Open Innovation in the Financial Services Sector - A global literature review

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Abstract. Despite the fact that it could help to overcome the current global financial crisis, the concept of open innovation is only very scarcely applied in the financial services sector. This international literature review covering the past decade provides an overview of the relevant body of literature on this topic. Two questions represent the starting point of this work: (1) Why is open innovation so scarcely applied in the banking, wealth management and insurance industries? and (2) Should the financial services sector use open innovation more widely? Our findings show that various organizational factors as well as monetary reasons prevent financial services companies from applying open innovation processes. Yet, by taking into account the potential benefits that the concept of open innovation may yield, this approach should indeed be applied more widely in the financial services industry.

Keywords. Innovation, Banking System, Financial Services, Business Management, Knowledge Management.

1. Introduction

Concepts such as open innovation (Chesbrough, 2003, 2011; Martovoy, Mention and Torkkeli, 2012; Mention and Martovoy, 2013), co-creation (Athanassopoulou and Johne, 2002; Bell and Loane, 2010; Hienerth, von Hippel and Berg Jensen, 2013; Martovoy and Dos Santos, 2012), and user-centered innovation (Athanassopoulou and Johne, 2002; Bátiz-Lazo and Woldesenbet, 2006; Bell and Loane, 2010; Jayawardhena and Foley, 2000; Oliveira and von Hippel, 2011) have raised the attention of scientists and practitioners alike, in various areas of economic activity.

At the same time, the process of innovation has become increasingly risky over the past few years (Chesbrough, 2011). One major factor in this change process is the improvement of Internet technology that resulted in the Web 2.0 (O'Reilly, 2004). This technological enhancement that facilitates the collaboration between organizations and their environments across the globe resulted in a reduced length of the product and service life cycle (Fasnacht, 2009). This “paradigm shift” (Bell and Loane, 2010, p.214) brought along by Web 2.0 (Bell and Loane, 2010; O'Reilly, 2004) introduced entirely new possibilities to the concept of open innovation (Chesbrough, 2003).

Yet, research on open service innovation largely bypassed the financial sector. Curiously enough, this domain has not been systematically investigated yet although this industry is highly important for economic growth (Jung, 1986) and employment in general (King and Levine, 1993), rendering financial innovations „a key player in the contemporary economy“ (Mention and Torkkeli, 2012, p.5). Gerstlberger, Kreuzkamp and da Mota Pedrosa (2010) further highlighted the fact that the significance of financial services is even larger in the case of Europe. Due to the current global financial crisis, this sector of the economy has received heightened attention by policy makers and researchers across Europe (Gerstlberger et al., 2010), but nonetheless, open innovation as a potential aid to overcome the crisis has been largely neglected by academia.

At the same time, customers' expectations of financial services firms are becoming more refined and elaborated, especially with regards to the clients' personal finances (e.g., credits, insurances, retirement plans, etc.). These changes have encouraged some financial firms to adopt innovative strategies in order to diversify into new products and new markets using the help of their most sophisticated customers (Akamavi, 2005; Martovoy and Dos Santos, 2012), also known as "lead users"(Athanassopoulou and Johne, 2002; Oliveira and von Hippel, 2011). Yet, Mention and Torkkeli (2012) still observe a lack of research in the area of customer involvement.

Despite heightened emphasis on joint collaboration (KPMG, 2007; Martovoy and Dos Santos, 2012; Mention and Martovoy, 2013) and co-creation between companies and their users for the purpose of introducing innovative services, such as online banking (Akamavi, 2005; Fasnacht, 2009; Martovoy and Dos Santos, 2012; Martovoy et al., 2012; Mention and Martovoy, 2013; Oliveira and von Hippel, 2011) or specific financial products (Akamavi, 2005; Gerstlberger et al., 2010), the financial services literature still provides comparably little insight into the significance of open innovation when developing new services and products (Martovoy et al., 2012).

Notwithstanding some studies in this area, not many results have been reported on the role of open innovation processes which include the co-creation with customers, employees, suppliers, partners, communities, universities and competitors in financial firms as front-line innovators (Akamavi, 2005; Martovoy et al., 2012).

Looking at the potential of open innovation as a method to improve services and products, we consider it to be all the more important to be investigated in more detail. We therefore provide an account on the scientific findