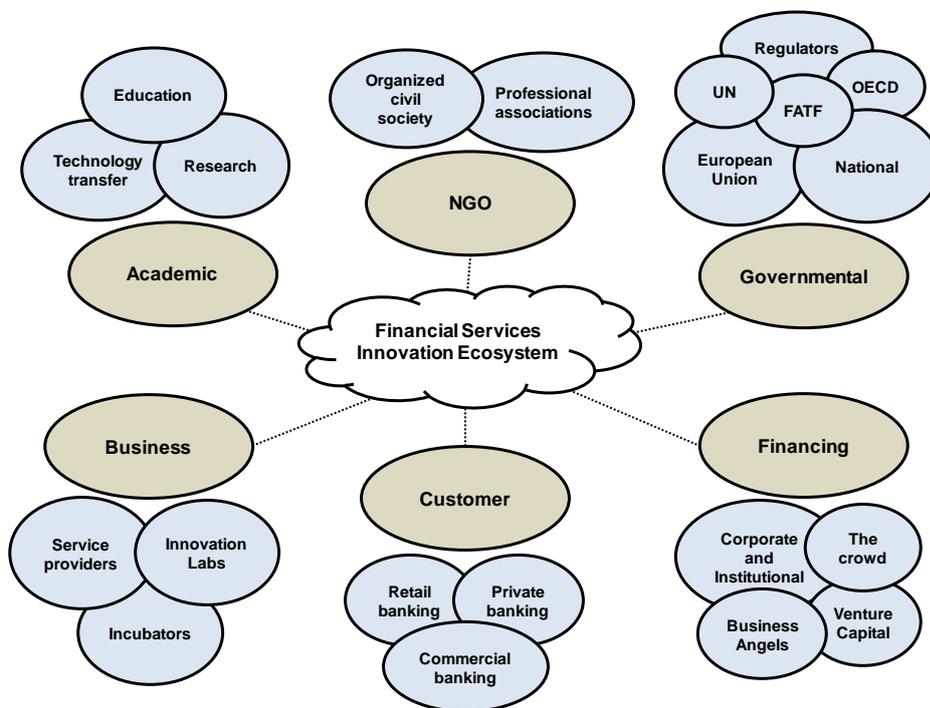


Figure 1: Financial services innovation ecosystem

The stakeholders in an innovation ecosystem are bound to each other by common interests and values (e.g. entrepreneurship, city logistics or food safety). This allows them to co-create innovative combinations of resources, beyond the individual scope and abilities of a single community, to address larger societal problems or answer unmet customer needs (or expectations). However the symbiotic relationships and dynamics in an innovation ecosystem require a central hub (e.g. a focal actor or a platform) that coordinates the value creation and sharing. The increased attention to

innovation as the engine of future growth and jobs, leads to the interest for start-ups and entrepreneurs that devise new (financial) services and solutions that can generate the needed innovation. Therefore ecosystems should leverage start-up companies, in a given region, to foster job growth and economic development (Startup Europe Partnership, 2014). This element can also be linked to the exponential growth of funding possibilities for start-ups that develop new technologies for financial services, labelled Fintech (The Economist, 2015).

Turbulences and waves of change in companies, mostly originating from the external environment, encourages evolutions in its organisation for innovation (Volberda et al., 2014). These make them more effective/efficient in their innovation ecosystem and this is also the case for financial services companies (Flier et al., 2001; Flier et al., 2003).

Within financial services companies, several areas can be identified where innovation is expected to bring significant benefits in the coming years. A comprehensive overview can be found in a report (World Economic Forum, 2015) where changes in societal perceptions and technological possibilities will challenge the current value chains for financial services: Emerging Payment Rails, Cashless World, Smarter, Faster Machines, New Market Platforms, Process Externalisation, Empowered Investors, Crowdfunding, Alternative Lending, Shifting Customer Preferences, Insurance Disaggregation, Connected Insurance. Each of these areas is believed to be pushing innovative ideas and the co-creation of new services, through the collaboration between the actors in the financial service innovation ecosystem.

1.2 Identification of the knowledge gaps

Collaboration for innovation implies multiple interactions with other companies and their employees, because the focus of search for innovation is moving from a more isolated (internal) focus towards a more open (external) focus on the innovation ecosystem (Iansiti and Levien, 2004). In essence, the innovation ecosystem refers to the interconnected actors surrounding an individual company, where these actors are coordinated for engaging in collaborative activities to ultimately generate innovation. A more detailed discussion on the concept of the innovation ecosystem can be found in section 2.2 of this dissertation.

Companies could also choose to compete with their peers by imitating their strategic choices (e.g. innovation management and its organisation) instead of making collaborative arrangements. However they are often confronted with difficulties on actually deciding to imitate, because it will also have its consequences regarding the actual realization of the anticipated benefits (Ordanini et al., 2008). Companies bundle resources (i.e. into a configuration that can be deployed) to create capabilities for increased or sustained competitive advantage (Amit and Schoemaker, 1993; Sirmon et al., 2007) which are routinized internally. This can create complementarity issues when this resource configuration needs to be adapted (Black and Boal, 1994). On the other hand these organisational routines (Nelson and Winter, 1982; Dosi, 1988; Zollo and Winter, 2002) will also make it harder to fully understand the implications of the choices to be made regarding resource reconfigurations and their implementation. The resource configurations in place at other companies are the result of their resource accumulation and historical particularities (Dierickx and Cool, 1989), which are path-dependent and company specific (Barney, 1991). The choice to imitate its competitors is not something straightforward, hence the necessity to jointly consider collaborative arrangements along the innovation process and its management.

Management research on innovation ecosystems is considered to be limited, with several questions remaining. It is considered that the implications for managing innovation in such as setting (e.g. directing and leveraging the collaboration in the innovation ecosystem) are in need of more research, coupled with practical implications for strategic management (Autio and Thomas, 2014). In particular insights on the coordination of the innovation ecosystem (Ritter et al., 2004), the distinctive influences of direct and indirect ties depending on the position in the innovation ecosystem (Adner and Kapoor, 2010), and the creation/appropriation of value in the innovation ecosystem (Autio and Thomas, 2014) needs more attention. Besides the limited amount of management research on the innovation ecosystem itself, the attention to financial services innovation is also limited despite its importance in the service economy (Mention and Torkkeli, 2012). A more detailed discussion on this underresearched area can be found in section 2.1.3 of this dissertation.

Innovation is a complex process in itself, which is directed by multiple stakeholders in it the innovation ecosystem. This multifaceted innovation process can be researched by taking an innovation ecosystem perspective because it is composed of three interrelated domains (organisational

capabilities, social capital and value creation) that can synthesise the innovation process in a company. This brings up the main research question of this dissertation:

How does the innovation ecosystem influence the innovation process within financial services companies?

1.2.1 Preferred actors in the innovation ecosystem

The innovation ecosystem for financial service companies has not yet been researched, similarly to the scarcity of ecosystem research in general. This offers an opportunity from a strategic management research perspective. In this dissertation it will be a smaller and open economy, with a significant international status for its financial service sector, the Grand Duchy of Luxembourg (more details can be found in section 3.4 of the dissertation).

Within an innovation ecosystem, the interconnected actors are one of the central research objects. Financial services can be classified as knowledge intensive business services (Schricke et al., 2012) and they were reported to be intensive users of external information from various sources to leverage the internal innovation process (Hollenstein, 2003; Weigelt and Sarkar, 2009; Oliveira and von Hippel, 2011; West and Bogers, 2014). Financial services companies will have to solve various organisational and technological hurdles in order to implement innovation (Ettlie and Reza, 1992). Inter-company cooperation can provide companies with information and resources that otherwise would have been difficult to obtain (Ahuja, 2000a). Cooperation with technology consultants is a possible solution to deal with the organisational and technological hurdles when implementing innovation (Weigelt and Sarkar, 2009) whilst cooperating with other financial services providers might be less appealing (Jacobsen and Tschoegl, 1999). Past research focused on the cooperation within the Luxembourg services sector (Mention, 2011) and hinted at the positive influence from customers and suppliers on the innovation novelty in the Luxembourg financial services sector. Professional associations are reported to be influential for adopting new regulations and facilitating relationships between their members (Deephouse, 1999; Greenwood et al., 2002), whilst the interactions between the government and these professional associations are in need of more research (Vermeulen et al., 2007a). Within the context of this dissertation, a first objective was to explore the use of these external and internal sources of information for innovation within the Luxembourg financial service

innovation ecosystem. The second objective was to determine which actors in the Luxembourg innovation ecosystem tend to be favoured partners for collaboration.

Therefore the first sub-research question of the dissertation is formulated as:

Which actors of the innovation ecosystem are preferably engaged for collaborative activities?

1.2.2 Organisational capabilities

Choosing to collaborate with other companies and actors in the innovation ecosystem also implies the need to have sufficient capabilities to effectively do so (Möller and Svahn, 2003; Ritter et al., 2004; Möller and Svahn, 2009). This requires for example the capability to absorb and use external information and know-how, known as absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002; Todorova and Durisin, 2007). Another capability that is essential refers to the creation of strategic alliances (Gulati, 1999; Das and Teng, 2000; Hagedoorn, 2002; Christoffersen, 2013) with other corporate or public actors in the innovation ecosystem. The possible contribution of absorptive capacity when dealing with actors from the innovation ecosystem is however unexplored and the importance of dynamic capabilities should also be relevant because these act as sensors for innovation opportunities (Teece, 2007). Regarding the latter, the possible contributions of organizational learning, closely linked to absorptive capacity mechanisms (Lipshitz et al., 2002; Knoppen et al., 2011), can also bring new insights for financial services and innovation ecosystem research because it improves the innovation performance during collaboration (Lin et al., 2012). Information technology is very important for, and historically omnipresent in, financial services (Chiasson and Davidson, 2005). Developing and absorbing technology has been reported as one of the benefits from collaboration (Ahuja, 2000b) with another company from the innovation ecosystem.

Therefore the second sub-research question of the dissertation is formulated as:

How do actors in the innovation ecosystem oversee their collaborative activities (i.e. inbound and outbound)?

1.2.3 Social capital

Intercompany collaboration is essential for innovation to emerge in the services industries, ignoring this exchange will actually limit the knowledge base for innovation (Pittaway et al., 2004) because leveraging these collaborative relationships is in itself a strategic resource for innovation (Dyer and Singh, 1998; Chisholm and Nielsen, 2009; Huggins, 2010). Inter-personal (Granovetter, 1985) and inter-firm relationships as resources to be leveraged for innovation (Mowery et al., 1996) are important in the innovation ecosystem. Relationships and ties between companies, also at the interpersonal level (Gulati, 1999; Adler and Kwon, 2002), will be created through collaboration for accessing new information needed to develop innovation (Ahuja, 2000b; Ahuja, 2000a). Innovation is generated from the conversion of various actors' information and social capital facilitates this conversion (Landry et al., 2002), hence some scholars regard social capital as the bedrock of innovation (Zheng, 2010). Social capital influences the company's ability to acquire new knowledge and apply it for innovative outputs (Nahapiet and Ghoshal, 1998). More specifically, knowledge acquisition was found to mediate between social capital and the exploitation of this knowledge (Yli-Renko et al., 2001). Furthermore social capital (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998) was found to be very relevant to explain the effects of these relationships and ties for collaboration, since they facilitate the flow of tacit knowledge (i.e. know how) in, and between, companies that can result in innovation (Tsai, 2001; Inkpen and Tsang, 2005). Within the strategic management literature, to which innovation certainly belongs (Keupp et al., 2012), social capital (i.e. ties and relationships) was found to explain company performance at multiple company levels (individual, team, organisational unit) and larger economic units such as communities and countries (Moran, 2005). An illustration of this, is the research finding that geographically bound social capital facilitates learning for innovation by reducing the costs of searching and exchange among actors from that same region (Laursen et al., 2012). Within the peculiar empirical context of this dissertation, it would be interesting to research if this finding can be corroborated.

The third sub-research question of the dissertation is formulated as:

How are the relationships between actors in the innovation ecosystem influencing (i.e. enhancing and constraining) collaborative activities?

1.2.4 Value creation

The internal organisation to create innovation, the implementation of one of the innovation process models (Rothwell, 1992; Rothwell, 1994), requires attention to the new service and product development process (Cooper, 1990; de Brentani, 1991; O'Connor, 1994; Cooper and Kleinschmidt, 1995; Cooper, 1996; de Brentani and Ragot, 1996; Menor et al., 2002; de Brentani et al., 2010; Van Oorschot et al., 2010). The new service development process is an important aspects of collaboration for innovation because it is oriented towards producing value (Schleimer and Shulman, 2011). In particular for the new service developments process, the collaboration with customers to co-create was reported to be relevant for developing new service and product innovation (von Hippel, 1986; Greer and Lei, 2012; Stock, 2014; West and Bogers, 2014) and represents one of the actors in innovation ecosystems which are not always considered in other research.

Customer orientation was reported to be the main factor for achieving incremental innovations in services sectors (Cheng and Krumwiede, 2012) and insights from customers are one among the main drivers of new service developments in financial services (Pallister et al., 2007). However research found mixed results regarding the degree of customer involvement during the service development process in financial services companies (Chien and Chen, 2010). Findings regarding the propensity to involve customers are also mixed since the type of financial customer plays a role. For example cooperation with customers was found to be higher in the retail banking segment, rather than corporate markets (Oliveira and von Hippel, 2011) whilst the opposite was also reported (Athanassopoulou and Johne, 2004). This research focused on the segment of private banking which is not often considered in academic research on financial services, with some notable exceptions but that do not cover Luxembourg (Lassar et al., 2000; Maire and Colletterte, 2011).

Customers are among one of the possible external sources of information for innovation and also a possible cooperation partner for the development of new services (Akamavi, 2005; Edvardsson et al., 2012; Greer and Lei, 2012; Edvardsson et al., 2013; West and Bogers, 2014). A successful new service development also requires an absorptive capacity (Cohen and Levinthal, 1990) to comprehend information and knowledge from the customer (Lusch et al., 2007) which is also relevant in the new service development process of financial services companies (Alam, 2002; Alam and Perry, 2002; Alam,

2006; Menor and Roth, 2008; Carbonell et al., 2009). Organisational learning during the process of new financial services development plays a mediating role between company antecedents (e.g. culture, openness or organisational) and innovation performance (Blazevic and Lievens, 2004). The financial services company's absorptive capacity (Jansen et al., 2005) is driven by organisational antecedents (Tu et al., 2006; Foss et al., 2011) but also by organisational learning mechanisms (Lipshitz et al., 2002; Naot et al., 2004; Knoppen et al., 2011).

The fourth and final research sub-question of the dissertation is formulated as:

How do actors in the innovation ecosystem create value (i.e. downstream and upstream) during collaborative activities?

An overview of the research question of this dissertation, its related sub-research questions and the contributions from the publications to these, is made available in Table 1. The main contributing publication to each sub-research question is listed in bold. However some elements of the other publications also provided insights on the sub-research question, but they were not critical to answering this sub-research question. More discussion on the individual contributions of the publications to the main and sub-research questions is available in sections 4.1 and 4.2 further on.

Table 1: Research (sub-)question(s) and contributions from publications

Main research question (RQ)	
<i>How does the innovation ecosystem influence the innovation process within financial services companies?</i>	
Sub-research question 1 (SRQ 1)	Main contributor to SRQ 1 Publication 1
<i>Which actors of the innovation ecosystem are preferably engaged for collaborative activities?</i>	Complementary insights by Publication 2 Publication 4 Publication 5

<p>Sub-research question 2 (SRQ 2)</p> <p><i>How do actors in the innovation ecosystem oversee their collaborative activities (i.e. inbound and outbound)?</i></p>	<p>Main contributor to SRQ 2 Publication 2</p> <p>Complementary insights by</p> <p>Publication 3 Publication 4 Publication 5</p>
<p>Sub-research question 3 (SRQ 3)</p> <p><i>How are the relationships between actors in the innovation ecosystem influencing (i.e. enhancing and constraining) collaborative activities?</i></p>	<p>Main contributor to SRQ 3 Publication 4</p> <p>Complementary insights by</p> <p>Publication 3 Publication 5</p>
<p>Sub-research question 4 (SRQ 4)</p> <p><i>How do actors in the innovation ecosystem create value (i.e. downstream and upstream) during collaborative activities?</i></p>	<p>Main contributor to SRQ 4 Publication 5</p> <p>Complementary insights by</p> <p>Publication 2 Publication 3 Publication 4</p>

The Conceptual Framework (Figure 4 on page 52), based on the three interrelated domains of an innovation ecosystem that characterise its dynamics (i.e. organisational capabilities, social capital and value creation, visualised in Figure 2 on page 49), will be elaborated upon in sections 2.3, 2.4, 2.5 and 2.6 of the dissertation. The links between the Conceptual Framework of the dissertation and the publications that contribute to the conceptual junctures of it (Table 6 on page 93), can also be traced back to the sub-research questions described above in Table 1. Their combination allows identifying the overall links between them, as shown in Table 2.

Table 2: Sub-research questions, Conceptual Framework and publications

Sub-research question	Juncture 1	Juncture 2	Juncture 3	Juncture 4	Conceptual Framework
	<i>Absorptive Capacity</i> <i>Service-Dominant Logic</i>	<i>Organisational Learning</i> <i>Strategic Relationships</i>	<i>New Service Development</i> <i>Relational Embeddedness</i>	<i>Service-Dominant Logic</i> <i>Absorptive Capacity</i> <i>Strategic Relationships</i>	
SRQ 1	X	X	X		Publication 1
SRQ 2	X	X		X	Publication 2
SRQ 3		X	X	X	Publication 4
SRQ 4	X		X	X	Publication 5
	Publication 2	Publication 3	Publication 4	Publication 5	Main contributing publication

2. State of the art

This section will elaborate extensively on the available knowledge from research on services innovation. Particular attention will be paid to past research on innovation and its management within the financial services sector, due to the topic of this dissertation. The conceptualisation of the innovation ecosystem will be discussed, leading to the conceptual model for the dissertation and opening up the path to its theoretical underpinnings, the Resource-based View of the Firm (RBV). Each factor directing the dynamics of the innovation ecosystem will be elaborated, its sub factors relevant for the dissertation and their theoretical appropriateness with the RBV will also be discussed.

2.1 Service innovation research

The success of companies, regions and even national economies is believed to be buoyed up by innovation (van der Panne et al., 2003) and hence it is widely researched in the management field. Defining the concept of innovation has received a lot of attention with mixed views on its exact typology, which is still under debate (Rowley et al., 2011), but at an abstract level it can be described as the introduction of something new which creates value for someone (Garcia and Calantone, 2002; O'Sullivan and Dooley, 2008). This bottom-line definition of innovation needs to be made more concrete and applied, leading to categories (i.e. typologies) of innovation. The earliest attempt provides the distinction between new products, new sources of supply, new production methods, exploiting new markets, and new ways to organize business (Schumpeter, 1934). The classification has gone through several evolutions over time and the international consensus around the identification and classification of innovation within a company is now centred around the guidelines formulated in the Oslo Manual (OECD, 2005). It proposes four different innovation types: process innovation, marketing innovation, organisational innovation and product innovation. A process innovation is the implementation of a new or significantly improved production or delivery method. The launch of new products and services usually has positive effects on the growth of a company and its employment, however the outcomes of process innovations can be ambiguous due to the realization of cost savings and other efficiencies (Fagerberg et al., 2006). A marketing innovation is the implementation of a new marketing method involving significant changes in product design, placement, product

promotion or pricing. An organisational innovation is the implementation of a new organisational method for a company's business practices and internal organization. For example the creation of a new application that supports the capitalization of company information on its operations or customers. Therefore organisational innovations are associated with renewing existing organisational procedures, routines and systems. Finally, product innovation is the introduction of a good that is new or significantly improved, compared to the previous product's intended use, components and materials. This category is deemed to include services innovation since successful product and service innovation often require the use of new knowledge and technology, often inciting inter-firm interactions and intra-firm investments. However most innovation-related collaborations between companies do not meet the anticipated results or fail along the way (Keupp et al., 2012).

It is important to mention that there is a debate on the distinctions and similarities between product and services innovation. Due to the presence of tangible elements (i.e. the "product") in any service offer, various perceptions of "a service" exist (Sampson and Froehle, 2006; Spohrer and Maglio, 2008). Nevertheless, the high level definition of a service can be described as paying for performance, that is experienced through an exchange where its value is coproduced by the customer and the supplier (Spohrer and Maglio, 2008).

On the one hand, the service sector is a major element of most economies and it also contributes to the overall development of a country. On the other hand, innovation is also found to be significant for realizing sustainable economic growth. Despite its acknowledged importance, research on services innovation is found to be underrepresented and underresearched (Edvardsson et al. 2013; Ordanini and Parasuraman, 2011) compared to research on product innovation (Ettlie and Rosenthal, 2011). However there are indications that this attention for services innovation is continuously evolving and gaining maturity (Papastathopoulou and Hultink, 2012). Possible explanations for this difference can be found in the significant research attention to the industrial (manufacturing) sectors within national economies, in line with the historical importance of this sector in most countries and the transition towards a service economy. The manufacturing sector was perceived to be more innovative than the service sector because they were believed to be passive adopters of technology from other sectors or emulating innovations developed within the manufacturing sector (Pavitt, 1984; Toivonen and Tuominen, 2009). However research involving the manufacturing sector (Schroeder et al., 1989; Crepon et al., 1998; Laursen and Salter, 2006; Gunday et al., 2011; Oke, 2013) is now

experiencing the need to move forward into services (Ettlie and Rosenthal, 2012), indicating the interest of the business community to consider service research.

To some extent this shift is not unexpected since past research also found that results dealing with innovation in the manufacturing sector cannot be readily copied nor extrapolated, to service innovation contexts (Hipp and Grupp, 2005). The service innovation process is different from the product innovation process (Blindenbach-Driessen and van den Ende, 2014). First of all services are less tangible, perishable as compared to products. Secondly its delivery to the customer is interactive and often produced at the same time. The supplier can create a stock of products, to accommodate for the changes in demand, something which is often not possible for services. (Bowen and Ford, 2002). Thirdly, a well thought-out design and integration of a dynamic production system is another critical element for service firms and service innovation. Within service companies, it is actually the front office who will organize the back office (i.e. production), the opposite situation as in manufacturing companies (Atuahene-Gima, 1996). Lastly the presence of knowledge, tacit information, is more contingent on service innovation than product innovation (Sundbo, 1997).

2.1.1 Schools of thought

There are three schools of thought within research on service innovation and these are described by taking into account the degree of differentiation (i.e. evolution) from innovation research in the manufacturing sector, which is considered to be product innovation research through technological adoption and usage (Gallouj and Savona, 2009).

The first one is referred to as assimilation or technologist (Gallouj, 1998) and does not make any distinction between service or product innovation since they are equivalents, having no particularities (Drejer, 2004). Service innovation should therefore be able to use the results and practices of product innovation. This school of thought especially characterizes the pioneering research on service innovation and its literature and its baseline is that innovation consists of a set of activities which are common to all sectors or types of innovation, hence no need to distinguish between service or product innovation. However it remains used in various research initiatives, more recent examples include a typology for the modes of innovation that can be distinguished by their appropriability, opportunity conditions and level of

cumulative knowledge (Peneder, 2010). Similarly the forms of innovation could be described, while leaving out the particularities of service innovation: process innovation, business model innovation, product/service innovation (Crossan and Apaydin, 2010).

The second school of thought distinguishes between the required organisation for product innovation and service innovation, both being different, and is hence referred to as demarcation (differentiation) or service-oriented (Drejer, 2004; Gallouj and Savona, 2009). This school of thought calls for dedicated models that suits the particularities of services since they are less tangible, perishable and the required innovation activities not necessarily very structured (Griffin and Hauser, 1996; Henard and Szymanski, 2001). The aim is also to include the non-technological elements (e.g. practices and business methods) in service innovation (Evangelista, 2006), as opposed to the assimilation (technologist) discipline. Most of the research done on service innovation contributes to this discipline (Sundbo, 1997; Oke, 2007; den Hertog et al., 2010) and the challenge for this discipline is to demonstrate significant difference from, or build upon, product innovation research (Drejer, 2004).

The last school of thought is referred to synthesis or integrative since it aims at building a unified theory for innovation, involving both product and process innovation (Gallouj and Savona, 2009). This school of thought believes that there is a convergence (Evangelista, 2006) between the typical elements of product innovation (e.g. tangible and standardization) and service innovation (e.g. intangible and less structured) since new forms of coordination and relationships between companies will be needed to facilitate this, representing the next step in the evolution of the economy (Gallouj and Savona, 2009). Companies will need to adopt innovation from various suppliers active in their value network (Agarwal and Selen, 2009). All of the three schools of thought have their drawbacks and comparing services companies with manufacturing companies is appropriate to counterbalance them and enrich their insights to advance innovation research.

The non-technological elements of innovation are less studied in services research and hence this dissertation will contribute to the insights from these elements (Gallouj and Savona, 2009). The orientation of the dissertation is within the integrative (synthesis) discipline of service innovation research. Services and products cannot be viewed as distinct features that can be offered by a service company (Normann, 2001; Vargo and Lusch, 2008b). They have

a common element, namely the exchange of something during a process which is beneficial for the other entity and done with that entity. This means that the tangible elements in a service are an integral part of the service that is offered. If products are present in a service offer, then they are a construct of applied knowledge making it a support to the service delivery itself (Vargo and Lusch, 2008b). A company has a set of resources (tangible or intangible) at its disposal (i.e. internally) or needs to look for those resources externally to realize its innovation activities, through a process (i.e. innovation process), and its degree of formalisation can be different. A further discussion regarding the assumptions, rationale and implications of this distinction, coupled with the evolution of an economy based on the exchange of goods towards one based on the exchange of services, can be found in the literature (Vargo and Lusch, 2006; Michel et al., 2008; Vargo and Lusch, 2008a; Lusch et al., 2010).

2.1.2 The innovation process

There has been substantial research on the innovation process itself, yet an archetypical process for its management could not be identified (Gupta et al., 2007). However it has become accepted that the degree of openness of the innovation process is paramount (Laursen and Salter, 2014; Van Beers and Zand, 2014), but this view came about through several evolutions. The conceptualisations of the innovation process as such can be described in five different generations over time (Rothwell, 1992; Rothwell, 1994).

The first generation (1950s - mid 1960s) viewed the innovation process as a linear sequence of activities that ultimately leads to an increase in sales through internal R&D activities. This model is referred to as “Technology Push” (Rothwell, 1992) because innovation is seen as something purely technological which had to be discovered and further developed. The first generation was especially focused on manufacturing new products and increasing production capacity because consumer demand was higher than the available offer from the producers. This model does not take into account the market being served, investing more in R&D was automatically expected to generate more revenues and growth since the market buys what is made available. The degree of openness in the first generation innovation process is therefore non-existent or marginally present.

The second generation (mid 1960s – mid 1970s) expands by starting to pay more attention to the market itself because production capacities were usually

sufficient and production technology was stabilizing. This stimulated companies to focus more on marketing the products offered. Therefore the market needs were being integrated in the innovation process, becoming “Market Pull” (Rothwell, 1992) while still remaining a linear and sequential set of activities. The risk with this model is that companies remain too focused on their actual customer base and do not engage in longer term R&D that could support the adaptation to major technological change. From this moment on the openness of the innovation process starts to increase, but R&D largely remains intra-mural.

The third generation (mid 1970s – mid 1980s) was created in an economic environment where there was overcapacity, stimulating companies to look at cost controlling and even rationalizations. This put pressure on R&D activities as failures became more costly and companies looked to successfully capitalize on its outcomes. The previous conceptualisations of the innovation process were found to be insufficient, both covering only some of the aspects surrounding successful innovations. The next conceptual evolution of the innovation process was the “Coupling Model” (Rothwell, 1992) where technological elements are combined with market needs, by using (still) a sequential set of activities, with feedback loops. In this view of the innovation process the degree of openness is more bidirectional compared to the previous ones, emphasizing exchanges with market needs and the technological community. The risk with this model is that the company remains focused on incremental innovation projects, addressing current market needs with established technologies, underestimating longer term evolutions which can be disruptive (Yu and Hang, 2010).

The fourth generation (mid 1980s – early 1990s) started to pay greater attention to the strategy around technology and the continuous globalization of the markets stimulated companies to engage more actively in strategic alliances with other companies. Networking became more and more important to be able to reduce production times since product life cycles were shortening. This was mainly a reaction to the growth of the Japanese companies who successfully reconceptualised their product development by integrating suppliers with their own internal R&D activities. The innovation process was no longer seen sequential but parallel developments were supported with different development teams working together on a given project. Therefore this view of the innovation process is being referred to as the “Integration Model” (Rothwell, 1992), R&D departments work more closely with the production department (horizontal collaboration) while

working with key suppliers and customers (vertical collaboration). In this view, the openness of the innovation process reaches a new level as the boundaries of the company itself are becoming less of an obstacle, but rather a potential strength to be considered seriously.

The fifth generation innovation process is referred to as the “System Integration and Networking Model” (Rothwell, 1994). The parallel development from the fourth generation model is further extended by increased usage of technology for innovation activities (i.e. technology enabling functions for design, communication and analysis), increasing collaborative research and marketing agreements with other companies, including customer and supplier involvement during the whole innovation process.

This last evolution in the conceptualisation of the innovation process contains synergies with the notions of the innovation ecosystem (Adner and Kapoor, 2010; Autio and Thomas, 2014), discussed in more detail in section 2.2, because the entire innovation process is dynamic, requiring extensive cooperation among other companies outside the company’s own boundaries (Nootboom, 2000; Enkel and Heil, 2014). The degree of openness is among the highest in the last model and further indicates the necessity to cooperate with the extended external environment (i.e. including actors beyond the traditional value chain such as regulators, customers, technology providers or even competitors) for realizing innovation. This indicates the need to move forward to an ecosystem perspective which meets those requirements and characterizes the extended interactions for, and during, cooperation between actors. The service dominant logic, also called S-D logic, is paying increased attention to systems for value creation, new services development and usage of networks in which companies operate (Lusch et al., 2007; Lusch et al., 2010). The need to consider the external environment for enhancing internal innovation activities, extending the innovation process within a single company, is an evolution that has been observed over the past decades. The next section will elaborate more specifically on past research dealing with financial services innovation, which particularities need attention.

2.1.3 Financial services innovation

Research in services innovation is in need of more investigation and understanding (Spohrer and Maglio, 2008; Ordanini and Parasuraman, 2011; Papastathopoulou and Hultink, 2012; Edvardsson et al., 2013) and particularly

in innovation in financial services (Anderloni and Bongini, 2009; Mention and Torkkeli, 2012; Gianiodis et al., 2014). It has also been reported that differences between countries are relevant context factors for the financial services sector (Flier et al., 2001; Flier et al., 2003). The empirical setting of the Grand Duchy of Luxembourg, with the importance of its financial service sector (which has been elaborated upon previously), is therefore more than appropriate and relevant for research on financial services innovation.

The evolution of the innovation process models through categorizing them across consecutive generations does not imply that a previous generation model is abolished or no longer being used. The innovation process models can evolve along the characteristics of each generation, however the prevailing innovation process model is different across companies, sectors and even the type of innovation pursued. The different generations as such do not represent a hierarchy where one process model is undoubtedly better than the other (Rothwell, 1992; Rothwell, 1994). This means that an innovation process and its implementation are always contextual and that imitation is also no guarantee for success (Storey and Hull, 2010). Hence the interest of listing some of the peculiarities of the innovation process within the financial services sector.

A first particularity of the financial services sector refers to the type of innovation that is produced by its innovation process. The common typology of innovation (OECD, 2005) with distinctions between (among other) product, service and process innovation were found to be less obvious in the financial services sector. Therefore various other typologies and taxonomies regarding financial services innovation have been discussed in this respect (Tufano, 2003; Frame and White, 2004; Mention and Torkkeli, 2012).

Secondly, most of the outcomes from the innovation process in financial services are incremental by nature, favouring evolutions along the existing competences and internal capabilities and hence the degree of newness of innovation is contextually constrained by the individual company (Avlonitis et al., 2001; Lyons et al., 2007). Linked to this, the patterns of the new service innovation process in financial service companies from Luxembourg have also been explored (Martovoy and Mention, 2015), highlighting that these companies try to keep a balance between the degree of openness along the different phases of this innovation process.

Thirdly, the product and processes innovation produced in financial services companies are often intertwined, it is not a discrete phenomenon. For example earlier research on the product life cycle (Abernathy and Utterback, 1978) in financial services sector was found to be characterized by a first part which is more product innovation oriented and a second part which is more process innovation oriented, the opposite of other sectors (Barras, 1993). This congruence of product and process innovations in financial services companies was reported to benefit company performance (Damanpour and Gopalakrishnan, 2001) but various challenges related to the creation and adoption of innovation in financial services exist (Bátiz-Lazo and Woldeesenbet, 2006; Lyons et al., 2007). The difficulty to clearly distinguish between product and process innovation is also related to the omnipresence of information technology to implement innovation in this sector, influencing their operations and hence inducing process innovations (Uchupalanan, 2000; Bátiz-Lao and Wood, 2002; Rossignoli and Arnaboldi, 2009; Tallon, 2010). Many of these IT-induced innovations in banks have occurred in their back-office operations, allowing them to reduce costs, gain efficiencies and use different channels for service provision to their customers, leading to innovations in their front-office (Berger, 2003; Boot and Marinč, 2008). Other research confirms this particularity and providing a clear distinction between product and process innovation in financial services is still less obvious (Thomke, 2003; Rossignoli and Arnaboldi, 2009).

Lastly, the distinction between product and service innovation in financial services companies is also vaguer, general services and products should not be regarded as two distinct elements that a company can offer (Normann, 2001). They share the exchange of something which is beneficial for the acquirer and which is co-created with the acquirer. This means that the tangible elements (i.e. product) in a service are an integral part of the service that is offered. The form of this tangible element might be a contractual document, coupled to the actual offered service. This document is hence a construct of applied knowledge, a manifestation of the company's know how, that acts as a support to the service provision itself (Vargo and Lusch, 2008b). The effectiveness of the new service development process will therefore be a contingency factor for the success of the co-created service-product (Storey and Easingwood, 1993; Edgett, 1994; de Brentani, 1995; Froehle and Roth, 2007). This service-product refers to the core offering in service companies, which tends to be intangible, yet it is not uncommon to refer to it as product as well (Oke, 2004). This opaqueness certainly applies to the financial services (Oke, 2007) since these are considered to be an example of a service

sector because their core business is dealing and processing intangibles and information (Baets, 1996). The products of financial services companies are hence information and knowledge intensive (Drew, 1994). From an international perspective, financial services are also classified as a service sector by Eurostat and other international organisations (UN et al., 2011). Therefore the new product development process or the new service development processes have been used interchangeably in extant research as examples for the implementation of an innovation process in financial services companies.

Earliest research on the product/service development process in financial services reported the success factors (Cooper and de Brentani, 1991; Cooper et al., 1994; Cooper and Edgett, 1996) and also that this sector does not appear to have a sophisticated development process (Edgett, 1996). More recent research found that product innovation in the financial services sector emerges from multidisciplinary teams (Vermeulen and Dankbaar, 2002) while its barriers are the rigid organisational structures (i.e. silos), the limited use of supporting tools during the new product development process and the considerable IT legacies (Vermeulen, 2004). Other barriers found were a weak market orientation (i.e. customer involvement), the presence of champions for new product development and a fitting reward structure (Vermeulen, 2005). The performance of new financial services innovation was also found to be contingent upon the project team's internal communication ability to reduce uncertainty during the innovation process (Lievens and Moenaert, 2000; Lievens and Moenaert, 2001). Additionally the intracompany institutional forces influencing product innovation in financial services have also been researched (Vermeulen et al., 2007b). The use of a less formalized (Menor and Roth, 2008) or a sequential innovation process (de Jong and Vermeulen, 2003) has more recently been reported in financial services companies. This process can be characterised by only a few phases (Athanasopoulou and John, 2004) or just the opposite with many phases (Alam, 2002; Alam and Perry, 2002). On the other hand innovation processes were reported to be more complex (Cooper and Edgett, 1996; Akamavi, 2005) whilst avoiding an ad hoc organisation for innovation was a characteristic of successful service innovations (de Brentani, 2001). This also supports the findings showing the presence of both formal and informal new service development processes in financial services companies are possible (Kelly and Storey, 2000). Research on the new service development process in financial services companies has also revealed two possible views on the importance of external cooperation and the implementation of their innovation

process (Martovoy and Mention, 2015). The first view regards the innovation process as an internal organisational issue with a few punctual interactions with the wider company environment (Edgett and Jones, 1991; de Brentani, 1993). Hence the degree of openness in this view is rather low and the cooperation with other actors in the innovation ecosystem is limited. The second view considers the involvement of external companies and actors from the innovation ecosystem as very relevant, building an innovation process that is therefore characterised by a higher degree of openness (Athanasopoulou, 2006; Menor and Roth, 2008; Fasnacht, 2009).

2.2 The innovation ecosystem

About two decades ago the concept of ecosystems first appeared in the area of management (Moore, 1993; Moore, 1996; Moore, 2006) and its adoption in research has been growing (Teece, 2007; Pierce, 2009; Adner and Kapoor, 2010; Chesbrough et al., 2014). Originally the concept was used in biology to describe the ecological system with interactions between plants, predators and prey, how they operate in this environment which ultimately creates an equilibrium, sustaining state for its inhabitants (Jackson, 2011). The view in management research is inspired upon the business ecosystem literature (Moore, 1996) which distinguishes between the company's core business (core contributors, direct suppliers and distribution channels), the extended enterprise (e.g. direct customers, suppliers of direct suppliers, customers of direct customers and suppliers of complementary products) and finally its ecosystem (e.g. trade associations, unions, investors, governmental/regulatory bodies and competitors with similar technology/organisation/products and services).

The ecosystem is a dynamic, complex system of relationships that evolves continuously and where the outcomes of the interactions between its constituents are not always predictable. The constituents are interdependent for each other's success, meaning that they should cooperate in order to create value but compete with each other on other occasions (Adner and Kapoor, 2010). This is different from a network, because the latter is a set of formally constructed relationships that can be complex but are not interdependent on each other for their success. Innovation ecosystems emerge around a central node, connecting the constituents, such as technology, a social or economic objective (Gobble, 2014). The cooperation for innovation within the innovation ecosystem ultimately aims at creating value that would not have

been possible to achieve by an individual constituent, by moving beyond company boundaries and turning new information into innovation (Adner, 2006). Therefore the innovation ecosystem shares similar beliefs as emphasised by the open innovation research stream which describes the purposive inflows and outflows of knowledge to accelerate the company's internal innovation process, and to expand the markets for an external use of innovation (Chesbrough et al., 2006; Chesbrough et al., 2014; West et al., 2014).

From an economical and business perspective, an ecosystem refers to the many interactions and relationships between companies, which are interconnected and seek to have a sustainable competitive advantage. Because of its dynamic character, it is necessary to take into account strategies that, on one side influence the ecosystem of the company, and on the other side deal with the influences of the ecosystem on the company (Iansiti and Levien, 2004). There are many definitions of the innovation ecosystem, this dissertation will follow the one most recently formulated (Autio and Thomas, 2014): “... *an innovation ecosystem [is] a network of interconnected organizations, connected to a focal firm or a platform, that incorporates both production and use side participants and creates and appropriates new value through innovation.*” (p. 205).

The main differentiator between the concept of an ecosystem and the network/cluster concepts available in management literature, is the involvement of the use side participants (e.g. customers and other stakeholders) together with production views, which makes this concept of an ecosystem the broadest network-based concept (Autio and Thomas, 2014). The ecosystem stream of literature is part of the extensive and diverse body of network literature in management research, where the involvement of use side participants is also considered. What sets an ecosystem apart from the rest is the explicit and simultaneous consideration of upstream (production side) and downstream activities (use side) (Autio and Thomas, 2014) where value is co-created (Adner and Kapoor, 2010; Lusch et al., 2010) through cooperation (Adner, 2006). The notion of an ecosystem is conceptually more advanced than other notions of value creation, such as value constellations (Normann and Ramírez, 1993) or value networks (Christensen and Rosenbloom, 1995), because the ecosystem considers the appropriation and use of the created value (Autio and Thomas, 2014). The exact boundaries of an ecosystem are also more difficult to determine since these are considered to be broader and porous (Santos and Eisenhardt, 2005; Gulati et al., 2012).

An ecosystem is also characterized by the presence of a coherent combination of competences and relationships between participants that results in a clear offer for a use group (Autio and Thomas, 2014). This is in line with the synthesis (integrative) view on services in this dissertation, where a product is an element of the actual service offer, created by reconfiguring resources within the dynamic and adaptive innovation ecosystem (Basole, 2009; Li, 2009). The view of the innovation ecosystem in this dissertation will be one that includes participants from the classical value chain (suppliers, distributors, ...) but also participants from outside this traditional conception (e.g. regulator, customer, technology provider, competitor). Defining the exact boundaries of an innovation ecosystem is challenging (Autio and Thomas, 2014).

The innovation ecosystem hence represents the interrelations (i.e. dynamics) between the (1) organisational capabilities to manage the in- and outflows of resources between the organisations, (2) the value creation sought within the ecosystem in an effort to create and produce innovation that goes beyond the possibilities of a single organisation, (3) the social capital that will be necessary and contingent factor for the interactions between the other organizations in the ecosystem. This overview of the factors directing the dynamics in an innovation ecosystem are presented in Figure 2.

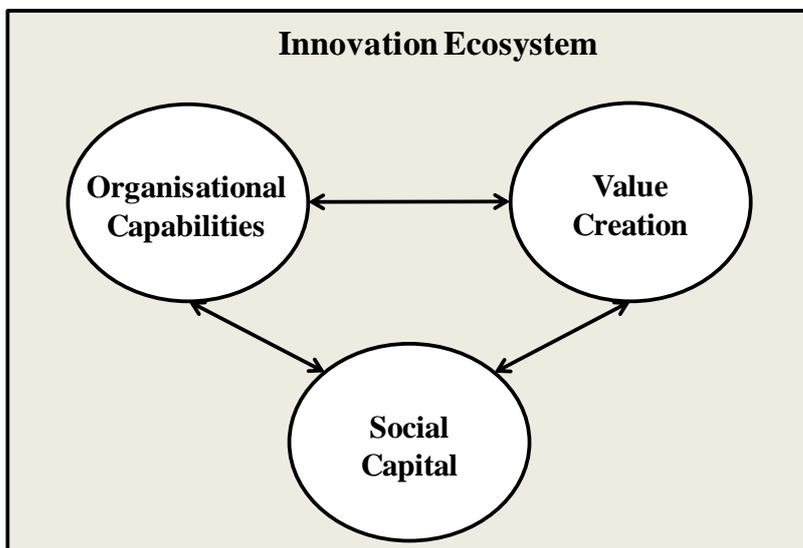


Figure 2: Drivers of the dynamics in an innovation ecosystem

2.3 The Resource-based View of the Firm (RBV)

Following the constructivist paradigm with an abductive reasoning in the dissertation, a theoretical background is needed to develop a conceptual framework that will guide (and evolve along) the research process. The choice of one theory over another one is never perfect because theory is an intellectual foundation to analyse the socially constructed artefacts with their subjective meaning (Kuhn, 1962): “... *a theory must seem better than its competitors, but it need not, and in fact never does, explain all the facts with which it can be confronted*” (p. 12). Therefore a theory with a large scientific applicability is preferred, to allow taking different perspectives without endangering its conceptual foundations (i.e. compatibility of those perspectives to the theory). For this dissertation there is need for a theory that can serve as a pivotal element, which allows taking perspectives on the innovation ecosystem, with the application of qualitative research methods.

From a theoretical perspective (Autio and Thomas, 2014), the ecosystem stream of literature builds upon the resource-based view (Barney, 1991; Dyer and Singh, 1998; Teece, 2007) with the core competence-based advantage (Porter, 1985; Prahalad and Hamel, 1990) where the innovation process is complex, having multiple sources and stakeholders (von Hippel, 1988). How companies can leverage the innovation ecosystem to improve their innovation performance and their managerial implications remains an area that requires further research (Autio and Thomas, 2014). A discussion of the innovation ecosystem as an external platform for technological evolutions, by discussing cases like IBM and Intel, is also available in the literature (Gawer and Cusumano, 2014). The management literature requires more research on the actual creation of innovation ecosystems, contrarily to the observation that there is a good understanding how ecosystems can evolve (Autio and Thomas, 2014).

The theoretical model of this dissertation will use the Resource-based View of the Firm (RBV) as a pivotal theory for taking perspectives. The ability of this theory to allow taking perspectives will be discussed in section 2.3.3 further on. The individual links between RBV and the perspectives will be discussed in sections 2.4.1 (organisational capabilities), 2.5.1 (social capital) and 2.6.1 (value creation). It will serve as the pivotal theoretical element with three theoretical linkages (perspectives) to the factors explaining the dynamics of the innovation ecosystem as previously shown in Figure 2. The latter figure

can be updated to show the theoretical view of the innovation ecosystem in this dissertation, as shown in Figure 3.

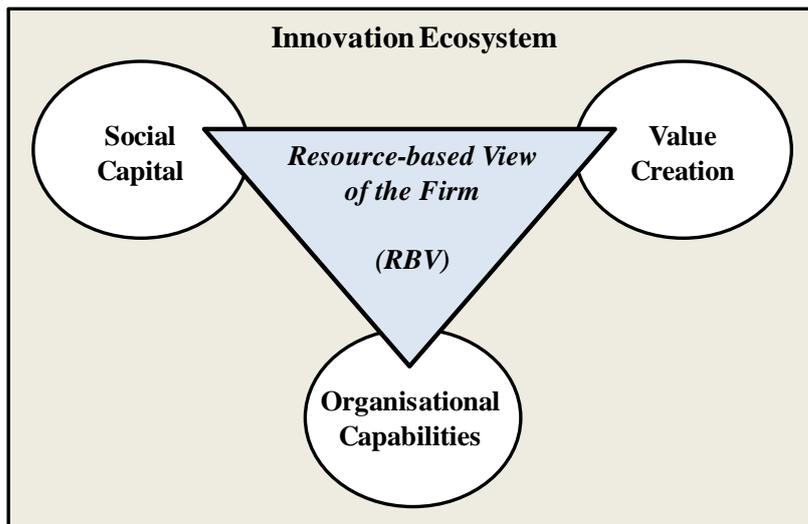


Figure 3: RBV as a pivotal theory for the innovation ecosystem

These factors explain the dynamics in the innovation ecosystem and each factor is composed of two sub factors, which leads to the conceptual framework of the dissertation in Figure 4. The latter is also used to integrate the publications associated to this dissertation. Each juncture of the conceptual framework represents an area of research covered by one or more publications (more details on this aspect are presented in Table 6).

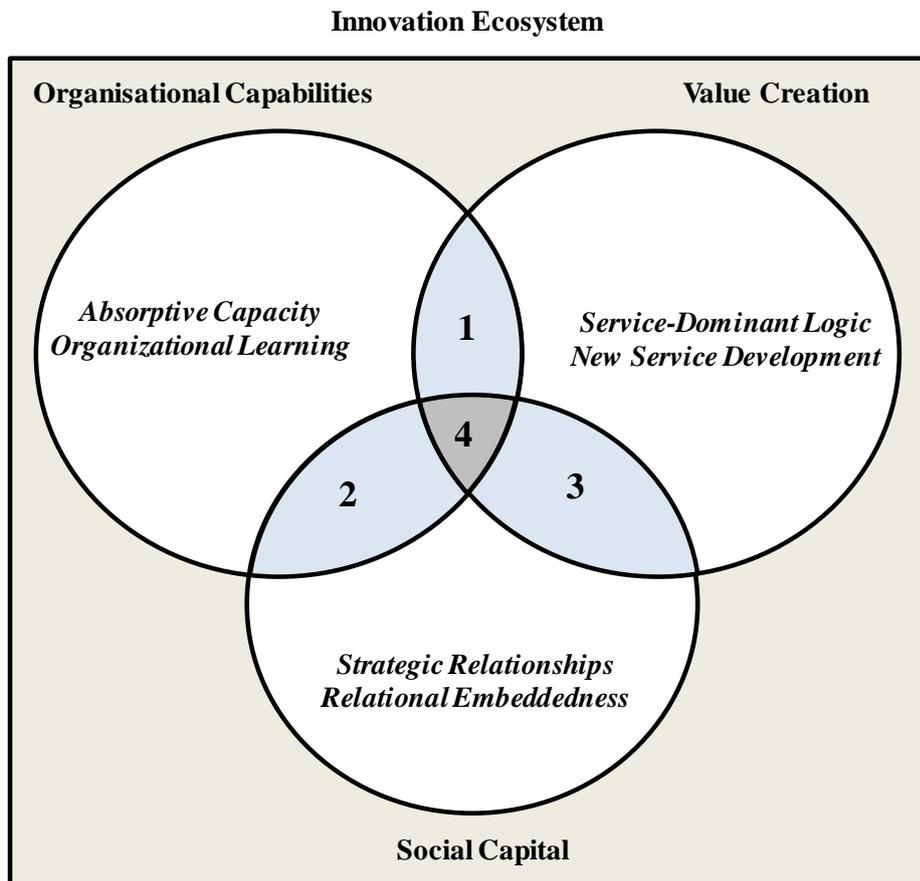


Figure 4: Conceptual Framework of the dissertation

The next section will describe the RBV in more detail and from there onwards each factor (including sub factors) of the conceptual model will be reviewed, and its theoretical link with the RBV will also be explained.

2.3.1 Assumptions and expected outcomes

The Resource-Based View of the Firm (RBV) was conceptualized at the end of the 1950s, by stating that companies consist of a bundle of tangible and intangible resources (i.e. information, knowledge, assets, ...) which can confer to them a competitive advantage, if these resources are

heterogeneously distributed among the competing companies, creating various economic rents (Mahoney and Pandian, 1992) that explain differences in company performance (Penrose, 1959). However the notion of RBV as such was only mentioned for the first time in the beginning of the 1980s (Wernerfelt, 1984) and it has been discussed (Dierickx and Cool, 1989; Conner, 1991; Wernerfelt, 1995; Eisenhardt and Martin, 2000; Barney et al., 2001; Peteraf and Barney, 2003; Acedo et al., 2006; Newbert, 2007; Sirmon et al., 2007; Sirmon et al., 2010; Barney et al., 2011) and extended (Barney, 1991; Amit and Schoemaker, 1993; Peteraf, 1993; Teece et al., 1997; Dyer and Singh, 1998; Das and Teng, 2000; Gulati et al., 2000; Lavie, 2006) ever since. Despite the support for this theory in management research, there have also been critical notes and commentaries on it, which will be developed in more detail in a dedicated section. An overview will be given on the general content of the RBV and its extensions. A comprehensive summary and discussion of the historical evolutions of the core RBV tenants is available in the literature (Barney et al., 2011).

The RBV provides insights on how a competitive advantage is created, namely by using resources which are heterogeneous and immobile (Barney, 1991). This means that the resources should be subjected to entry or mobility barriers (Porter, 1998) which make it difficult for them to be used by competing companies (i.e. immobile) and that these resources are subject to degrees of difference between them (i.e. heterogeneous). Once the competitive advantage is created through bundling the resources to implement the value creating strategy (Wernerfelt, 1984) it is desirable for the continuity of the company that this becomes a sustainable competitive advantage, i.e. that the current and potential competitors cannot duplicate the chosen strategy that creates the competitive advantage (Barney, 1991). Therefore a company's resources must satisfy the following criteria (necessary yet not sufficient) to be able to sustain the competitive advantage: be valuable, rare, inimitable and non-substitutable (Barney, 1991), also known as the VRIN framework (Barney and Hesterly, 2012). These earlier conceptualisations of RBV are focused on the company itself, how it can arrange its controlled resources into distinctive organisational capabilities (Penrose, 1959; Wernerfelt, 1989; Mahoney and Pandian, 1992) when implementing a strategy to create value. Since the RBV views competition as a process of 'creative destruction' (Schumpeter, 1950) rather than as a static situation (Nelson and Winter, 1982), it implies that a company will eventually be compelled to find new combinations of resources to sustain a competitive advantage (Ghemawat, 1986).

However the earlier conceptualisations of the RBV do not provide sufficient answers as to how a company would perform such a new combination of resources and more generally how it would deal with market dynamism that pressures the idea that economic rents can be maintained since competition is kept at large by acquiring or developing complementary resources (Eisenhardt and Martin, 2000). This leads to a first extension of the RBV by introducing the notion of dynamic capabilities (Teece et al., 1997) to explain how a company can remain competitive by having the: “... *ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments.*” (p. 516). More importantly, the relevance of the external environment is explicitly mentioned here, the company should also try to influence the external environment to sustain its competitive advantage instead of focusing exclusively on managing its internal environment of resources to sustain competitive advantage. A company needs to distinguish between operational capabilities and dynamic capabilities (Helfat and Winter, 2011), as discussed in the section on organisational capabilities before (cfr. 2.4). Dynamic capabilities will facilitate evolutions in the company, alter or extend the way it is doing business in order to survive (i.e. sustain competitive advantage) by influencing its operational capabilities, i.e. internal environment (Winter, 2003) but also attempt to influence its ecosystem, i.e. external environment (Teece, 2007; Teece, 2014).

Along the first extension of RBV with the importance of its dynamic capabilities, the focus of attention from the company level is further pushed beyond company boundaries, towards a second extension of the RBV emphasizing the embeddedness of the individual company in a network of relationships (Dyer and Singh, 1998). This second extension is known as the relational view which enriches the understanding of a company’s competitive advantage by emphasizing that resources can be interconnected, outside the company’s boundaries. An individual company might not be able to deal with increased international competition and hence seek cooperation with other companies. More specifically, network routines used for this cooperation can explain the competitive advantage of one company relative to another through the creation of relational rents originating from 1) relation specific resources, 2) knowledge sharing routines, 3) complementary resources and capabilities, and 4) effective governance of the cooperation (Dyer and Singh, 1998). A sustainable competitive advantage can be obtained through external resources, which can be available to the firm through its relational networks (Zaheer and Bell, 2005). This is also associated to the call for the resource-based view of the firm to account for external network capabilities in addition to internal

capabilities (Lavie 2006), where intercompany relationships are leveraged (Gulati et al., 2012). These social relationships and ties (Granovetter, 1983; Granovetter, 1985), strategic alliances (Das and Teng, 2000; Gulati et al., 2000) are also a part of the company's innovation ecosystem (Autio and Thomas, 2014).

There have been discussions regarding the reconceptualization of the RBV with a strong focus on knowledge, the ultimate strategic resource of a company with specific knowledge management capabilities, creating the Knowledge-based view of the firm (KBV) (Grant, 1996). This view makes, roughly speaking, a distinction between tacit knowledge and explicit knowledge and the knowledge creating company (Nonaka and Konno, 1998; von Krogh et al., 2000; Nonaka et al., 2006), with its transfer particularities (Kogut and Zander, 1992; Szulanski, 1996) that can lead to competitive advantage if properly managed. This stream of literature has also resulted in many discussions (Grant, 1997; Kodama, 2006; Felin and Hesterly, 2007; Håkanson, 2010) and critiques (Foss, 1996; Eisenhardt and Santos, 2002; Gourlay, 2006) because knowledge is viewed as the most problematic resource of a company (Spender and Scherer, 2007).

Lastly there is another stream within RBV which emphasises that a company can have a sustainable competitive advantage by considering how its resources and capabilities interact with the natural environment, leading to the Natural-Resource-based View (NRBV) which also fosters sustainable and socially responsible companies (Hart, 1995; Hart and Dowell, 2011).

2.3.2 Critiques and limitations

Despite the strong presence and acknowledgements of the RBV in management research (Barney et al., 2011), it is certainly not without critiques and possible theoretical limitations (Priem and Butler, 2001a; Priem and Butler, 2001b; Foss and Knudsen, 2003; Lado et al., 2006; Lockett et al., 2009; Kraaijenbrink et al., 2010; Warnier et al., 2013). The importance of Penrose's ideas themselves as a foundation for the RBV have been acknowledged (Kor and Mahoney, 2004) but also critically reviewed (Rugman and Verbeke, 2002; Rugman and Verbeke, 2004). The RBV is accused of not being able to clearly and unambiguously define its core theoretical constructs such as sustainable competitive advantage and resources (Foss and Knudsen, 2003) leading to different interpretations (Priem and Butler, 2001a; Priem and Butler, 2001b). The RBV also focuses on the

realization of competitive advantage through the use of strategic resources, which are the only resources that are deemed important. Few distinctions are made between the different types of resources and their possible contribution to the creation of a competitive advantage (Warnier et al., 2013), however marketing literature did offer a possible categorization (Hunt and Morgan, 1995): “... we propose that the multitude of potential resources can be most usefully categorized as financial (e.g., cash reserves, access to financial markets), physical (e.g., plant, equipment), legal (e.g., trademarks, licenses), human (e.g., the skills and knowledge of individual employees), organisational (e.g., competencies, controls, policies, culture), informational (e.g., knowledge resulting from consumer and competitor intelligence), and relational (e.g., relationships with suppliers and customers).” (p. 6-7).

The presence of weaker resources that will influence decision-making (i.e. time and investment needed) in a company because of the company's path dependencies due to prior investments (West and DeCastro, 2001) are largely ignored. Past research also provided an overview of the common points of critique on the RBV, of which some are deemed critical. The definition of resource is impracticable, the value of those resources is sometimes ambiguous, and the VRIN characteristics of resources are neither necessary nor sufficient for a sustainable competitive advantage (Kraaijenbrink et al., 2010).

The fact that the RBV accounts for both tangible and intangible resources for value creating strategies can be in itself problematic for empirical research (Godfrey and Hill, 1995). There is also the intense discussion surrounding the claim/refute that the RBV is in essence tautological (Barney, 2001; Priem and Butler, 2001b; Peteraf and Barney, 2003). The establishment of a hierarchy of organisational capabilities is one of the reactions to these tautology claims, besides specifications regarding the definitions and interpretations or omissions in the RBV (Barney, 2001; Makadok et al., 2001; Peteraf and Barney, 2003), providing insights on the possible interrelations between orders of capabilities and hence the underlying routines (Helfat and Winter, 2011; Felin et al., 2012; Winter, 2012). Various propositions are also made for future research involving the RBV, emphasizing the distinction between potential and realized capabilities, by paying attention to the process of deploying resources bundled in a capability to understand difference in sustained competitive advantage. Another proposition relates to the contextual value of resources, requiring different types of resources and their configurations to further explain sustainable competitive advantage

(Kraaijenbrink et al., 2010). The static value creation in the company is also criticized and the current turbulent and dynamic environment is a good reason to include many different actors from inside but also outside the company to create value, involving various social influence mechanisms (Kraaijenbrink et al., 2010).

The discussion regarding the status of RBV as a theory, leading to a Resource-based Theory of the Firm (RBT), is ongoing but the RBV is believed to offer insights on the decision-making of managers (Lockett et al., 2009), pointing at the possible managerial implications that RBV can have. It points at the need to consider the ecosystem in which companies operate, offering opportunities and possible threats, but also the need to know the distinctive strengths of the company to provide complementarity and facilitate value creation. Path dependency is central for the company's available resources, pointing to the influences they will have on future resource bundles to remain competitive. Meeting the future challenges can be done by meeting customer demands through various possible resource configurations. This implies also that investments must be made to reconfigure where needed and develop new combinations, leading to innovations. These are possible through internal coordination to set-up the resources that can create the competitive advantage, involving external specialist resources from the ecosystem that lead to the required new configuration and innovation (Lockett et al., 2009).

2.3.3 Complementarities with other theories

Theory always plays an important role in research and different theories can provide useful insights on the management topic under investigation. It is acknowledged that in management research a single theory is often inadequate to fully cover the implications of the research question. Therefore the complementarities between theories provide useful contributions that go beyond the merits of using a single theory. They can be bridging perspectives (Lewis and Grimes, 1999), which is a goal of management science (Gioia and Pitre, 1990), and management science in itself is multidisciplinary by nature (Oswick et al., 2011).

However this requires that the deployed theoretical perspectives share a minimum amount of characteristics in order to be compatible, and for them to be able to meaningfully enrich the research findings (Okhuysen and Bonardi, 2011). Besides their level of commonality, how researchers will handle the differences between them and how they bring together elements from each

theory, plays an equally important role in the success of the integration attempt. Therefore four integration approaches are proposed within management research (Mayer and Sparrowe, 2013): (1) a single research phenomenon with different theoretical perspectives, (2) a single research phenomenon with apparently disparate theoretical perspectives, (3) applying one theoretical perspective to the domain of another theoretical perspective, and lastly (4) streams of literature sharing a similar explanatory account.

The first approach of integration will be chosen for this dissertation because of the three theoretical perspectives that will be used to investigate innovation behaviour of financial services companies. The foundational assumptions and complementary insights between the blind spots of each perspective offer a better representation of the observed reality. The justifications for these theoretical compatibilities and how they are complementary will be discussed in the next sections.

Proponents of the RBV have also acknowledged that RBV is eclectic and complementary to other theories for explaining the strategic behaviour of companies (Lockett et al., 2009). Innovation is certainly such a strategic behaviour, especially within the ecosystem of the company since the current, dynamic business environment does not permit it to be solely focused on its own internal organisation and strategy formulation. These complex relationships in the company's ecosystem cannot be fully understood by a single theory or theoretical perspective (Gray and Wood, 1991). The RBV is well suited to offer synergistic effects through multidisciplinary approaches (Kraaijenbrink et al., 2010; Barney et al., 2011) and can embrace other theories leading to richer insights (Mahoney and Pandian, 1992; Palmatier et al., 2007). Along the same line, this dissertation will use elements from the social capital (i.e. embeddedness and ties) and marketing (i.e. new service development) streams of literature with the RBV (i.e. organisational capabilities and organisational learning), to illustrate the importance of leveraging relationships (predominantly outside-in point of view) and company capabilities (predominantly inside-out point of view) within an innovation ecosystem (Autio and Thomas, 2014). The complementary theories that will be used in the dissertation will be presented in the following sections. Each one of them is presented as a "perspective" that is interconnected to the pivotal theory, namely the RBV. The perspectives will be composed of two underlying constructs which will be linkable to the publications associated with this dissertation, demonstrating their theoretical and conceptual affinities.

2.4 Organisational capabilities

Research on the notion of organisational capabilities has received much attention, both conceptually and empirically (Teece et al., 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Wang and Ahmed, 2007; Peteraf et al., 2013; Vogel and Güttel, 2013; Di Stefano et al., 2014). This notion is linked with the theoretical backgrounds of the resource-based view of the firm (RBV), which will be discussed in more detail later on, to achieve a competitive advantage and sustain in the future (Prahalad and Hamel, 1990; Barney, 1991; Nelson, 1991; Peteraf, 1993; Teece et al., 1997; Teece, 2014).

Capabilities and resources are specific to a company and hence they are non-homogenous (Peteraf, 1993) and path dependant (Teece et al., 1997), being a significant source of creating and enhancing a sustainable competitive advantage (Barney, 1991). Organisational capabilities are therefore specific to companies (Nooteboom, 1999) and should be rare, difficult to copy and valuable to create competitive advantage (Wernerfelt, 1984). However other research claims that organisational capabilities can have communalities across companies (Eisenhardt and Martin, 2000). The definition of resources and capabilities that will be used in this dissertation are as follows (Helfat and Peteraf, 2003): “*Resource refers to an asset or input to production (tangible or intangible) that an organization owns, controls, or has access to on a semi-permanent basis. An organisational capability refers to the ability of an organization to perform a coordinated set of tasks, utilizing organisational resources, for the purpose of achieving a particular end result. Both resources and capabilities may evolve and change over time in important ways.*” (p. 999). From the nineties onwards, the economic environment was characterized by significant increases of competition between companies that required changes and reconfigurations to the resources and capabilities they had, challenging the more static view that persisted until then (Wang and Ahmed, 2007). Therefore a distinction needs to be made between operational capabilities (Helfat and Peteraf, 2003; Winter, 2003) or dynamic capabilities (Teece et al., 1997), although literature acknowledges that a clear distinction can be challenging (Helfat and Winter, 2011). The operational capabilities are more focused on performing an activity (e.g. making a product or delivering a service) which requires coordinating repetitive patterns of tasks, also known as routines (Nelson and Winter, 1982), needed for performing that activity. Dynamic capabilities on the other hand refer to (Teece et al., 1997): “*... the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities*

thus reflect an organization's ability to achieve new and innovative forms of competitive advantage ...". (p. 516). The capabilities within a company have a hierarchy between them (Winter, 2003; Schilke, 2014), which places the operational capabilities as the lowest level of organisational capabilities (i.e. zero-level capabilities that embody the status quo in the company), dynamic capabilities are a first-order organisational capability and lastly learning mechanisms are second-order capabilities. Dynamic capabilities are hence viewed as a derivative of the zero-level operational capabilities since they induce change in that level of capabilities. Following this reasoning, learning mechanisms are a derivative of the dynamic capabilities since they induce change in them directly but also in the operational capabilities (Zollo and Winter, 2002; Schilke, 2014). This was a first attempt to clarify how organisational capabilities relate to each other, but their distinction has been, and still remains, a topic of discussion (Collis, 1994; Helfat and Winter, 2011; Schilke, 2014).

This broader view on resources and dynamic capabilities as a higher level concept, are relevant and appropriate within ecosystem research and innovation (Teece, 2007; Teece, 2014; West et al., 2014). Within the innovation ecosystem, the participants will each use their distinctive capabilities, a combined set of resources (Miller, 2003), to create value by cooperating with other companies or stakeholders (Autio and Thomas, 2014). Companies need to take strategic decisions regarding their strategy and distribution of resources (i.e. capabilities) to manage the surrounding innovation ecosystem or even shape it to their own advantage (Autio and Thomas, 2014). However the importance of routines in operational capabilities can also pose a threat to innovation, inducing core rigidities (Leonard-Barton, 1992), organisational inertia (Nelson and Winter, 1982) and difficulties in shifting from a technological trajectory (Dosi, 1982). This needs to be overcome by a company's dynamic capabilities that can reconfigure the operational capabilities, described as the capability paradox (Schreyögg and Kliesch-Eberl, 2007). The functions of dynamic capabilities are also referred to as "sensing" (Teece, 2007) for opportunities/threats inside and outside the boundaries of the company by (Teece, 2008): "...*scanning, searching, experimenting, and probing.*" (p. 509) creating new configurations of resources for remaining competitive. A more recent discussion of the characteristics of dynamic capabilities specifically can be found in the literature (Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009). The literature on capabilities provides many examples of dynamic capabilities that a company needs to have or should have, some examples are (non-exhaustive

and without any order of importance) the combinative capability (Kogut and Zander, 1992), an alliance capability (Heimeriks and Duysters, 2007), the technological capability (Ortega, 2010), a reputation capability (Heugens et al., 2004), and an absorptive capacity (Cohen and Levinthal, 1990).

Within this dissertation, absorptive capacity (detailed in 2.4.2) will be an important concept for dealing with the inside-out and outside-in elements of the innovation ecosystem. Inside-out because the company needs to take decisions that are intended to shape the innovation ecosystem and outside-in because the ecosystem will require openness of the company's innovation process to seize the opportunities that it can offer. The mediating role of organisational learning, especially in the new financial services development process, is less often researched (Blazevic and Lievens, 2004) and there is a link between organisational learning and organisational capabilities (Zollo and Winter, 2002). This will be the next concept that will be developed further, due to its interrelation with absorptive capacity which is a dynamic capability (Easterby-Smith et al., 2008).

2.4.1 Theoretical link with the RBV

Organisational capabilities are a central element in the RBV, their description and implications have been previously discussed (cfr. 2.4). Within the context of innovation, these capabilities are part of the decisions that a company can take in order to facilitate innovative outcomes by structuring their innovation process or invest in new practices or tools. The dynamic capabilities (1st order capability) will allow companies to do better than their competitors and facilitate future innovative outcomes. The focus here will therefore be on a specific dynamic capability, a company's absorptive capacity. This capability is expected to be relevant when dealing with the multiple actors and information in the innovation ecosystem (Autio and Thomas, 2014). Capability learning (2nd order capability) will be the second construct that is relevant for this dissertation but the company's operational capabilities (i.e. zero-order capabilities) are left out of scope because they focus on the current competitive advantage and associated resource bundles, which includes innovation practices, in a company. The process of acquiring resources and their development in the company deserves more research, despite it being vital (Barney et al., 2011) since the company's context also influences this process (Combs et al., 2011). Creating the necessary resource base requires internal resource accumulation (Dierickx and Cool, 1989) and external acquisition (Sirmon et al., 2007; Maritan and Peteraf, 2011).

2.4.2 Absorptive capacity (1st order capability)

The process and decisions through which companies acquire and deploy resources is a topic of interest within RBV research (Sirmon et al., 2007; Sirmon et al., 2010). The capability to absorb and use information (Cohen and Levinthal, 1990; March, 1991) is also critical when leveraging relationships (Pittaway et al., 2004) within the innovation ecosystem. This organisational capability can be the source of a competitive advantage (Liao et al., 2010), leading to innovative outputs (Tsai, 2001) and even increased firm performance (Kostopoulos et al., 2011). There have also been many discussions regarding the conceptualization of absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002; Lane et al., 2006; Todorova and Durisin, 2007; Easterby-Smith et al., 2008; Volberda et al., 2010; Marabelli and Newell, 2014) but the bottom line is that there is a need to capture new resources and then actually use those resources through a reconfiguration of the existing bundles. It belongs to the important area of companies trying to influence and manage the innovation ecosystem around them (Autio and Thomas, 2014). Recent research also confirmed the importance of absorptive capacity as a mediator in the services sector. Improving the performance of service innovation and new service developments requires absorptive capacity (Chang et al., 2014) and this could also be expected in the empirical setting of this dissertation.

2.4.3 Organisational learning (2nd order capability)

A company's survival is influenced by its efforts to proactively learn and anticipate the changes in the external environment such as technological possibilities and evolutions in customer requirements and expectations. The company must capitalize on its organisational learning to be able to meet these challenges. Organisational learning (Argyris and Schön, 1978; Miller, 1996; Easterby-Smith et al., 2000) is especially relevant during the innovation process as it is one of the mechanisms that directs the anticipated changes (Blazevic and Lievens, 2004). The ability of a company to learn as a whole (i.e. organisational learning) will be relying on the contributions of its employees when solving its organisational issues (Simon, 1991; Kim, 1993). Their experiences are important since these will be transferred to the organization through reciprocal exchanges. The company must make decisions on what resources should be used and combined in order to facilitate this learning, involving the acquisition of knowledge and the exploitation of

this knowledge for the benefit of the company (March, 1991; Levinthal and March, 1993).

Organisational learning is cumulative throughout the company and involves the acquisition of information from the external and internal environment (Cohen and Levinthal, 1990). This requires the bundling of resources (i.e. capabilities) into absorptive capacity for the company to facilitate organisational learning. Various organisational learning mechanisms are needed to develop this absorptive capacity in a company, especially when relationships are important (Knoppen et al., 2011) such as in innovation ecosystems (Autio and Thomas, 2014).

Organisational learning is therefore connected with the company's organisational capabilities and it is also needed to develop these capabilities, which are referred to as capability learning (Winter, 2000; Zollo and Winter, 2002; Harrison and Boyle, 2006; Prashantham and Floyd, 2012). Other (innovation) management research considers organisational learning as a capability in its own right (Goh, 2003; Alegre and Chiva, 2008; Goh et al., 2012). A final note, the notion of organisational learning is also closely related to that of learning organisation, yet they are distinct streams of theorizing (Easterby-Smith et al., 1998). Organisational learning is interested in how learning occurs in a company whilst the learning organization is interested in how learning should occur in a company (Vera et al., 2011). In this dissertation the view of organisational learning as capability learning (learning to learn) is taken (Schilke, 2014). The view on organisational learning capability and capability learning do have similarities, which include their approach from the individual or organisational level of analysis, and their need for resources and tasks (routines) to implement them in the company (Lejeune, 2009).

Organizational learning is linked to absorptive capacity and the other organisational capabilities (Winter, 2003) since learning from cooperation in the innovation ecosystem depends on the ease of access a company has to external resources (e.g. relationships) and having the required internal capability to leverage these (Pittaway et al., 2004). Organisational learning facilitates the creation and change of dynamic capabilities, which are also required for managing alliances (Zollo and Winter, 2002).

2.5 Social capital

The concept of social capital refers to the importance of relationships between individuals, that allows them to realize more during their endeavours, or at least faster and with less difficulty, than if they would perform alone. This has also its implications to the business world and the interactions between companies, where associations through networks are important. Social capital therefore provides an ease of access to information and resources, while potentially improving the relevance and quality of this exchange (Adler and Kwon, 2002). Social capital can be described as (Adler and Kwon, 2002): “... *the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor.*” (p. 23). However there are many other possible views of social capital due to its breadth in interpretation but also its units of analysis, providing a continuing debate on its definition (Woolcock and Narayan, 2000; Adler and Kwon, 2002; Zheng, 2010).

Social capital has the distinct feature that it is long-lasting, interconnects relationships between individuals (Bourdieu, 1986; Coleman, 1994) and represents a persistent source of competitive advantage (Adler and Kwon, 2002). These networks between companies can create value from this social capital by reducing transaction costs, for example search and information costs (Landry et al., 2002), fostering innovation activities (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998). Social capital is hence one of the innovation-inducing factors (Zheng, 2010).

Social capital allows companies to exchange relevant, rare information and resources (Uzzi, 1997) and network ties facilitate access to innovation (Burt, 1987), also in the context of financial services (Uzzi, 1999; Uzzi and Gillespie, 2002; Uzzi and Lancaster, 2003; Zaheer and Bell, 2005; Burt, 2007). Social capital is all about the embeddedness of the relationships which has two dimensions to be considered: structural embeddedness and relational embeddedness (Granovetter, 1985). Structural embeddedness refers to the configuration, i.e. structure (Burt, 1992; Burt, 2004), of the network with the positioning and clustering of information seekers and providers (e.g. centrality, hierarchy, ...), whilst relational embeddedness refers to the quality of the relationships (e.g. trust, closeness, motivation, ...). Finally there is also the cognitive dimension of social capital which refers to resources facilitating

meaning and interpretation, providing shared vision with values and norms (Nahapiet and Ghoshal, 1998; Zheng, 2010).

Regarding the network ties in relational embeddedness, these are considered to be another stream within social capital, namely the strength-of-ties literature (Granovetter, 1983). This strength-of-ties literature is interested in the nature of the relational bond between social actors, which can be stronger or weaker, resulting in a strong or weak tie. This tie is expected to impact the information exchanges, more specifically a strong tie is believed to facilitate focused and deep information exchanges whilst a weak tie will result in diversified and superficial exchanges (Hansen, 1999). Strong ties have a high degree of redundant information and are motivated by a high degree of reciprocity, whilst weak ties have a high degree of non-redundant information and are motivated by a low degree of reciprocity (Granovetter, 1973). This leads to the basic expectations that information can flow through the weak ties into other social networks, because they provide non-redundant and novel information, hence making them valuable (i.e. “the strength of weak ties”). This is close to the notion of “structural holes” (Burt, 1987; Burt, 1992) which describes the absence of a connection between two clusters of strong ties that each have non-redundant information that the other cluster could use. A bridge, potentially a weak tie, is needed to transit that novel information from one cluster to the other (Hansen, 1999), possibly leading to innovation (Ahuja, 2000a; Zaheer and Bell, 2005). The two concepts of structural holes and weak ties are correlated, however weak ties do not automatically assume the presence of structural holes (Capaldo, 2007), they are not interchangeable (Reagans and McEvily, 2003). On the other hand strong ties were also reported to be a necessary intermediate of valuable knowledge (Levin and Cross, 2004). Past research also found that relational embeddedness plays a stronger role in explaining innovation-oriented tasks while structural embeddedness is more suited for routine tasks (Moran, 2005). Research also found that a company needs an organisational capability (i.e. network capability) to create such bridges to cross structural holes in order to be innovative (Zaheer and Bell, 2005). Research also distinguishes “embedded ties” between companies (i.e. close relationships) as opposed to “arm’s length ties” or market ties where the relationships are purely transactional (Uzzi, 1997; Uzzi and Lancaster, 2004).

The social aspects in economic actions (Granovetter, 1985; Uzzi, 1997) also play an important role in the concept of an innovation ecosystem (Autio and Thomas, 2014) because they help explain the use of the horizontal and

vertical relationships between the various stakeholders of that ecosystem, in their pursuit of value creation and appropriation. Relationships between participants in the innovation ecosystem are symbiotic, if the system is successful then the participants will be successful (Li, 2009).

Innovation ecosystems can be coordinated by a central hub company or set of companies that drive the cooperative value creation, its capture and sharing (Iansiti and Levien, 2004). Past research showed that this coordination role, embedded in the relations of the ecosystem (Autio and Thomas, 2014), can also be a not-for-profit organization (Chesbrough and Appleyard, 2007). Having a balance between community values and value creation is necessary for developing relationships in the ecosystem which can foster the co-evolution towards a desirable, common objective (Autio and Thomas, 2014). The importance of social capital, its need for development in innovation research and in particular the link with the innovation ecosystem is deemed to be a research area with potential (West et al., 2014).

2.5.1 Theoretical link with the RBV

The RBV recognizes (to some degree) different types of resource, i.e. physical capital, human capital, and organisational capital (Barney, 1991). Social capital, i.e. relationships, needs to be added to this list because they are a strategic intangible resource (Chisholm and Nielsen, 2009; Huggins, 2010), being an integral part of the innovation ecosystem of a company (Autio and Thomas, 2014). It has also been discussed in more detail in the previous section of this dissertation (cfr. 2.5). Within the RBV, resources that are difficult to copy are socially complex, often trust enabled relationships between companies and inside the company (Barney, 2014). These relationships can therefore be a source of sustained competitive advantage (Dyer and Singh, 1998; Lavie, 2006) and innovation (Ahuja, 2000a; Pittaway et al., 2004; Zheng, 2010) for a company since they will facilitate exchanges between the actors in the innovation ecosystem (Dyer and Hatch, 2006; Gulati et al., 2012). In this dissertation the focus will be on alliances, creating strategic relationships for innovation and other beneficial outputs (e.g. reduced risk, reduced length of the internal innovation process, ...), and the embeddedness of these relationships in the innovation ecosystem as a facilitating element of exchanges and transactions. Although the social dimension is very important, having such relationships offering opportunities, does not imply that pursuing them will certainly lead to success (Adner and Kapoor, 2010; Greve et al., 2010). They can also create constraints that can

pose significant hurdles to innovation and collaboration (Granovetter, 1985; Uzzi, 1997; Lazzarini et al., 2008) in the innovation ecosystem. The company's ability to adapt and coordinate its resources when dealing with changes in its innovation ecosystem is influenced by its own social network (Kleinbaum and Stuart, 2014).

2.5.2 Strategic relationships (Alliances)

Leveraging relationships are a strategic asset (Mowery et al., 1996; Dyer and Singh, 1998; Das and Teng, 2000) and the RBV requires to take into consideration external resources and external capabilities in the innovation ecosystem (Lavie, 2006). Innovative companies were found to be able to manage structural holes (cfr. 2.5) in their network, hinting at their ability to use external capabilities and develop their own internal capabilities facilitating this (Zaheer and Bell, 2005). The collaboration between actors in the innovation ecosystem can be described as an alliance between two or more actors because alliances cover a wider spectrum of collaboration, with on the one extreme unique or short-term contracts and on the other extreme, the acquisition of a company (Contractor and Lorange, 2002). Strategic alliances (Gulati et al., 2000; Gulati et al., 2012) are infused with social elements and are hence a part of the social embeddedness of the innovation ecosystem (Autio and Thomas, 2014) In this collaboration the actors work together in a co-ordinated manner in pursuit of a shared or complementary goal (Christoffersen, 2013) and these strategic relationships (alliances) in the innovation ecosystem can benefit the generation of innovation ideas, better technology transfer (Nosella and Petroni, 2007), reducing the time needed for innovation (Hagedoorn, 2002) and other economic/technological opportunities. The importance of reciprocal social exchange mechanisms, for example commitment to the shared or complementary goal or trust through social embeddedness (Granovetter, 1985), are important for organisational learning during these strategic relationships (Muthusamy and White, 2005).

2.5.3 Relational embeddedness (Relationship quality)

A more detailed description on relational embeddedness and its positioning in social capital is available in a previous section (cfr. 2.5). Relational embeddedness is reported to stimulate the absorptive capacity of companies (Ebers and Maurer, 2014), indicating its contributions to organisational learning that will change the dynamic capabilities in a company (Winter, 2003). Relationships that are strongly embedded are known for being sources

of critical resources and information for innovation (Powell et al., 1996) yet these embedded relationships can suffer from lower collaborative commitment after a certain time and investment (Chang, 2011), in line with the paradox of social embeddedness (Granovetter, 1985). Despite this, the company can acquire competitive advantage through its embedded relationships through its more intense exchanges between the actors, joint problem solving and coordination (McEvily and Marcus, 2005).

2.6 Value creation

Defining value is always challenging (Woodall, 2003; Lepak et al., 2007). Before the increased focus on customers when developing new services, value creation was solely viewed from the producer (i.e. company) perspective where it meant returns for the owners of the resources (Sirmon et al., 2007) or adding value in the chain of companies (Porter, 1985). There is need to distinguish between value creation and value capture (Bowman and Ambrosini, 2000; Lepak et al., 2007). Value creation requires innovation as it must create (or reinforce) the use value for the customer or reduce exchange value (i.e. the price paid) for the customer (Priem, 2007). Value capture on the other hand refers to the appropriation of received payments from the customer, the ability of a company to keep those payments (i.e. exchange value) for itself and not need to redistribute it within the upstream or downstream value chain (Priem, 2007). This distinction refers to the situation that value creation does not necessarily result in value capture, nor by the originator of the value creation in the first place (Lepak et al., 2007). There are also discussions regarding the sources and targets of value creation, companies can be sources of value creation through their organisational capabilities but these tend to overlook the target users (Lepak et al., 2007).

The discussion of value (use or exchange) has highlighted possible tensions. Value for the company is usually sought where various producers add value through the value chain (Lepak et al., 2007). Once value has been created it needs to be produced and various models have been published in the literature related to the development of new services. The company's organisational capabilities (Menor and Roth, 2008) are needed in this process and dynamic capabilities (e.g. absorptive capacity) play an important role for acquiring and using new information and ideas from outside the company's boundaries, inducing change due to their learning experiences. A strategy for service development is also required to guide the alignment of resources and

capabilities to deliver the created value (Edvardsson et al., 2013). When co-creation happens, it is done in an embedded social context, customers evaluate value-in-use in a social context (Edvardsson et al., 2011). Social embeddedness (Granovetter, 1985), relational embeddedness in particular (Moran, 2005), can facilitate the creation of new services during the NSD process because it plays a stronger role in explaining innovation-oriented tasks. Relational embeddedness, since it refers to the quality of a relationship, will contribute to the need for reciprocity between actors during their interactions, an essential condition for joint co-creation of services (Grönroos, 2011).

In general, there has been an evolution in management research from a predominantly production focus of value creation, where the customer is marginally involved, referred to as value co-production (Ramírez, 1999), towards value creation where the customer plays an important role, referred to as value co-creation (Ramaswamy, 2011; Galvagno and Dalli, 2014; Ranjan and Read, 2014). The marketing stream of literature of Service Logic by the Nordic School (Grönroos, 2006; Grönroos, 2008; Gummesson, 2008; Grönroos, 2011) provides interesting insights on the interrelation of these two paradigms on the process of value creation itself. Value creation is also defined as the value-in-use for the customer (Grönroos, 2008). Marketing literature offers insights on these dynamics of the value creation process, which is a dialogical process where customer centric elements and production centric elements (Grönroos, 2011): “... merge into one integrated process of coordinated actions, where both parties are active, learn together and from each other, and may directly influence each other.” (p. 290) resulting in a (Grönroos, 2011): “Value-in-use creation model” (p. 291). The value creation process has two sides, value-in-use for the customer and exchange value for the company. This means that there is need for a phase where the created service is actually produced and delivered through front and back office operations (Grönroos, 2011). After the value creation process with the customer (i.e. co-creation), the company involved in this co-creation must produce this value-in-use with its organisational capabilities (i.e. co-production) and from there onwards the issue of value capture will need to be addressed. Value creation (use) and value capture (appropriation) is a characterizing element of the innovation ecosystem (Adner and Kapoor, 2010). A discussion regarding the distinction between value creation processes and value outcomes is also available in the literature (Gummerus, 2013).

Customers, regulatory agencies or technology providers are examples of the upstream (production side) and downstream (use side) activities covered by innovation ecosystems (Autio and Thomas, 2014). The involved actors can also co-evolve capabilities (Moore, 1996; Iansiti and Levien, 2004) leading to innovative outputs, in line with the importance of organisational learning and dynamics capabilities (Teece et al., 1997; Zollo and Winter, 2002; Winter, 2003; Teece, 2007). This value creation is also embedded in a social context where the actors learn and adapt their roles. Communication is essential for this interaction, being paramount for the transfer of information between the customer and the company (Edvardsson et al., 2011). In general, the value creation process is context sensitive and has been approached in marketing literature through various perspectives which emphasise the importance of relationships and the context surrounding this process of interactive exchanges (Normann and Ramírez, 1993; Normann, 2001; Vargo and Lusch, 2004; Grönroos, 2006; Grönroos, 2008; Michel et al., 2008; Vargo and Lusch, 2008a). However they all converge on the following point: it all happens outside classical boundaries of the actors and value creation will emerge, be co-created, at the intersections of resources made available through this external network (Chandler and Vargo, 2011).

2.6.1 Theoretical link with the RBV

Within the context of RBV, the value creation needs to be further researched since it does not provide enough details on that aspect (Kraaijenbrink et al., 2010; Barney et al., 2011). The RBV provides insights on the importance of value creation within firms (Lockett et al., 2009) but not how this can be done or through which mechanisms (Kraaijenbrink et al., 2010). The influence of demand side elements is for example generally overlooked within the RBV (Barney, 1991; Priem, 2007). This value creation dimension of the RBV has received a relatively recent uplift in research attention from the marketing stream of literature (Mele and Della Corte, 2013; Barney, 2014; Kozlenkova et al., 2014) despite calls more than a decade ago, that marketing literature on customer value offers complementarities for the sustained competitive advantage in the RBV (Srivastava et al., 2001).

In this dissertation the external influence of the ecosystem on the development of new services will be discussed. Taking into account that there is a need to consider co-creation (i.e. customer-centric) elements and co-production (i.e. producer-centric) elements for developing new services, the next section will focus on a framework where the customer is the most important and central

element for new service development, namely the S-D Logic (Vargo and Lusch, 2004). The notion of value creation with customers is as such not new in management research (Prahalad and Ramaswamy, 2000; Prahalad and Ramaswamy, 2004; Ramaswamy and Gouillart, 2010; Ramaswamy, 2011) but this was the result of an evolution from a more production oriented approach.

2.6.2 Service-Dominant Logic (Customer as co-creator)

The service dominant logic, also called S-D logic, was formulated as an evolution from the goods dominated logic (also called G-D logic) where tangible goods were produced (Vargo and Lusch, 2004; Vargo and Lusch, 2006). The S-D Logic also has an interesting approach to the types of resources that a company uses to develop new services, where it offers a possible answer to calls within the RBV literature to take into account the many different types of resources (Kraaijenbrink et al., 2010). The S-D Logic distinguishes between operant and operand resources (Vargo and Lusch, 2004). Operant resources are dynamic ones that are created/used, whilst operand resources are static ones that are consumed/depleted (Lusch et al., 2010). Otherwise described as (Vargo et al., 2008): “... *operant resources (those that act upon other resources), such as knowledge and skills, ... operand resources (those that an act or operation is performed on, such as goods).*” (p. 148). The core beliefs of this customer centric view on marketing and new service development are formulated in the Foundational Premises (FPs) of S-D Logic (Vargo and Lusch, 2008a) and the underlying conceptual transitions towards S-D Logic (Lusch and Vargo, 2006).

The S-D Logic is considered to be especially suitable for studying service innovations because it combines both services and tangible goods (Ordanini and Parasuraman, 2011) into an integrated overarching service view (Vargo and Lusch, 2006) which is consistent with synthesis approach for service research (Edvardsson et al., 2013). This approach is also the one taken in this dissertation (cfr. 2.2) and S-D Logic can also be used when considering an innovation ecosystem perspective (Ordanini and Parasuraman, 2012; Akaka et al., 2013), as in this dissertation. The S-D Logic is essentially actor oriented, relational (Vargo and Lusch, 2004; Vargo and Lusch, 2008a) and value is co-created with the customer through innovative resource integrations (Vargo, 2008; Vargo and Lusch, 2008a). The S-D logic considers both companies and customers as essentially resource integrators (Vargo and Lusch, 2006) acting in (socially embedded) networks where they learn (Lusch et al., 2010) and

develop dynamic capabilities (Zollo and Winter, 2002) that can lead to service innovation (Agarwal and Selen, 2009), echoing the co-evolution characteristic of innovation ecosystems (Autio and Thomas, 2014).

However S-D Logic has also not been without critique, especially from scholars of the Nordic School (Grönroos, 2006; Gummesson, 2008; Grönroos, 2011; Grönroos and Gummerus, 2014). The S-D logic is deemed not to be comprehensive enough for marketing management without considering the distinct yet intertwined customer and producers (Grönroos, 2008). Value creation has always two sides, the use value for the customer and the financial value (i.e. exchange value) for the company (Gupta and Lehmann, 2005). On the other side, the S-D Logic and Service Logic are found to have many features in common (Grönroos, 2006). Other researchers view co-creation as the main literature whereas S-D Logic has chosen a niche focus on one element (i.e. customer) of the bigger picture (Cova et al., 2011): *“The co-creation paradigm and its cousin in marketing, service-dominant (S-D) logic ...”* (p. 233). The S-D Logic has one of its FPs which states that the customer is always co-creator of value, but the implications of this are debated (Grönroos, 2011). The customer as the central value creator and resource integrator is plausible but this customer needs to receive these resources from somewhere. Hence the company will be the facilitator of the customers’ value creation (Grönroos, 2011): *“... the customer creates value, and the firm facilitates value creation”* (p. 289).

The basic point is that the customer and the company can both be co-creators of value. However this is not always the case as it depends on the direct interactions between them and the company’s decision to participate in the customers’ value creation processes (i.e. use value) with its production process (i.e. facilitate value). It is also possible that the direct interactions are missing or fail to meet the conditions of reciprocity, leading to a situation where the customer is involved (as a resource) in the production process of the company, making the customer a co-producer of potential value (Grönroos, 2011). The following section will focus on the more industrial view of new service development where the customer is involved, without being the centre of attention since the value pursued will be predominantly producer value.

2.6.3 New Service Development (Customer as co-producer)

The development of new services is important to meet the competitive pressures within services industries, hence requiring particular attention to the new service development (NSD) process (Menor et al., 2002) for creating new service offers. The NSD process refers to a set of resources for developing these new services which generally (Froehle and Roth, 2007): “... *focus on planning, defining, and executing the actual sequence of stages - design, analysis, development, and launch - the service firm follows when creating its new offerings.*” (p. 170).

However the exact amount and detail of the various stages remains much debated (Johne and Storey, 1998; Alam, 2002; Alam, 2006) as is the appropriate degree of formalization of the NSD process (de Brentani, 2001; Blindenbach-Driessen and van den Ende, 2006). Despite this, the NSD process has been a topic of interest for innovation management research within financial services (Thwaites, 1992; Johne, 1993; Kelly and Storey, 2000; Menor and Roth, 2008) and an overview of the evolutions in service operations and trends is also available in the literature (Chase and Apte, 2007).

Following the previous elaborations on the simultaneous character or product/service/process innovation in (financial) services (cfr. 1.1.4), design, development and decision problems in the NSD process are very similar to those taken during the new product development (NPD) process (Krishnan and Ulrich, 2001). The involvement of customers is also researched within the NSD process, receiving increased attention (Magnusson et al., 2003; Edvardsson et al., 2012). The social context of new service developments is left out of scope in extant research, leaving open the possible contributions of relationships between actors as a commitment to innovation (Edvardsson et al., 2011).

This element is also highlighted in the notion of the innovation ecosystem, the insights from NSD research are relevant since the innovation ecosystem has a simultaneous view on co-creation downstream, for example with the customer (Vargo and Lusch, 2008a), and co-production upstream, for example with a supplier (Chen et al., 2011). The innovation ecosystem is characterized by a dynamic value creation through co-creation and co-production, by collaboration between its network participants (Lusch et al., 2010), leading to new service offers (Autio and Thomas, 2014). The importance of involving customers in the new service development process has been discussed in the literature (Alam, 2002; Prahalad and Ramaswamy, 2004) and there is

agreement that it should be considered, despite possible drawbacks (Vermeulen, 2005; Dyer and Hatch, 2006; Ford et al., 2012), for co-creating new services because they increase the success of the innovation outcomes (Mahr et al., 2014) and one of the essential elements to run an effective NSD process (Froehle and Roth, 2007).

3. Research Design

The entire research process during the dissertation (but also in other research activities) is designed around a specific research paradigm which will influence the activities of the researcher in finding answers to the research question. This paradigm is a fundamental element and sets the boundaries for the research process. Secondly the type of reasoning adopted by the researcher will bridge the research paradigm with the actual research methodology. The methodology itself is defined by the chosen disciplinary approach and research methods, which both need to be compatible with the adopted research paradigm. Research methods themselves represent the smallest level of detail for the actual application of the research process, framed around the research paradigm.

3.1 Paradigm

A paradigm is definable as a set of beliefs, values and techniques regarding the nature and conduct of research within a given research community (Kuhn, 1962). Differently stated, paradigms are (Guba and Lincoln, 1994): "... *basic belief systems based on ontological, epistemological, and methodological assumptions*" (p. 107). Because it's a belief system with various layers, it implies that a paradigm can create different views of the same research topic across several, specific research communities. This is especially the case in the social sciences, which includes management science (Avenier and Gavard-Perret, 2008).

The ontological assumptions refer to the view that a researcher has on the types of things that exist, if these can be part of a reality (i.e. something that is not being imagined) that is observable through investigation. The basic questions surrounding the meaning of things and their associations refer to ontology. Therefore an important ontological question in (management) science deals with the ability of a theory to represent reality (Kilduff et al., 2011).

Epistemology refers to the study of what constitutes (legitimate) knowledge, making a distinction between an opinion and a justified belief (Steup, 2014). It is often referred to as the philosophy of science (Avenier and Gavard-Perret, 2008) since it intends to answer questions such as for example: What is knowledge? What are its origins and its limits? When is knowledge valuable?

Therefore any researcher should reflect on epistemology because the ultimate objective of research activities is to produce valid knowledge. The underlying conditions of knowledge validity are therefore important to justify the significance of newly created knowledge (i.e. research results). An epistemological discussion tries to determine how researchers “know” certain things, how they “claim to know” these things or commonly “believe to know” these things. The objective of epistemology is therefore to explain the grounds for rightly believing these things, often referred to as the justification conditions (Pollock, 1968).

However epistemology should not be confused with the research’s methodology (Piaget, 1967) since methodology refers to the approach that will be used by the researcher to engage the topic of interest and generate new knowledge. Epistemology will stimulate thought on the appropriate research practices and analysis techniques, to generate what is defined as being knowledge, and meet the validity criteria for this generated knowledge.

In the field of management the dominant paradigms are, roughly, representable by two groups, the positivist and the constructivist paradigm (Avenier and Gavard-Perret, 2008). The first group disposes of a (Reichardt and Cook, 1979): “... *hypothetico-deductive, particularistic, objective, outcome oriented, and natural science world view*” whilst the second group emphasises “... *inductive, holistic, subjective, process-oriented, and social anthropological world view*” (p. 9-10). Each group has its own, recognized and explicit assumptions but within each group there can be several sub-groups. These sub-groups are subject to debate and hence it is deemed difficult to classify these sub-groups within the field of management research. The fact that different denominations of the sub-groups can refer to the slightly different characteristics does not facilitate unambiguous distinctions (Avenier and Gavard-Perret, 2008). The differences between the positivist and constructivist paradigm are significant and therefore tensions and discussion in the various management research communities should not come as a surprise. There were even discussions regarding the scientific nature of management itself (Gulick, 1965; Gribbins and Hunt, 1978). Besides the debate on the legitimate paradigm of management science itself (Knights, 1992; Hunt, 1994; Tsoukas, 1994; Fabian, 2000; Ghoshal, 2005; Reed, 2005), the rigor-relevance discussion and the academic-practitioner knowledge gap still receives a lot of scholarly attention (Aram and Salipante, 2003; Kieser and Nicolai, 2005; Pfeffer, 2005; Van De Ven and Johnson, 2006; Shapiro et

al., 2007; Hodgkinson and Rousseau, 2009; Kieser and Leiner, 2009; Kieser and Leiner, 2011; Sandberg and Tsoukas, 2011; Birkinshaw et al., 2014).

The paradigm for this dissertation

The constructivist paradigm (Guba and Lincoln, 1994) will be chosen because the researcher also believes that there is no absolute truth in management science. More generally speaking, science is never a truly objective inquiry, solely based on formal logic and experimentation. This also explains the existence (and importance) of different research communities around a research topic (Kuhn, 1962). Besides the personal belief of the researcher, the main research question itself (*How does the innovation ecosystem influence the innovation process within financial services companies?*) requires a paradigm that embraces a process-oriented view of the world, one where the intertwined interactions between people and their artefacts (e.g. technology and organizations) are recognized. The managerial issues faced by people can often be conceptualized in a variety of ways and therefore management science should avoid being constrained by the (Bettis, 1991): "... *normal science straightjacket*" (p. 315). The social context of management science needs to be considered because the artefacts made by people have intersubjectively created meaning without an equal in natural science (Lee, 1991). This is especially the case for innovation because this phenomenon cannot exist without a social context for creating and recognizing it (i.e. innovation per se can only have a subjectively created meaning). Additionally, the concept of an innovation ecosystem itself is an artefact all about complexity and interrelatedness in business and its management (Moore, 2006; Autio and Thomas, 2014). The constructivist paradigm for innovation research is therefore defensible because it is a (Crotty, 1998): "... *view that all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context*" (p. 42).

When following the constructivist paradigm, the legitimation of the research process and its generated research results is the key element for its validation (Avenier and Gavard-Perret, 2008). This will be discussed in more detail further on in section 3.5 and Table 3 provides an overview of the constructivist paradigm with its consequences for subsequent research activities.

Table 3: Constructivist paradigm (Guba and Lincoln, 1994)

Paradigm assumptions	Questioning	Consequences for research activities
<i>Ontology</i>	What is the form and nature of reality and, therefore, what can be known about it?	Multiple realities can exist since they are mental constructions that are experientially and socially created. There are no natural or other causal laws directing these realities (i.e. relativism). The observed realities (i.e. results) are more or less informed and/or sophisticated.
<i>Epistemology</i>	What is the nature of the relationship between the knower or would-be knower and what can be known?	The researcher is not separable from the researched (observed) topic (i.e. subjectivism). The results are created along the process of investigation itself (i.e. transactional).
<i>Methodology</i>	How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known?	Interactions between the researcher and the topic will lead to refinements of the observed reality (i.e. hermeneutical). Consensus construction leads to more informed and/or sophisticated results compared to the previously reported constructions.

3.2 Reasoning

The scholarly reasoning underlying management science (inductive, deductive and abductive) is an important intermediary step between the paradigm of the research and the actual methodology that will be deployed. It is actually part of the justification of new knowledge in a given research community and will guide the generation of explanations (Mantere and Ketokivi, 2013). The scholarly reasoning needs to be complemented with the cognitive reasoning

process of the researcher, to illustrate the creative thought processes behind theoretical innovation in management research (Cornelissen and Durand, 2014). This complementary element also provides stronger foundations to the deductive, inductive or abductive reasoning that can be applied during the research process.

Inductive reasoning

This form of reasoning starts from the observed data and makes its conclusions emerge from this data (Brown and Eisenhardt, 1997), hence it also referred to as bottom-up approach where the researcher goes from the particulars to the general (Shepherd and Sutcliffe, 2011). Induction recognizes the complexity of management phenomena in their context specific settings and tries to understand these as such. Its aim is therefore to create new knowledge about how things work, why they work in a specific way, and how we can make sense of them in a way that they might be changed (Eriksson and Kovalainen, 2008).

Deductive reasoning

It is characterized as being a top-down approach and somewhat antagonistic to inductive reasoning (Shepherd and Sutcliffe, 2011). The researcher will draw a conclusion for the particular by relying on the general, by using logical consequences and repeated observations from existing knowledge (Mantere and Ketokivi, 2013).

Abductive reasoning

In this type of reasoning, initial doubt will play an important role since explanatory associations are generated by the researcher in the search for explanations (Peirce, 1878; Cornelissen and Durand, 2014). More precisely, abduction seeks the best possible explanation among a set of explanations for a given observation (Lipton, 2004). There is an interplay between conceptualization and observations where the researcher starts with an expectation, and is required to work backward to create a plausible explanation from a theory (Van Maanen et al., 2007). Abduction produces the best possible explanation (i.e. preconceptions), which initially appears to fit into an organized pattern of theoretical concepts (Paavola, 2004). When this preconception is still doubted, attempts to resolve it are made to finally create a stable belief (Burks, 1946). These are exploratory tested to verify the initial

expectations and this feedback is used to modify the initial explanation (Shepherd and Sutcliffe, 2011).

Abductive reasoning hence implies consecutive iterations between the theory, the concepts used and the observations, to better understand the context and build new knowledge by creating intelligent representations. The produced knowledge does not necessarily manifest itself in predictive theories nor normative rules (Avenier and Gavard-Perret, 2008). Abductive reasoning, within the field of management science, has also been referred to as systematic combining (Dubois and Gadde, 2002). It has a stronger reliance on theory compared to inductive reasoning but it is less strictly adhering to a previously developed theory compared to deductive reasoning. Abductive reasoning will construct propositions based on existing theory and make them testable in an empirical setting. This is not the same as with inductive reasoning where the theory will be created from the empirical data itself. Abductive reasoning is therefore focused on a framework constructed by the researcher, which is evolving along the research process due to the feedback from the empirical results and new theoretical insights gained over time (Dubois and Gadde, 2002).

The reasoning for this dissertation

The scholarly reasoning will be abductive and it is appropriate within the constructivist paradigm because the knowledge it helps produce is intended to advance the understanding of the empirical situation through a heuristic research guide (i.e. evolving framework) stimulating reflexion and direction along the research process. Its iterations between existing theory and the empirical setting stimulate the development of plausible research propositions by the researcher (i.e. subjective inference), while emphasizing the process-oriented (i.e. interrelatedness) and social anthropological world view (i.e. complexity and artefacts) of the constructivist paradigm. In order to complete the previous, the cognitive reasoning process in the dissertation is best described as being (Cornelissen and Durand, 2014): “*Heuristic analogies*” (p. 1002) because the innovation ecosystem has its conceptual origins in natural sciences (Jackson, 2011) which will be combined with existing management theories to provide a reconceptualization to stimulate theory development (Cornelissen and Durand, 2014).

The chosen reasoning is also relevant for the main research question (*How does the innovation ecosystem influence the innovation process within financial services companies?*). Abductive reasoning will facilitate the further development of innovation ecosystem theory whilst a conceptual framework facilitates sufficient intellectual control over the social context with its subjectively created meanings. The latter being the case for management research and certainly the notion of an innovation ecosystem. The creation and evolution of a conceptual framework will help the researcher to avoid (Weick, 1979): “... *describing everything, and as a result describe nothing.*” (p. 38).

3.3 Methodology

3.3.1 Disciplinary approach

Methodology will also focus on how to practically organise the required research, hence the need to consider the disciplinary approaches in the management research communities. A disciplinary approach defines the organisational system (or set-up) that a researcher prefers when identifying, creating and legitimizing the research activities. It refers to the content of management research and hence distinguishes itself from the chosen paradigm and epistemology. There are various disciplinary approaches in management research, which can be summarized in a typology for research approaches (Fabian, 2000).

The proposed typology is based on three groups of criteria and the first one refers to the evolution of paradigms for management research’s development: the emphasis is towards a unified paradigm (solidarity), or a selected few paradigms (integration), or no dominant paradigms (segregation). The second group of criteria deals with the epistemological views on the purpose of research, either developing existing knowledge in more depth or extending what knowledge is researched (leading to more breadth). The last group of criteria considers the quality standard for the validation of the new knowledge that is created from research, requiring a single standard of quality or multiple standards for different kinds of research (Fabian, 2000).

This dissertation’s disciplinary approach is best described as *interactionism* because it (Fabian, 2000): “... *emphasises resolving differences between theoretical perspectives – making the development of theories and studies that*

bridge different perspectives a prominent goal of management science.“ (p. 357). In this approach, the evolution towards a few paradigms is important and includes theoretical insights that are originated in another domain, falling into the category of integration. Secondly the focus on creating knowledge breadth characterises this disciplinary approach for management research by enriching the insights. Finally the validation is enhanced through a universal quality standard for comparison because the focus is on the creation of dialogue to meet the reality of management which is multi-composite (i.e. requiring a bridging between perspectives).

3.3.2 Research methods

In line with the constructivist research paradigm, the methods for researching the topic of this dissertation will be mainly qualitative data collection and analysis. Such methods aspire to develop theory through an exploration of the phenomenon (Patton, 2001). Qualitative methods are well suited to address “how” research questions and their processual analysis (Pettigrew, 1997), therefore being appropriate research methods to the main research question of this dissertation.

The qualitative research methods (i.e. sampling, data collection and analysis) used in this dissertation are: semi-structured interview, case study and Qualitative Comparative Analysis (QCA). Qualitative analysis involves the organisation and categorisation of the data (i.e. coding) followed by synthesizing and pattern searching (Dey, 1993). To this must be added the importance of existing theory for the abductive reasoning (i.e. the need for a literature review but which does not need to be as exhaustive as with a deductive reasoning). It leads to the development of a conceptual framework with plausible research propositions as a basis for applying these methods but it also evolves due to the analysis itself (Dubois and Gadde, 2002; Dubois and Gadde, 2014). There is a growing interest for qualitative research methods in management science (Lowe and Gardner, 2000; Gephart Jr, 2004) and its continued acceptance (Bansal and Corley, 2012; Bettis et al., 2014). The specific data sources and applied methods in every publication will be discussed in their dedicated sections (4.3 to 4.7).

Semi-structured interview

The use of interviews facilitates a direct and more personal contact with the research participant. It is one of the most widespread qualitative techniques in

management research where the data is jointly generated by the researcher and the interviewee. There are various types of interviews depending on the number of participants, the type of data sought, the research objective or the expected degree of interaction between the researcher and the interviewee. (Gavard-Perret et al., 2008).

The semi-structured interview is used when a balance is sought between the degree of exploration with the interviewee and the preselected themes of interest related to the research question. It is recognized as a verbal research technique to collect information with a flexibility and a specific purpose in mind (Pinto and Grawitz, 1967). Therefore the creation of the interview guide is essential for this type of interview because the researcher must prepare the verbal exchange with targeted, yet open questions. There is a need to transform what is of research interest in domains and interview questions which are easy to understand by the interviewee (Mason, 2002).

Case study

A case study should be considered when the focus of the research is on “how” and “why” questions, where the contextual conditions are important due to the blurred boundaries between this context and the researched phenomenon (Yin, 2003). Within qualitative methods, a case study has also been identified as offering one of the most interesting research opportunities because they generate rich descriptions and insights on a phenomenon in its empirical setting (Eisenhardt and Graebner, 2007; Siggelkow, 2007). Certain information can even be impossible to obtain other than through a case study (Sykes, 1990) for example when research needs to explore a process and its different outcomes (Pettigrew, 1992; Hartley, 1994). When selecting a case it needs to be based on the likely influence of the various organisations and the interviewees on the research question (Gerring, 2007).

Existing theory has a role in a case study because the results of the case study need to build on it, which is not necessarily statistical generalisation (Stoecker, 1991; Yin, 2003). The credibility and transferability of a case study should therefore be evaluated by looking at its theoretical (analytical) generalisation (Mitchell, 1983; Yin, 2003). However the use of multiple case studies in the same context supports the transferability of the results (Eisenhardt, 1989; Yin, 2003). Nevertheless a single case study can be legitimate and interesting from a research point of view because it can provide (Siggelkow, 2007): “... a very powerful example” (p. 20). Abductive

reasoning was discussed as an appropriate reasoning to produce such an incisive single case study (Dubois and Gadde, 2002; Dubois and Gadde, 2014).

Qualitative Comparative Analysis (QCA)

Qualitative Comparative Analysis (QCA) is a method that allows a systematic comparison between cases (respondents), while preserving an appreciation of the within-case complexity (Rihoux and Ragin, 2008). The primary objective of QCA is to identify, and compare, which configurations of conditions result in the outcome of interest, typically distinguishing which conditions are necessary and which are sufficient for the outcome to occur. This method has been applied in strategy and organisation research and is useable with many theories (Fiss, 2007; Grandori and Furnari, 2008; Greckhamer et al., 2008; Fiss, 2011; Rihoux et al., 2013) and was also listed as an alternative method to consider in information technology innovation research (Fichman, 2004). However it has not been used for innovation ecosystem research despite its potential contributions (e.g. which relationships are necessary and sufficient for co-evolution?).

The technique is particularly useful when there are a relatively small number of cases to analyse, since probabilistic statistical methods require more input (Rihoux, 2003). This method is also suited for small-N analysis of more complex causalities (Pajunen, 2008). A set-theoretic approach has strong advantages for studying customer involvement in innovation studies. QCA facilitates researching which causal elements combine into configurations of necessary and sufficient conditions for the outcome that is studied (Rihoux and Ragin, 2008). Specifically, this systematic approach will look for patterns that are consistent along the different cases (Rihoux and Ragin, 2008).

The Crisp Set Qualitative Comparative Analysis (csQCA) technique is the commonly used version and is also the most suitable for the smaller amounts of cases and causal conditions in our set. This technique of QCA uses exclusively binary variables as inputs as recognized as a genuine methodological innovation (Gerring, 2001) and it aims to develop a middle road between qualitative and the quantitative approaches (Ragin, 2008b; Ragin, 2008a).

3.4 The empirical setting and its features

The Grand Duchy of Luxembourg, more generally referred to as Luxembourg, is one of the Member States which has been experiencing significant growth from its services economy. Luxembourg is ranked third among the leading developed countries in the world who export financial services, amounting to 60% of its total service export (UNCTAD, 2012). On the other hand it is first among the leading developed countries concerning financial services import, representing around 51% of its total service imports (UNCTAD, 2012). It represents an interesting empirical setting for innovation studies, especially for knowledge-intensive business services, such as financial services (Schricke et al., 2012). About $\frac{1}{4}$ of Luxembourg's employment market deals with knowledge-intensive activities, the highest proportion within the European Union and nearly the double of the EU average. The exportation of knowledge-intensive services, as part of the services export, is also the highest within the European Union. These facts illustrate the importance of the country's specialisation in the financial services sector, which is considered to be the main growth engine over the past three decades (European Commission, 2013b).

Research and innovation investments in the Luxembourg services sectors amount to 53% of all private R&D and innovation expenditures in the country. Financial services in particular represent 23% within the services sector, and the dedicated financial services innovation investments even tripled from 2003-2007. However these investments dropped by 27% in the following two years (European Commission, 2013b). The overall economic turbulences affecting the global financial markets also hit Luxembourg, causing the overall level of innovation investments in this services sector to go down as well. A possible reason for this is the change in the income structure of financial services providers, shifting from intermediation to commissions and transactions fees. The latter's importance in Luxembourg has more than tripled over the past three decades, and commissions/fees are known to be prone to variations in the overall economic environment (Bourgain et al., 2009). Despite this, the level of R&D and innovation investments is considered to be high and especially significant for the financial services sector (European Commission, 2013b). In general, the financial services industry is economically very important, it represents approximately 30% of the country's tax revenues (Luxembourg for Finance, 2012) and it contributes to almost 26% of its gross domestic product (Luxembourg for Finance, 2014b).

The growth in investment services from Luxembourg merits particular attention and some more details. It is the largest fund centre in Europe, occupying 27% of the market for investment fund domiciles in Europe (e.g. France is second with about 16% and Ireland is fourth with about 14%), accounting for 32% of the European market for assets under management (e.g. France is second with about 16% and Ireland third with 15%). The central location of the country within the European Union is also noticeable by its importance for cross-border business activities, accounting for 68% of the entire cross-border market for European fund distribution (Luxembourg for Finance, 2014b). Luxembourg also represents the second largest domicile of funds worldwide, next to the USA which is by far the largest. For example, Luxembourg represents about 9.5% of the domiciled funds worldwide, whilst the USA represents roughly 50% of this global market. By comparison, the third and fourth largest domiciles of investment funds are France and Ireland with each 4.5% of the world market in investment funds (EFAMA, 2014). A smaller EU Member State, such as the Grand Duchy of Luxembourg, plays therefore a significant role in the global fund industry.

Recent developments that further demonstrate the importance of Luxembourg for international financial services include the creation of the largest cross-border Renminbi Yuan (RMB) business in the Eurozone (Luxembourg for Finance, 2014a) or being one of the leading Islamic finance centres in Europe, ranked 5th worldwide (Luxembourg for Finance, 2014c). According to the Luxembourg Financial Services Regulator (CSSF) there are currently 148 banks in Luxembourg, of which the country of origin is usually a member of the European Union. These include (among other) 33 banks from Germany, 15 banks from France, 10 banks from Italy, 9 banks from the United Kingdom and 7 banks from Belgium (CSSF, 2014). Countries of origin from outside the European Union include Switzerland (12 banks), People's Republic of China and the United States of America (6 banks each), Brazil and Japan (5 banks each), Israel and Qatar (3 banks each), Canada, Norway, the Russian Federation and Andorra (2 banks each), and finally Turkey and Liechtenstein (one bank each).

The banking institutions in Luxembourg employ roughly 26 000 people, the regulated companies who do not have a banking licence (i.e. Professionals of the Financial Sector) employ more than 14 500 people and the management companies employ more than 3 250 employees, bringing the total direct employment in the banking sector to more than 44 000 jobs (KPMG, 2014). This fact excludes other professional service providers (e.g. consultants) who

have banking institutions as their customers. Luxembourg as a financial centre is ranked 12th worldwide, moving up one place compared to 2013, belonging to the top of Europe, being well regarded and the only other European centres scoring better are Frankfurt, Geneva, Zurich and London. It is also listed among the 10 centres likely to become more significant and Luxembourg's profile is characterized as an emerging global contender (Z/Yen Group, 2014).

3.5 Assessing research quality

At the end of the research process a set of results is obtained and these need to be assessed in order to judge their quality. Within the positivist paradigm, this assessment is done by discussing the validity (which is decomposed into internal and external validity), the reliability and the objectivity of the obtained research results by applying quantitative research methods (Lincoln and Guba, 1985).

Internal validity focuses on the credibility of the obtained results by taking into account the used methods, the sample and its measurement. External validity focuses on the transferability of the research results, taking into account their representativeness for similar contexts and theoretical generalizability. The reliability of the research results focuses on their stability, that these results are independent of the researcher and research context (Avenier and Gavard-Perret, 2008).

However the research in this dissertation was created by following the constructivist paradigm with qualitative research methods. In such a setting, the positivist criteria for research quality need to be revisited and specific attention must go to the particularities of the constructivist paradigm and qualitative research methods. First of all the quality of the research results needs to be rephrased and interpreted as the trustworthiness of the research results (Lincoln and Guba, 1985; Wallendorf and Belk, 1989). Or said otherwise, the legitimation of the research results obtained through a constructivist paradigm with qualitative methods, can be judged by evaluating their trustworthiness (Avenier, 2010). In order to make this evaluation, the following evaluation criteria for trustworthiness were defined (Table 4): credibility, transferability, dependability, confirmability (Lincoln and Guba, 1985) and integrity (Wallendorf and Belk, 1989).

Table 4: Evaluating research results in a constructivist paradigm

Trustworthiness (i.e. research quality)	Main question for the evaluation (Wallendorf and Belk, 1989, p. 69)	Same, yet different criteria in a positivist paradigm
<i>Credibility</i>	How do we know whether to have confidence in the findings?	Internal validity
<i>Transferability</i>	How do we know the degree to which the findings apply in other contexts?	External validity
<i>Dependability</i>	How do we know the findings would be repeated if the study could be replicated in essentially the same way?	Reliability
<i>Confirmability</i>	How do we know the degree to which the findings emerge from the context and the respondents, and not solely from the researcher?	Objectivity
<i>Integrity</i>	How do we know whether the findings are based on false information from the informants?	Objectivity

Credibility intends to find out if the research findings are adequate and credible representations of constructed reality of the researcher. It is therefore important that the results presented by the researcher are sufficiently complete and plausible. The required countermeasures to warrant such credibility of the research results can be observation, debriefings by peers (i.e. validation by experts), member checks (i.e. informant feedback), triangulation (i.e. data sources, literature, methods and researchers) and prolonged engagement with the research participants (e.g. length of interviews). This facilitates

redundancy and saturation in the data collection while enhancing the interpretation of the data (Lincoln and Guba, 1985; Wallendorf and Belk, 1989).

Transferability wants to assess the ability of the generated results in a given context can be applicable in a different context. Warranting transferability can be achieved by a purposive sampling of the type of informants in the given context, paying attention to the fine-tuning of the research's conceptualization of the observed reality (i.e. confirming and challenging the underlying theory) and triangulation across sites (Lincoln and Guba, 1985; Wallendorf and Belk, 1989). Demonstrating external validity through a statistical representativeness is often not possible in qualitative research since the objective is not necessarily to obtain such type of representativeness. The researcher should also elaborate on the transferability within a broader societal (e.g. business) context (Gavard-Perret and Helme-Guizon, 2008).

Dependability seeks to estimate the possible changes that affect the context of the research of the informants providing the data, ultimately affecting the initial data collection and interpretation. The best warrant for dependability is a longitudinal approach to the research context itself. Otherwise observations, member checks and debriefings with peers can also provide assurance regarding the dependability of the research findings, paying attention to the possible sources of change. The researcher should legitimize how the continuous changes affecting the research context might have influenced the data, the methods or their analysis, during the entire research process (Lincoln and Guba, 1985; Wallendorf and Belk, 1989).

Confirmability evaluates the documentation of the research process that delivered the results. This encompasses the overall traceability of the data collection, the analysis and the formulation of the results. For example the elaboration of the interview guide can be documented or a description of the different steps taken by the researcher for the analysis. Possible warrants for confirmability are therefore triangulation and a confirmability audit where the coherence between data and the results is examined. Verbatim material, research decriptions and analysis reports are therefore valuable inputs for any evaluation of the research results (Lincoln and Guba, 1985; Wallendorf and Belk, 1989).

Integrity refers to the possible biases in the research results due to intentionally wrong, misleading or deceiving data provided by the informants

to the researcher. It is an extension of the important to remain curious and critical throughout the entire research process. Possible warrants for integrity are the prolonged engagement with the interviewee to develop trust, triangulation (i.e. across data sources, methods and researchers), having a good interviewing technique (e.g. having understandable questions, reframing of questions and self-revelation) and safeguarding informant identity (Wallendorf and Belk, 1989).

The measures to be taken by researchers following a constructivist paradigm for legitimizing their generated knowledge are summarized in Table 5.

Table 5: Warranting the trustworthiness of the obtained results

Evaluation criteria	Measures which can be taken by the researcher
<p><i>Credibility</i> How do we know whether to have confidence in the findings?</p>	<ul style="list-style-type: none"> • Observation • Debriefing by peers (i.e. validation by experts) • Member check (i.e. informant feedback) • Triangulation (i.e. data sources, literature, methods and researchers) • Prolonged engagement with the research participant (e.g. length of interviews)
<p><i>Transferability</i> How do we know the degree to which the findings apply in other contexts?</p>	<ul style="list-style-type: none"> • Purposive sampling • Triangulation across sites
<p><i>Dependability</i> How do we know the findings would be repeated if the study could be replicated in essentially the same way</p>	<ul style="list-style-type: none"> • Longitudinal approach • Observation • Member check • Debriefing by peers
<p><i>Confirmability</i> How do we know the degree to which the findings emerge from the context and the respondents, and not solely from the researcher?</p>	<ul style="list-style-type: none"> • Triangulation • Confirmability audit • Documented research process

<i>Integrity</i> How do we know whether the findings are based on false information from the informants?	<ul style="list-style-type: none">• Prolonged engagement with the interviewee• Triangulation• Having a good interviewing technique• Safeguarding informant identity
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Throughout the research process, the necessary measures were taken to warrant the trustworthiness (i.e. research quality) of the findings in the dissertation. The publications their trustworthiness will be discussed in sections 4.3 to 4.7 of the dissertation.

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4. Summary of publications

This section will provide a high level view on the five publications, followed by a more detailed breakdown per publication. Their individual objectives, research methods, data sources, research results and research quality (i.e. limitations) will be discussed.

Each of the intersections is related to a paper of this dissertation, except for publication 1 which is the starting point for focusing on actors within the innovation ecosystem. The links with the publications per conceptual juncture will be shown in Table 6. The main contributing publication to each juncture of the conceptual model is listed in bold. However some elements of the other publications also provided insights on the juncture, but they were not critical to researching the central concepts of interest in that specific juncture of the conceptual framework.

Table 6: Conceptual Framework and contributions from publications

Juncture	Central concepts	Accompanying research
1	Absorptive Capacity Service-Dominant Logic	Main contributor to juncture 1 Publication 2 Complementary insights by Publication 3 Publication 5
2	Organisational Learning Strategic Relationships	Main contributor to juncture 2 Publication 3 Complementary insights by Publication 4 Publication 5

3	New Service Development Relational Embeddedness	Main contributor to juncture 3 Publication 4 Complementary insights by Publication 2 Publication 5
4	Service-Dominant Logic Absorptive Capacity Strategic Relationships	Main contributor to juncture 4 Publication 5 Complementary insights by Publication 2 Publication 3

The relation of publication 1 with the others in the Conceptual Framework will be shown in Figure 5. An overview of the publications, their individual contributions and their contributions to the overall research question of the dissertation will be made available in Table 7.

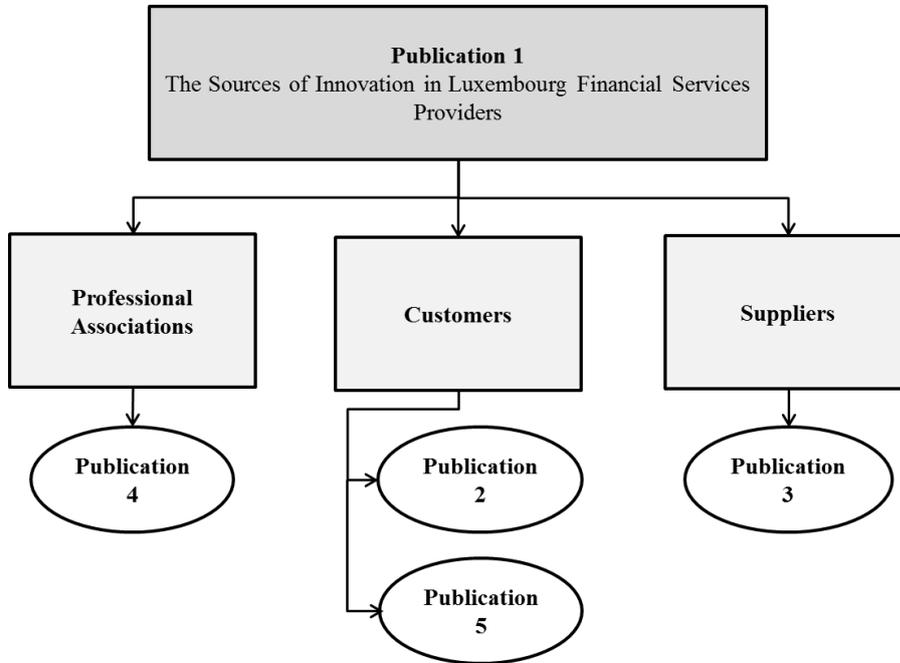


Figure 5: Origination of the publications

4.1 Contributions to the research question

Table 7: Contributions from publications to the main research question

Publication	Individual research question(s)	Individual contribution(s)	Contribution(s) to the main research question: “How does the innovation ecosystem influence the innovation process within financial services companies?”
1	<ul style="list-style-type: none"> • What are the important sources of information for innovation in Luxembourg financial services? 	<ul style="list-style-type: none"> • Cooperation with customers is relevant for new to market innovation. • HNWI (customer segment), consultants and professional associations are likely to be important external partners. • Organisational capabilities (e.g. absorptive capacity) are needed to facilitate this external cooperation for innovation. 	<ul style="list-style-type: none"> • Cooperation within the Luxembourg financial services sector is characterized by use side and production side participants. Innovation does not only necessarily result from isolated initiatives by a focal company but is likely from intra-industry cooperation as well. • The innovation process in this setting is likely to be complex since various stakeholders were found to be a driving force. • Financial services companies also need to make resource allocation decisions to manage their innovation ecosystem and the connection of it to their internal innovation process.
2	<ul style="list-style-type: none"> • What type of customer contributes to financial service innovation? • To what extent are customers good sources of original, valuable and realisable ideas? • To what type of innovation does the customer contribute in the financial services industry? 	<ul style="list-style-type: none"> • New service innovation (in the core service offer) can be obtained by involving the HNWI customer segment. • Involving customer in the development of new services is necessary but not sufficient. • Customer involvement without original or valuable ideas can still result in new to the company innovation. 	<ul style="list-style-type: none"> • The involvement of customers (i.e. use side participants) in the Luxembourg financial services sector is focused on a dedicated customer segment. Individual companies seeking service innovations should therefore not overlook this group in the innovation ecosystem. One of the characteristics of a healthy innovation ecosystem is its ability to create niches, as illustrated with HNWI in this setting. • This purposive cooperation with the customer leads to value co-creation, which will eventually need to be co-produced with the financial services companies' technology and other knowledge intensive service providers. This illustrates the dynamics in the innovation ecosystem to develop new service offers by exploring, seeking and exploiting (e.g. technological) complementarities and competences.

<p>3</p>	<ul style="list-style-type: none"> • How can learning mechanisms influence the contributions of social capital to external knowledge acquisition from innovation partners? 	<ul style="list-style-type: none"> • Formulation of research propositions within the context of the financial services industry. • Formulation of measurement constructs for structural and policy learning mechanisms. 	<ul style="list-style-type: none"> • The ecosystem needs to be able to deliver innovation leading to new markets, by co-developing capabilities. This can be done by paying managerial attention to the underlying organisational learning mechanisms of these capabilities that might lead to new service offerings. • Cooperation with production side participants will foster this co-development and hence influence the internal innovation process of the company. • Relationships among the actors in the ecosystem are a pivotal element, facilitating this co-development of capabilities, their value production and innovation process.
<p>4</p>	<ul style="list-style-type: none"> • How was financial innovation developed in Luxembourg? • How does regulation influence the innovation process in the Luxembourg financial services sector? 	<ul style="list-style-type: none"> • New financial service innovation can be created by regulation (and vice versa). • Leveraging network relationships through industrial associations facilitates new financial service development. 	<ul style="list-style-type: none"> • The significance of embedded relationships among actors of the innovation ecosystem is illustrated, how these are symbiotic and how each actor benefits if the ecosystem as a whole gains from the joint efforts. • The individual innovation process of a financial services company in Luxembourg will be enriched by the contributions from other companies active in professional associations. • The coordination through the professional associations fosters performance in the innovation ecosystem through value creation and value appropriation (sharing among the actors in the ecosystem). • The informal mechanisms of exchange through the professional associations and regulatory bodies facilitate the internal innovation process in a financial services company. They also provide the needed control on the information flows and act as a conduit for primary development initiatives in the overall ecosystem.

5	<ul style="list-style-type: none"> • How can customers contribute to new financial services? • What facilitates the use of external knowledge from customers? 	<ul style="list-style-type: none"> • Formulation of research propositions in the context of the financial services' industry. • Policy and structural learning mechanisms are expected to facilitate absorptive capacity and consequently facilitate the co-creation of new services innovation. 	<ul style="list-style-type: none"> • A financial services company must invest in capabilities (e.g. absorptive capacity) to realize service innovation through co-creation with use side participants from its ecosystem. • Value creation with use side participants can lead to new combinations of resources and evolution in the innovation ecosystem itself (e.g. introduction of a new actor). This induces changes to the company's innovation process because these new relationships can burden existing control mechanisms for information flows or foster new (technological) complementarities.
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4.2 Contributions to the sub-research questions

Following the summary in the previous section dealing with the individual contributions of the publications to the main research question, another summary will be made to highlight the contributions of the publications to the sub-research questions. The basis for this discussion is Table 1.

Table 8: Contributions from publications to the sub-research questions

Publication	Contribution(s) to sub-research question
1	The actors in the innovation ecosystem of Luxembourg financial services companies that are preferably engaged for collaborative activities are customers, consultants and the professional associations (cfr. SRQ 1).
2	<p>Collaboration in the innovation ecosystem requires attention to the management of these collaborations and steering the innovation activities. In particular for financial services, the downstream value creation efforts (cfr. SRQ 4) with a specific customer group (HNWI) can be promising, also requiring organisational capabilities to cover the inbound and outbound oriented innovation activities (cfr. SRQ 2).</p> <p>This collaboration with these selective customers (cfr. SRQ 1) was found necessary and sufficient for creating financial service innovation in the core service offer within this research context.</p>
3	<p>The relationships in the innovation ecosystem can actually foster the learning and development of organisation capabilities that are needed for creating new financial services (cfr. SRQ 3).</p> <p>Organisational learning itself requires attention to its structural and policy and mechanisms that will ultimately drive the organisational capabilities of a financial service company (cfr. SRQ 2).</p> <p>The organisational learning has also its implications for value creation with the innovation ecosystem (cfr. SRQ 4) because these are indirectly influencing the capability of the financial services company to successfully manage collaboration for value creation.</p>
4	<p>The enhancing and constraining elements of relationships in the innovation ecosystem can be coordinated through the professional associations. In the context of financial services in Luxembourg, the public and private actors of the innovation ecosystem share expectations and anticipate new financial regulations that create new services (cfr. SRQ 3).</p> <p>The mechanism of value creation and appropriation in the innovation ecosystem was hereby illustrated. The external inducement from financial service regulations was used to create upstream value (cfr. SRQ 4), coordinated by the professional associations which are a preferred actor (cfr. SRQ 1).</p> <p>Financial regulations can be co-created because there is a need for top-</p>

	down requirements and bottom-up solutions, in order to reduce the asymmetries between market participants and regulators (Gubler, 2011). This also demonstrates the need for absorptive capacity as an organisational capability for dealing with external information (cfr. SRQ 2).
5	Creating value in the innovation ecosystem requires an effective use of the relationships (cfr. SRQ 3), coupled with a strong customer focus (cfr. SRQ 1) and organisational capabilities (cfr; SRQ 2) to co-create and eventually co-produce the new service (cfr. SRQ 4).

4.3 Publication 1

The sources of innovation in Luxembourg financial services providers.

Objective

To start answering the dissertation's main research question dealing with the influences of the innovation ecosystem on the innovation process within financial services companies, an initial overview of the possible sources of innovation in this sector could be helpful. Research results that allow the identification of innovation sources in this empirical setting, could start the exploration of the possible downstream (use side) and upstream (production side) activities within the innovation ecosystem. Research sub-question 1 results from this objective.

Data sources and research methods

A survey was developed after consultation of the literature on the sources of innovation, cooperation for innovation and the innovation process. The initial survey was pre-tested through interviews which allowed increasing the intended meaning of the survey items. Finally it was distributed through the Luxembourg Bankers' Association (ABBL) to all of its members. This resulted in the creation of a database for a descriptive statistical analysis containing 25 companies, representing 24% of the population in its empirical setting. Missing data was completed by using secondary data available from corporate websites, their annual reports, and the website of the Luxembourg Financial Services Regulator (CSSF).

Research results

The use side elements identified through the survey were High-Net-Worth Individuals (HNWI), SMEs and large customers, being important for new or significantly improved service developments. The production side elements showed that consultants and professional associations around the financial services sector were regarded as important sources of information for innovation. The importance of having sufficient organisational capabilities emerged when dealing with the various sources of innovation, when managing innovation in the company and in the innovation ecosystem.

Limitations

The credibility of the obtained research results requires some caution because the survey needed to be filled in by taking into account the respondents' memory of the past three business years. The correctness of the declared answers and data could therefore be biased. This required the identification of the highest possible decision makers (e.g. CEO and Innovation Manager) in the companies because they should have a good memory of the past three business years and the main events that have impacted the company. Another possible bias could be located in the completion of

missing data. They were completed where possible by calling respondents and consulting publicly available data on corporate websites. However the developed survey was based on a thorough literature review regarding the sources of innovation and it was pre-tested through interviews with potential respondents having the desired profile. This allowed reducing the potential misinterpretations of the survey and favoured a fine-tuning of the questions. Finally the selected sample could suffer from a population coverage bias but it reached more than 70% of the registered financial services providers in Luxembourg by cooperating with the leading professional association in this sector. The smaller sample size and response rate could also be viewed as biases. However the obtained response rate falls within the expected ranges for this type of survey, in the financial sector, and with the requirement of having decision-makers as respondents.

The transferability of the research results should be sufficiently warranted since the research process is adequately documented and the obtained results could be applied to a similar context of open, services economies where financial services have a prominent place. However it is not the intended focus of this publication (and the dissertation) to produce statistically generalizable findings for other, similar contexts, leaving a potential bias.

The dependability of the research findings requires caution since the results are centred on a database which was built in 2012, following the financial crisis that affected many EU member states (and the USA). But the contextual environment of this research is in constant flux, the (Luxembourg) financial services sector is also dealing with new EU regulatory efforts on investment products (e.g. AIFM and UCITS V), the creation of the European System for Financial Supervision (ESFS), the outcomes of the EU Savings Directive and an increased attention to tax rulings within the EU.

4.4 Publication 2

Knowledge sourcing from customers in new financial service development.

Objective

The importance of use side elements in the innovation ecosystem and its likely influence on the innovation process within financial services emerged in the previous publication. The contributions from customers as a source of information in the financial services company's innovation process needs to be further explored because there are multiple customer segments. Taking into account the importance of private banking in Luxembourg (as well as the professional investment services) and the findings from publication 1, the segment of High-Net-Worth Individuals (HNWIs) - private persons having at least \$1 million investable assets - could prove

to be a fruitful research topic. Hence research sub-question 2 supports this objective and the overall interest to the main research question.

Data sources and research methods

The dataset from the survey in publication 1 was used but a different analysis technique was applied, Qualitative Comparative Analysis (QCA), to counterbalance the smaller sample size. The database could benefit from this technique to compare the results obtained with a traditional descriptive statistical analysis. In particular a crisp set QCA was applied to the obtained survey data to find converging elements and facilitate triangulation.

Research results

The characteristics of the involved customers during new service development initiatives were congruent with the HNWI customer type. They demand complex services, execute high volume transactions, have longstanding relationships and favour tailored services. It was found to be necessary and sufficient as a condition for achieving innovations in the core service offer of Luxembourg financial services companies. Therefore this customer segment should be relevant and it can justify specific investments into the involvement of these customers.

Limitations

The credibility of the results share similar remarks as formulated for publication 1 since the same database was used for analysis. However there has been method triangulation because QCA was used to corroborate the finding from the descriptive statistics in publication 1 that HNWIs could be a relevant customer segment for innovation in financial services. Caution is needed here because the use of QCA is still not fully accepted in mainstream management literature, but it is among the few methods available for analysing smaller databases. The choices that were made to calibrate the database and to be able to run the analysis could be viewed as a bias. But this is a necessary procedure and inherent to the method (due to its deterministic instead of probabilistic nature) when applying a crisp set (i.e. dichotomous) QCA. The choice for a fuzzy set (continuous) QCA was not pursued due to an even greater difficulty for determining the thresholds of membership of the data (compared to a crisp set analysis).

The transferability of the research results should be sufficiently warranted since the research process, the QCA analysis and the choice made for calibrating the data are adequately documented, facilitating traceability. These results are not intended to support statistically generalizable findings for other, similar contexts, leaving a potential bias. However the results offer scarce insights on the relevance of this specific customer segment for financial services companies' innovation process because this segment has been left out of scope.

The dependability of the results can definitely be challenged by the ongoing changes in the fiscal policies within the EU which are affecting the private banking market in Luxembourg and elsewhere. The importance of this customer segment might be changing but this cannot be concluded based on these results (nor is it the intention).

4.5 Publication 3

Alliances in the financial services sector - Exploring its organisational learning mechanisms.

Objective

During the joint development (i.e. co-production) of new services by using technology from a supplier within the innovation ecosystem, the capability to acquire information from that source is important but this it is also influenced by the relationship between supplier and acquirer. They influence the innovation process of financial service companies, stimulating various learning mechanisms when dealing with the emerging innovation. Exploring these learning mechanisms will allow better understanding of the interplay between capabilities and relationships in the innovation ecosystem.

Data sources and research methods

There was no initial data collection for this publication because the final output was a conceptual model that enriches a confirmed model (Yli-Renko et al. 2001) with expected contributions from organisational learning, facilitating the acquisition from external information and knowledge through strategic relationships (i.e. alliances). The research methods are hence constrained to the consultation of the published management research and the formulation of research propositions based on the conceptual model.

Research results

Dealing with new knowledge (e.g. technological) requires an organisational capability (i.e. absorptive capacity) and the financial services provider's social capital (i.e. relationships) contributes to a successful knowledge acquisition. Organisational learning mechanisms are also paramount in acquiring new knowledge during the innovation process since they drive a company's absorptive capacity. Various research propositions were formulated that can be used to further research these influences and two measurement scales have been developed to assess specific learning mechanisms (policy learning and structural learning). Structural learning mechanisms are expected to influence the social interaction which can lead to the acquisition of external information. On the other hand policy

learning mechanisms are expected to influence the quality of relationships and supplier ties which can lead to a better external information acquisition.

Limitations

The research propositions are based on a conceptual model that was available in the literature (Yli-Renko et al. 2001) but they extend this model by including the influences from the learning mechanisms. The credibility of these research propositions is therefore acceptable but they require further empirical testing through interviews or a survey, representing a bias. The new constructs for the learning mechanisms are based on the literature but also require further testing in a financial services setting. The contents of the constructs' are based on the reported finding in literature and contextual elements from the financial services sector found in academic literature. This counterbalances the mentioned biases but does not entirely nullify them.

The transferability of the results is limitedly possible since the research propositions and the newly developed constructs for the learning mechanisms have not been tested before but are based on literature and expectations. The reliability of the results is also not assessable at this point but there is an increased awareness regarding technology for financial services (a.k.a. Fintech) and innovation (e.g. creation of innovation labs associated to large financial services providers, innovation contests for stimulating internal innovation initiatives and ideas). These could provide interesting venues for future research activities.

4.6 Publication 4

Exploring the influence of regulation on the innovation process.

Objective

Within an innovation ecosystem the relationships between companies, public bodies and associations are facilitating exchanges that can lead to new service offers, actual value co-creation and appropriation leading to innovation. The role of professional associations emerged from the results in publication 1 and this source of innovation is expected to influence the innovation process of the Luxembourg financial services providers. These social exchanges and embedded ecosystem relationships need to be explored further in this empirical setting where regulation is a major external factor.

Data sources and research methods

The literature on social embeddedness was consulted and reviewed to develop an interview guide and associated conceptual model. A total of six semi-structured interviews were used for the collection of the primary data and the interviewees

were selected to represent the various actors in the innovation ecosystem (e.g. financial services regulator, public authorities, professional associations and private companies). Secondary data was obtained from regulations and legislation on the European and Luxembourg level were used to prepare the interviews. In this publication a case study approach was used (i.e. effects of new regulation and new financial services development).

Research results

The observed high relational embeddedness of the actors facilitates deep exchanges and the common goal to deal effectively and efficiently with new financial services regulation. The case study provided an example of how participants in the innovation ecosystem combine resources to deliver a coherent set of services, an improvement on the solitary action of an individual company. The co-creation of these new financial series also induces their co-production afterwards, providing an adequate coverage of the upstream and downstream activities within the ecosystem and the importance of embedded relationships.

Limitations

The results are sufficiently credible because the information was collected from key profiles in the ecosystem, by using a semi-structured interview guide that was developed after thorough consultation of the available literature, leading to the overarching conceptual model. The interviews were transcribed (some interviewees allowed the interview to be tape recorded) and the reports were submitted for validation to the interviewees who unanimously provided their feedback. The interview analysis was conducted by using the interview guide, which served as a frame for structuring the information and facilitated horizontal comparisons. A possible selection bias remains and the amount of interviews could also be extended to facilitate more intra-actor comparisons of the obtained information. However the relevant actors (i.e. companies and public bodies) were selected and sufficiently diversified to avoid an imbalance in the sources of information. Professional sources dealing with financial service regulation and their transposition in EU Member States were also consulted.

The transferability of the results is adequate since the entire research process was documented and is traceable. The interview guide could be re-used in a different financial services context. A new case study using the guide could also further test the degree of transferability. However, as previously stated, the nature of the research does not permit a statistical generalizability but incites the development of insights for other similar contexts. The dependability of the results is supported, to some extent, by the documentation of the research process and the increased attention of regulators to financial services and its innovation ecosystem. This change in the overall environment could actually create an incentive to go further and seek new empirical contexts, since there is an increased emphasis on compliance requirements.

4.7 Publication 5

Co-creating new financial services: Absorbing innovation-related knowledge from customers.

Objective

The innovation ecosystem co-develops new services by integrating resources through embedded relationships. This facilitates the co-evolution of participants' organisational capabilities through learning from this co-creation of value. The overall interactions between critical capabilities (e.g. absorptive capacity) for dealing with external information from use side participants (e.g. customer), which are among the strategic relationships of a financial services company requires more knowledge on how this customer involvement could be leveraged (research sub-question 5).

Data sources and research methods

A conceptual model and associated research propositions were constructed by consulting the available literature. An interview guide was created to assess these research propositions and fine tune the conceptual model based on the obtained qualitative inputs. A total of six interviews were done in five companies that were listed among the top 10 of a national innovation contest and hence expected to offer interesting insights on the co-creation of innovation and using external sources to realize this.

Research results

A conceptual model dealing with the involvement of customers for co-creating new financial services was developed and several research propositions were formulated. The creation of new financial services through customer involvement stimulates all the aspects of a company's absorptive capacity and the actual co-creation through resource re-combination requires specific investments. The underlying learning mechanisms should be viewed as elements that can hinder/facilitate these investments into leveraging customers as an external source of information. The importance of established routines could actually hinder the investment into external information sourcing from customers since there are no immediately measurable benefits. Prior experiences with customer involvement should also facilitate/hinder these initiatives, coupled with the general tendency of operational departments to avoid potential risks (e.g. involving a customer). The strategic vision and support for innovation by the leaders in the financial services companies is also expected to be relevant for successfully integrating customers in the co-creation of new services.

Limitations

The credibility of the findings remains at a theoretical level since the conceptual model is based on the available literature and provides an integration of the existing knowledge in this area. The transferability of the results is limited since the research propositions provide substance for further developments, illustrating its exploratory nature. The dependability is not assessable at the moment. Financial companies are reported to experiment more with the involvement of customers in the development of new financial series. However the reported research in this context remains scarce and hence these results contribute to the further development of this research area.

5. Conclusion

This final section will summarize the findings from the different publications which provide contributions to the main research question of this dissertation: *How does the innovation ecosystem influence the innovation process within financial services companies?* The theoretical implications for research, the insights for practice and the possible policy implications will be formulated. Specific attentions will be paid to the possible biases and limitations of the dissertation (i.e. its research quality or more precisely its trustworthiness due the paradigm, reasoning and methods characterising the research process). Possible future research directions will also be discussed.

5.1 Discussion of the main findings

Beyond the direct contributions of the various publications to the central research question (Table 7) and its sub-research questions (Table 8), their cumulative combination also permits discussing the salience of the dissertation. Therefore this dissertation offers a contextual example of an innovation ecosystem around financial services companies in an international financial centre, also characterised by a small and open economy. Additionally insights regarding how this innovation ecosystem will influence the innovation process in an individual financial services company.

The research results highlighted the need to sufficiently link the internal innovation process (through first and second order organisational capabilities) with the available social capital across the innovation ecosystem to induce collaborative value creation with actors from the innovation ecosystem. This implies that a financial services company needs to be able to sense the innovation ecosystem through its organisational capabilities to leverage its strategic partners (with whom there is preferably an embedded relationship) for co-creating new financial services that will also be co-produced in the innovation ecosystem. The external influences from the innovation ecosystem need to be captured adequately to remain active in the ecosystem and fully realize the benefits it offers to its actors (e.g. the co-evolution of organisational capabilities leading to the creation of new service offers going beyond individual company efforts or securing a balanced value appropriation).

Through its associated publications this dissertation touched upon the distinct characteristics of an innovation ecosystem (i.e. organisational capabilities, social capital and value creation). The dissertation considered the upstream (e.g. producers and professional associations) and downstream actors (i.e. customers). The innovation process of a given financial services company is directly influenced by this innovation ecosystem. Its inbound collaboration activities are pushing the interactions with the company's own innovation activities. During those interactions, the absorptive capacity of the financial services company will be

essential to handle the information and knowledge coming from the innovation ecosystem whilst social capital between the actors can smooth this absorption and utilization. These interactions are ultimately intended to create value for the company itself but also for the innovation ecosystem as a whole, to nurture the co-evolution of its actors. On the other hand the innovation process of the financial services company can also influence the innovation ecosystem, with its outbound activities. It should try to steer the innovation ecosystem to which it belongs, either as a coordinator or collaborating with other actors to co-create and ultimately co-produce value. The preferred actors within the innovation ecosystem of financial services companies will generate the strongest inbound influences on the internal innovation process. Hence the formulation of the first sub-research question: *Which actors of the innovation ecosystem are preferably engaged for collaborative activities?*

The customers, consultants and professional associations were found to be particularly relevant for Luxembourg financial services companies. They collaborate with the financial services company during its upstream (production side) or downstream (user side) value creation activities. In particular, the involvement of high-end customers and the professional associations in the financial services company's innovation process was researched in more detail. The customer segment of high-net-worth individuals (HNWI) needs to be considered with interest since collaborating with them is not only necessary but also sufficient to generate innovation in the service offer of the financial services provider. The interest of involving other segments of customers was not found to be sufficient for developing new financial services. This finding is expected to be linked to the importance of the private banking activities in Luxembourg, being a particular context where involving customers is inherent and nurtured through the entire service offer. This niche with a high degree of service customization can generate new financial services as a result of synergies between a long experience and accumulated knowledge which can be juridical, strategic or technical in nature. The innovation process in financial services companies is complex due to the multiple layers of regulations and the importance of technology for the delivery of services. The innovation ecosystem can facilitate access, and even the use, of the missing information and knowledge for creating and producing a new service. In particular, the professional associations want to transform upcoming financial regulation into an opportunity for creating new services. This will be facilitated through the different communities of practice (working groups) organised by the professional associations. This actor of the Luxembourg innovation ecosystem fosters a wide collaboration, allowing their members to co-develop the necessary capabilities to innovate. This allowed the creation of a new niche in cross border investment services two decades ago and this innovation ecosystem continues to thrive (as well as its actors). The development of viable niches is a key characteristic of a well-functioning innovation ecosystem (Autio and Thomas, 2014) and the empirical setting of the dissertation allowed demonstrating the contributions of certain actors in the innovation ecosystem (i.e. high-end customers and professional associations) as levers for the innovation process of a single financial services company.

Collaborating in the innovation ecosystem and the subsequent influences on the innovation process of a company requires organisational capabilities. Therefore the second sub-research question was: *How do actors in the innovation ecosystem oversee their collaborative activities (i.e. inbound and outbound)?*

Regarding the inbound activities from the innovation ecosystem, detecting and integrating valuable ideas from a preferred actor in the innovation ecosystem requires absorptive capacity. This organisational capability will interact with the innovation process to co-create the new service and eventually co-produce it with the innovation ecosystem. Actors should be aware of the need to make available time and resources, to keep developing these to improve this important capability. Here organisational learning, with its structural and policy mechanisms, will play an important role because they will enhance (or constrain) the absorptive capacity to identify, acquire, and use ecosystem information or knowledge that is critical for developing the new financial services. The structural learning mechanism refers to the current use of organisational capabilities (absorptive capacity in this case) during exploration with the innovation ecosystem but also includes the social integration mechanisms that foster collaboration and the subsequent exploitation of the information and knowledge obtained from the innovation ecosystem. It was expected that the typical environment of a financial services provider would be more risk averse and oriented towards control (Dovey and Fenech, 2007), which might not stimulate the co-evolution of absorptive capacity through the interactions with other actors in the innovation ecosystem. The findings showed that this is not necessarily the case in the empirical setting. More managerial attention to other external collaborations and innovation initiatives, an important element of policy learning mechanism, favoured the creation of dedicated innovation units (i.e. absorptive capacity investments) which are expected to foster a formalisation of the intra-company innovation process and practices. The involvement of other customer segments for developing new financial services is another example where the company's absorptive capacity will stimulate reconfigurations in the operational capabilities of financial service companies, following the creation of new financial services which need to be put into operation.

Social capital will facilitate the exchanges between the organisational capabilities and the innovation ecosystem, as briefly indicated before. Therefore the third sub-research question was: *How are the relationships between actors in the innovation ecosystem influencing (i.e. enhancing and constraining) collaborative activities?*

The informal exchanges through the actors in the innovation ecosystem influence the individual innovation process in financial services companies by their ability to provide critical information and knowledge in a relatively short time frame. These strategic relationships influence the internal innovation process as sources of privileged access to critical resources for the developing a new financial service. However the quality of these relationships will determine the ease of access. The choice to share more, due to the higher embeddedness of the relationship can therefore be more important than having several connections which are less deep.

The collaboration in the innovation ecosystem can also be constrained by relationships. Therefore individuals from an actor in the innovation ecosystem need to build or maintain the quality of the relationship through regular interactions, other joint projects and past experiences of success (or failure). The dissertation extended current knowledge on the symbiotic effects of social capital and external knowledge acquisition by emphasising the organisational learning mechanisms possible moderating role. Actors can ease on their appropriability practices as a consequence of their embedded relationships with partners.

They can also choose to disclose more to this particular actor when the overall objective of the innovation ecosystem should be met. The national interest of a business sector (i.e. financial services) is one of those motivations why companies cooperate, to ensure the survival of the overall innovation ecosystem itself (and thereby themselves). This was also demonstrated in the case study about financial services regulation and the importance of the embedded relationships between members of the professional associations. Informal, embedded relationships are an integral part of the social capital within the innovation ecosystem. It emerged as a powerful mechanism that will influence the internal/external search efforts within the innovation process of an individual financial services company. Social capital is a contingent element for the organisational capabilities needed for creating and producing new services with the innovation ecosystem.

The need for social capital and organisational capabilities to leverage and manage the innovation ecosystem are all oriented towards value creation with (and within) the innovation ecosystem. This brings back the last sub-research question of the dissertation: *How do actors in the innovation ecosystem create value (i.e. downstream and upstream) during collaborative activities?*

The dissertation showed that the innovation ecosystem around Luxembourg financial services. It offers an interesting case for the value co-creation and appropriation within innovation ecosystem research (Autio and Thomas, 2014). The importance of the professional associations, contrary to the more common focus on private companies or the government, were found to play an important role. They were found to occupy a central position, enabling and facilitating the value creation and sharing. This illustrates that Luxembourg financial services can be characterized as a hub-based innovation ecosystem (Nambisan and Baron, 2013). The dissertation also contributes to the call for insights on how an innovation ecosystem is coordinated (Ritter et al., 2004). The actual coordination by the professional associations ensures the common direction and realization of the innovation ecosystem benefits. Social capital and organisational capabilities are acquiring, creating and using the necessary resources (Blyler and Coff, 2003) the new financial services to be offered and produced in the innovation ecosystem. Private, public and professional associations act as complementary resources which can be critical for developing new financial services. In this empirical context, the control of the innovation ecosystem around a financial services company is facilitated by the hub coordination of a not-for-profit organization (i.e. a

professional association) that stimulates exchange between members and business development (Chesbrough and Appleyard, 2007). The iterative formulation of the goal of the innovation ecosystem, followed by implementation monitoring through the coordinating role of the professional associations contributes to the possible approaches that other international financial centres with a small and open economy could consider. Finally the findings contribute to the required insights on the distinctive influences of ties and their positioning in the innovation ecosystem (Adner and Kapoor, 2010). In fact the individual persons in the innovation ecosystem can have a direct tie with another person and meet during the coordination activities of the professional associations occupying a central position (e.g. during working groups). In that particular social context, the person can generate new social connections and exchanges with other participants from different actors in the innovation ecosystem. At first these new links will be characterized as weak ties create through the central position of the strong tie. But these weak ties will actually facilitate the absorption of information and knowledge which is critical for developing new financial services with the innovation ecosystem, hence becoming a powerful tie (Granovetter, 1973) without it being a direct tie and without a central position in the innovation ecosystem.

5.2 Theoretical implications

Research in financial services innovation (Mention and Torkkeli, 2012; Gianiodis et al., 2014) and innovation ecosystems (Autio and Thomas, 2014) are both under researched and hence this dissertation will contribute to the further investigations surrounding this research topics. The theoretical elements behind organisational capabilities, social capital and value creation are complementary with the resources-based view of the firm, which served as the pivotal theory in this dissertation. The conceptual framework is, to the best of the researcher's knowledge, one among the few integrated theoretical approaches to the various elements that need to be considered in innovation ecosystem research (Autio and Thomas, 2014).

The dissertation offers an integrating approach to theoretical fields that are compatible and which could benefit from each other (for more details see section 2.3 and section 2 in general where theoretical appropriateness was discussed), building bridges between them to advance understanding (Gioia and Pitre, 1990). In short, the RBV is suited to offer synergistic effects for multidisciplinary approaches (Kraaijenbrink et al., 2010; Barney et al., 2011) and can embrace other theories leading to richer insights (Mahoney and Pandian, 1992; Palmatier et al., 2007).

However this does not imply that the RBV is the only possible pivotal theory to illustrate the dynamics between organisational capabilities, social capital and value creation in an innovation ecosystem. Within management science there is no such thing as a superior theory because there are always elements or facets which can be left out of scope or added. There is need for finding a balance in any theory. On the one hand it must be sufficiently encompassing the managerial perspectives of the

topic researched, creating rich content through thick descriptions. On the other hand there is a need to make abstractions of these managerial perspectives, creating clarity with thing concepts that are easily replicable. Here the paradigm, reasoning and objective chosen by the researcher will play a paramount role in selecting a theory or sufficiently complementary theories to cover the most significant domains surround the research topic. The objective of the research should be either to discover (i.e. exploratory or explanatory) or verify (i.e. confirmatory) certain research expectations based on a theory or complementary set of theories. In the end there is need to make a choice because (Folger and Turilo, 1999): “... *either discovery or verification inevitably focuses on some things and thereby misses others.*” (p. 755). The choice of one theory over another one is never perfect because theory is an intellectual foundation to analyse the socially constructed artefacts with their subjective meaning (Kuhn, 1962): “... *a theory must seem better than its competitors, but it need not, and in fact never does, explain all the facts with which it can be confronted*” (p. 12). The objective of the main research question in this dissertation is exactly to explore the innovation ecosystem in the empirical setting of international financial services. The sub-research questions share this objective and even offer explanatory insights regarding the value creation in the innovation ecosystem.

Providing conceptual models and associated research propositions is also a valid theoretical contribution, as supported by the following (Corley and Gioia, 2011): “... *those that provided revelatory insights did so not so much by introducing new concepts (as the typical editorial depiction would have it) but much more often by offering a novel approach to integrating prior thought and research into some model or framework that constituted a different way of understanding some phenomenon.*” (p. 19). Publications 3 and 5 fall in the latter category whilst publication 2 and 1 involve a basic empirical analysis of a dataset collected through a dedicated survey. Publication 4 is a qualitative case study of an innovation ecosystem where insights from social capital and value dynamics were integrated. Publication 2 experimented with an innovative analysis technique, Qualitative Comparative Analysis (Rihoux and Ragin, 2008; Rihoux et al., 2013), offering a first application in financial services research.

These synergies with organisational capabilities are linked to the use of absorptive capacity to tap into the ecosystem to acquire resources which support the company's own innovation activities aimed at maintaining/enhancing its competitive edge. Moreover, social capital research provided insights on the role and use of embedded relationships in the innovation ecosystem. Last but not least, marketing literature added the required perspective on value creation in the innovation ecosystem where resources will be reconfigured to new service offers. One of the main characteristics of innovation ecosystems is that it aligns the actors in providing a coherent set of practices and standards that are co-generated and leads to co-produced service offers (Autio and Thomas, 2014). This was also illustrated by the case study on financial regulation for new service development.

Following this, the dissertation further contributes to innovation ecosystem theories and literature by providing qualitative evidence on the catalytic effects of an established industry expertise (i.e. niche) which created the current ecosystem for financial services in Luxembourg. It continues to function well by setting common objectives and providing informal governance and exchange mechanisms to create financial service innovation, while ensuring a shared value appropriation in the ecosystem by providing a clear interpretation of financial services regulations at an international level. This theoretical finding could also resonate with the “small world” dynamics (Watts and Strogatz, 1998) where a system of actors is both closely and locally clustered with short, easy connections between each other. This dissertation hence contributes to this literature and within innovation ecosystem literature it has not yet attracted much research attention (Uzzi and Spiro, 2005). A case is provided for innovation in the Luxembourg financial sector. A “small world” system was also reported in Germany where financial institutions are highly connected in their region (Kogut and Walker, 2001) however the implications for innovation management in that setting were left out of scope. In the empirical setting of this dissertation it has been reconsidered and researched to a certain extent.

5.3 Managerial implications

Research has claimed that innovation ecosystems are becoming the next basis for competition (Normann and Ramírez, 1993; Iansiti and Levien, 2004) and that the concept of an innovation ecosystem can be used as a vantage point for designing innovation strategy and its implementation (Iyer et al., 2006; Teece, 2007; Chesbrough et al., 2014). Empirical evidence on these claims remains in need of more research due to its fragmentation (Autio and Thomas, 2014). Yet innovation leaders and managers could use the insights from this dissertation and associated publications.

In particular the creation of an innovation ecosystem with its value co-creation and adequate appropriation does not necessarily require an individual company to become the hub or focal company (Adner and Kapoor, 2010). This dissertation has shown that such a coordinating position can successfully be played by strongly embedded professional associations acting as an platform for communities of practice (Fox, 2000). This is an alternative to technological platforms which are more common in the soft/hardware industry. Companies could therefore avoid overinvesting in their own innovation activities and supporting organisational capabilities, it might be more cost effective to consider the leverage that professional associations might provide.

Innovation managers and leaders must be aware that having a favourable position in the ecosystem does not automatically generate its advantages (Burt, 1992). They should be aware that strategic relationships need to be managed and nurtured, by fostering socially embedded relationships that can provide them more easily with

relevant information and opportunities to secure a longer term positional advantage in the ecosystem. On the other hand they should support investments in resources that facilitate the exploration and exploitation of cooperation strategies. Searching for complementary assets and new possible combinations of resources requires them to have an innovation process that is a balance between being producer oriented and customer oriented, since co-creation always needs to be co-produced in a later phase of new service development. Easier exchanges between actors in the innovation ecosystem should be facilitated by these investments in formal and informal elements, while being aware that an ecosystem is dynamic, that new business models can foster changes in the ecosystem itself that can stimulate the company to reposition itself to keep offering value and sustain its competitive advantage. Companies should not refrain from reflecting on their inside-out strategies to manage the innovation ecosystem (or at least maintain their exchanges of information to seize opportunities). The ecosystem itself will impose outside-in strategies in need of elaboration to improve the company's overall innovation performance. With respect to the latter, it is important to involve multiple stakeholders in the innovation process and be aware how relationships could affect the success of innovation initiatives with the ecosystem.

Customer involvement for new financial services is an area that should be of interest for financial services companies since they can be sources of innovation. Different customer segments can be more or less effective to involve in co-creation efforts. The involvement of retail customers has been receiving more interest, as financial services companies try to engage with this segment to increase its profitability and unearth hidden opportunities. It is important to have dedicated human resources for the co-creation exercises with customers, to be able to capitalize and fine tune the potential service offer. Secondly it should be decided up front what type of service innovation will be sought, an incremental or radical innovation. In order to avoid a limited added value from engaging with customers, it is necessary to have the required interpersonal and technical skills to guide the customer in this co-creation. There is a risk that the customer his perception will be limited to the actual situation and not the real needs. On the other hand the financial service company must carefully select the customer they want to involve in the co-creation efforts. Therefore attention to screening the potential customer to involve might be needed. Therefore tools such as an engagement platform could be considered, to adequately select the customer. Customer involvement could also be considered in different phases of the normal new service development process. This covers not only their involvement during the more conceptual stages but also during the testing phases.

5.4 Policy implications

The importance of innovation for the economic development, the relevance of the financial services sector in the economy and the particularities of managing innovation in financial services was previously described in the dissertation. Policy

makers could benefit from the dissertation's findings but these need to be interpreted with the reported biases regarding the transferability (i.e. small and open economy and the weight of financial services for that national economy) and stability (i.e. significant changes affecting the financial service sector in the EU and also globally) of the obtained research results.

A first policy implication concerns the awareness that policy makers should have regarding *the importance of using external sources of innovation (e.g. consultants, customers or professional associations) from the innovation ecosystem around financial services companies* (cfr. 4.2, 4.4, 4.5). The professional associations can be true catalysts of innovation within the innovation ecosystem, occupying a coordinating role for the development of new services and business opportunities. As shown in publication 4, the governmental bodies should be actively engaged by this coordination mechanism. Its effectiveness will be reinforced by the relational embeddedness of their representatives and a clear, shared common goal to continuously develop the financial services sector.

A second policy implication deals with *the need of financial services companies to tap into the external sources of innovation to enrich their own internal innovation process*. Value co-creation in the innovation ecosystem requires financial services providers to engage with the other actors in the ecosystem, upstream and downstream. Policy makers could decide to facilitate these meetings through networking events, which will stimulate the development of (informal and formal) contacts which build up relationships that could facilitate co-creation and innovation learning among the actors (cfr. 4.5, 4.6, 4.7). This could also stimulate and support the actor's development of the needed internal capabilities to manage the external sources.

A third policy implication follows from this observation, *namely the establishment of public support schemes for innovation initiatives*. The development of the needed internal capabilities to manage the innovation process and the external sources of information requires investments in human resources, science-based support and methodological support. It is arguable that the available resources for these aspects might be missing, or at least public support should guide actor's attention towards them.

A fourth policy implication focuses on the larger awareness of the importance of innovation and the engagement of the general public. *Policy makers could initiate various campaigns to make it clearer to its citizens that research and innovation matter for everybody*. Citizens should not feel awkward to assist when being invited by a private or public company. This could also be done through the organisation of an "innovation week" or "science fairs" where financial services companies could also show the type of initiatives they take and how citizens can assist.

The last policy implication refers to the issue of value appropriation after the actual co-creation within the innovation ecosystem. *Policy makers could provide intelligent legislation dealing with intellectual property, cooperation for innovation cooperation or initial exchanges of ideas, fostering trust and transparency which are also important for the embeddedness of ecosystem relations (social dynamic dimension influencing the value creation dimension, both requiring organisational capabilities).*

5.5 Evaluation of the dissertation's research quality

The findings of the dissertation need to be interpreted with some caveats in mind regarding the evaluation criteria for qualitative research in a constructivist paradigm (credibility, transferability, dependability, confirmability and integrity). For more details, see Table 4 and Table 5 in the dissertation. These indicators for the quality of the research results (i.e. their trustworthiness) were also used to discuss the individual publication's legitimation, possible biases and limitations (in their dedicated section in sections 4.3 to 4.7).

Regarding credibility, the descriptive analysis of the survey from publication 1 does not allow for testing causality but limits itself to providing indications regarding the importance of certain items in the survey, subjective to further inquiry. The possible bias related to the survey sample size was mentioned but this was partially mitigated by checking the market position/weight of the responding companies. In publication 2 the application of QCA was applied as a means to counter the smaller sample size and apply an innovative analysis technique which has not yet reached its full recognition in the innovation research field. The conceptual models were not (yet) subjected to rigorous empirical testing in the Luxembourg context, they were explored with semi-structured interviews (qualitative methods) and fine-tuned in accordance. The literature on innovation ecosystems itself, especially the creation of such systems, considered to be under development since it conceptually represents the widest possible network interactionist construct in management research, making it also challenging to research (Autio and Thomas, 2014).

However the credibility of the research results was assured by a systematic triangulation between academic literature, professional publications and debriefing with peers. The interviewees were selected through purposive sampling, based on their expected potential to advance the research with its context. This selection was always discussed with peers and modified where needed. The duration of the interviews all lasted for at least 40 minutes, providing sufficient time to make sure that the interview questions were understood or rephrased where needed. Member checking was also systematically used to gather feedback on the interviewee data provided, also contributing to the required traceability and documentation of the research.

Regarding the transferability of the research results, the qualitative methods and abductive reasoning approach of the dissertation do not intend (nor claim) to create fully replicable and generalizable conclusions. This implies that some caution is needed when trying to apply the findings to different national and industrial settings which could be deemed suitable for innovation research. The transferability of all the empirical settings of financial services in Luxembourg provides a restrained, yet significant field for innovation research for international financial services. This arguably leads to idiosyncratic implications and conclusions since the context of the research setting might not be transferrable to others.

Although the transferability of the research findings can be more challenging, triangulation across sites was assured through the planning of the interviews with different companies. The research was conducted in a small, open and international financial centre. Hence the results could be transferable to similar contexts as this (e.g. Ireland, Singapore, Liechtenstein, Malta or Cyprus) but it could be less obvious for larger, more diversified economies.

The dependability could be improved as the original research design did not explicitly foresee a longitudinal approach to the innovation ecosystem. However this area remains important for new research and the insights provided in the dissertation shed light on the creation of innovation ecosystems around financial services companies. However the detailed verbatim, the availability of the conceptual models, the literature reviews and interview guides allow replicating the findings by another researcher. The feedback from the interviewees was always asked and debriefings by peers (e.g. by the supervisors or during conferences) also support the dependability of the results. Research on innovation (in financial services) and its imperative for growth is also subject to debate, adding to the challenge of crafting beneficial innovation for society, where research also provides unambiguous societal/practical outcomes (Gummesson, 2014; Hausman and Johnston, 2014). The financial services environment was arguably undergoing strong changes due to the economic and financial crises, creating inherent instability around the research topic.

Confirmability was accounted for throughout the research process. For example the interview guides were initially constructed after a literature review (in line with the abductive reasoning by the researcher). This also resulted in a conceptual model of the research which was used to formulate the interview questions, without overly constraining the data collection. Triangulation between primary and secondary sources of data also supported this evaluation criterion. Through the interviews, a few unexpected elements emerged which enhanced the discussion of the previously identified conceptual model, contributing to the incisiveness of the findings. The latter also fostered critical thinking, putting into perspective the chosen theory and the research findings.

Integrity of the informants was sought by allowing them to provide feedback on their inputs and by guaranteeing their anonymity. Most informants did not object to the audio recording of the interview itself if they would get the verbatim with the opportunity to comment. Only a few interviewees did not want to be audio recorded, as this made them feel uncomfortable. The research context and the objective of the interviews was always explained up front and repeated at the start of the interview. The researcher acquired significant interview skills through the involvement in other research projects where the informants were engaged with qualitative research methods. The informants occupied all hierarchical levels and their business activity was also heterogeneous, fostering interviewer flexibility and adaptation to the expectations of the interviewee.

5.6 Perspectives for further research

One avenue of future research would be to empirically test and validate (alternatively challenge) the conceptual models designed along the dissertation (i.e. publication 3 and 5). This could be done by launching a survey in an international financial centre, preferably but not necessarily in the Grand Duchy of Luxembourg. The research propositions could therefore be used for further explanatory research, following the exploratory phase of their formulation and the confirmatory phase through the survey's quantitative data analysis. Secondly, among the outcomes of publication 1, the likely importance of knowledge-intensive business services providers (e.g. consultants) emerged but this group of possible sources of innovation for financial services companies is left underexplored in the dissertation. There is a specific literature stream, e.g. (Tether and Tajar, 2008; Weigelt, 2013), on the use/importance of consultants (denominations differ in the literature) that could be tapped into to create new research propositions to be tested in a financial services context of innovation management. They are another actor in the innovation ecosystem that merits more research attention. Publication 3 touches upon this element but without more in-depth developments. More detailed insights into the micro processes during the value co-creation and co-production phases of financial services innovation could be another avenue for further research, adding more insight to the findings of publication 4 where relational embeddedness was found to be important for the innovation process in financial services companies, coordinated by the professional associations. This could also lead to increased practical insights on the management of the innovation ecosystem.

Because of the dynamic nature of innovation ecosystems and their evolution over time, future research could be done on anticipating these evolutions. What signals such an eminent evolution that will reshuffle the current playing field? What challenges can this pose to the focal firm or coordinating actor? A longitudinal study would be very insightful to answer these questions.

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Part II: Publications

Publication I

De Smet, D., Mention, A.-L. and Torkkeli, M.
Uncovering the sources of innovation for financial services

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Uncovering the sources of innovation for financial services

Abstract

The financial services sector is significant for the overall economy and specifically for small and open economies where it can be a major contributor. A dedicated survey was created and launched to gather insights about the perceived importance of external sources of information for innovation. Preliminary statistical analyses have shown that consultants are regarded as an important external source of information, while the CEO and supporting front line employees are important internal sources for innovation. Regarding the use of customers, High Net-Worth Individuals (HNWI), SMEs and large customers were found to be important for new or improved service development.

Keywords: Financial services; Innovation; Survey; Small and open economy; Information sources.

Introduction

The economic environment in Europe is currently pushing many companies to revise their service offers, their underlying organisational structures to deliver these services and ultimately their positioning in the overall value network (Normann and Ramírez, 1993). Reinforcing or stimulating innovation becomes an even more strategic topic for the company's further development and survival. Companies therefore need to tap into the various sources of innovation and transform these innovation inputs into new or significantly improved service offers that will sustain their competitive advantage (Teece et al., 1997). Generally speaking, innovation in services receives less research attention and is slowly gaining maturity (Papastathopoulou and Hultink, 2012), despite the importance of service industries for growth and employment in the economy.

In an effort to reduce risk and costs related to innovation, companies can look outside their firm boundaries for external sources of information (Chesbrough et al., 2006; Chesbrough, 2011) that will complement their own internal innovation activities. The various "information sources for innovation" are also known as "external sources of knowledge" in extant innovation research (Clausen et al., 2012). Empirical research using the standardized Community Innovation Survey (CIS) data also refers to it as important information sources for innovation.

An alternative view on the sources of innovation involves a more functional classification by type of economic actor (e.g. suppliers, users, producers, or others such as universities or public research centres) that contributes to the development of product, process, or service innovation (von Hippel, 1988). This view also includes the notion that the external environment needs to be considered for enhancing internal innovation activities and investments into new service development that external cooperation for innovation can lead to competitive advantage (Tether, 2002; Tether and Tajar, 2008b). Scholars also argue that the innovation process in every industry is different due to its structural characteristics and industry specificities (Castellacci, 2008; Fraga et al., 2008) that can provide complementary insights. This emphasizes the research interest of for example innovation for, and within, the financial services industry (Mention and Torkkeli, 2012), precisely the contextual setting of this research.

The structure of this research article is as follows: Section 2 will outline the available literature on the use of external sources for innovation. Section 3 will discuss the chosen research methods and the empirical setting in more detail. The conclusions will be discussed in Section 4 and the last section deals with the implications and avenues of future research.

Literature review

The major stream of innovation research focuses on the industrial sector and the development of new products (Brown and Eisenhardt, 1995). This was slowly extended to include processes, organizational structures and services (Papastathopoulou and Hultink, 2012). The various resources for innovation activities can be acquired or developed by the company itself. Therefore research distinguishes between internal and external sources for innovation, being either physical or intangible (knowledge) resources. The latter is

significant for a company's capacity to innovate (Linton, 2000) since it was found to support the recognition of opportunities but also the exploitation of these opportunities (Kaya and Patton, 2011). Internal R&D investments (e.g. marketing research, software development, trainings, ...) are not the only source of information and knowledge for the company's innovation activities, the external sources can play an even bigger role (Tether and Tajar, 2008a). The literature stream on open innovation has been emphasizing this need to open-up the boundaries of companies to enrich their internal innovation activities (Chesbrough et al., 2006). Different types of strategies can be chosen to realize this, each which were found to have a longer term effect on the company's likelihood to continuously innovate (Clausen et al., 2012).

Despite the findings that external information sources are not to be disregarded, previous research found that the internal sources also play an important role in the development of a company's innovation capability. Too much reliance on the external sources will insufficiently foster the development of know-how and experience to implement and develop innovation (Shefer and Frenkel, 2005; Cassiman and Veugelers, 2006). Other research indicates that innovation performance increases over time as the company invests more in research and development (Crepon et al., 1998; Zhao et al., 2005). Internal capabilities and ideas remain important for fostering innovation (Koschatzky, 1998; Nooteboom et al., 2007), therefore internal and external sources can be viewed as being complementary. Having a mix of innovation sources is also important since innovation is always involving risk and companies can have to mitigate these by opting for a combination of internal and external elements (Leiponen and Helfat, 2010; Mention, 2011).

Recent research emphasized the need to have sufficient attention for external sources (West and Bogers, 2014). A central part of the innovation process involves the search for new ideas that have commercial potential. Firms often invest considerable amounts of time, money and other resources in the search for new innovative opportunities. Such investment increase the ability to create, use, and recombine new and existing information (Laursen and Salter, 2006). Various typologies of external sources are used and lists four groups of sources external to the company: market (suppliers, competitors, consultants, customers, commercial R&D), institutional (university, government, research organisations), specialised (technical standards, regulations, health and safety), and other (trade fairs, associations, technical press, conferences) (Laursen and Salter, 2006). A very similar classification of possible external sources of knowledge for innovation has been used in other research (Leiponen and Helfat, 2010). Other classifications distinguish between cooperation and information sourcing: market, science, competition, and group resources (Mention, 2011). Financial services companies were found to be intensive users of external knowledge sources such as clients/customers, suppliers, competitors, firms belonging to the same group, universities, other (private and public) research institutions, consultants, technology transfer institutions, patents, professional conferences/journals, fairs/exhibitions and computer-based networks (Hollenstein, 2003).

However establishing an order of importance among these sources for service innovation remains difficult. On the one hand more recent research found that a majority of service innovations in the financial sector (specifically commercial and retail banking services) were produced by users instead of the companies or their suppliers (Oliveira and von Hippel, 2011). On the other hand customer insights were found to be among the main drivers of new service development in financial services (Pallister et al., 2007).

Research methods

Empirical setting

This research was conducted in the Grand-Duchy of Luxembourg, more specifically within its financial services sector. This is a unique setting which is very relevant for research in financial services. Luxembourg is the largest fund centre in Europe, occupying 27% of the market for investment fund domiciles in Europe (e.g., France is second with about 16% and Ireland is fourth with about 14%), accounting for 32% of the European market for assets under management (e.g., France is second with about 16% and Ireland third with 15%). The central location of the country in the European Union is also noticeable by its importance for cross-border business activities, accounting for 68% of the entire cross-border market for European fund distribution (LFF, 2014). Luxembourg also represents the second largest domicile of funds worldwide, next to the USA which is by far the largest. For example, Luxembourg represents about 9.5% of the domiciled funds worldwide, whilst the USA represents roughly 50% of this global market. For a comparison, the third and fourth largest domiciles of investment funds are France and Ireland with each 4.5% of the world market in investment funds (EFAMA, 2014). A smaller EU Member State like the Grand-Duchy of Luxembourg has therefore a significant role in the global fund industry. In general, its financial services industry is very important, for example, it represents approximately 30% of the country's tax revenues (LFF, 2012) and it contributes almost 26% of its gross domestic product (LFF, 2014).

Data collection

A survey was designed in order to gather first insights on the external information sourcing for innovation activities in financial services companies. This survey contained 25 multiple choice questions which were aggregated further into five parts: sources of information for innovation activities; the outputs of these innovation activities; the cooperation for innovation; the role of customers in new service development; general and economic data about the company. The survey was developed in English and pre-tested with three companies through face-to-face interviews, lasting about 45 minutes each. This pretesting favoured the overall comprehension of the survey and the wording of certain questions, improving the clarity of the entire survey. The desired respondent profile involved employees with considerable decision-making power, occupying a strategic position in the financial services company. Therefore chief executive officers, other members of the "c-suite" and members of the executive committee responsible for innovation, business development, new service development, marketing, organisation or quality were listed as desirable profiles. They were asked to fill in the survey, taking into consideration the last three business years (2010-2012) as a point of reference. Most of the completed surveys

were returned by email or surface mail. The rest was collected by the research team through interviews at the respondent's premises, where the survey was used as a structured interview guide. Data collection efforts were launched in August 2012, the overall number of the banks and branches of credit institutions authorised to carry on their activities in Luxembourg represented 142 entities at that time (CSSF, 2012) employing 26.700 persons (KPMG, 2012). The majority of these banks (103 units, as of 27 August, 2012) were members of the Luxembourg Bankers' Association (ABBL), the country's leading industry association. Those banks which were not member of the ABBL were mainly parent credit institutions which settled down their branches in addition to their respective group members authorised activities.

The survey was distributed among the banks who were member of the ABBL and the ABBL agreed to distribute the survey. The initial distribution took place on 31st July 2012. Following that, various reminders were sent to improve the response rate of the survey, secondary data from the company's website or the regulatory authorities' website was used when possible. In total 14 entities refused to take part in the survey in a spoken or written form, while the rest did not reply at all. The final research sample consists of 25 banks, representing 24% of the total population.

This response rate is fair and useable because (1) the sample is representative of the Luxembourg financial services sector; (2) it falls within the normal range of response rates for research where companies are contacted; and (3) it falls within the normal range when leadership/executive layers of companies are contacted. The number of employees represented by the respondents in our sample amounts to 11.300 employees and therefore our sample covers 42% of the total population in this sector. The average response rate for surveys dealing with companies was found to be 35% with a standard deviation of 18% (Baruch and Holtom, 2008). In particular, the response rate for the financial services industry was found to be 57% on average, with a standard deviation of 21% (Baruch and Holtom, 2008). However this does not reduce the quality of the response rate since we need to keep in mind that the response rate as such is not more important than the response representativeness (Cook et al., 2000). Accessing top executives is known to have a lower response rate, the median response rate of executives was found to be 32% with an interquartile range of 20% - 46% (Cycyota and Harrison, 2006).

Data Analysis

Taking into consideration the smaller size of the sample ($n=25$), yet being representative of the whole population, quantitative methods such as probit or logistic regressions for making predictions based on this survey data are less appropriate. Nevertheless, descriptive statistics can provide indications of trends for further analyses. Therefore Pearson's chi-squared (χ^2) was calculated for testing goodness of fit and independence between variables. Additionally Cramér's V (ϕC) has been calculated for measuring the association between these variables. Following that the p-values were calculated to obtain significance indications for the χ^2 and ϕC measures of the two variables.

The significance level for the measures was set at 95% to have sufficiently stringent thresholds. However some outcomes surrounding the 90% significance level were retained in the results because they also offer complementary insights.

Associations between variables were made by using the innovation output variables (new to the bank innovations + new to the market innovations) and the provision of deposit services. Deposit services belong to the core service offer in the intermediation model used by banks (Stanhouse and Stock, 2004): “At their most fundamental level, banks are in the business of borrowing and lending money” (p. 1825). Additionally the latter was chosen because it is a stable element of financial service companies since investment services are being viewed cautiously by the majority of the customers, creating an inflow in savings accounts. The meaning of the used variables (Table 1) and a summary of the analyses (Table 2) are made available as to have an overview.

Table 1 Overview of the variables for analysis

Variable	Description
SourceNGO	How important to your bank’s innovation activities were non-governmental organisations as information/knowledge sources?
SourceInformal	How important to your bank’s innovation activities were informal, personal interactions as information/knowledge sources?
ActMerger	To what extent were mergers important for the development of new or improvement of existing services at your bank?
CoopClients	To what extent co-operation with clients was valuable for your bank’s innovation activity?
CoopAssociat	To what extent co-operation with professional/industry associations was valuable for your bank’s innovation activity?
BenefitNetwork	To what extent the co-operation with partners (including the entities belonging to your bank’s group) led to benefits for your bank such as gaining access to partners’ networks?
ModeTech	Did your bank cooperate with your partners through technology (internet, video conference, and etc.)?
NSDTeam	Did your bank have a permanent team of employees responsible for the service development/improvement?
TeamWork	Team members for service development/improvement meet on a regular basis?
SpecificNSD	Does it happen that your bank designed a specific process of new service development for a given client(-s)?

CharactOrdinar	What were the characteristics of clients with whom your bank co-operated on the development of new or improvement of existing services? Ordinary clients.
CharactDemand	What were the characteristics of clients with whom your bank co-operated on the development of new or improvement of existing services? Demanding clients.
CharactTailor	What were the characteristics of clients with whom your bank co-operated on the development of new or improvement of existing services? Clients who ask for tailored services (niche clients).
CharactPower	What were the characteristics of clients with whom your bank co-operated on the development of new or improvement of existing services? Clients who have higher purchasing power.
ClientDurationOY	What was an average duration of the co-operation between your bank and clients to develop new or improve existing services? One year
WhoClientsHNWI	Who were your clients? High Net Worth Individuals
SourceConsult	How important to your bank's innovation activities were consultants as information/knowledge sources?
InternalBackstage	To what extent were backstage employees important as internal source of information for innovation (within your bank)?
InternalOther	To what extent "other" was important as an internal source of information for innovation (within your bank)?
InternalCEO	To what extent the CEO was important as an internal source of information for innovation (within your bank)?
ActKnowledge	To what extent the acquisition of external knowledge (copyrights, patents, trademarks, industrial designs, and trade secrets) was important for the development of new or improvement of existing services at your bank?

Table 2 Results of the analysis

Variable 1	Variable 2	χ^2	ϕ_c	p-value
SourceNGO	New2Markt	7.9932	0.5654	0.0462
SourceInformal	New2Markt	12.3737	0.7035	0.0062
ActMerger	New2Bank	7.6870	0.5545	0.0529
CoopClients	New2Markt	10.9458	0.6617	0.0120
CoopAssociat	New2Bank	8.6440	0.5880	0.0344
BenefitNetwork	New2Markt	8.3672	0.5785	0.0390
ModeTech	New2Markt	4.5752	0.4278	0.0324
NSDTeam	New2Markt	5.4688	0.4677	0.0194
TeamWork	New2Markt	6.1508	0.4960	0.0462
SpecificNSD	New2Markt	8.4656	0.5819	0.0036
CharactOrdinar	New2Markt	5.5901	0.4729	0.0181
CharactDemand	New2Markt	6.8659	0.5241	0.0088
CharactTailor	New2Markt	5.2965	0.4603	0.0214
CharactPower	New2Markt	5.8549	0.4839	0.0155
ClientDurationOY	New2Markt	5.5901	0.4729	0.0181
WhoClientsHNWI	New2Markt	5.2965	-0.4603	0.0214
SourceConsult	BankServicesDeposits	6.6667	0.5164	0.0357
InternalBackstage	BankServicesDeposits	5.7540	0.4797	0.0563
InternalOther	BankServicesDeposits	4.1667	-0.4082	0.0412
InternalCEO	BankServicesDeposits	6.1012	0.4940	0.1068
ActKnowledge	BankServicesDeposits	2.9412	0.3430	0.0863
WhoYourBank	BankServicesDeposits	2.9412	-0.3430	0.0863
WhoYourBank_Other	BankServicesDeposits	5.7692	0.4804	0.0163
CoopConsult	BankServicesDeposits	10.0000	0.6325	0.0186
BenefitDepend	BankServicesDeposits	6.7308	0.5189	0.0345
ProtectSecrecy	BankServicesDeposits	4.1667	0.4082	0.0412
CostCreative	BankServicesDeposits	4.8951	0.4425	0.0865
ProtectNone	BankServicesDeposits	2.6789	-0.3273	0.1017
WhoClientsHNWI	BankServicesDeposits	5.2517	0.4583	0.0219

Research findings and discussion

Cooperation and networks for innovation activities

Informal personal interactions were found to be associated with the introduction of new to the market services ($\phi C = 0.7035$) in Luxembourg. This observation needs to be investigated further since it might show that NGOs and/or professional associations might be relevant information sources since these involve such informal personal interactions that can influence new services development. The ϕC association is rather high so some caution is required when interpreting this observation. Gaining access to partner networks is a benefit from cooperation that is associated with new to the market introductions and innovation ($\phi C = 0.5758$) in Luxembourg financial services providers. This is in line with the importance of social capital that can result in preferential knowledge and information for innovation (Inkpen and Tsang, 2005).

Non-governmental organisations as sources of innovation are associated with the introduction of new to the market services ($\phi C = 0.5654$) in Luxembourg. These might play an important influence in the creation of various themed investment/savings solutions (e.g. impact finance, micro finance, philanthropy ...) for various segments of customers (e.g. retail or private banking). Another example relates to the provision of microfinance in the financial service sector, found to be influenced by NGOs (Battilana and Dorado, 2010).

The cooperation with professional associations is associated with the introduction of new to the bank services ($\phi C = 0.5880$) in Luxembourg. Industry associations are important stakeholders that target networking and information sharing among its professional members, arguably contributing to institutional isomorphism (DiMaggio and Powell, 1983). In the financial services sector, it was also found that direct and close contacts are important (Burt, 2007). Hence these networks can be valuable sources of information for financial services companies, something which seems to be supported by this observation. This finding could be extended by future research, why this cooperation is important, what are their drivers and mechanisms explaining its possible success.

A significant association between the provision of deposit services with consultants was found ($\phi C = 0,5164$). Consultants were reported to be specialist knowledge providers, especially in the (financial) services sector (Tether and Tajar, 2008a; Weigelt and Sarkar, 2009) and this observation indicates that the Luxembourg financial services sector is also familiar with this. Additionally consultants were found to be associated to bank deposits services in Luxembourg financial services companies ($\phi C = 0,6325$), further indicating that this group is likely to be important. Consultants are reported to be complementary sources for companies (Tether and Tajar, 2008a) and this observation seems to converge with those results of past research.

On the other hand, the significant associations between internal sources and deposits included the back stage employees (i.e. support for front line employees) with $\phi C = 0,4797$, the CEO emerged as relevant but with a lower significance level (90% significance level and $\phi C = 0,4940$) and "other internal sources" ($\phi C = -0,4082$). Unfortunately none of the respondents provided more details on this last category, leaving an area for further

research. The survey did however provide the possibility to indicate marketing or business intelligence employees as potential internal sources, yet they did not emerge as significant.

The benefit of a better controlled dependence due to working with external partners for new or significantly improved services is associated with bank deposit services ($\phi C = 0,5189$). This could indicate that the Luxembourg financial service sector is using various external suppliers that could create dependencies in their value chain since important resources need to be integrated from the external environment (Pfeffer and Salancik, 2003). Therefore the importance of social capital (Nahapiet and Ghoshal, 1998; Inkpen and Tsang, 2005) and good networks (Granovetter, 1983; Granovetter, 1985; Uzzi, 1996; Uzzi, 1997; Uzzi and Lancaster, 2003) in the financial service sector emerges again as very likely to be relevant. However during the involvement of external partners for new or significantly improved services, loss of creativity within the bank was associated with deposit services ($\phi C = 0,4425$). This emphasizes the importance of investing in own resources and capabilities (e.g. absorptive capacity) for innovation next to external information and knowledge sources for innovation (Zahra et al., 2006; Todorova and Durisin, 2007; Knoppen et al., 2011; Robertson et al., 2012; Su et al., 2013).

Capabilities and resources for innovation activities

Mergers are important for the development or significant improvement of services and can result in new to the bank services ($\phi C = 0,5545$). Luxembourg is an open economy with several financial companies having their headquarters outside of the country or strong corporate links with foreign holdings. This observation shows that an inflow of knowledge and information for new services innovation in Luxembourg could be facilitated by these corporate relationships.

This is complementary to the finding that activities such as the acquisition of external knowledge (e.g. copyrights patents, trademarks, industrial designs, and trade secrets) are associated with the development of new or improved services within Luxembourg banking institutions ($\phi C = 0,3430$). This can also be regarded as complementary with the previous importance of consultants as an external source. This type of supplier can have easier access to other external sources of knowledge, less easily accessible by Luxembourgish banking institutions. For example the consultants can also work with the competitor of their client, making available to them insights that the client might not have (Weigelt and Sarkar, 2009). On the other hand, the professional associations favour networking between peers and providers, also stimulating information transfer, playing a pivotal role in a company's institutional context (Greenwood et al., 2002). The associations provide an opportunity to learn more about the peers and it can facilitate mimicking behaviour, copying peers' organizational templates (Greenwood and Hinings, 1996). This finding also points to the potential need for organizational capabilities to absorb new knowledge and information, and also the capabilities to effectively use new knowledge to create (improve existing) services (Weigelt, 2013). This requires absorptive capacity (Cohen and Levinthal, 1990) and associated company investments (Zahra and George, 2002; Todorova and Durisin, 2007; Volberda et al., 2010).

Regarding the development of new or improved services, the survey found that banks developing new or significantly improved services by themselves, is associated to the provision of bank deposit services ($\phi C = -0,3430$) or they jointly relied on other partners who were not part of their group ($\phi C = 0,4804$). The first element hints at the possibility that Luxembourgish banking institutions have either invested or either drawn upon existing internal capabilities to develop these services. This indicates that there is an innovation process within the Luxembourgish banking institutions, possibly with a varying degree of formalisation. This finding is complementary with the importance of 'other internal sources'. The second finding highlights the contribution of external partners for developing new or significantly improved services, which is a complementary finding to the importance of consultants or industry associations as external sources of information and knowledge. Financial services companies in Luxembourg disposing of a dedicated NSD (new service development) team are associated with new to the market innovations. This indicates that having an internal team and investments into capabilities can result in new to the market innovations ($\phi C = 0,4677$). Additionally NSD teams working together on a permanent basis are associated to new to the market innovations ($\phi C = 0,4960$). This could illustrate the relevance of having internal resources committed to innovation activities and hence the relevance of investing in absorptive capacity (Cohen and Levinthal, 1990).

Customers and innovation activities

The cooperation with customers is valuable for the banks innovation activities and is associated with the introduction of new to the market services ($\phi C = 0,6617$). This finding could indicate the importance of specific customer segments for innovation (e.g. private banking in Luxembourg). Cooperation with customers is indeed interesting to investigate further (Akamavi, 2005), in line with its growing interest within financial services since it remains relatively new (Pallister et al., 2007). Additionally, customers can serve as a source of external information and knowledge (Greer and Lei, 2012) to leverage the internal innovation process (Bindroo et al., 2012).

Respondents who have a dedicated process for NSD with a given customer are associated with new to the market innovations ($\phi C = 0,5819$). This further reinforces the interest of dedicated customer groups and associated internal investments (capabilities) for these groups. Demanding customers are associated with the introduction of new to the market services ($\phi C = 0,5241$), coupled with previous findings and further showing the research interest for customer involvement within Luxembourg financial services.

Regarding the type of customers, the HNWI (high net worth individuals) are associated to the provision of deposit services ($\phi C = 0,4583$). Small and medium sized enterprises and large customers were not found to be associated. Therefore this specific group of customers should be explored further.

Customers also asking tailored services ($\phi C = 0,4603$), niche customers, are also associated with new to the market innovations. Customers with higher purchasing power are associated with new to the market services ($\phi C = 0,4839$), hinting again at the aforementioned HNWI segment of customers. Specifically HNWI customers as an involved group of customers were found to be associated with new to market innovations

($\phi C = -0,4603$). This outcome (- sign of ϕC) is not problematic as the calculations involve a 2x2 table for these variables.

Conclusion

This research is among the first to consider the Luxembourg financial services sector as its empirical setting for innovation research. This is surprising because its context is unique for financial services, providing a high potential research area for (services) innovation research. A specific decomposition of the types of customer in this sector and setting also provides possible subgroups to consider as external sources of innovation.

The investments financial services companies make for innovation activities should be in internal capabilities to deal with external and internal sources of information, which can lead to innovation. In building this capability, the importance of networks for innovation, through professional associations for example, should also be recognized and explored. This will allow the company to be able to actually exploit in a later phase, for creating service innovation. Involving customers as another source of information for innovation should be considered, yet attention should be paid to the type of customer to involve. Within the setting of the Grand-duchy of Luxembourg, HNWI's could be a relevant group to consider.

Limitations

The importance of the national and sectoral context is an integral part for this research's attention to the sources of innovation within the Luxembourg financial services sector. However this creates difficulties for replicating the research in a different empirical context and hence the generalizability of the obtained results to the European financial services sector (for example) is not possible or should be done with caution. The obtained results cannot imply causality and are hence limited to correlations.

Future research

The obtained results provide important indications on possible external sources of information for innovation in Luxembourg financial services companies. First of all the importance of networks emerged from the data. Further research is required to investigate the importance of these (industry) networks for the innovation process within financial services companies. Additionally the reasons, motivations for the cooperation through networks, their drivers and mechanisms should be researched. This can provide more insights on the dynamics of these cooperations, explaining possible successes and failures when using networks for innovation within the financial services sector. The importance of HNWI also emerged from the data and merits a further investigation into its possible contributions to new or significantly improved financial service innovations. The possible contributions from specific organizational capabilities to create new or significantly improved financial services, is another possible angle for continuing the investigation in this empirical setting.

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Publication II

De Smet, D., Mention, A.-L. and Torkkeli, M.

Knowledge sourcing from customers in new financial service development

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Knowledge sourcing from customers in new financial service development

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Abstract: The involvement of customers for new service developments is an area that receives considerable research attention, yet its exact outcomes and process are found to be ambiguous. Therefore different contexts should be studied to capture the multifaceted nature of service innovations. This research focuses on the results of a survey in an international financial services setting. This survey was distributed among the members of the leading professional association for financial services. The obtained dataset was studied by using qualitative comparative analysis (QCA) and descriptive statistics in order to explore customer involvement and facilitate the emergence of research propositions and recommendations in this setting. The company's actual pool of customers influences the composition of its service offer (i.e., its core services, supplementary services and service delivery). The presence of a specific customer type was found necessary and sufficient as a condition for achieving core service innovations within the context of international financial services.

Keywords: customer involvement; innovation; new service development; financial services.

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1 Introduction

Both scholars and practitioners have drawn their attention to the role users or customers play in the innovation process (von Hippel, 1978, 1986). The context of financial services for customer involvement has also been subject to an increased interest (Cooper and Edgett, 1996; de Brantani, 1993). Such collaborative innovation is often referred to as co-creation and can be a useful approach in overcoming inherent problems of the conventional market research techniques (Thomke and von Hippel, 2002). Compared to other sectors of the economy, our understanding of the research phenomenon in services is limited. Extant research findings provided mixed evidence on the extent to which the involvement of customers into the innovation process is beneficial (Greer and Lei, 2012). Taking into account the recent research findings which advocate for a further understanding of the topic, our study is aimed at shedding light on the role customers play in services innovation of an understudied sector, financial services (Akamavi, 2005; Mention and Torkkeli, 2012).

There is significant ambiguity in our understanding of co-creation in financial services (Martovoy and Dos Santos, 2012; Mention and Torkkeli, 2012). Some scholars argue that customers can be helpful for financial innovation (Drew, 1995; Menor and Roth, 2008), while others have some concerns about this (Avlonitis et al., 2001; Vermeulen, 2004). The propensity to co-create seems to be dependent on the nature of the market served: retail or corporate financial services (Oliveira and von Hippel, 2011). However a firm's own customer clusters also play a critical role in the development of innovations (Bindroo et al., 2012) and customers of financial institutions are reported as an important source of innovation in the sector (Hollenstein, 2003; Pallister et al., 2007). They can be involved in several stages of the innovation process (Alam and Perry, 2002;

Cooper and Edgett, 1996; Edgett and Jones, 1991; Edgett, 1996; Storey and Easingwood, 1993), however the degree of customer involvement varies (Chien and Chen, 2010). Meanwhile, some scholars argue that customers may have problems in articulating their needs (Avlonitis et al., 2001) or may not be interested in new financial offerings (Vermeulen, 2004). In overall, the existing body of literature on co-creation in financial services is limited and requires further research attention (Akamavi, 2005; Mention and Torkkeli, 2012). This study aims to bridge this gap by answering the following questions:

- 1 What type of customer contributes to service innovation?
- 2 To what type of innovation do customers contribute in the financial services industry?

A dedicated survey was launched with the help of the leading association of banks in Luxembourg, namely the ABBL (The Luxembourg Bankers' Association). It was distributed to all of its members and the final dataset contained the full answers of 25 financial services companies. This dataset will be used to explore the involvement of customers in an international financial centre which is ranked 17th in the world and 4th in Europe, following leading financial centres such as London, Zurich and Geneva (Z/Yen Group, 2015). In overall, financial services account for 38% of the country's GDP (LFF, 2013). Apart from the firms dealing with the insurance/reinsurance, asset management, and supporting financial services, banks located in Luxembourg represent the biggest share of the financial cluster, accounting for 19% of the country's gross domestic product (LFF, 2013). Following the smaller dataset, qualitative comparative analysis (QCA) will be used to explore this empirical setting. This method has been applied in various management contexts and is useable with many theories (Fiss, 2007, 2011; Grandori and Furnari, 2008; Rihoux et al., 2013), but its use in innovation management studies remains very scarce (to the best of our knowledge). The technique is particularly useful when there are a relatively small number of cases to analyse, since probabilistic statistical methods require more input (Rihoux, 2003). This method is also suited for small-N analysis of more complex causalities (Fiss, 2007; Pajunen, 2008).

The research findings unveil that financial services companies tend to involve

- 1 more demanding complex services
- 2 having higher volume transactions
- 3 with whom the financial services companies have longstanding relationships
- 4 who have a strong motivation to find solutions to their contexts.

These characteristics are typical for high net worth individuals (HNWI). Involving HNWI can indeed result in service innovations: working with this type of customer is found to be necessary and sufficient for achieving core service innovations in the Luxembourg financial services sector. This finding is supported by other results which indicate that involving customers is necessary but not sufficient to create innovations that are new to the company.

Services are composed of a central (i.e. core) value, with supplementary elements enhancing this and finally the delivery of the service to customers (Lovelock and Wirtz, 2011). The core service provides the main benefit to the customer, a solution to a problem. Therefore, core service innovation refers to changes in those solutions for customers. Supplementary service elements enhance the core value, facilitating its use by

the customer. Innovation in supplementary services hence represents changes in those facilitating and enhancing elements. Innovation in service delivery refers to changes in the way core and supplementary elements are delivered to the customer. An important outcome of involving customers for new services is described by the degree of novelty associated to the subsequent changes in the composition of the service offer. In particular, the distinction between ‘services new to the bank’ and ‘services new to the market’ will be used to describe the degree of novelty of the service innovation through customer involvement.

This paper is structured as follows: Section 2 covers the literature review; the research context and method is presented in Section 3; findings and their discussion are available in Section 4; conclusions and limitations will be discussed in the fifth section.

2 Literature review

In general, solid empirical evidence on how new service development are developed or how the characteristics of these initiatives can predict the organisation’s innovation, is limited (Alam, 2002; Alam and Perry, 2002; Jaw et al., 2010; Stevens and Dimitriadis, 2004). Scholars argue that the innovation process in every industry is different due to its structural characteristics (Fraga et al., 2008). This re-emphasises the research interest of innovation for, and within, the financial services industry (Mention and Torkkeli, 2012). A recent review (Papastathopoulou and Hultink, 2012) found that research dealing with new service development is however gaining in maturity because this topic is expanding. In particular the involvement of customers to innovation process (co-creation) has been a growing sub-topic, together with the critical success factors of the new service development process.

Co-creation refers to the innovating with users rather than to users (Prahalad and Ramaswamy, 2004a, 2004b; Vargo and Lusch, 2004). This assumes active participation of customers in the innovation process. Co-creation is normally used in order to alleviate problems associated with the traditional market research. It is seen as an approach to overcome difficult-to-transfer nature of the information about needs and wishes possessed by customers (Thomke and von Hippel, 2002). A recent review of diverse body of literature on the co-creation pinpoints both positive and negative aspects of collaborative innovation with customers (Greer and Lei, 2012), while outlining several avenues for further research among which are the selection of customers, managing customer interaction and effect of co-creation on in-house innovators.

Extant literature suggests that the role of customers in financial service innovation remains mixed (Mention and Torkkeli, 2012). One group of scholars argues that customers can be a relevant source of inputs for development of new financial offerings (Drew, 1995; Menor and Roth, 2008), while another one is rather sceptical about the degree of customers’ willingness and ability to contribute to new financial service development (Avlonitis et al., 2001; Vermeulen, 2004). In the same vein, some studies confirmed that antecedents for co-creation (measured by the degree of inter-firm communication) are evident mainly in corporate financial markets (Athanasopoulou and Johne, 2004), while another study showed higher rate of co-creation in retail financial markets (Oliveira and von Hippel, 2011). This study is aimed at unveiling the role customers play in innovation in services taken on the example of the financial sector.

Drawing upon an empirical study, Hollenstein (2003) shows that financial services companies were found to be intensive users of external knowledge from various sources, including customers, but no further implications were given regarding their involvement for new service development. Another study also suggests that customer insights are one among the main drivers of new service developments (Pallister et al., 2007).

Research evidence suggests that customers can be involved to several stages of innovation process in financial services. Alam and Perry (2002) found that although inputs originating from customers are evident at all stages of new service development process in financial services, the most popular ones are: idea generation, service design, and service testing and pilot run. Other studies show that when customers contribute to the following stages of new service development: concept development, service design, and trials, new financial products are usually attributed with higher success rates (Cooper and Edgett, 1996; Storey and Easingwood, 1993; Thomke, 2003). However, considerable variation in the degree of customer involvement was found in other research (Chien and Chen, 2010). In the latter study, customers' involvement was reported to be valuable for the financial services organisation when there is a different point of view between the departments involved in new product development. Another study suggests that involvement of customers is critical for the success of service development initiatives, yet its effectiveness in the various service development stages is ambiguous (Carbonell et al., 2009). Financial service providers were among those surveyed by the scholars (representing around 23% of the sample). Involving the customers was found to be important when there is technological uncertainty whilst their impact on the performance of new service development was not found to be dependent on the stage of the service development process.

Meanwhile, some scholars are critical about customer involvement for innovation in financial services. Customers of financial services companies can have problems in defining their needs (Avlonitis et al., 2001) whilst customers may be unwilling to cooperate because of the perceived complex nature of new financial offerings or lack of interest in them (Vermeulen, 2004). In the similar vein, it is suggested that customers in the financial services sector seem to lack confidence in the financial services provider, requiring more transparency and customer education (Howcroft et al., 2007). Also the customer segment plays a role in new service development initiatives. The degree of communication with customers was found to be higher in corporate markets than in retail markets (Athanasopoulou and John, 2004) and the propensity to involve customers seems to be higher in retail, rather than corporate markets (Oliveira and von Hippel, 2011).

Existing literature suggests several customer selection criteria and various ways of how co-creation in financial services is actually organised. Drawing upon a qualitative study, financial service providers for new service development projects tend to select more demanding customers in retail markets, while opting for the ones with whom they have longstanding and intertwined relationships in corporate markets (Martovoy and Dos Santos, 2012). Another study suggests that customer inputs are administered by the means of regular meetings, customer observation and in-depth interviews (Alam and Perry, 2002). New communication technologies can be also useful for co-creation in financial services, fostering real-time development of new financial services (Naudé et al., 1998). Few studies addressed the link between the involvement of customers for financial innovation and its outcomes. Drawing upon the mixed sample including financial services, customer orientation was found to be the main factor for achieving

incremental innovations in the service industry (Cheng and Krumwiede, 2012). Another study conveyed that customer involvement was not found to have a direct effect on competitive superiority or sales performance. However indirectly it was found to positively affect the speed of innovation and an improvement of the technical quality of the service (Carbonell et al., 2009).

The co-creation literature stream with customers is all about value creation but this also implies the need of capturing this value in a later stage. There is need to distinguish between value creation and value capture (Bowman and Ambrosini, 2000; Lepak et al., 2007). Value creation requires innovation as it must create (or reinforce) the use value for the customer or reduce exchange value (i.e. the price paid) for the customer (Priem, 2007). Value capture on the other hand refers to the appropriation of received payments from the customer, the ability of a company to keep those payments (i.e. exchange value) for itself and not need to redistribute it within the upstream or downstream value chain (Priem, 2007). This distinction refers to the situation that value creation does not necessarily result in value capture by the originator of the value creation in the first place (Lepak et al., 2007). There are also discussions regarding the sources and targets of value creation, companies can be sources of value creation through their organisational capabilities but these tend to overlook the target users (Lepak et al., 2007).

In general, co-creation and customer involvement as a phenomenon appears to be underexplored not only in the context of financial services (Akamavi, 2005) but for services in general (Greer and Lei, 2012). More research is foreseen on the roles are played by customers, and how and when customers are appropriately involved in the development process of financial products and services.

3 Research context and methods

3.1 Data collection

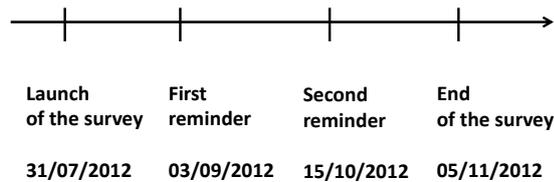
A dedicated survey of 25 multiple choice questions was launched, drawing upon the literature review. The survey questions were further grouped into the seven sections of the questionnaire: general information about a firm; sources of knowledge for innovation; output of innovation activities; cooperation for innovation; role of customers in new service development; general and economic data about firm; and information about a respondent. The questionnaire was developed in English and pre-tested with three firms through face-to-face interviews which lasted around 45 minutes each. This allowed improving the wordings of some questions in order to make them clearer. Targeted respondents were chief executive officers and their deputies, executives responsible for innovation, business development, new service development, marketing, organisation or quality. Respondents were asked to fill in the questionnaire on different aspects of innovation activity at their firms for the past 2.5 years, taking 2010–2012 as their reference period. Most of the completed questionnaires were returned by respondents by e-mail or postal service, while the rest was collected by us at their premises.

By the start of data collection (31st July 2012), overall number of the banks and branches of credit institutions authorised to carry on their activities in Luxembourg (except rural banks) was equal to 142 entities (CSSF, 2012) representing 26,700 employees (KPMG, 2012). Majority of these banks (103 units) were members of the professional association ABBL. Those banks which are not members of the ABBL

are mainly parent credit institutions which settled down their branches in addition to their respective group members authorised to carry on their activities pursuant to Article 2 of the Law of Grand-Duchy of Luxembourg (5 April, 1993).

We opted to disseminate the questionnaire among the banks which are members of the ABL. We contacted the ABL administration, presented the developed questionnaire and asked for their support in reaching their members. The ABL agreed to send out the questionnaire via e-mail to all its members. The initial distribution took place on 31st July 2012. After having obtained nine replies, a reminder about the survey was sent to the bank's deputy executives, names and e-mails of which were collected from the banks' respective websites coupled with the internal database of available contacts, increasing the collection by five more responses. The second reminder was sent out in mid-October 2012, resulting in an extra of eleven completed questionnaires. Fourteen banks refused to take part in the survey in a spoken or written form, while the rest did not reply. In overall, the research sample consists of 25 banks which represent 24% of the parent population. The steps in the data collection are summarised in Figure 1.

Figure 1 Phases in the data collection



The obtained response rate is acceptable because

- 1 our sample is representative of the Luxembourg banking sector
- 2 it falls within the normal range of response rates in studies where organisations are contacted
- 3 it falls within the normal range of response rates for studies where top executives are contacted.

The number of employees represented by the respondents in our sample amounts to 11,300 employees and therefore our sample covers 42% of the total population.

The average response rate for surveys dealing with organisations was found to be 35% with a standard deviation of 18% (Baruch and Holtom, 2008). In particular, the response rate for the financial services industry was found to be 57% on average, with a standard deviation of 21% (Baruch and Holtom, 2008). However, this does not reduce the quality of the response rate since we need to keep in mind that the response rate as such is not more important than the response representativeness (Cook et al., 2000). Accessing top executives is known to have a lower response rate, the median response rate of executives was found to be 32% with an interquartile range of 20%–46% (Cycyota and Harrison, 2006).

Taking into account the sample size and the peculiar context of the Luxembourg financial services industry, we have opted for using a mixed research design, appropriate because our purpose is to pursue complementarity (Greene et al., 1989). In particular, we applied a concurrent nested design (Plano Clark and Creswell, 2008) also known as

multilevel design (Tashakkori and Teddlie, 1998). Therefore, we explored the research phenomena by analysing it in two phases: an initial phase and an advanced phase, where the qualitative method is nested within the quantitative one. Embedding a qualitative part within a quantitative design can enrich the description of the sample (Morse, 1991, 2005).

3.2 *Data analysis – QCA*

QCA is a method that allows a systematic comparison between cases (respondents), while preserving an appreciation of the within-case complexity (Rihoux and Ragin, 2008). The primary objective of QCA is to identify, and compare, which configurations of conditions result in the outcome of interest, typically distinguishing which conditions are necessary and which are sufficient for the outcome to occur. This method has been applied in various management contexts and is useable with many theories (Fiss, 2007, 2011; Grandori and Furnari, 2008; Rihoux et al., 2013), except in innovation management studies (to the best of our knowledge). The technique is particularly useful when there are a relatively small number of cases to analyse, since probabilistic statistical methods require more input (Rihoux, 2003). This method is also suited for small-N analysis of more complex causalities (Fiss, 2007; Pajunen, 2008). A set-theoretic approach has strong advantages for studying customer involvement in innovation studies. QCA facilitates researching which causal elements combine into configurations of necessary and sufficient conditions for the outcome that is studied (Rihoux and Ragin, 2008). Specifically, this systematic approach will look for patterns that are consistent along the different cases (Fiss, 2007; Rihoux and Ragin, 2008).

The crisp set qualitative comparative analysis (csQCA) technique is the commonly used version and is also the most suitable for the smaller amounts of cases and causal conditions in our set. This technique of QCA uses exclusively binary variables as inputs as recognised as a genuine methodological innovation (Gerring, 2001) and it aims to develop a middle road between the case-oriented (qualitative) and the variable-oriented (quantitative) approaches (Ragin, 2008a, 2008b).

3.2.1 *Data analysis: Part 1*

Overview and the description of the variables tested in the QCA are given in Annex. The data analysis was performed in two phases. The initial phase involved the analysis of descriptive statistics and publicly available information regarding the respondents in our sample, leading to an initial comparison. Data from the survey was analysed by looking at the type of company, their various operations and answers to the survey. This was complemented by additional contextual knowledge on the financial services sector in Luxembourg due to frequent interactions during other research activities in this sector. Missing data were completed through telephonic interviews and by consulting freely available annual reports, corporate communication and industry papers.

3.2.2 *Data analysis: Part 2*

The second phase involved the application of QCA to foster a deeper comparison between the cases through its systematic set-theoretic approach. We used the freely available software package fs/QCA (Ragin and Sean, 2009), which is a reference in the

field and which is also the most popular with around 80% of market share (COMPASSS, 2013). The full list of variables can be found in Annex.

The necessary variables were dichotomised before the actual analysis began. Most of the concerned variables were already binary. Following the necessary steps in csQCA analysis, we first created a dichotomous data table. Based on the dichotomous table, the creation of a truth table began. Following the fsQCA manual (Ragin, 2008a, 2008b), all the data was analysed. In particular, the frequency threshold of configurations was set at 2 (considering our smaller sample), their consistency thresholds were set at 0.75 and the truth table algorithm was used. For the obtained results, the solution consistency was set at 0.8 and solution coverage was set at 0.7 to favour acceptable values for the Boolean minimisation process in this algorithm.

Two different types of calibrations were prepared to test the data. Some variables had values ranging from 1 to 4, and these were recoded to 1 if the score was 3–4 or 0 if the score was 1–2. The second calibration used the averages for the same causal conditions, if the item was above the average, 1 was coded, if it was below the average, then 0 was coded.

4 Findings and discussion

Since this paper aims at exploring an international financial services setting for customer involvement with the obtained survey data, descriptive statistics and QCA will both be discussed.

4.1 Descriptive analysis

The obtained results have shown that as compared to other sources of knowledge, customers have an upper medium importance (1.96) for innovation in financial services, followed by the company's own resources (2.76), other entities belonging to the company's group (2.33) and finally consultants (2.00). The degree of importance of the sources of knowledge is measured on a scale from 1 (low) to 3 (high). This find seems to be in line with earlier studies (Pennings and Harianto, 1992; Vence and Trigo, 2009) which pointed out the importance of group members, suppliers and consultants for innovation in the financial services sector. However, the higher standard deviations (from 0.9 to 1) point to the fact that the degree of importance of customers as a source of knowledge for innovation and cooperation varies from one company to another.

While the majority of the respondents consider customers as a highly important sources of knowledge for innovation (36%), their respective importance as a cooperating partner drops to about 27%. Research findings also suggest that about one third of the surveyed financial services companies reports low importance of customers in financial service innovation. Moreover, at least 4% of the respondents did not source any input from customers and at least 18% did not cooperate with them over the period of years 2010–2012. This means that there are some endogenous and exogenous factors in the dyadic relations between banks and their actual and potential customers that may influence the degree of actual importance of the latter for innovation in financial services.

Aiming at responding to this issue and taking into account the controversy which exists in the literature on the actual role customers play in financial innovation (Athanasopoulou and Johne, 2004; Avlonitis et al., 2001; Menor and Roth, 2008;

Oliveira and von Hippel, 2011; Vermeulen, 2004), the following section of the research findings sheds light on the extent to which new service development managers at financial services companies perceive inputs originating from customers as original, valuable and realisable ones. In this attempt we follow the conceptual construct and the delineation among these definitions as pointed out by previous research (Kristensson et al., 2004).

The findings suggest that financial services executives are confident about customers' potential in providing valuable and original ideas. Yet, they seem more sceptical about the extent to which customers can be a good source of realisable ideas. This may be a sign of a higher likelihood of new-to-market innovations at those financial services companies, which integrate suggestions of their customers into innovation process. We have not found strong support for the argument that customers have difficulties in formulating their actual needs for new or improved services (Avlonitis et al., 2001) meanwhile we cannot reject this either. Probably, the ability of customers to convey their actual needs for new financial services depends on the market served.

Meanwhile, the majority of the respondents reported perceiving customer involvement for the development of new or improved services as important. It may partially contradict earlier research where authors argue that customers may lack interest in new financial products (Vermeulen, 2004). Again, this can be driven by the nature of customers served by the surveyed entities in Luxembourg: institutions (27%), high net worth individuals and families (23%), small and medium sized firms (20%), large firms (20%) and retail customers (10%).

In overall, 48% of the financial services companies reported they cooperated with customers for the development of new or improvement of existing services over the period 2010–2012. Half of them reported that the duration of cooperation between the financial services company and a customer was continuous, while 16% reported that cooperation with customers for development of new and improvement of existing services lasted from several months to several years. It leads to an argument that banks located in Luxembourg tend to establish and maintain long-term rather than short-term relationships with customers for innovation.

As pointed out in the literature review, customers can contribute to all stages of the new service development process, yet idea generation, service design, service testing and pilot run were reported the most frequent as customer input (Alam and Perry, 2002). Our findings confirm past research where the involvement of customers is critical for the success of service development initiatives, yet its effectiveness in the various service development stages remains ambiguous (Carbonell et al., 2009). Research findings also suggest that 83% of surveyed banks designed a specific process for new service development for a given customer. It means that in some circumstances financial institutions can be rather flexible in involvement of customers and accommodation of their inputs within the innovation process.

Taking into account the ongoing discussion in the literature on the attributes of customers more suitable for co-creation, we asked our respondents to report on the criteria they use in the selection of relevant customers for joint innovation process. Research findings unveil that financial institutions tend to involve

- 1 customers asking for complex banking services (91% of respondents)
- 2 customers that execute high volume transactions (83%)

- 3 with whom financial institutions have longstanding relationships (75%)
- 4 requiring customised services (75%)
- 5 having a strong motivation to find solutions to their contexts (75%).

Obtained research findings have partially confirmed the recent qualitative study concluded that companies operating in financial services sector prefer to select demanding customers and those with whom financial institutions have longstanding and intertwined relationships (Martovoy and Dos Santos, 2012). Over the period of years 2010–2012, respondents stated that they transformed customers (initially involved to the co-creation) to business partners, meaning that both parties agreed to share profits and losses.

The nature of the developed and administered questionnaire allowed us to see the extent to which inputs from customers of financial service companies were associated with the three main types of innovation in services (Lovelock and Wirtz, 2011). Explorative statistics suggest that executives responsible for innovation at financial services companies usually perceive customer involvement as being linked to innovation in supplementary services (facilitating and enhancing services), innovation in delivery process (the way how core and supplementary services are delivered to customers), and innovation in core services (central component that supplies the principle benefit customers seek).

These findings suggest that the actual role of customers in financial service innovation tend to concentrate around the periphery of financial offerings (facilitating and enhancing services as well as their delivery) rather than its core. The following section will investigate if the type of customer is a differentiating element for realising innovation in its core services.

4.2 *Crisp set qualitative comparative analysis*

After the csQCA for exploring the obtained data from the survey, two sets of results were obtained, corresponding to the two types of calibrations that were made. All the parsimonious solutions that were obtained meet the thresholds for solution consistency (>0.8) and solution coverage (>0.7). Parsimonious solutions were chosen because they show the core conditions that will always be there when a desired outcome occurs. The solution coverage refers to how much of the outcome is explained by each solution term and by the solution as a whole (comparable to R^2 in regressions). Solution consistency refers to the extent to which empirical evidence supports the existence of a relationship between the solution and the outcome (Rihoux and Ragin, 2008). The results of the csQCA analysis with the first calibration of the data will be presented in Table 1.

Table 1 Overview of the csQCA results with ‘calibration 1’

<i>Boolean formulation</i>	<i>Parsimonious solution consistency</i>	<i>Parsimonious solution coverage</i>
1 WHNWI → NC	1	0.8
2 ~CLI + CLA + CLC → N2B	0.842	0.842
3 ~CLL + (~CLI*CLC) + (~CLI*CLA) → N2B	0.875	0.736

Notes: ‘~’ stands for ‘NOT’; ‘+’ stands for ‘OR’; ‘*’ stands for ‘AND’.

We remind that Annex contains the detailed names of the variables and their descriptions.

The first result in Table 1 is clearly shown in line one, new service innovation in the core services (NC) can be obtained by having a segment of high net worth individuals (WHNWI). Therefore this segment is found to be necessary and sufficient for core service innovation in the Luxembourg financial services industry.

The second set of results in Table 1 deals with the nature of the introduced service innovation in this setting. The findings indicate that no significant conditions (e.g. being part of an international group, etc.) were found that lead to new to the market innovation (N2M) through customer involvement; however new to the bank innovation was found (N2B).

When looking at innovations new to the financial services company, involving customers (CLC) for new service developments is found to be sufficient, but not necessary. Line 2 in Table 1 shows that there are multiple paths leading to new to the bank innovation (N2B) in an international financial services setting. First of all, customers that are interested in being involved in new service development initiatives can lead to new to the bank innovations. Secondly, customers having difficulties in articulating their needs for new services are not necessarily an impeding factor for realising new to the company innovations. Thirdly, new to the bank innovations can be achieved through more formal customer involvement. Therefore the customers involved during new service development or improvements of existing services, should be interested in this involvement and those customers having difficulties in expressing their needs should not be excluded from this initiative.

Line 3 in Table 1 shows that a customers' prior experience with a service makes it easier to involve them since their latent preferences are expressed more clearly, facilitating the introduction of new to the company innovations. However innovations new to the company by involving interested customers for new service developments can also be neither necessary nor sufficient. Customers that are interested in working with the company in a new service development initiative could, despite having difficulties in articulating their actual needs, lead to new to the company innovations.

Table 2 will provide an overview of these interpretations of the results in Table 1.

Table 2 Interpretation of the csQCA results with the 'calibration 1'

<i>Boolean formulation</i>	<i>Interpretation</i>
WHNWI → NC	Having high net worth individuals in the customer base is a necessary and sufficient condition for realising innovation in its core financial services.
~CLI + CLA + CLC → N2B	Having customers who are interested in being involved in the development of new (or improvement of existing) services is sufficient but not necessary as a condition for realising new to the bank innovation. Involving customers who have difficulties in articulating their actual needs for new or improved services is sufficient but not necessary as a condition for realising new to the bank innovation. Involving customers through a more formal cooperation in the development of new or improvement of existing services is sufficient but not necessary as a condition for realising new to the bank innovation.

Notes: '~' stands for 'NOT'; '+' stands for 'OR'; '*' stands for 'AND'.

Table 2 Interpretation of the csQCA results with the ‘calibration 1’ (continued)

<i>Boolean formulation</i>	<i>Interpretation</i>
~CLL + (~CLI*CLC) + (~CLI*CLA) → N2B	<p>Having customers whose latent preferences are easy to capture due to past experiences with a new service is sufficient but not necessary as a condition for realising new to the bank innovation.</p> <p>Working with interested customers and a more formal cooperation with customers are sufficient but not necessary as conditions for realising new to the bank innovation.</p> <p>Working with interested customers and customers having difficulties in articulating their actual needs for new or improvement of services are sufficient but not necessary as conditions for realising new to the bank innovation.</p> <p>Involving interested customers is a condition that is neither sufficient nor necessary to realise new to the bank innovation.</p> <p>Formally cooperating with customers is a condition that is neither sufficient nor necessary to realise new to the bank innovation.</p> <p>Customers who have difficulties in articulating their needs for new or improved services customers is a condition that is neither sufficient nor necessary to realise new to the bank innovation.</p>

Notes: ‘~’ stands for ‘NOT’; ‘+’ stands for ‘OR’; ‘*’ stands for ‘AND’.

The data was then analysed again, with a second calibration, and the results will be presented in Table 3.

Table 3 Overview of the csQCA results with ‘calibration 2’

<i>Boolean formulation</i>	<i>Parsimonious solution consistency</i>	<i>Parsimonious solution coverage</i>
1 WHNWI → NC	1	0.8
2 (CLI * CLC) + (~CLI * ~CLC) + (~CLV * ~CLI) + (~CLO*~CLI) → N2B	0.875	0.736

Notes: ‘~’ stands for ‘NOT’; ‘+’ stands for ‘OR’; ‘*’ stands for ‘AND’.

The first result in Table 3 shows that new service innovation in the core services (NC) can be obtained by having a segment of high net worth individuals. This segment is found to be necessary and sufficient for core service innovation in the Luxembourg financial services industry.

The second result is found in line 2 of Table 3 and shows that innovations new to the company can be found by involving customers, doing so is sufficient but not necessary. In particular it was found that formally involving non-interested customers can still lead to new to the company innovations. On the other hand customers who are interested can also lead to new to the company innovations, even without actually cooperating with them. Regarding the ideas that customers might have for new service development, the customers can have non-valuable or non-original ideas but involving them could still lead to new to the company innovation, if they are interested in this involvement for new services.

To summarise, both types of calibrations found that having high-net-worth individuals (HNWI) in its customer base can result in core service innovations for the banking institutions. Luxembourg has a confirmed and historical expertise in private banking. The HNWI group of customers (disposing of normally at least \$m1 investable assets) is arguably a known customer group and the exploration of the dataset with csQCA indicated that this group is also a source of service innovations for the financial services companies in Luxembourg. The Luxembourg private banking sector represents 6% of the global private banking market (LFF, 2013) and HNWI customers represent about 14% of the Luxembourg private banking market (ABB, 2012). Therefore, an important, yet no majority group of customers, can be necessary and sufficient for achieving core service innovation in an international financial services setting. This finding is in line with previous expectations that customers' clusters within companies play an important role in the development of innovation new to the company (Bindroo et al., 2012).

Table 4 will provide an overview of these interpretations of the results presented in Table 3.

Table 4 Interpretation of the csQCA results with 'calibration 2'

<i>Boolean formulation</i>	<i>Interpretation</i>
WHNWI → NC	Having high net worth individuals in the customer base is a necessary and sufficient condition for realising innovation in its core financial services.
(CLI * CLC) + (~CLI * ~CLC) + (~CLV * ~CLI) + (~CLO * ~CLI) → N2B	Customers not interested in being involved in the development of new or improvement of existing services but still involving them formally, are sufficient but not necessary conditions for realising new to the bank innovation. Customers who are interested in being involved in the development of new or improvement of existing services and not involving them formally are sufficient but not necessary as conditions for realising new to the bank innovation. Customers who are interested in being involved in the development of new or improvement of existing services whilst those customers have non-valuable ideas are sufficient but not necessary as conditions for realising new to the bank innovation. Customers who are interested in being involved in the development of new or improvement of existing services whilst those customers have non-original ideas are sufficient but not necessary as conditions for realising new to the bank innovation. Involving interested customers is a condition that is neither sufficient nor necessary to realise new to the bank innovation. Involving customers having non-valuable ideas is neither sufficient nor necessary to realise new to the bank innovation. Involving customers having non-original ideas is neither sufficient nor necessary to realise new to the bank innovation. More formal cooperation with customer is neither sufficient nor necessary to realise new to the bank innovation.

Notes: '~' stands for 'NOT'; '+' stands for 'OR'; '*' stands for 'AND'.

Both calibrations indicate that collaborations with customers are necessary but not sufficient to create innovations that are new to the financial services company. In particular three scenarios can be discussed after the application of csQCA (corroborated by the two different calibrations) to the dataset:

- 1 working with customers a priori interested in being involved in the development of new or improvement of existing services
- 2 more formally cooperating with customers who are not a priori interested in being involved in the development of new or improvement of existing services
- 3 not cooperating more formally with customers who are a priori interested in being involved in the development of new or improvement of existing services.

In the first scenario, the involvement of interested customers was found to be a condition for realising new to the bank innovations. A more formal collaboration with customers is an enhancing element for their involvement. However interested customers who can more difficult articulate their needs can also contribute to new to the bank innovation, even though their ideas might be neither original nor valuable sources for this innovation. In the second scenario the company will more formally cooperate with customers, even though these are not always interested in the new service development initiative. It might be the case that in order to favour new to the bank innovations, that the company needs to mix its involved customers to create synergies which might not have been apparent at first. The last scenario shows that there can be other sources of innovation (West and Bogers, 2014) new to the bank than the interested customers or that this innovation can materialise without structural agreements or other means of formalisation with the involved (interested) customers. Another explication for new to the bank innovation could be the importance of managerial ties as a source of novel and useful information for innovation. The presence of institutional ties (e.g. being part of an international group) was not found to be relevant for enhancing financial services innovativeness (Bell, 2005).

5 Conclusions

Involving customers for new service developments for the financial sector is expected to be an interesting research field. However, research findings on role of customers in financial innovations seem to be ambiguous, requiring further attention (Mention and Torkkeli, 2012). This research sheds insights on the customer type that can be involved for developing new or improved financial services. The exploration of the survey data through descriptive statistics and a csQCA showed that there are converging results regarding the importance of having high net worth individuals in its customer base to foster core service innovation.

The descriptive statistics found that financial service companies tend to involve

- 1 customers demanding complex services
- 2 execute high volume transactions
- 3 have longstanding relationships

- 4 customers who ask for tailored services; and customers who have strong motivation to find solution to their context.

These criteria of are very similar to the characteristics of high net worth individuals (HNWI), corroborating the csQCA findings that HNWI customers are necessary and sufficient for innovations in core financial services. Digging deeper into the data with csQCA allowed to identify three situations in the dataset:

- 1 working with customers a priori interested in being involved in the development of new or improvement of existing services
- 2 more formally cooperating with customers who are not a priori interested in being involved in the development of new or improvement of existing services
- 3 not cooperating more formally with customers who are a priori interested in being involved in the development of new or improvement of existing services.

Descriptive statistics also found that the role of customers seems to be lower when they are acting as cooperating partners in the innovation process, lagging behind bank's group members, consultants and suppliers. About one third of the surveyed financial institutions reports low importance of customers in financial service innovation. Moreover, at least 4% of banks in our sample did not source any input from customers and at least 18% did not cooperate with them over the period of years 2010 to mid-2012. However the majority of the respondents reported seeing customers interested in an involvement for new service developments. Almost half of the sample declared involving customers for financial services innovation, and that this involvement was part of their practices, rather than a short term initiative.

This research has shown that in an international financial centre setting, customers classified as high net worth individuals (HNWI) can be very relevant for innovation in the core services offered by financial institutions and also contribute to the development of services which are new to the financial institution itself. The data allowed to uncover three scenarios related to customer involvement:

- 1 working with customers a priori interested in being involved is necessary for new to the bank service innovation
- 2 more formally cooperating with customers who are not a priori interested in being involved should still be mixed with interested customers since they can have very useful experiences to share
- 3 not cooperating more formally with customers who are a priori interested in being involved which showed that customers are not the only source of service innovation.

5.1 Managerial implications

The findings of this research equip managers responsible for innovation in financial services with the valuable knowledge necessary for both tactical and strategic innovation management decisions. Customers can play an important role in financial services innovation, but innovation managers should pay attention to sufficiently mix the customers who are interested in cooperation and those who are a priori not interested in being involved. The fact that customers might have difficulties in elaborating on their actual needs for the new service should constrain their participation because problem

solving exercises should help in identifying these actual needs. On the other hand they should also pay attention to other external sources of innovation such as their providers or consultants (for example). From the research findings one can also expect that the company involving customers should also require the necessary skills to make this involvement successful, since customers their ideas might not always be neither valuable nor original ones. Therefore, one can expect the facilitators to have sufficient experience in problem solving exercises and interpersonal skills to enrich the interactions and knowledge exchanges.

5.2 Limitations and future research

As with all research results there are limitations to be taken into consideration. This research is limited by the national context since we decided to explore the research phenomenon in Luxembourg. However, this setting is unique and significant for international financial services, due to its important weight on the national economy and its international character. Therefore, consecutive research efforts aimed at cross-national studies would be helpful in the understanding to what extent findings of our study are applicable to other smaller, yet international, services contexts. The obtained findings could be generalisable to other smaller, yet specialised international financial centres like Ireland, Monaco, Singapore or Liechtenstein for example.

This generalisability is less suitable to large and very diversified financial centres but at the same time the objective of this research was to explore the obtained dataset and not to conduct confirmatory research. One could expect that supplementary services would be rather important for high net worth individuals since these enhance the core service offer, in order to distinguish the services by this provider and high net worth individuals are demanding customers. However, no indications were obtained from the data, hence representing a possible future area of research. Linked to this, the use of customers for new to the market services could not sufficiently be research since this type of innovation did not emerge throughout the data analysis. Future research could therefore try to investigate the importance of customer ideas that stimulate new to the market innovation, rather than favouring the inflow of ideas that lead to new to the company innovation. Insights into the core conditions for new to the market innovations remain an area for further exploration.

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Annex

<i>Adapted label for csQCA</i>	<i>Original label in the survey</i>	<i>Description</i>
PG	PartGroup	In 2012, was your bank part of a bank group?
N2M	New2Market	Output: New to your market services
N2B	New2Bank	Output: New to your bank services
NC	NatureCore	Nature of the innovations introduced: core services
NS	NatureSuppl	Nature of the innovations introduced: supplementary
ND	NatureDelivery	Nature of the innovations introduced: delivery process
CLO	ClientOriginal	Clients can be a good source of original ideas
CLV	ClientValuable	Clients can be a good source of valuable ideas
CLA	ClientArticulation	Clients have difficulties in articulating their actual needs for new or improved services
CLP	ClientPinpoint	Clients usually point to a problem rather than provide a concept of solution
CLL	ClientLatent	Latent preferences of clients may be difficult to capture unless they have experience with a new service
CLI	ClientInterest	Usually, clients are not interested in the co-operation on development of new or improvement of existing services
CLC	ClientCoop	Did your bank co-operate with clients for the development of new or improvement of existing services?
BSD	BankServicesDeposits	Bank services: deposits
BSL	BankServicesLoans	Bank services: loans
BSC	BankServicesCash	Bank services: cash management
BSI	BankServicesInvest	Bank services: investments
WRE	WhoClientsRetail	Clients: retail
WHNWI	WhoClientsHNWI	Clients: high net worth individuals and families
WSME	WhoClientSMEs	Clients: SMEs
WLA	WhoClientLarge	Clients: large firms
WIN	WhoClientsInstitutions	Clients: institutions
MNA	MarketsNational	Markets: national (other regions of [your country])
MNE	MarketsNeighbours	Markets: neighbouring EU countries
MEU	MarketsEU	Markets: other EU, EFTA, EU candidate countries
MOT	MarketsOther	Markets: all other countries

Notes: '~' stands for 'opposite'; '+' stands for 'OR'; '*' stands for 'AND'.

Publication III

De Smet, D., Mention, A.-L. and Torkkeli, M.

Alliances in the financial services sector - Exploring its organisational learning mechanisms

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Alliances in the financial services sector – exploring its organisational learning mechanisms

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Abstract: The financial services sector is undergoing many changes, including the use of new technologies for offering new services. An alliance can be formed with younger technology start-ups to facilitate the internal innovation process of financial services providers. On the one hand, dealing with new knowledge (e.g., technological) requires an organisational capability (i.e., absorptive capacity) and the financial services provider's social capital also contributes to a successful knowledge acquisition. On the other hand, organisational learning mechanisms are also paramount in acquiring new knowledge during the innovation process since they drive a company's absorptive capacity. This paper will explore the under-researched organisational learning mechanisms during an alliance in the financial services sector. In particular the influences of policy and structural learning mechanisms on the social capital constituents (i.e., social interactions, relationship quality and supplier network ties) should be interesting areas for further exploration and a first measurement construct will be proposed in this conceptual paper.

Keywords: absorptive capacity; financial services; organisational learning; research propositions.

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1 Introduction

Inter-firm cooperation is known to facilitate the creation, transfer and exchange of critical information and knowledge between companies (Gomes-Casseres et al., 2006). The definition of inter-firm cooperation can be described as an alliance between firms because it considers a spectrum of inter-firm cooperation, with on the one extreme unique or short-term contracts and on the other extreme, the acquisition or merger between companies (Contractor and Lorange, 2002). This means that the temporal element of an alliance can be multifaceted, taking various forms or types of inter-firm cooperation. This cooperation has inherently an important behavioural characteristic, because entities work together in a coordinated manner in pursuit of a shared or complementary goal (Christoffersen, 2013). External conditions (regulation, economic and competitive elements) can foster the creation of inter-firm cooperation (Contractor and Lorange, 2002). An alliance is often more knowledge intensive and characterised by a high failure rate, ranging from issues with its goal, partner characteristics, an uneven learning or lack of incentives to pursue the inter-firm cooperation further (Duysters and Kok, 1999). Despite this risk, an increasing stream of literature emphasises the importance of inter-firm cooperative strategies to develop a competitive advantage and a company's innovation initiatives (Ritala and Hurmelinna-Laukkanen, 2009; de Faria et al., 2010).

The motivations for an inter-firm cooperation can be the development of new services (McEvily and Chakravarthy, 2002), realise economies of scale/scope, reduce costs, share risks (Ahuja, 2000b; Das and Bing-Sheng, 2000; Hagedoorn, 2002) and shorten innovation cycles (Pisano, 1990; Hagedoorn, 1993), having a positive effect on the companies' growth (Powell et al., 1996) and organisational learning (Hagedoorn and Duysters, 2002). It can also lead to dealing with regulations and industry standards more effectively (Benfratello and Sembenelli, 2002; Nakamura, 2003; De Smet, 2012; Geum et al., 2013). Inter-firm cooperation is therefore a means for the external acquisition of knowledge. Prior ties between the companies are important for cooperation (Granovetter, 1985; Sampson, 2007), having a positive effect on the likely value of the pursued innovation (Petruzzelli, 2011).

This article will contribute to the stream on organisational learning during open innovation initiatives (Chesbrough et al., 2006; Chesbrough, 2011; Knoppen et al., 2011; Lichtenthaler, 2011) by relying on an alliance. Prior research dealing with innovative technology start-ups found that the capability to acquire knowledge mediates social capital and the exploitation of knowledge (Yli-Renko et al., 2001). Structural and policy mechanisms of organisational learning, driving the company's absorptive capacity (Lipshitz et al., 2002; Knoppen et al., 2011) have not been studied extensively, to the best of our knowledge. Therefore this paper will present for the first time in the context of financial services, a possible measurement scale for these mechanisms.

2 Literature review

2.1 Financial services as a context for an alliance

In general, research interest for the financial services sector needs to be supported (Mention and Torkkeli, 2012). Information technology is very important in financial services (Chiasson and Davidson, 2005) and it is also one of the main drivers in alliance formation (Ahuja, 2000b). Many IT-induced innovations in banks have occurred in its back-office operations, allowing them to reduce costs, gain efficiencies and use different channels for service provision to their customers, leading to front-office innovations (Berger, 2003; Boot and Marinč, 2008). Therefore, the context of financial services should be interesting when researching inter-firm cooperation. It was also reported that the deregulation of this sector was beneficial for enhanced cooperation (Edvinsson and Malone, 1997). Alliances with moderately similar partners were found to contribute significantly more to firm innovation than alliances with minimally or highly similar ones (Nooteboom et al., 2007; Sampson, 2007), explaining that these alliances can be a conduit for information and resources that otherwise would have been difficult to obtain (Ahuja, 2000a).

Bank holding companies were studied before (Wischnevsky et al., 2011), focusing on organisational innovation and the influence of regulation as an external driver of the innovation process in these companies. The innovation process is iterative by nature and explains intra-sector differences due to its path dependency (Crossan and Apaydin, 2010). Another financial services example deals with the knowledge hurdles that needed to be solved to implement innovation. This can be done by working with supply side

agents like consultants and other external service providers (Weigelt and Sarkar, 2009). Overcoming these hurdles in the financial sector can also be achieved by intra-sector cooperation through professional associations (De Smet, 2012).

This shows the interest of open innovation initiatives in the financial services sector because the firm boundaries are loosened to draw in new knowledge through these alliances (Chesbrough, 2003). Cooperation in general between banks could be difficult because they have similar scopes and hence knowledge redundancies (Jacobsen and Tschoegl, 1999) which also constrains the incentives to engage in alliances. Co-opetition strategies (Brandenburger and Nalebuff, 1996) are therefore also challenging in this sector. An innovative outcome generally refers to process and product innovation in the financial services sector (Rossignoli and Arnaboldi, 2009).

2.2 Knowledge acquisition and organisational learning

The link between the tacitness of knowledge and innovation depends on the relationship between the innovation partners. It is generally assumed that tacit knowledge is embedded in social interactions and routines in the organisation, making it a barrier for absorption of this knowledge by another company (Mowery et al., 1996; Simonin, 1999). More embedded relationships with mutual and reciprocal exchanges (e.g., knowledge, ideas or solutions) between the companies will increase the likelihood that the firms will benefit from providing knowledge to other companies during product developments (Tranekjer and Knudsen, 2012). Therefore knowledge tacitness could limit inter-organisational learning in an alliance.

However it was found to simultaneously enhance innovation outcomes because different knowledge stocks can be combined during the alliance, resulting in innovation without learning (Nielsen and Nielsen, 2009). The latter finding hence emphasises the relevance of various possible combinations of knowledge, partner characteristics and relational quality. The higher the quality of their relationship, the less tacitness of knowledge will be a constraint for an innovation outcome during the alliance.

It is generally acknowledged that social capital can influence the company's ability to acquire new knowledge and apply it for innovative outputs (Nahapiet and Ghoshal, 1998). There is also an increased attention to the role of networks as means for knowledge exchange in the innovation process (Christopherson et al., 2008), hereby making social capital interesting to study alliances. The transfer of this knowledge is additionally complicated by possible differences in culture, organisational/cognitive distance and other elements (Gulati, 1995).

Acquiring knowledge is essentially a social process, and the knowledge acquisition was found to mediate between social capital and knowledge exploitation (Yli-Renko et al., 2001). The capability to acquire knowledge is also an element of a company's absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002). Absorptive capacity is relevant when looking at alliances, because it improves the innovation performance of the involved companies (Lin et al., 2012). This absorptive capacity is driven by organisational learning mechanisms (Lipshitz et al., 2002; Knoppen et al., 2011) which are: structural, cultural, psychological and policy related.

3 Research methodology

The research question of this paper is: How do structural and policy organisational learning mechanisms influence social capital constituents within the financial services sector?

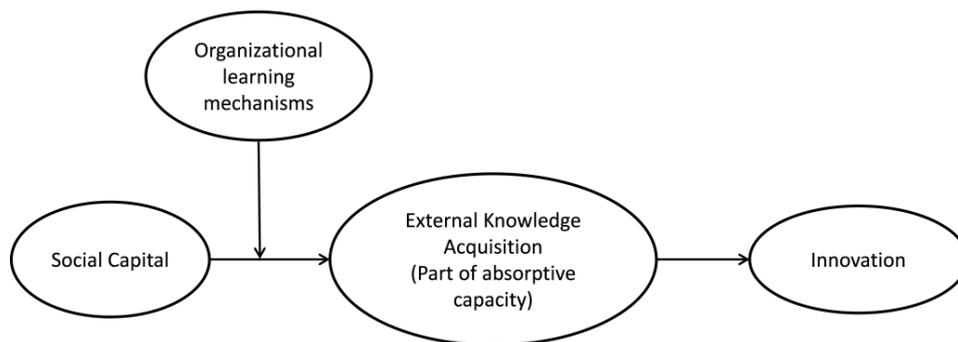
The literature review showed that research into the acquisition of knowledge during and alliance in the financial services sector has not been studied extensively (to the best of our knowledge). Innovation for, and within, financial services generally requires more research attention (Mention and Torkkeli, 2012). Different sectors studying absorptive capacity should also be conducted (Flier et al., 2003; Jansen et al., 2005; Easterby-Smith et al., 2008; Fraga et al., 2008).

It was demonstrated before that a company’s external knowledge acquisition capability mediates social capital and knowledge exploitation (Yli-Renko et al., 2001). However the organisational learning mechanisms driving absorptive capacity (Knoppen et al., 2011), and hence the acquisition capability as part of the company’s potential absorptive capacity (Zahra and George, 2002), have not been studied before. This should be of interest because these organisational learning mechanisms could influence social capital since absorptive capacity and social capital generally facilitate learning which leads to innovation (Nielsen and Nielsen, 2009).

Three new research propositions on this unexplored area, together with new possible constructs for the influence of policy and structural organisational learning mechanisms on the constituents of social capital will be provided. The influences from cultural and psychological mechanisms are left out of this paper because these fields could be studied (mainly) by sociologists and psychologists.

The overall research model is available in Figure 1 (i.e., organisational learning elements that are underexplored in previous research).

Figure 1 Research model



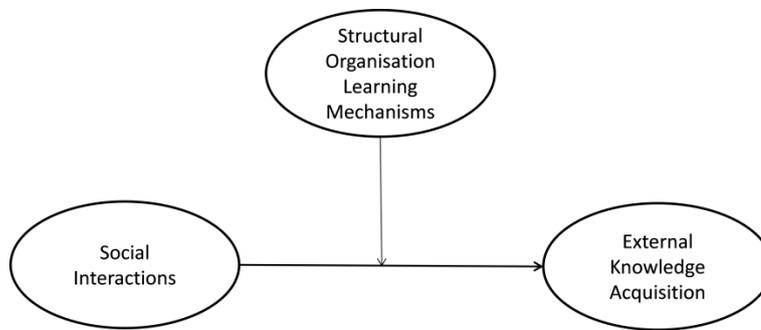
3.1 Research proposition 1

Social interaction is used as a proxy for ‘social integration’ (Knoppen et al., 2011) which is expected to lower the barriers for knowledge exchange. Hence the use of structural mechanisms should foster social interactions since the actors meet in a professional environment because of the professional structures, allowing to get acquainted, fostering more intense exchanges, in breadth/depth and specialised know-how (Ring and Van De Ven, 1994; Dyer and Singh, 1998).

Therefore,

- *Research proposition 1:* Structural organisational learning mechanisms moderate social interactions, contributing to the external knowledge acquisition capability.

Figure 2 Research proposition 1

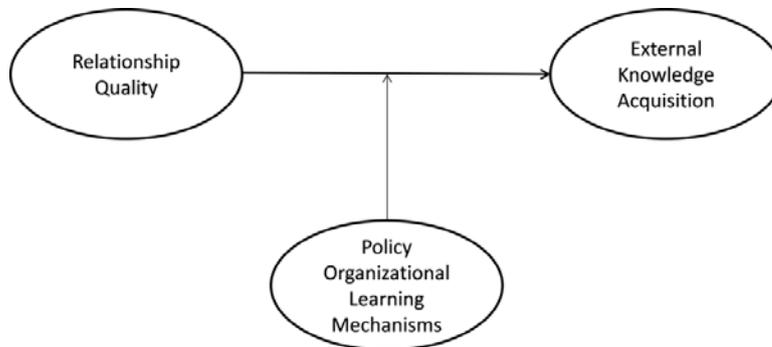


3.2 Research proposition 2

Relationship quality refers to the development of mutual goals, norms and understanding that encourages reciprocity for knowledge exchanges (Dyer and Singh, 1998; Nahapiet and Ghoshal, 1998). Reciprocity contributes to managing the expectations, reaching congruence, which is very important for companies pursuing new knowledge. This congruence reduces the need for a more formal monitoring mechanism and speeds up the knowledge exchange while providing sufficient control. Furthermore, relative absorptive capacity is reported to be at its best when the companies dispose of this congruence (Yli-Renko et al., 2001). Because the acquisition capability is an element of potential absorptive capacity (Zahra and George, 2002), it should play a role for the aforementioned relative absorptive capacity. Policy organisational learning mechanisms should influence this because the formal and informal acts of management towards information/knowledge exchange should influence reciprocity and the presence of a common goal (Lipshitz et al., 2002).

Therefore,

- *Research proposition 2:* Policy organisational learning mechanisms moderate relationship quality, contributing to the external knowledge acquisition capability.

Figure 3 Research proposition 2

3.3 Research proposition 3

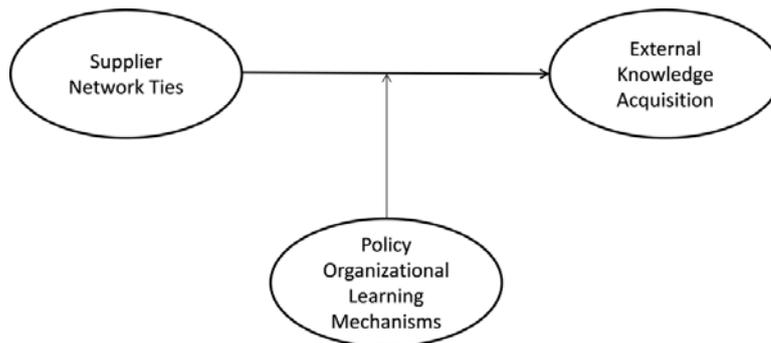
Instead of customer network ties discussed in the article by Yli-Renko et al. (2001), we need to talk about supplier network ties in this context. A large financial service provider in Luxembourg entered into an alliance with a young start-up firm to offer mobile payment solutions to existing retail customers. Because we take the perspective of the financial services company, the original link of customer network ties is modified to supplier network ties. This is interesting because providers of knowledge in open innovation initiatives are usually younger firms, with higher absorptive capacity and high R&D intensity, having fewer barriers to knowledge sharing (Tranekjer and Knudsen, 2012). Supplier network ties refer to the possibility that the buying company gets more contacts with other start-ups, active in a similar sector. Therefore the acquisition from the buyer can experience a snowball effect of new knowledge that it can absorb (Rindfleisch and Moorman, 2001).

The previously mentioned quality of the relationship refers to the use of less formalised control mechanisms due to reciprocity, facilitating the knowledge exchanges. Supplier network ties refer to the access of new knowledge beyond what is available at the supplier itself. By disposing of this supplier contact, the company can have access to other knowledge providers and this diversity is reported to be key for the speed and depth of technological learning (Zahra et al., 2000), applicable in this research context. The strength of ties could play a role in the organisational learning from this supplier. Strong ties and weak ties are used to distinguish between ties, each offering a different type of knowledge that can be acquired. Strong ties are good for deep knowledge exchanges whilst weak ties are good for broadening the available knowledge resources. These can create bridges to useful knowledge that others might not have (Lin, 2001; Levin and Cross, 2004), even technical advice (Constant et al., 1996), which can facilitate the adoption of innovation (Rogers, 2003). Therefore weak ties can be potentially powerful, despite the fact that strong ties create cohesion or embeddedness, which can also be beneficial provided that they do not blind the knowledge exchangers due to a too focused search for information, creating a lot of knowledge redundancies (Uzzi, 1996, 1997; Hansen, 1999; Ruef, 2002; Uzzi and Lancaster, 2003). Empirical research on the strength of a ties found that closeness (i.e., emotional intensity) is the best indicator for the strength of the tie, whilst frequency of contact and duration were less effective (Friedkin, 1980; Granovetter, 1983; Marsden and Campbell, 1984).

However management needs to decide to pursue this, they select the innovation partners, thereby making policy choices.

- *Research proposition 3*: Policy organisational learning mechanisms moderate supplier network ties, contributing to the external knowledge acquisition capability.

Figure 4 Research proposition 3



In order to research the influences from policy and structural organisational learning on social capital's contribution to the external knowledge acquisition capability, the following set of interview questions (i.e., serving as a proxy for a construct) will be used.

3.4 New measurement constructs

Following the literature review (Lipshitz et al., 2002; Naot et al., 2004; Knoppen et al., 2011), new measurement scales are proposed for increasing the available knowledge on organisational learning mechanisms within the financial services companies' innovation process.

The newly defined construct for the influence of structural learning mechanisms:

- 1 a formal review of innovation initiatives facilitates the dissemination of 'lessons learned'
- 2 the presence of a dedicated organisational unit for innovation facilitates the dissemination of 'lessons learned'
- 3 the presence of a dedicated organisational unit for innovation facilitates the dissemination of new information/knowledge for the company
- 4 disposing of a common, physical location for employees working on the innovation initiative facilitates the dissemination of new information/knowledge for the company
- 5 creating a new organisational function for innovation within the company facilitates the dissemination of new information/knowledge for the company.

The newly defined construct for the influence of policy learning mechanisms:

- 1 the management's formal commitment to information/knowledge exchange for innovation initiatives facilitates the dissemination of new information/knowledge in the company
- 2 the management's tolerance to errors in innovation initiatives facilitates the dissemination of new information/knowledge in the company
- 3 the management's investments in offering training for innovation initiatives facilitate the dissemination of new information/knowledge in the company
- 4 the management's investments in reward systems for innovation initiatives facilitate the dissemination of new information/knowledge in the company.

4 Discussions

The three research propositions allow for exploring the new measurement scales that could shed new insights on the way organisational learning manifests itself in financial service companies, which engage with start-ups to facilitate their internal innovation process.

A case study research approach is appropriate for further exploring this research due to the need to take into account the context in innovation studies. The practical implications of alliance findings depend on the circumstances of the firms so case studies should be interesting method to provide insights (Sampson, 2007). Open innovation initiatives, which can result from an alliance, are often studied through case studies (Erzurumlu, 2010) and alliances are an essential element of an open innovation strategy. The degree of openness and thus the optimal level of the open innovation process can differ from case to case (Lazzarotti and Manzini, 2009). The contextual element of the innovation process needs to be taken into account, requiring case study research, since the drivers and impacts of the type of innovation will be different across sectors and countries (Christopherson et al., 2008; Fraga et al., 2008). Finally, the patterns of innovation differ fundamentally by sector, firm and strategy, requiring an understanding of the mechanisms that generate innovation (Enkel et al., 2009; Huizingh, 2011).

The theoretical contributions focus on expanding the knowledge on absorptive capacity and its driving mechanisms in financial services companies (Cohen and Levinthal, 1990; Zahra and George, 2002), extensions to the 'strength of ties' and 'embeddedness' (Granovetter, 1973, 1985; Uzzi, 1997) factors of social capital (Nahapiet and Ghoshal, 1998). An exploration of relational embeddedness in the financial services sector was researched before (Uzzi and Lancaster, 2003; De Smet, 2012) but the organisational learning mechanisms were left out of scope.

A larger scale survey could also be used to validate the proposed measurement scales or interviews could be used to preliminary test the constructs.

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Publication IV

De Smet, D.

Exploring the influence of regulation on the innovation process

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Exploring the influence of regulation on the innovation process

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Abstract: The influence of regulation on the innovation process in the financial services industry is at present an area that is understudied. The Grand-Duchy of Luxembourg provides an interesting case study because it was the first to quickly and effectively transpose a major EU directive for financial services, namely the Undertakings for Collective Investment in Transferable Securities (UCITS) directive. Additionally, no prior study was done on the mechanisms which facilitated a faster innovation process in Luxembourg's financial services industry.

The interplay between the government, professional associations and private actors was studied. A positive influence of this interplay on the implementation of the UCITS directive was found, offering a better understanding of the mechanism of externally induced innovation.

The obtained results provide interesting new venues of research and indicate the importance of reputation and the existing mechanisms of relational embeddedness to enhance the innovation process in Luxembourg's financial services industry.

Keywords: innovation process; regulation; Luxembourg financial services industry; relational embeddedness; reputation.

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This paper is a revised and expanded version of a paper entitled 'Regulation-induced innovation: case study of the UCITS directive in Luxembourg' presented at 1st Summit on Innovation for Financial Services, Luxembourg, 21–23 September 2011.

1 Introduction

The objective of this paper is to explore what could be the mechanisms for quickly transposing the first Undertakings for Collective Investment in Transferable Securities (UCITS) directive in the Grand-Duchy of Luxembourg, thereby illustrating the innovation process in its financial services industry and the overall influence of regulation on the innovation process. By doing so, this paper will contribute to three literature gaps.

First of all the successful interplay between the government, professional associations and private actors of the financial services industry will be demonstrated. These interactions are not yet fully understood nor empirically researched (Lounsbury, 2001; Vermeulen et al., 2007). Secondly, this paper will show how government, professional associations and private companies can positively affect the implementation of regulation since legal obligations do not always lead to an acceptance (Tolbert and Zucker, 1983). Professional associations and private companies can be very influential in adopting new regulations (Deephouse, 1999; Djelic, 1998; Ettlie, 1983; Greenwood and Subbady, 2006) and this paper will shed more light on the mechanisms of this interplay during the innovation process of the financial services industry. Thirdly, this paper will contribute to a better understanding of externally induced innovation (Marcus, 1988; Meyer et al., 1990; Pennings and Harianto, 1992; Thornton, 2004) and its influence on the innovation process, by focussing on a regulation (i.e., UCITS directive) which led to market creation (Greve, 1995; Haveman, 1992; Rao, 1998). The latter facilitated an increased financial innovation, illustrating the ‘financial innovation spiral’ (Merton, 1995), following market creation through regulation.

The adopted research methodology will be case study research with several semi-structured interviews of leading professionals, professional associations and representatives of the public actors. The use of a case study approach is appropriate to study the influences of a country’s regulatory framework on innovation for very specific markets (Blind, 2012), such as the financial services industry in the Grand-Duchy of Luxembourg. The relevance of this industry in innovation studies has been described as [Pennings and Harianto, (1992), p.31]: “... *an interesting case for innovation researchers*”. Finally, the use of a country’s regulatory framework as a policy instrument for innovation is an emerging topic for policy makers (Blind et al., 2004) because it influences an industry’s innovation process.

The fast transposition of the first UCITS directive was a remarkable event. The exponential growth of the fund management industry in Luxembourg is considered to be one of the results of this transposition (Moisson, 2010). For example, Luxembourg is the largest fund centre in Europe: it occupies about 27% of the market for investment fund domiciles in Europe (e.g., France is second with about 18%), it accounts for about 31% of the European market for assets under management (e.g., France is second with about 20%) and it represents about 75% of the entire cross-border market for European fund distribution (Luxembourg For Finance, 2012a). The reputation of the Luxembourg financial centre was thereby confirmed and even reinforced, a clear benefit linked to the first mover advantages for financial service providers (Rossignoli and Arnaboldi, 2009; Tufano, 1989).

The role of relational embeddedness and reputation in these three gaps was explored, leading to the conclusions that:

- 1 regulation *per se* should not be viewed as a constraint on the innovation process of the financial services industry and financial innovation
- 2 there is a strong relational embeddedness, characterised by two drivers: collaborative commitment between the actors of the financial services industry and reputation seeking/confirming behaviour
- 3 these previous elements facilitated a faster transposition of the UCITS directive (compared to other EU countries).

2 Background information on the UCITS regulation(s)

The Directive 85/611/EEC of 20 December 1985 was the first of the UCITS package of EU regulations. The objective of this directive is to facilitate a cross-border handling of mutual funds for consumers by offering a ‘European Passport (EU Passport)’ to these regulated investment products. This EU Passport allows funds accredited in one EU Member State to be commercialised in the entire EU. This led to the creation of a single architecture for offering regulated products to consumers. Hence, this initiative supports the creation of a European market for investment funds and is considered today as one of the success stories of the EU Single Market, with the Grand-Duchy of Luxembourg as its leader (Moisson, 2010). The UCITS directives were particularly aimed at investment products for retail consumers (i.e., investors) because they establish a level of protection through investment limits, organisational and disclosure requirements. Therefore, UCITS funds are considered to be well regulated, high quality investment products. They can be considered as a quality label for retail investment products that enjoy an international reputation.

It was transposed into Luxembourg law on 30 March 1988, shortly after an amendment (Directive 88/220/EEC) of the original directive. The original deadline for implementation did not change, it was required to be implemented (at the latest) on 1 October 1989. This means that the first UCITS directive was implemented only eight days after its first amendment (but a few years after its publication) and within the original timeframe. By doing so, the Grand-Duchy of Luxembourg was the first Member State to effectively transpose this EU directive. There were negotiations for a UCITS II directive but these failed, hence UCITS II was never implemented and remained at a draft status. Important amendments to the original text (Directive 85/611/EEC) were formulated in Directive 2001/107/EC (i.e., Management Directive) and Directive 2001/108/EC (i.e., Product Directive) of 21 January 2002. These three directives are referred to as UCITS III. They modified several aspects such as the eligible assets, the investment techniques, requirements for the fund’s prospectus and rules on the management companies.

The latest version of UCITS is Directive 2009/65/EC of 13 July 2009, which is often referred to as UCITS IV and which is also a recast of the original UCITS directive. The latter was accompanied with a set of detailed implementation measures (comprising two Commission Directives and two Commission Regulations) dealing with key investor information (Commission Regulation No. 583/2010), rules for the conduct of UCITS management companies (Commission Directive 2010/43/EU), UCITS mergers and master-feeder structures (Commission Directive 2010/42/EU), and finally the notification procedure and supervisory cooperation (Commission Regulation No. 584/2010).

Several minor amendments to the original UCITS directive were made by Directive 88/220/EEC (regarding the use of mortgage bonds), Directive 95/26/EC (regarding the strength of the supervisory authority's powers, following the BCCI scandal), Directive 2000/64/EC (regarding the exchange of information with third countries), Directive 2004/39/EC (i.e., MiFID, Markets in Financial Instruments Directive, having impacts for intermediaries that distribute UCITS open-ended funds), Directive 2005/1/EC (regarding new organisational structures for financial services committees) and Directive 2008/18/EC (regarding the implementing powers of the European Commission).

Table 1 summarises the important evolutions of the UCITS legal framework and illustrates its fast transposition into Luxembourg law.

Table 1 Important evolutions of the UCITS legal framework and its transposition into Luxembourg law

	<i>EU level</i>	<i>Luxembourg level</i>
UCITS I	Directive 85/611/EEC of 20 December 1985, which was amended by Directive 88/220/EEC of 22 March 1988 Deadline for transposition: 1 October 1989 Repealed: 1 July 2011	Law of 30 March 1988
UCITS II	Remained a draft directive in early 1990s, because the Council did not reach a consensus.	None
UCITS III	Directive 2001/107/EC of 21 January 2002 Directive 2001/108/EC of 21 January 2002 Deadline for transposition: 13 August 2003	Law of 20 December 2002
UCITS IV	Directive 2009/65/EC of 13 July 2009 Commission Directive 2010/43/EU of 1 July 2010 Commission Directive 2010/44/EU of 1 July 2010 Deadline for transposition: 30 June 2011	Law of 17 December 2010

The fast and effective implementation of the UCITS directive was stimulated by a long established expertise in the private banking sector, dealing with diversified portfolios. This means that there was a substantial evolution over time regarding these mutual funds, meeting the criteria laid down in the UCITS directives. The Grand-Duchy of Luxembourg was the first to transpose the first UCITS directive, which gave birth to multiple first mover advantages. Luxembourg is now the first fund market in Europe and second in the world after the USA. The UCITS directives allowed to creation of a Single EU market for open-ended investment funds for retail customers. For example, the total amount of net assets invested in Luxembourg funds amounted to more than 2 billion euro at the end of 2011 and represents about 27% of the European market. For a comparison, France comes in second with about 17% and Germany with 14% of the European market. The net asset from UCITS funds in Luxembourg represent about 1,760 billion euro and corresponds to 31% of the European market. Again for comparison, France has 19% and Ireland has 15% of the UCITS market in Europe (EFAMA, 2011a). The evolution of the Luxembourg fund industry has been tremendous because in 1990 the total net assets represented 72 000 million euro, a lot less than the 2,096 billion euro in 2011 (ALFI,

2012). Luxembourg also represents the second largest domicile of funds worldwide, next to the USA which is by far the largest. For example, Luxembourg represents almost 10% of the domiciled funds worldwide, whilst the USA represents about 47% of the global market. For a comparison, the third largest domicile of investment funds is France with 6% of the world market in investment funds (EFAMA, 2011b).

A smaller EU Member State like the Grand-Duchy of Luxembourg has therefore a significant role in the global fund industry. In general, its financial services industry is very important, for example, it represents about 30% of the country's tax revenues and it contributes to 38% of its gross domestic product (GDP) in 2010. The Luxembourg financial services industry is also considered to be the most attractive for fund promoters (Luxembourg For Finance, 2012b).

Pushing through innovations requires champions who set the example (Black, 2005) and Luxembourg set the example with its UCITS transposition. Luxembourg's first mover advantage is confirmed everywhere and widely acknowledged. This is consistent with literature, which states that innovations always stress the service when promoting adoption (Rothwell, 1977). Service in this context thus refers to the EU passport for cross border investment services to retail customers. Yet the mechanisms for this faster and effective transposition remain unexplored, whilst more is known on its impacts (Moisson, 2010; Pieretti et al., 2007).

3 Regulation and innovation in the financial services industry

In general, regulations can be viewed as a tool which public authorities can use to promote innovation in business. It refers to a set of formal and informal rules aimed at governing the actual and intended behaviour of consumers, business and even the public agencies. Formal regulation refer to official/legal procedures and rules (e.g., a national law on consumer protection) whilst informal regulation refer to unofficial/social procedures and rules (e.g., codes of conduct). Informal regulation may also emerge as a substitute to missing or deficient formal regulation (Kathuria, 2007; Goldar and Banerjee, 2004; Pargal et al., 1997).

The competence to regulate is a monopolistic power attributed to the public authorities, therefore regulations can influence decisions and preferences (Department for Innovation, Universities and Skills, Department for Business, Enterprise and Regulatory Reform, and Better Regulation Executive, 2008). The overall objectives of regulations are to set boundaries to something new, that reduces costs and risks, provides a service that is more aligned with customers' demand (Frame and White, 2004) or introduces more efficiency and transparency into the market (Braithwaite and Drahos, 2000). These objectives can also be applied to financial regulations (e.g., UCITS) since they can be used to motivate the need for a specific regulation and why it's deemed necessary. This is also emphasised in the following definition of financial innovation and explains already the potential link between innovation and regulations [Rossignoli and Arnaboldi, (2009), p.278]: *"Financial innovation is thus primarily defined as the product and organizational innovation, which allows cost and risk reduction for the single bank and/or an improvement of the services for the financial system as a whole"*.

In the latter definition, the role of regulations and its involved actors (government, private companies and professional associations) are indirectly referred to by the expression 'financial system as a whole', since the government can use its monopolistic

power in all possible industries. Innovation represents the adoption of a new idea, process, product or service, developed internally or acquired from the external environment (Pennings and Harianto, 1992). On the other hand, innovation can also be considered as a meta-principle for contemporary regulatory policy (Scott, 2004). Therefore, regulations are a distinctive policy instrument which encompasses all possible forms of public intervention in the social and economic system, including intended and unintended interventions (Black, 2001; Daintith, 1997).

This indicates that regulations and innovation are strongly linked since regulations are part of this external environment and it's deemed to be a principle for regulatory policy. For example, it can provide a coherent framework for financial services. Interestingly, innovation can be acquired by looking at changes in the regulatory framework because [Marcus, (1988), p.387]: "*Innovation is a matter of external inducement*".

The possibility of regulations to induce innovation is therefore reinforced. Regulations can also be created as a response to a crisis or a disaster that needs to be avoided in the future (creating a sense of urgency) or due to shifts in public opinion (Lo, 2009). Finally, the importance of regulations to induce innovation was described by Miller (1986, p.460): "*The major impulses to successful innovations over the past twenty years have come, ..., from regulation and taxes*". A distinction needs to be made between regulation-induced innovation and regulatory innovation, since the latter focuses on innovation that occurred within government agencies (Greaves, 2009). This paper will focus solely on the regulation-induced innovation, through the UCITS directive, for the financial services industry in the Grand-Duchy of Luxembourg.

Often regulations are perceived as a constraint for innovation initiatives since they invoke changes to existing standards or established practices. However, regulations are not the only possible constraint on financial service providers since they are also impacted by market or internal constraints (Ben-Horim and Silber, 1977). Interestingly, a modification in the regulatory framework is reported as one of the main drivers of change in the financial services industry, next to technological innovation, competition, globalisation, supplier diversification, general economic influences, mergers and acquisitions (Rossignoli and Arnaboldi, 2009). Since change through regulations is an essential element in the financial services industry and because most of the innovations in financial services are absorbed from other industries (Rossignoli and Arnaboldi, 2009), 'regulation-induced innovation' is highly relevant for the innovation process in the financial services industry. The latter must be understood first and foremost as a process of change, a change in the type and variety of available financial products to be sure, but also a change in financial intermediaries and markets themselves (Gubler, 2011). Changes imply that existing ways of working will need to be adapted and therefore the main challenge related to innovation is strongly associated with resistance to the intended changes (Marcus, 1988). This indicates the significance of the innovation process' characteristics in a given industry, to cope with these (potential) changes. This is supported by the observation that an adaptation to the regulatory framework has a significant influence on the performance of innovation initiatives (Blind, 2012).

The complex nature of regulations needs to be taken into account, as clearly described by Frame and White (2004, p.121): "*Regulation is a two-edged sword*". This means that they can constrain or stimulate innovation, indicating that it needs to be designed with care, as clearly illustrated by Lumpkin (2010, p.104): "*Usually, it is improperly conceived and poorly designed regulation that results in net economic costs*". This

inherent challenge can also be observed throughout the history of financial regulation, characterised by a rhetoric of going back and forth between regulation and deregulation, also known as the 'regulatory dialect' (Finnerty, 1985). It further illustrates the implications for professionals and civil servants, that regulations are often complex and dynamic by nature (Blind, 2012; Gubler, 2011). This also explains the various patterns and possible mechanisms for implementing specific EU regulations (Falkner et al., 2006), such as the UCITS directive, and the importance of the innovation process' characteristics in a given industry.

An innovation process involves the reciprocal actions between companies, government intuitions and individuals. Strong corporate leaders can reduce the risks associated with the adoption of innovation if they are closely involved in the marketing of this innovation (Ettlie, 1983). An industry's innovation process consists of six phases (recognition, idea formulation, problem solving, solution, development, utilisation and diffusion) which must be integrated towards a common objective (Marquis, 1988). Implementing an EU directive is a form of innovation because it plays a crucial role as external inducement for starting the innovation process in an industry. The first phase of an industry's innovation process (e.g., within financial services) might be triggered when regulatory authorities (e.g., EU institutions) start the drafting of a new regulation (e.g., financial regulation such as the UCITS directive). The initiation is contingent on the industry's ability to identify the potential new market demand resulting from the proposed technical advances in that new regulation. The actual innovation will be achieved when the solution is introduction to the market, after scaling up and fine tuning (i.e., transposition into national law). Finally, the innovation will be used more and more by the industry's actors, stimulated by its diffusion through its various communication channels and members. This also illustrates the possibility of regulations to result in the creation of new services and even new markets (Rennings and Rammer, 2011). Standardised terms foster sufficiently high volumes, avoiding possible information asymmetries (Merton, 1995). This all illustrates the multitude of actors in the innovation process for financial services and that regulations can stimulate financial innovation.

The transposition into national legislation of UCITS has stimulated an ability to offer 'regulated investment products'. This led to the creation of new organisational structures and processes for investment services. For example, compliance checks are needed for the investment product's characteristics, leading to changes in the internal control framework. Besides that, various fund processing models, risk management processes and IT infrastructures will be impacted. All these processes need to be adequately organised and documented. Regarding new structures, for example, the role of the management company is defined and it requires a supervisory/governance structure which must be put into place to oversee the fund's activities. Another important element is the role of the depository bank. It must ensure that the fund's net asset value (NAV) calculation is done under the fund's predefined rules, illustrating again the need to establish new organisational structures for processing the required information and its verification. The creation of this market for regulated investment products led to new innovation opportunities like derivative products that are tied to the new market, in order to hedge specific risks (Gubler, 2011). This phenomenon is commonly referred to as the 'financial innovation spiral' (Merton, 1995). It stresses that one financial innovation often leads to several other, contiguous innovations.

4 Social embeddedness as a theoretical concept

Following the call to explore other relevant conditions of the regulatory framework in a country (Blind, 2012), the notion of social embeddedness will be used to study the innovation process in Luxembourg's financial services industry (illustrated by the fast and effective transposition of UCITS). Social embeddedness is often used to study the strategic decisions of companies (Andrews and Knoke, 1999; Varadarajan and Jayachandran, 1999) and the opportunities identification process of new venture developments (Hayton et al., 2011).

This theoretical framework is appropriate because it facilitates an understanding of regulations' development and implementation, where the social dimensions of the political environment, the regulated entity and the market environment play an important role (Black, 1997, 2002; Haines, 2009). This is especially true for an innovation process since it's inherently embedded in such an environment (Utterback, 1971; Whittington, 1993). It refers to the influence of the institutional context on companies and their actions are not solely made up of economic considerations (Granovetter, 1985; Zukin and DiMaggio, 1990). This involves professional associations because they play a pivotal role in the institutional context (Greenwood et al., 2002), leading corporate actors can defy/foster regulatory forces (Deephouse, 1999; Schneiberg and Bartley, 2001) and the government itself because they can trigger market creation through regulatory changes (Greve, 1995; Haveman, 1992; Rao, 1998).

Social embeddedness has two major dimensions: structural and relational embeddedness (Granovetter, 1985, 1992). Relational embeddedness refers to the influences of relations, whilst structural embeddedness refers to the pattern of relations between a set of actors (Barden and Mitchell, 2007; Chang, 2011) which can be described as [Nahapiet and Ghoshal, (1998), p.244]: "*The impersonal configuration of linkages between people and units*".

This article will focus on the relational embeddedness of the involved actors, since structural embeddedness is dependent on relational embeddedness (Podolny and Baron, 1997; Rowley et al., 2000). Relational embeddedness helps to understand the influence of their network on economic behaviour (Barden and Mitchell, 2007). Furthermore, it is reported to explain several forms of government relations (Hitt et al., 2006), an element that is certainly present in the transposition of EU regulations (e.g., UCITS). The possibility of a government to induce innovation through regulations was discussed before (cf., Section 3), reinforcing the choice of relational embeddedness. The concept is also reported to be under-researched (Burt, 1997) and formal business transactions in financial services are based upon reciprocity and reputation, which requires local embedding. This means that embeddedness allows researching *why* the financial services industry in Luxembourg was able to be the first to have the UCITS directive transposed into national legislation. It further allows researching the associated innovation process in Luxembourg's financial services industry because embeddedness is a characteristic of an innovation process (Utterback, 1971). The research activities can now be framed to explore the mechanisms that contributed to a faster transposition of the UCITS directive and its subsequent first-mover benefits (Tufano, 1989).

5 Application within the Luxembourg financial services industry

Previous research in financial services which also used embeddedness as a theoretical framework, dealt with learning and knowledge transfer (Uzzi and Gillespie, 2002; Uzzi and Lancaster, 2003), custodial banking in Australia (Agnes, 2002) and the financing of companies (Uzzi, 1999). This research aims at offering a new perspective on relational embeddedness, by looking at a country where the financial services industry is very important and which also was the first to transpose a pan-EU financials services regulation (i.e., the UCITS directive).

Relational embeddedness could play an important role in explaining why the UCITS directive was quickly transposed, since it needs to be drafted into national law and the impacted industries can have lobbying power. They are part of the group of actors who will exchange information on the needed dispositions, supporting the externally induced innovation initiative. It has also been reported that relational embeddedness plays a more important role in innovation oriented tasks rather than execution oriented tasks (Moran, 2005). Having access to extended social networks and possessing the required expertise is also reported as a contingent element for identifying innovation opportunities (Ardichvili and Cardozo, 2000). The quick transposition of UCITS into national law can be considered such an innovation-oriented task since it avoids regulatory (legal) uncertainty regarding new regulations, which can have a negative effect on innovation (Marcus, 1981). Within relational embeddedness, relational closeness (i.e., the quality and amount of contacts that actors have with each other) and collaborative commitment (i.e., willingness to support each other in joint initiatives) can be distinguished (Chang, 2011).

Past contacts, referrals and frequent transactions are important elements of relational embeddedness (Barden and Mitchell, 2007). However, the degree of relational embeddedness varies according to certain conditions, an area reported to be under-researched (Chang, 2011). The use of an industry goal and reputation can be important conditions to shed light on how relational embeddedness can play a role. For example, in the Luxembourg financial services industry, reputation is very important. Hence, an industry goal to maintain reputation could be an interesting condition to research, coupled to the interplay between the involved stakeholders (i.e., actors in the industry's innovation process). Moreover, past research focussed more on closeness and less on commitment, despite the multi-dimensional character of relational embeddedness (Dacin et al., 1999; Hite, 2003). It was also reported that collaborative commitment is important for accumulating trust in their relationship (Emerson, 1962).

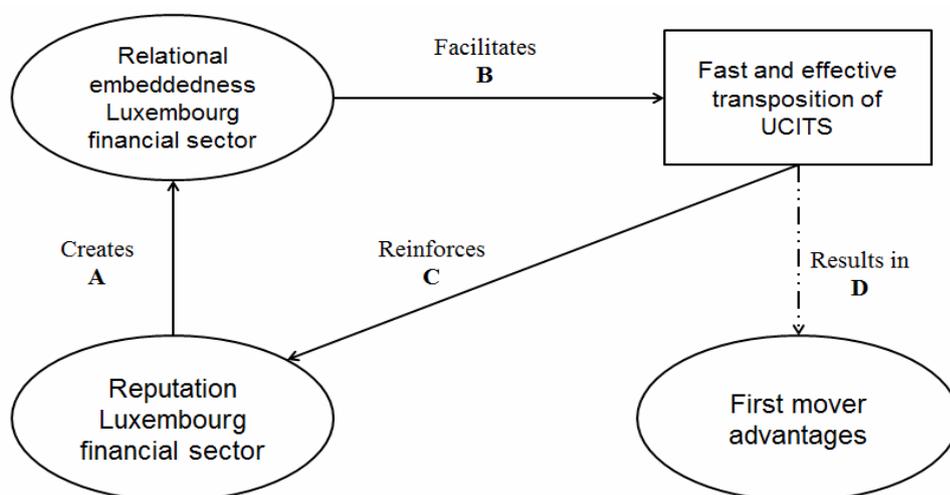
The high importance attributed to Luxembourg's reputation as a financial centre will probably be an important element influencing its innovation process (and hence the transposition of UCITS). Reputation was found to be a significant constituent in many organisational settings (Deephouse, 2000; Fombrun, 1996; Hall, 1992; Merton, 1968) and especially in financial services because first movers can actually [Rossignoli and Arnaboldi, (2009), p.282]: "... exploit the fly wheel effect of the launch of new products/processes to improve its reputation in the market". Therefore the high importance attributed to Luxembourg's reputation as a financial centre will influence its innovation process (and hence the transposition of UCITS).

In general, suppliers and customers are receptive to social proofs of competence, such as reputation or status (Rao et al., 2001) or symbolic outputs, such as appearance and behaviour (Anderson-Gough et al., 1998; Starbuck, 1992). Again this is especially true in the financial services industry (Brockman, 1996; Buckley and Nixon, 2009; Macey, 2010). On the other hand, companies under institutional pressure copy strategies in times of increased uncertainty (Milstein et al., 2002).

This could also explain a fast transposition of UCITS in national law, on the condition that the new regulation eliminated several (legal or market) uncertainties. Finally, it is also possible that the innovation is spurred by competitive pressures which, for example, threaten an existing line of business (Molyneux and Shamroukh, 1996).

Therefore, the following conceptual model (Figure 1) can describe the entire situation:

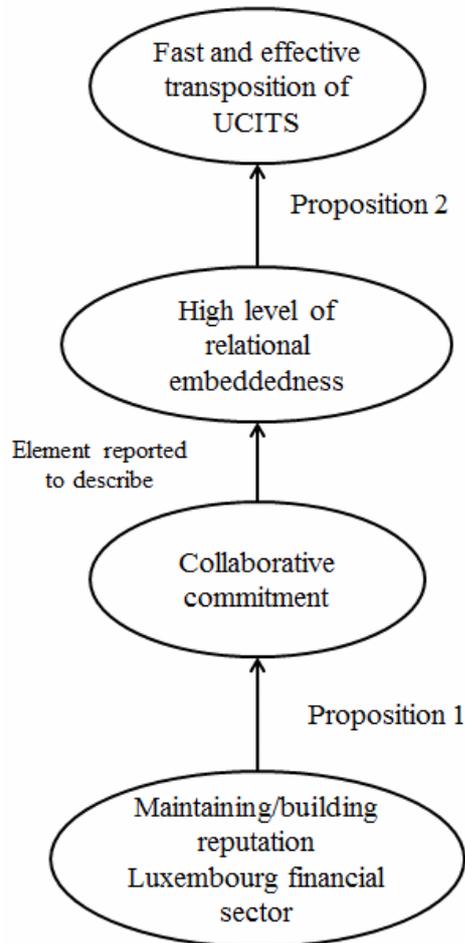
Figure 1 Conceptual model regulation-innovation in Luxembourg



- Notes: A: High pressures to maintain the reputation of the Luxembourg financial services industry will contribute to a higher level of relational embeddedness.
 B: Strong relational embeddedness in the Luxembourg financial services industry will contribute to a faster and high quality transposition of UCITS into Luxembourg national law.
 C: The effects of a regulation-induced innovation will reinforce the reputation of the Luxembourg financial services industry.
 D: Regulation-induced innovation manifests itself through contiguous innovation after UCITS transposition and implementation.

This conceptual basis will be refined by formulating the following research propositions, which are visualised in Figure 2.

- Proposition 1** The industry goal to maintain its reputation will positively impact the collaborative commitment leading to a high level of relational embeddedness in this context.
- Proposition 2** Faster UCITS transposition is facilitated by a high level of relational embeddedness (driven by reputation) between the government, industry associations and leading professionals.

Figure 2 Research propositions based on the conceptual model

6 Research approach and results

An innovation process can be better understood by using an event-history analysis (Pennings and Harianto, 1992). Thus, the event of the UCITS transposition in Luxembourg national law provides an interesting research topic for regulation-induced innovation and the influence of regulations on the innovation process in the financial services industry.

Based on the proposed conceptual model, several semi-structured interviews were conducted to explore its research propositions (cf., Figure 2). The targeted interviewees are governmental actors, professional associations and private actors. An interview guide was developed in order to conduct the interviews. The structure of the interview guide will be inspired upon the conceptual model, but it will focus on a part of it as shown on the visualisation of the research propositions. This research opted for a case study

approach since it is reported to be well suited for exploring processes (Hartley, 1994) and when the researcher addresses *how* and *why* questions about an event (Leonard-Barton, 1990). This meets the need to research the associated innovation process of the first UCITS transposition (i.e., event). Finally the opted case study approach [Gerring, (2004), p.349]: “... enjoys a natural advantage in research of an exploratory nature” and such an approach was reported as necessary to explore other relevant conditions for innovation in very specific industries (Blind, 2012).

The case selection technique was based on the likely influence of the various organisations and the interviewees (Gerring, 2006). The selection bias is therefore limited (King et al., 1994) and a smaller case study is better suited to [Ebbinghaus, (2005), p.149]: “understand the political and historical contingencies of macro-social units”. Therefore, the approach is appropriate and sufficient to meet the objective of this research.

A total of six individuals were interviewed: two representatives of leading professional associations (A1 and A2), two representatives of public actors (G1 and G2) and two representatives of major private actors (P1 and P2). All the interviewees occupy strategic, leading positions in their respective organisations. All the interviews were tape recorded (except for two) and an interview summary was drafted afterwards. The interviewees who did not want to be recorded shared more sensitive information, which required confidentiality (Nicholson and Kiel, 2007). These interviewees adequately represent a local network because the number of possible actors is more limited due to the smaller size of the country. The interviews lasted between 45 to 60 minutes each and they were conducted from November till December 2011.

6.1 Results regarding research Proposition 1

The interviews confirmed that there is a collaborative commitment in the financial services industry, shared between the government, the professional associations and the private actors. For example, a representative of an association (A1) said: “*The promotion of the Luxembourg financial centre is a joint-initiative. There is a political will to support the development of the financial sector in Luxembourg*”. Another association (A2) further adds that: “*The importance of the reputation of the financial centre is widely spread and accepted. Our reputation must be maintained and it's always considered by the government and the other actors*”. A government representative (G1) states it as: “*In a broader sense yes, the common goal is to stimulate the development of the Luxembourg financial centre. We always opt for a consensus building approach, we listen and there is strong political support for being a leader and to be recognized as the competence centre for investment funds*”. Government representative G2 further adds that: “*We have a dedicated governance structure and a clear political will to develop the financial sector*”. Private actors also perceive this outspoken support (commitment) towards the development of the financial centre. As a major private actor (P1) formulated it: “*There is a cluster focussing exclusively on the financial sector of the country*”. Another private player (P2) states: “*There is a strong local network for financial services and related regulations*”. To conclude, the collaborative commitment is clearly present in the following, condensed expression by an association (A2): “*Everybody wants to dispose of a large cake [i.e. financial services industry], allowing everybody to keep eating from it*”.

The government and professional associations both organise working groups on a regular basis and dispose of ‘standing committees’ where experts provide feedback on

new legislations and regulatory evolutions. The individuals active in those committees and working groups are members of the professional associations and interested private parties (often member of one of the major associations in the financial services industry). The financial services regulator has also a seat.

One could argue that these compositions also exist in other countries. However its operation in Luxembourg is deemed more effective by a large international player (P2): *“Working groups also exist abroad but the difference in Luxembourg is that the actors listen to each other and that there is a clear support for initiatives in the financial sector”*. This can be supplemented by another private player (P1): *“It is easier to reach consensus when there is a clear direction, which is to dispose of a flourishing financial centre”*. In order to conclude, another statement from a private actor (P1): *“There is a focussed approach and a shared agenda. This facilitates fast and effective transposition and implementation. Understanding the business’ needs and impacts is so much easier when these are present. This is a differentiating factor compared to other countries”*. This information is important because it illustrates the presence of a shared vision, a common objective, which is an essential characteristic for effective innovation initiatives (Pearce and Ensley, 2004) and a necessary element of an innovation process (Marquis, 1988).

The Luxembourg Financial Services Regulator (CSSF) and the Ministry of Finance also organise similar working groups, inviting the industry to exchange their views. This facilitates a regulatory dialogue between the policy makers and those who are going to be impacted by it. On the other hand the regulator can express his future expectations and evolutions. A professional association (A1) nicely illustrates this by saying: *“We consider that the regulator is “business oriented”, because it invites the industry to provide its opinion. Needless to emphasise that every actor has always its own role to play and this is strictly adhered to”*. This is shared by the private actors who describe the regulator as having a customer-driven approach with a business-minded orientation. The results of the committees are transferred quickly to the participants, the regulator and industry. An association (A2) explains: *“This fosters a common understanding of regulations’ implications for the Luxembourg financial centre”*.

But the initiatives come mainly from the financial services industry itself since they know more what their needs are. As interviewee G1 formulates it: *“That’s why the government is listening to the industry and jointly explores the various possible initiatives”*. The complementarity between the public and private actors in the innovation process for financial services is clearly illustrated by G2: *“Our approach is pragmatic in order to have a business friendly regulatory framework that is in full conformity with the international requirements. We play our role in the innovation initiatives for the financial sector, and the other actors play theirs”*. This supports earlier findings regarding a successful innovation process. Those who are working in the field on a daily basis, are also those who are most likely to notice instances of, and opportunities for, innovation (Marquis, 1988).

The importance of reputation is mentioned every time as an important driver for initiatives in this industry. As a representative of a professional association (A1) said: *“It is imperative to continue emphasising our leading role”*. Furthermore, reputational gain is also found to be vital for the members participating to these various committees, according to association (A1): *“These committees are very important and people want to be part of them. It’s considered an honour to participate and it’s good for the reputation of the individual member as well, whilst the results are oriented to serve the needs of the*

industry". Another professional association (A2) states: *"We are known for this sector and we want to be the first"*. The actors share a committed goal for the financial services industry since they organise joint campaigns abroad, a clear indication of this commitment (stated by both the professional associations). *"A good reputation is a core element of the Luxembourg financial centre and this is a shared belief between the actors. Everybody wishes the same thing, advancing the economy and maintain the reputation of the financial centre"*. The private actors also share this element. For example, a private player states (P2): *"There is a clear respect when Luxembourg's opinion is asked on financial regulations. Luxembourg has an expertise and reputation that others do not have"*. The other private actor described it as (P1): *"Luxembourg has the status of being a leader in financial regulation. This leadership position must be maintained"*.

It is interesting to mention another concrete example of the collaborative commitment of the actors towards the financial services industry and the importance of reputation as a driver for their joint initiatives. As a major business player formulated it (P2): *"Professional associations and the "Luxembourg for Finance" agency invest considerable efforts in the communication of Luxembourg's benefits and international reputation for UCITS funds"*. Therefore, participation by the private actors is deemed as essential and part of reputation building.

All these elements show that a collaborative commitment exists in the Luxembourg financial services industry, and that reputation is an important driver. However committed relationships can foster, or at times, be contingent on exchanges between actors, described as the paradox of embeddedness (Uzzi, 1997). For example, a representative of a professional association (A2) illustrated this by stating that: *"The concerns for the centre's reputation were used to assess the opportunity of a certain investment product in Luxembourg. Many feared the possible backlash on its reputation because not enough was known about the product (e.g. risks, intermediaries and the industry experts). This led to a slower adoption of this specific product, compared to another financial centre"*. A government actor (G2) makes this more explicit: *"We need to know with whom we are dealing and what could be the possible risks for our established reputation. There is a prudential approach, perhaps a bit too careful, but this is perceived as being the better alternative to being careless"*.

The performance of an organisation can be contingent on its effectiveness to address the needs of niche markets. The latter requires fast adaptations and market reactivity (Schumpeter, 1950). Embedded networks can offer competitive advantages of that type (Uzzi, 1997) and the findings cited before point out that Luxembourg is an interesting case. Its focus on investment products and private banking, coupled with a strong relational embeddedness, allows the Luxembourg financial services industry to move faster and maintain (confirm) a reputation on those niches.

6.2 Results regarding research Proposition 2

The financial services industry is perceived to have a high level of relational embeddedness, due to its 'informal dialogue', as illustrated by an association (A1): *"These regular exchanges through various committees create a good understanding between the actors and this is unique, this allows Luxembourg to move faster"*. This is a possible reason why UCITS was quickly transposed in Luxembourg, by building on its high level of relational embeddedness (coupled with the importance of reputation

mentioned before). This is further illustrated by the following statement of a representative of an association (A1): *“The dialogue between the actors (government, associations and private companies) is well institutionalised in Luxembourg. It is a way of working that has been adopted only recently by some other countries”*.

However another representative of a professional association adds (A2): *“Because most of the people on those committees know each other and are also participating to working groups at EU level, there is a very efficient information flow and the implications of regulatory changes are well prepared before engaging the very formal legislative process”*. The representative of the Ministry of Finance adds: *“The actors are approachable and favour dialogue. The lawmakers need to be informed about the actual situation on the terrain, and industry can be informed about the directions of new EU regulations. This two-way communication benefits both”*. A private actor (P2) describes it as: *“In Luxembourg, all the different actors are more closely aligned. The different professional associations and private actors have a shorter and more direct access to the regulator”*. The public actors share this view (G2): *“We are a smaller country and this implies that the key people are easier to find. There is a group of national experts which might be viewed as a network”*.

This also illustrates the expectation that [Nahapiet and Ghoshal, (1998), p.243]: *“Network members can gain privileged access to information and to opportunities”*. This information, coupled with the earlier mentioned citations, indicate the relevance of a network for financial services and its contribution to innovation-oriented tasks (Moran, 2005), such as transposing a directive. It also illustrates the efforts of the actors to avoid regulatory uncertainty since that is detrimental to innovation initiatives (Marcus, 1981).

This further shows the high level of relational embeddedness for the financial services industry in Luxembourg and that it can greatly facilitate a faster transposition of new regulations. It is plausible that the fast transposition of UCITS was facilitated by the committed collaborative efforts of the various public and private actors, supporting their high degree of relational embeddedness. Last but not least, the various joint ‘problem solving arrangements’ (i.e., the various committees) reduce errors and the number of needed iterations, which promotes learning and innovation-oriented work (Uzzi, 1997) and it’s a clear illustration of a required phase within a successful innovation process (Marquis, 1988). Since embedded ties can promote innovation, and because strong indications of relational embeddedness were found, the effective transposition of UCITS led to various other innovations (product, process and organisational) in Luxembourg, affirming its reputation at an international level for financial services.

This can be illustrated by G2: *“The transposition of UCITS was viewed as an opportunity, important choices regarding the options for implementation needed to be made. Therefore it was decided that investment funds with multiple compartments needed to be included”*. The latter was a financial novelty at that time and the Luxembourg financial services industry was among the frontrunners to offer a legal framework (i.e., legal certainty) for this financial product, hence making it possible to have a cross-border distribution across the EU. Last but not least, the transposition of UCITS did not include a preference for a contractual or corporate form of the investment funds’ legal structure. The actors decided to accept both types, facilitating again cross-border distribution. The relevance of UCITSs innovation-inducing effects and the subsequent development of the financial services industry in Luxembourg is clearly stated by the following statements: *“Our pragmatic approach reinforced the international potential of UCITS for the financial services sector in Luxembourg”* (G2) and *“The objective is to have legal certainty and*

foster reputation through the new legislative framework that conforms to the international (e.g. EU) agreements. In order to achieve this, we listen to the industry to find intelligent solutions within the borders set by those agreements” (G1).

7 Conclusions and implications

Following the need to consider the multiple and complex dimensions of successfully using a country’s regulatory framework to promote innovation (Blind, 2012), several semi structured interviews were conducted through a case-study approach, relying on the theory of social embeddedness. It was used to explore the innovation process in the Luxembourg financial services industry and the results confirm the interest of studying it in more depth, paving the way for other research activities. The results confirm the interest of studying it in more depth and pave the way to other research activities.

The importance of reputation as a driver for the collaborative commitment between the government, the private actors and the professional associations (research Proposition 1) and the beneficial influence of a high level of relational embeddedness between them (research Proposition 2) have been demonstrated. This means that the innovation process for the implementation of the UCITS directive in the Luxembourg financial services industry was faster and more effective.

The strong relational embeddedness in the Luxembourg financial services sector is reinforced by the close interactions between the professional associations, government agencies and private actors. This is facilitated by the dedicated governance structure for financial regulations, supporting efficient communication between its members. They are well informed and know what to expect from new financial regulations (i.e., their impact). A reputation seeking/confirming behaviour also contributes to this embeddedness, fostering the identification of innovations. Finally, a common goal is being pursued with a high degree of commitment towards it, as illustrated by the various statements. More precisely, there is a shared willingness (i.e., collaborative commitment) to advance the Luxembourg financial services. Therefore, a successful interplay was demonstrated between the government, professional associations and private actors of the Luxembourg financial services industry. These elements illustrate that various knowledge domains need to be connected in order to produce valuable innovation opportunities (Burt, 1992), such as those within the frame of an EU directive. Furthermore, collaboration between market participants and regulators is emphasised by the ‘New Governance Paradigm’ (Ayres and Braithwaite, 1992), for similar reasons linked to the individual-centred context of knowledge (Lobel, 2004). This is congruent with the general role of regulation in the financial innovation process, namely that it is co-created in order to reduce the importance of information asymmetries. This also refers to the ‘New Governance Paradigm’ because co-creation enables to [Gubler, (2011), pp.112–113]: “ ... harness the greater expertise and information of private market actors and supplement it with government-sponsored institutions that can pick up the slack or help correct for private market actors’ misaligned incentives”. In other words, regulations should be co-created because there is a need for top-down requirements and bottom-up solutions, in order to reduce the asymmetries between market participants and regulators (Gubler, 2011). This emphasises the importance of the actors and their roles in the innovation process within the financial services industry. A directive provides the requirements of a new regulation, yet the Member State is free to choose the various

options of implementation. Therefore regulation can be co-created but the outcome and timing of this co-creation can be different from one Member State to another. The latter was clearly observed during the interviews, through the importance of having legal certainty, disposing of a commonly accepted framework for doing business and the various committees in place. Hence regulation can stimulate financial innovation, as illustrated with the transposition of the UCITS directive in Luxembourg.

Therefore this paper contributes to a better understanding of the interactions between government, professional associations and private companies, during the innovation process of an externally induced innovation (i.e., new regulation such as the UCITS Directive). The mechanisms for this 'regulation-induced innovation' were explored for the first time in the Luxembourg financial services industry. The transposition of an EU directive is innovation because its characteristics fully correspond to it [Freeman and Soete, (1997), p.6]: "*An innovation in the economic sense is accomplished only with the first commercial transaction involving the new product, process, system or device ...*" More precisely, the implementation of the UCITS Directive certainly led to a first cross border transaction for an investment product that met certain requirements, aimed at providing sufficient investor protection and stimulating an EU internal market for retail investment products.

A high level of relational embeddedness between the actors of the Luxembourg financial services industry proved to be an important asset in explaining a faster transposition of the UCITS directive, which also led to an intelligent legal framework for new business developments. This directive provided an external inducement to the innovation process of the Luxembourg financial services industry, nurturing the already high willingness to support this industry. The result was a quick identification of the common approach for offering cross border services and its subsequent transposition into national law. Any possible confusion or hesitation to offer innovative cross border, regulated investment products was thereby eliminated and the way was clear to introduce various new products and corresponding organisational structures. These resulted in product innovations (e.g., capital protection funds, fund of funds, etc.) which are closely coupled to process innovations (e.g., verifying eligible asset classes, coherence with the investment policy, use of derivatives, etc.) in the financial services industry (Rossignoli and Arnaboldi, 2009).

However a faster transposition of an EU directive, or being the first Member State to implement, can also have detrimental effects. This can be the case when the Member State is tempted to go beyond the regulatory requirements of the directive when transposing into national law, a situation referred to as 'Gold plated EU legislation' (Kaeding, 2007). This faster transposition imposes national companies to adapt earlier to upcoming EU legislation than their competitors, which could possibly lead to a competitive disadvantage in the EU Single Market (Stephen, 2004). However, the presence of such detrimental effects did not emerge during the various interviews.

The latter also provides answers to whether regulations in general can stimulate or hinder financial innovation. In this case EU regulation was approached as an opportunity by the impacted parties (inspired by their common commitment), resulting in a joint innovation initiative whose effectiveness was reinforced by their relational embeddedness. This culminated in a successful identification of innovations, paving the way to the diffusion of new investment products for consumers, illustrating financial innovation through external inducement (i.e., regulation-induced innovation). This research has shown that regulations *per se* should not be viewed as a constraint on

financial innovation. The process of dealing with regulations (i.e., externally induced element, triggering the innovation process) is found to be more relevant and more indicative for the enhancing (or impeding) role of regulations.

The creation of a market following regulation (Greve, 1995; Haveman, 1992; Rao, 1998) was made possible by UCITS and it led to various contiguous innovations (Gubler, 2011; Merton, 1995) such as described before. Therefore externally induced changes in the regulatory framework of the Luxembourg financial services industry caused several other innovations (Marcus, 1988). These can be characterised as new financial innovation since it provides new products, foster new organisational structures (e.g., contractual or corporate form for the funds' legal structure), provides legal certainty regarding the framework for cross-border distribution, supports cost reductions and improves the services offered by the financial system as a whole (Rossignoli and Arnaboldi, 2009).

Other potential factors contributing to the faster implementation of UCITS are Luxembourg's historical expertise and high reputation for financial services, and the possible competitive pressures from other EU financial centres.

This can be coupled to the clear commitment towards the development of the financial services industry and the importance of maintaining its reputation. Besides the historical importance of the financial services industry to Luxembourg, its economic importance for the country could also stimulate the government to attribute special attention to it. For example, the Luxembourg financial services industry represents 30% of the country's tax revenues and it contributed to 38% of its GDP in 2010 (Luxembourg For Finance, 2012b).

Innovation effectiveness is determined by the speed at which it is developed and the magnitude of the innovation (Gopalakrishnan, 2000), reinforced by the shared vision of the members within a team (Pearce and Ensley, 2004). The introduction of UCITS in the Luxembourg financial services industry can also be considered as an effective innovation due to its faster transposition and its significant impact on the industry (exponential growth in UCITS funds, international recognition, a larger choice for retail investors, ...). Last but not least, the clear vision (i.e., common objective) between the actors of the innovation process in the Luxembourg financial services industry was clearly demonstrated.

However there are two limitations to the conclusions of this research paper.

Firstly, the sample of interviewees could be enlarged in order to get even more feedback. However saturation was reached during the interviews, indicating that the final stage in this qualitative research was reached and that closure was appropriate (Eisenhardt, 1989). Also, a good diversification was reached between the important actors in the local network. Secondly, the interviewees could have been biased since they may not have an interest in sharing important details of the interactions between the government, the regulator, private actors and its professional associations. This corresponds to a traditional response bias for semi-structured interviews but these were adequately remediated. Last but not least, all (except two) of the interviews were tape recorded and interview summaries were made. This favours the quality of the chosen approach and its internal validity.

Most importantly, this research paper provides relevant, first indications regarding the reasons *why* the Grand-Duchy of Luxembourg was able to quickly and effectively transpose the UCITS directive. This was due to high relational embeddedness, fuelled by its high reputation in financial services and its collaborative commitment (also demonstrated by its unique governance structure). The UCITS directive is therefore an

example of a regulation-induced innovation because its associated first mover benefits were fully reaped by the Luxembourg financial services industry.

These research results provide an interesting basis for future research. For example, the detailed and rich interactions between the various committees in the Luxembourg financial services industry should provide interesting material from a behavioural or managerial perspective. A comparative analysis between countries disposing of a significant financial services industry is also a possibility. This would allow researching differences or similarities between the mechanisms of relational embeddedness in financial services industries.

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Co-creating new financial services: Absorbing innovation-related knowledge from customers

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**Co-creating new financial services:
Absorbing innovation-related knowledge from customers**

ABSTRACT

Customers are reported to be providers of innovation-related knowledge for the development of new services. In order to benefit from this source of innovation-related knowledge, a company requires the organizational capability to identify and use it, denoted as its absorptive capacity. This research provides a conceptual framework for the co-creation of new financial services, which is driven by the underlying organizational (learning) mechanisms of a company's absorptive capacity. The context of financial services, which are characterized as being knowledge-intensive, should provide an interesting area of research for testing this conceptual framework.

Keywords:

Open Innovation; absorptive capacity; customers; co-creation; new service development; financial services; conceptual model

Introduction

The objective of this paper is to develop a conceptual model for the co-creation of new service innovations within the financial sector. Involving customers in these companies' innovation process should allow accessing their innovation-related knowledge, which is vital for new service developments. This model can be used in subsequent research to propose testable constructs. To the best of our knowledge, this model is among the first to propose a knowledge view for the innovation process within financial services companies.

Solid empirical evidence on how new services are developed or how the characteristics of its development can predict the organization's innovation, are scarce (Jaw, Lo, & Lin, 2010; Stevens & Dimitriadis, 2004). However a recent review found that research on new service development is gaining maturity (Papastathopoulou & Hultink, 2012). Relationships in general, customer-centricity in particular, are pivotal in explaining a possible co-creation of new services (Normann, 2001; Normann & Ramírez, 1993; Vargo & Lusch, 2004; Vargo, Maglio, & Akaka, 2008). An industrial company's search strategy for external knowledge was found to influence its innovation performance (Garriga, von Krogh, & Spaeth, 2013; Laursen & Salter, 2006). Customers can serve as a source of external knowledge (Greer & Lei, 2012) to leverage internal knowledge, accelerating the company's innovation process. The involvement of customers during the development (i.e. co-creation) of new financial services, known to be knowledge intensive (European Commission, 2012), will be the context of conceptual paper.

Various modes of customer involvement, ranging from the seminal contribution on lead users (von Hippel, 1986) to the consultation of expert users, have been studied and represent a major research stream within Open Innovation (Greer & Lei, 2012). Open Innovation is also a

structural component of the current evolution towards a more knowledge-based economy (White, Gunasekaran, & Ariguzo, 2013). Information systems and technology play a paramount role in the financial services industry because it was one among the first to adopt it (Chiasson & Davidson, 2005). Many innovations in banks have occurred in its back-office operations, allowing them to reduce costs, gain efficiencies and use different channels for service provision to their customers, even leading to some front-office innovations (Berger, 2003; Boot & Marinč, 2008). This search for operational efficiency, through technology, was found to be complementary with profound customer knowledge within financial services (Curry & Penman, 2004). Furthermore financial services companies were found to be intensive users of external knowledge from various sources, including customers (Hollenstein, 2003).

The financial services industry is interesting because it has undergone the recent 2007-2008 crisis. In this turbulent environment, these knowledge intensive firms aim at enhancing their absorptive capacity to realize a competitive advantage by finding unmet customer needs, creating new service offers, by using similar technology available to their competitors (Doll & Vonderembse, 1991; Tu, Vonderembse, Ragu-Nathan, & Sharkey, 2006). Therefore customer involvement in the development of new financial services, and using absorptive capacity as a concept, should require more research attention. Within the context of knowledge intensive financial services, customers were reported to be important sources of innovations (de Jong & Vermeulen, 2003) and meeting latent customer needs (Avlonitis, Papastathopoulou, & Gounaris, 2001) requires tapping into their knowledge and initiate the process of absorptive capacity (Lane, Koka, & Pathak, 2006).

The company's absorptive capacity allows it to identify, internalize and exploit knowledge (Cohen & Levinthal, 1990; Zahra & George, 2002). This organizational capability can be the source of a competitive advantage (Liao, Wu, Hu, & Tsui, 2010), leading to innovative outputs (Tsai, 2001) and increased firm performance (Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011) while being essential for the innovativeness of new products and services (Melkas, Uotila, & Kallio, 2010). Organizational mechanisms (Tu et al., 2006), of which some relate to learning (Knoppen, Sáenz, & Johnston, 2011), and organizational practices (Foss, Laursen, & Pedersen, 2011) pave the process of absorptive capacity (Zahra & George, 2002) in a company. Absorptive capacity is hence a set of organizational capabilities that are used to recognize and assimilate new external knowledge, followed by a transformation of existing internal knowledge to exploit the new configuration of its knowledge base, a.k.a. reconfiguration of its resources (Michel, Vargo, & Lusch, 2008b). Absorptive capacity is the result of continuous learning through internal R&D (Cohen & Levinthal, 1990) or collaborations with customers (Dierickx & Cool, 1989). Companies should therefore pay significant attention to innovation-related knowledge from their customers (Lane & Lubatkin, 1998; Zahra & George, 2002) and methods that help understand customer requirements during the innovation process (Hannola, Friman, & Niemimuukko, 2013).

We will make three contributions to the literature on innovation management. First, service innovations are understudied (Edvardsson, Meiren, Schäfer, & Witell, 2013; Ordanini & Parasuraman, 2011) compared to research on product innovations (Ettlie & Rosenthal, 2011). Innovation for, and within, financial services specifically requires more research attention (Mention & Torkkeli, 2012). The proposed conceptual model emphasizes the importance of knowledge for new services. These intangible and tacit resources need to be accessed,

internalized and exploited to produce service innovations. This can be done through co-creation initiatives with the customer, needed to create competitive advantage.

Second, the significance of customer involvement in new service development (de Brantani, 1993, 1995; Edvardsson, Kristensson, Magnusson, & Sundström, 2012) and the company's external knowledge exploration with customers (Greer & Lei, 2012; Grimpe & Sofka, 2009) has been emphasized before, yet the role of customers in the development of new financial services (Akamavi, 2005) and their co-creation (Martovoy & Dos Santos, 2012; Oliveira & von Hippel, 2011) is not extensively studied. The conceptual model shows that co-creating new services with customers requires absorptive capacity. This organizational capability is at the same time depending on the financial service company's own learning over time, which is driven by several organizational (learning) mechanisms (Knoppen et al., 2011; Tu et al., 2006) and organizational practices (Foss et al., 2011). These should also be considered when initiating service co-creation initiatives with customers, trying to access their innovation-related knowledge. Therefore the conceptual model could also guide the needed research on the critical drivers of success and failure in service innovations (Edvardsson & Tronvoll, 2013).

Third, different sectors as organizational contexts for the (open) innovation process and absorptive capacity needs more research (Easterby-Smith, Graça, Antonacopoulou, & Ferdinand, 2008; Flier, Van Den Bosch, & Volberda, 2003; Fraga, Martins, & Anciaes, 2008; Garriga et al., 2013; Jansen, Van Den Bosch, & Volberda, 2005). Absorptive capacity research within the financial services sector has been very scarce to the best of our knowledge. This conceptual model could hence offer a first step in taking into account the financial services industry

contextual factors for new service developments with customers, reported to be at a very early stage in this sector (Perks, Gruber, & Edvardsson, 2012).

Literature review

The following streams of literature will be considered in this section: the logic of value and value constellations (Michel et al., 2008b; Normann & Ramírez, 1993), the co-creation of new services with customers (Edvardsson et al., 2012; Edvardsson, Tronvoll, & Gruber, 2011; Ford, Edvardsson, Dickson, & Enquist, 2012; Michel, Brown, & Gallan, 2008a; Perks et al., 2012) and the Service-Dominant (S-D) logic (Lusch, Vargo, & Tanniru, 2010; Vargo & Lusch, 2004, 2006, 2008a; Vargo et al., 2008).

The Strategic Interest of Involving Customers

Involving customers can result in innovations is reported in the literature on key users (Bogers, Afuah, & Bastian, 2010; von Hippel, 2005), co-creation (Alam, 2002; Alam & Perry, 2002; Bogers & West, 2012; Nambisan, 2002; Prahalad & Ramaswamy, 2004b) and the external sources of innovation for companies (Hollenstein, 2003; West & Bogers, 2014). There is a wide variety of sectors in which customer involvement led to innovation, see for example Bogers et al. (2010). Recently an overview for the financial services sector was made available (Oliveira & von Hippel, 2011). The latter research found that important financial services innovations were first created and used by a type of customer which is actually able to self-service his needs. Hence customer involvement is important for new financial services innovations. Customer involvement in financial services is also reported to be understudied (Akamavi, 2005).

Multiple definitions for innovation are proposed in the literature, each emphasising the presence of something new (Garcia & Calantone, 2002), adding value for the customer (O'Sullivan & Dooley, 2009). Creating value is at the heart of a company's strategy and strategy links together the company's resources in order to achieve it. Knowledge and relationships are part of these essential resources and may alternatively be defined as the company's competencies and customers (Normann & Ramírez, 1993).

A company's competences refer to its accumulated knowledge over time, which is embodied in its business processes, techniques and technology used. Without these competences (i.e. knowledge), the company would not be able to dispose of its current service offer. Of course a company needs customers that actually want to this service offer, otherwise their competences (i.e. knowledge) would be futile. The company's customer base, which is a relationship with another entity, is hence essential for the going concern of the company. The customers are part of a value constellation with the company, and as such they are neither external nor internal, but rather both. The involvement of customers does not only bring (new) knowledge that shapes the company's (future) service offer, but also information (Lusch, Vargo, & O'Brien, 2007) and new relationships (Edvardsson et al., 2011; Hunt & Derozier, 2004).

There is an interactive loop between the company's knowledge (competences) and relationships (customers). New knowledge pushes companies forward into new business systems with new customers, who will in turn co-create new offerings that leverage the company's knowledge base, leading to the establishment of new relationships. The investments in the enlarged knowledge base (e.g. new technologies and expertise) must be recouped and this pushes companies to look for new customers, in order to dispose of a larger customer base to exploit

their acquired knowledge. This restarts the loop, pushing the acquisition of new customers, stimulating the innovation process of the company.

A company's strategy aims at relentlessly increase the needed fit between its competencies (knowledge) and the value creating activities for its customers (relationships). It's about the perpetual design and redesign of the intertwined business systems (Normann & Ramírez, 1993). This requires a continuous dialogue between the company and the customers, because their role will be reconfigured during the process of value creation. This reconfiguration is a key task, changing the roles and relationships in the business system itself which can lead to strategic innovation, meaning significant customer value improvements, new business systems or the remodelling of the markets (Christensen, Johnson, & Rigby, 2002). Because the environment is changing, adaptations to the strategy are required in order to survive, emphasizing the importance of reinventing value instead of limiting oneself to adding value (Normann & Ramírez, 1993).

The extent of customer involvement during the new financial service development initiative is reported to be different according to the type of financial service being co-created and the specific phase of this involvement in the development process. It is possible that more profitable, financial services can be created for one group of customers and that deeper relationships can be developed through other services, targeting different customers (Cheung & To, 2011). Despite this varying effectiveness of involving customers, doing so has a positive effect on the performance of the new financial service development process (Chien & Chen, 2010) and it is critical for its success (Carbonell, Rodríguez-Escudero, & Pujari, 2009). The benefit of involving customers, users or final beneficiaries in the development process of a new

product or service has not been without critique. The co-creation is challenging because it requires the assimilation of knowledge and expectation management at the same time (Ford et al., 2012; Magnusson, Matthing, & Kristensson, 2003). There is also a risk that the involved customer shares (i.e. leaks) knowledge to competitors, leading to knowledge spill-overs that are contingent on future and existing customer involvement (Dyer & Hatch, 2006). Research even found that customer involvement could be potentially harmful or of limited added value since innovative ideas do not always emerge from the customer himself and trying to satisfy the customer's wishes at all costs could lead to an impasse. This could be the case because customers' perception is limited to their actual situation yet formulating their needs can be limited to what is technically feasible for the company (Leonard & Rayport, 1997). This difficulty regarding customer needs is not new (Bonner, 2010). The requirements proposed by the customer to meet his need could also have changed by the time development is ready (Bennett & Cooper, 1981). Other critical views on customer involvement in innovation projects for financial services can be found in the literature, see for example (Avlonitis et al., 2001; Vermeulen, 2005). Retail segment customers were found to be more costly to get involved than corporate customers (Walter, 2009). Other factors that are essential for involving customers in new financial services innovation are local regulations and customer preferences (Grant & Venzin, 2009). This implies that customer needs' collection, and meeting those needs, can lead to a competitive advantage for national (retail) markets. Differentiation for the customers is of course driven by the various groups of customers. Retail banking offers a wide product range and multiple customer segments, therefore any internationalisation involves making trade-offs between the different requirements of different business entities. The incentives of the involved customer must be known and the company should estimate its opportunity costs when engaging a specific group of customers. There can be agency costs resulting from the misaligned interests

since customers want to acquire exactly what they need, whilst companies focus on as low as possible development costs and synergy effects by incorporating solution elements that they already possess (i.e. its current competences) (von Hippel, 2005).

Services and products shouldn't be regarded as two distinct elements that a company can offer (Normann, 2001; Vargo & Lusch, 2008b). They have a common element, namely the exchange of something during a process which is beneficial for the other entity and done with that entity. This means that the tangible elements in a service are an integral part of the service that is offered. If products are present in a service offer, then they are a construct of applied knowledge making it a support to the service provision itself (Vargo & Lusch, 2008b). This research positions itself in the stream which synthesizes product and service constituents during the exchange between entities. Knowledge is a central element, creating and facilitating this exchange, as part of the innovation process.

The characteristics of goods and services can be described by distinguishing between (Vargo et al., 2008: 148): "... operant resources (those that act upon other resources), such as knowledge and ... operand resources (those that an act or operation is performed on, such as goods)". A further discussion regarding the assumptions, rationale and implications of this distinction, coupled with the evolution of an economy based on the exchange of goods towards one based on the exchange of services, can be found in the literature (Edvardsson et al., 2012; Michel et al., 2008b; Vargo & Lusch, 2004, 2008a, b). An overview of the main differences between goods and services can be found in Table 1.

Insert Table 1 about here

Technology is omnipresent in the financial services sector due to its early adoption of it (Chiasson & Davidson, 2005) and because it is at the centre of structural change in this sector (Consoli, 2005). Furthermore financial services can be considered as a good example of a service industry because its core business is using its competences for processing information and dealing with intangible aspects (Avison, Jones, Powell, & Wilson, 2004; Baets, 1996), which implies the use of (mainly) operant resources. Therefore it is rightfully classified as a knowledge intensive sector (European Commission, 2012).

Co-creation with Customers

Customers can refer to users, lead users, intermediate users or the final beneficiaries of a service. These can provide crucial inputs for what they need and play an important role in new product and service development (Bogers et al., 2010; Edvardsson et al., 2011; Magnusson et al., 2003; von Hippel, 1986). The role of customers has also been changing due to a shift from a production economy to a service economy (Normann, 2001; Vargo & Lusch, 2008a), being a source of service innovations (Oliveira & von Hippel, 2011; Vargo & Lusch, 2004). A possible application to the financial services sector and a classification of types of customers through their involvement was researched (Pallister, Wang, & Foxall, 2007) whilst other classifications of customers, in non-financial services, are also available (Edvardsson et al., 2012). The customer can also develop new service ideas themselves and take the initiative to introduce it to an interested producer (von Hippel, 1978). This is also referred to as the democratization of innovation (von Hippel, 2005) because the user (i.e. customer) is put at the centre of interaction with the company, the customer is actually the locus of search for innovation.

Co-creating new services represents an innovation activity where the interactions and relations between customer and company are central (Ramaswamy & Gouillart, 2010). The involvement of customers in the value co-creation should be done actively (Nuttavuthisit, 2010) since their relationship is believed to be a fruitful originating environment for innovations (Hult, Ketchen, & Arrfelt, 2007). The customer can always be a co-creator of value (Vargo & Lusch, 2006), emphasizing the intertwined business system where entities iteratively exchange (Vargo & Lusch, 2008a). This value is contextual and phenomenological determined by the beneficiary of the service (Vargo & Lusch, 2008a), implying that it has many possible manifestations.

The assessment of value is therefore done on the basis of the value in that specific context through co-creating it with the customer (Edvardsson et al., 2011; Flint, 2006). Co-creation is not the same as co-production because co-creation can lead to something which seemed valuable innovation during co-creation but which isn't after production because the customer can't or won't use it (Ford et al., 2012). Co-production is a phase of the service co-creation (Vargo & Lusch, 2008a), requiring entities in the business system to possess divergent knowledge to generate innovative combinations, making them a potential source of value co-creation. This co-creation is also embedded in a social context where the actors learn and adapt their roles. Communication is essential for this interaction, being paramount for the transfer of information between the customer and the company (Edvardsson et al., 2011) in the innovation process.

To conclude, this concept of co-creation refers to the part of a company's capability in developing and commercializing new services through knowledge-driven interactions with its customers. During these interactions, innovation-related knowledge can lead to a reconfiguration of existing competences in the company to provide the new service offer that delivers value to its

customers. When the new service is commercialized, it will create relationships with new customers and reinforce those in the existing customer base. This growth of customer relationships will enhance new knowledge exchanges to keep delivering value for the enlarged customer base. The symbiosis between a company's competences (knowledge) and relationships (customers) restarts when the required value-in-use of the renewed service offer is co-created again. Therefore this reconfiguration of a company's competences does not only lead to service innovations, but also changes in its organizational structure and even its competitive landscape. For example new companies can be created that have a different strategy, one that does fit between the required competences (knowledge) and relationships (customers) to deliver value (Normann, 2001; Normann & Ramírez, 1993).

The Value Co-creating Process with Customers

Value co-creation is an iterative process (Prahalad & Ramaswamy, 2004a; Ramaswamy & Guillard, 2010) of a knowledge-driven reconfiguration of the company's internal resources (Edvardsson et al., 2011; Hunt & Derozier, 2004; Lusch et al., 2007; Normann, 2001) This requires an organizational capability (i.e. absorptive capacity) to acquire new knowledge and reinvent value, through co-creation with customers. Knowledge is an essential element due to its in- and outflows between the involved actors (Bogers & West, 2012). Finally the probability of cooperation between innovation partners was also reported to be significantly influenced by their absorptive capacity (Guisado-Gonzalez, Guisado-Tato, & Ferro-Soto, 2013).

Because of the presence of tangible elements (i.e. goods or operand resources) in any service offer, various definitions of "What is a service?" can exist (Spohrer & Maglio, 2008). An overview and its conceptualisations are available in the literature and we follow the service and

S-D logic's stream of research (Merz, Yi, & Vargo, 2009; Normann, 2001; Normann & Ramírez, 1993; Vargo & Lusch, 2006, 2008a, b).

The difference between knowledge and information is that the latter refers to a (Lusch et al., 2007: 10): "... specialized operand resource which can be exchanged relatively independently of the operand resources – pure information". Knowledge is broader since it includes technologies, specialized expertise, business processes and techniques (Normann & Ramírez, 1993), making it less transferrable as a whole. This is also made apparent by the need to "liquefy" existing service offers, meaning unembedding operand resources (such as information or technology) from the operand resource in order to use it for reconfiguring it into a new service offer during co-creation with the customer (Normann, 2001). The company must therefore also be able to unlearn which can also be referred to as desorptive capacity (Lichtenthaler & Lichtenthaler, 2010).

The intangible nature of services requires a more extensive exchange of information with the customers during new financial service development (Vermeulen, 2004). Consecutive collaborative interactions with customers (Kristensen, 1992) during new service development are part of problem-solving exercises where recurrent meetings help build a shared understanding (Peters, Johnston, Pressey, & Kendrick, 2010). The information needed is generally time-consuming to collect, transfer and use. This is costly and is also referred to as sticky information (von Hippel, 1994) or the tacitness of knowledge (Grant, 1996; Nielsen & Nielsen, 2009), reported to influence the locus of problem-solving during the innovation process (Simon, 1999). The type and amount of knowledge needed to innovate will contribute to the stickiness and innovation costs of information (von Hippel, 2005). This stickiness can be related to the

characteristics of the specific information itself and the features of the involved actors (von Hippel, 1994). However the embeddedness of involved the actors can foster the development of new services by reducing this stickiness or tacitness (De Smet, 2012; Granovetter, 1985; Uzzi, 1997; Uzzi & Lancaster, 2003).

Learning theory as a theoretical background

Organisational learning is all about achieving strategic renewal in the organisation itself (Sambrook & Roberts, 2005). The co-creation with customers is part of this strategic renewal since the objective of strategy is to relentlessly increase the fit between the company's capabilities and the value creating activities for its customers. Organizational learning is an essential element of new service development (Stevens & Dimitriadis, 2004) whilst the organizational learning process can also be viewed as an innovation process (Simon, 1999). The mechanisms that connect the organizational learning (i.e. structural, cultural, psychological and policy) influence its absorptive capacity (Knoppen et al., 2011) and absorptive capacity drives innovation (Lichtenthaler, 2009). Learning theory is therefore inherently driving the concept of absorptive capacity (Easterby-Smith et al., 2008), being part of the innovation process. These mechanisms that connect the learning process in an organization, leading to new knowledge stocks, are contingent on the relational context (Knoppen et al., 2011; Lipshitz, Popper, & Friedman, 2002; Naot, Lipshitz, & Popper, 2004). This importance of relationships was emphasized before for the co-creation of new services, where the interactions between the customer and the company are central (Prahalad & Ramaswamy, 2004a; Ramaswamy & Gouillart, 2010).

The structural mechanisms refer to the established routines during exploration and the social integration mechanisms that foster it and a subsequent exploitation (Dyer & Singh, 1998). The financial services sector is generally characterised by a more conservative environment (Vermeulen, 2004) with more rigid hierarchical lines of control (Johne, 1993) and more formal rules and procedures as micro-regulative forces (Vermeulen, Van Den Bosch, & Volberda, 2007). This can lead us to believe that the structural mechanisms should be more developed, to facilitate institutional control. These could be beneficial for financial services companies since a centralisation of the approach for innovation, offering more control, fosters organizational knowledge capitalisation (Yeoh, 2009). On the other hand the organisational structures can have impeding effects on the innovation process (Vermeulen & Dankbaar, 2002) while the financial services is argued to be less innovative (Vermeulen, 2005; Volberda, Van den, Flier, & Gedajlovic, 2001).

Policy mechanisms refer to decision making managers, how they want innovation initiatives to be handled and choices in directing the learning process, especially regarding the partner to learn with (Easterby-Smith et al., 2008), a customer for example. Insights into the specific policies (Lane et al., 2006) which focus on involving customers as a source of external knowledge, should be interesting. The influence of managers in steering the inter-organizational relationships for innovations (e.g. with a customer) was also found to be important (Easterby-Smith et al., 2008).

Cultural mechanisms of organisational learning refer to norms and values that encourage learning such as for example transparency, integrity and accountability (Knoppen et al., 2011). The psychological mechanisms refers to the psychological safety fostering risk taking in order to

learn something new (i.e. deviating from routinization) and the commitment to share knowledge with others (Lipshitz et al., 2002). Within the financial service sector, micro institutional factors (regulative, normative and cultural/cognitive) were researched before, showing the presence of risk avoiding and various different meanings associated to knowledge exchanges during co-creation (Vermeulen et al., 2007). The social context around the customer and company during new service developments also need to be taken into account (Edvardsson et al., 2011) because otherwise knowledge exchanges will not be possible (Nicolajsen & Scupola, 2011). This is also related to the need for trust, another social characteristic, in the interactions between customers and the company (Roberts, Baker, & Walker, 2005).

Absorptive Capacity and Innovation-related Knowledge

There have been many discussions regarding the conceptualization of absorptive capacity (Cohen & Levinthal, 1990; Easterby-Smith et al., 2008; Lane et al., 2006; Volberda, Foss, & Lyles, 2010) and this research will follow the description by Zahra and George (2002) because their process approach is aligned with the research interest of this study, i.e. how can customer knowledge be identified and used for new financial services developments. The process of absorptive capacity drives innovation but its internal composition is always debatable because its components are expected to be strongly interrelated (Knoppen et al., 2011). Absorptive capacity is composed of two elements: potential and realized absorptive capacity (Zahra & George, 2002).

Potential absorptive capacity describes the company's organizational capabilities to acquire and assimilate external knowledge. The acquisition capability describes the identification and acquisition of external knowledge that is critical for the company. The assimilation capability refers to the routines in place to analyse, interpret and understand information obtained from an

external source (Kim, 1997). Realized absorptive capacity focuses on actually using the absorbed knowledge from the external environment, requiring a transformation and exploitation capability. Transformation deals with the necessary modifications to existing internal knowledge, following the acquisition and understanding of new external knowledge (i.e. internalization). The exploitation capability refers to the leverage and refinement of its current competences with the new knowledge that was reconciled through the transformation capability. This can imply changes to structures, routines, systems, roles to provide new services. All this illustrates the reconfiguration of the company's resources after a successful capture and integration of knowledge from its customers, to sustain a competitive advantage (Michel et al., 2008b; Normann, 2001).

Absorptive capacity is a multifaceted concept with a broader empirical support (Flatten, Engelen, Zahra, & Brettel, 2011; Jiménez-Barrionuevo, García-Morales, & Molina, 2011; Kostopoulos et al., 2011; Lim, 2009; Murovec & Prodan, 2009). It has moderating effects on the relationship between technological opportunity and innovative effort (Nieto & Quevedo, 2005). The industry was found to have a moderating effect on the knowledge acquisition and innovation capability (Liao et al., 2010). The knowledge acquisition was also found to be able to increase the innovativeness of the involved company (Cepeda-Carrion, Cegarra-Navarro, & Jimenez-Jimenez, 2012). Absorptive capacity plays an important role in organizational learning and the reconfiguration of resources to better fit the company with its strategy and environment (Lewin & Volberda, 1999).

Within the context of knowledge intensive financial services, customers were reported to be important sources of innovations (de Jong & Vermeulen, 2003). Meeting latent customer

needs (Avlonitis et al., 2001) requires tapping into their knowledge and initiate the process of absorptive capacity (Lane et al., 2006). The acquisition capability was found to have positive effects on absorptive capacity (Liao et al., 2010), confirming its theoretical relevance, therefore likely to facilitate the reconfiguration of the company's resources to address strategic opportunities identified with the customers. The influence of co-creation initiatives within financial services companies on their performance was found to be diverse, depending on its strategic type (Manion & Cherion, 2009). Favourable customer outcomes also require market orientation. However market and resource orientation are both needed for the company to achieve innovativeness (Paladino, 2007). Measures of co-creation require more research in general (Payne, Storbacka, & Frow, 2008). However operational performance was found to be positively affected by leveraging customer knowledge (Yeung, Lo, Yeung, & Cheng, 2008).

Co-creation with customers is beneficial but much debate is ongoing regarding how this should be done as it also depends on the type of innovation being pursued (Gustafsson, Kristensson, & Witell, 2012). It is also new within the financial services sector (Papastathopoulou & Hultink, 2012; Perks et al., 2012). Finally, the customer base of a company is often not considered as a resource for building capabilities during co-creation (Prahalad & Ramaswamy, 2004b; Zhang, Ye, Chen, & Wang, 2011) and the decomposition of co-creation for service oriented companies has a capability has also been explored (Karpen, Bove, & Lukas, 2012).

Conceptual model on co-creation with customers

The customer is a source of critical knowledge (Greer & Lei, 2012), being the locus of search for the company's potential absorptive capacity. The current customer base will provide opportunities for knowledge exploration, requiring an acquisition capability within the company as part of its absorptive capacity (Zahra & George, 2002). The customer is also a provider of innovation-related knowledge (Bogers et al., 2010) and the company's absorptive capacity helps to explore this knowledge, which can lead to creation of innovation after internalization and exploitation of this knowledge. Customer relationships can lead to new knowledge, initiating the value co-creation process (because it's knowledge-driven), which is influenced by the organizational (learning) mechanisms and practices affecting absorptive capacity (Foss et al., 2011; Knoppen et al., 2011; Tu et al., 2006). The literature review and learning theory lead to the development of the following conceptual model (Figure 1), which will be used to define the research propositions.

Insert Figure 1 about here

The acquisition capability is invaluable to initiate the process of absorptive capacity to get innovation-related knowledge from customers during co-creation. Since various organizational (learning) mechanisms pave absorptive capacity, investigating these driving forces should yield interesting new research. The financial services industry is generally characterised by a more conservative environment (Vermeulen, 2004) with more rigid hierarchical lines of control and more formal rules and procedures (Vermeulen et al., 2007). Co-creation with customers is also new in this sector (Papastathopoulou & Hultink, 2012; Perks et al., 2012), implying a lower level of prior relevant knowledge. The organisational structures can have enhancing or impeding effects on the innovation process (Vermeulen & Dankbaar, 2002)

and financial services is argued to be less innovative (Vermeulen, 2005; Volberda et al., 2001). Therefore influences from its innovation policy, communication climate or cultural learning mechanisms can be expected. Vision is also needed (Nonaka & Takeuchi, 1995; von Krogh, Ichijo, & Nonaka, 2000) to generate new organizational knowledge by justifying the involvement of new actors (Giroux & Taylor, 2002), for example the customer. Therefore the following research propositions can be formulated.

Research proposition 1: The more rigid organizational routines of financial services companies impede its acquisition capability.

Research proposition 2: The lower level of prior relevant knowledge surrounding customer involvement during new service developments impedes the financial services providers' acquisition capability.

Research proposition 3: The possible lack of an innovation policy in financial services companies impedes its acquisition capability.

Research proposition 4: The more risk averse cultural setting of financial service providers impedes the acquisition capability for innovation-related knowledge from customers.

The financial services sector uses complex information systems, confirming the need for involving persons disposing of adequate level of internal knowledge. However a more complex knowledge system in the organisation is regarded as precondition for innovation (Nonaka, von Krogh, & Voelpel, 2006) . This implies that a larger stock of knowledge is available within the financial services companies, but that this must be accessed or stimulated. This shows the interest of the assimilation, transformational and exploitation capabilities in the process of

absorptive capacity. Knowledge scanning mechanisms and prior relevant experience should therefore be significant organization mechanisms that influence absorptive capacity.

Conclusions and limitations

The extant body of literature on co-creation initiatives with customers for new service developments was reviewed. Specific attention was paid to the importance of customer resources (i.e. their innovation-related knowledge) and company resources (i.e. competences and customer relationships) as inputs for this format of new service developments in the financial services sector. A company's absorptive capacity will facilitate the exploration, transformation and exploitation of innovation-related knowledge. The organizational learning mechanisms within a company drive its absorptive capacity and the latter drives innovation in knowledge intensive sectors like financial services. This is synthesized in the conceptual model which has several implications for research and practice.

Academic Implications

This conceptual model can be used to guide future research in co-creation initiatives within the financial service sector, by paying specific attention to the underlying organizational learning mechanisms.

Insights into the specific structures, policies or processes of absorptive capacity also represent interesting venues of new research (Lane et al., 2006). The research propositions contribute to this need and the various organizational (learning) mechanisms also represent a multitude of other possible research propositions involving absorptive capacity process' other

capabilities (assimilation, transformation and exploitation). Also the interrelations between the underlying capabilities present further avenues for research.

A possible venue for new research would be the use of longitudinal case studies to get more detailed insights on how learning occurs, how financial services companies realize service innovations through their organisational learning mechanisms and hence develop and use their absorptive capacity. There are various theoretical frameworks that could be used for further empirically testing the proposed conceptual model. The use of social capital theory could provide interesting research propositions to explore the influence of reciprocity, trust and network ties on the organizational learning mechanisms. A single in-depth case study might also be used, where detailed insights are collected on a very specific financial service innovation. The level of innovativeness of the co-created services is another area to be explored, since good customer relationships might have negative effects on the innovativeness of the new service (Knudsen, 2007).

Future research could focus on the possible differences between first movers and first followers, regarding customer involvement for co-creating new financial services. The diffusion of financial service innovations is reported to be rapid amongst competitors since they can be copied quickly (Roberts & Amit, 2003), giving an advantage to imitators (Molyneux & Shamroukh, 1999) and imitators' development costs can be halved compared to the first movers (Tufano, 1989).

Managerial Implications

Innovation managers and executives of financial services companies can gain insights from this conceptual model. It emphasizes that the involvement of customers for their new services development requires an investment in elaborating a dedicated environment (Nonaka & Konno, 1998) to do so. They need to pay attention to the needed absorptive capacity and contextual organizational learning mechanisms that can help to improve this capacity for leveraging innovation-related knowledge from customers. In particular the policy and structural learning mechanisms can be stimulated to enhance the effectiveness of the co-creation initiatives with customers and even initiate the learning to co-create with hem. The cultural and psychological learning mechanisms are also something that addresses executive leadership by emphasizing the importance of innovation (e.g. values), devising a strategy for innovation and by fostering an environment where risks can be taken for learning from customers. Vision is needed (Nonaka & Takeuchi, 1995; von Krogh et al., 2000) to generate new knowledge within the company and stimulate its search, fostering the involvement of external actors (Giroux & Taylor, 2002) such as customers.

Policy Implications

Policymakers could stimulate innovation networks and support transversal exchanges with new customers since these can stimulate a company's absorptive capacity. The costs of organising a space for co-creation and learning can be high, costs that private actors do not always want to bear, creating a possible role for policy makers to facilitate networks. Following this, the challenge of knowledge appropriability regimes for financial services companies emerges (Bader, 2008). The public authorities could develop new laws or guidelines to facilitate productive cooperation as innovation has important economic spillovers (Leahy & Neary, 2007).

Other policy measures could be oriented towards stimulating the formulation of a strategy for innovation and associated initiatives.

Limitations

The objective of this paper is the formulation of a conceptual model that can be used as a basis for guiding empirical research. As such, the elaboration of targeted and testable research hypotheses is excluded from this research. However various venues for future research have been formulated. Other industry or country characteristics could also be considered since these should influence service co-creation with customers due to its foundational differences (Fraga et al., 2008). The linking of the conceptual model with established service development models (Alam, 2002; Alam & Perry, 2002; Nambisan, 2002) is also left outside the scope and presents an additional future contribution to this research.

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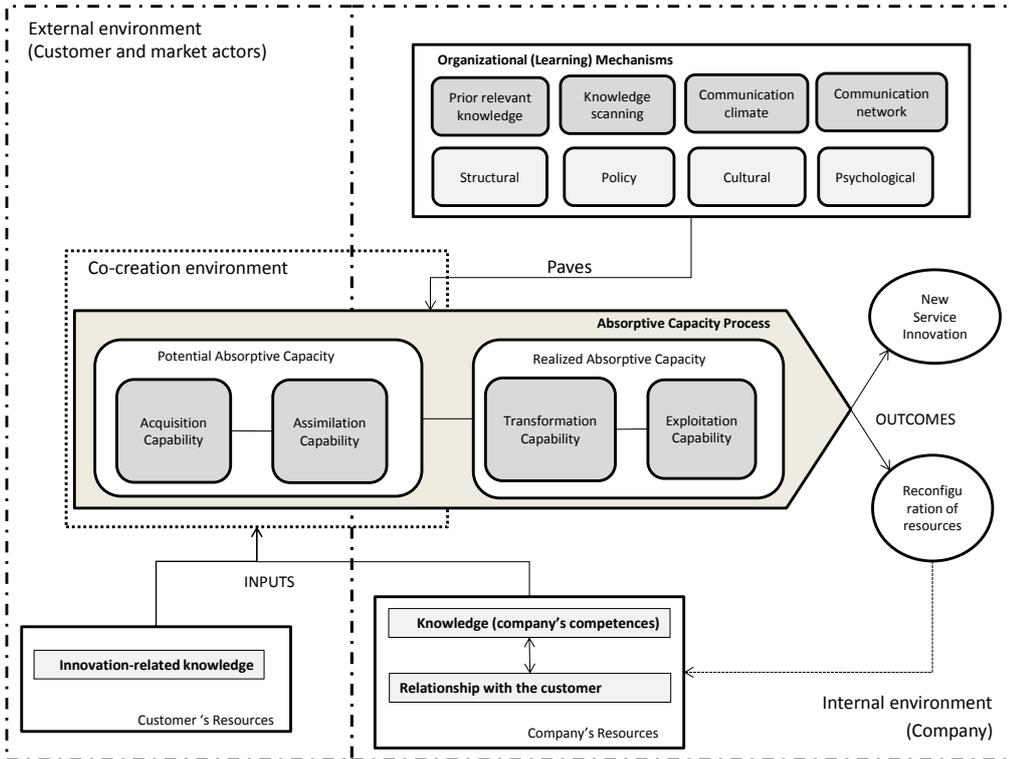
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TABLE 1
Goods versus services

	Goods	Services	Reference
The resources used	Primarily operand resources	Primarily operant resources, sometimes transferred by embedding them in operand resources-goods.	(Vargo et al., 2008: 148).
The role of customers	Receives a good. Marketing tries to categorize, promote and distribute to customers. The customer is an operand resource.	Co-producer of service. Marketing is a means to interact with the customers. The customer is mainly an operant resource, sporadically being involved as an operand resource.	(Vargo and Lusch, 2004: 7).
The firm-customer interaction	The customer is acted upon to generate transactions with other resources.	The customer is actively involved in relational exchanges and co-production.	(Vargo and Lusch 2004: 7).
Creator of value	Firm, often with input from other firms in a supply chain.	Firm, network partners and customers.	(Vargo et al., 2008: 148).

FIGURE 1

Conceptual model for customer involvement in financial services



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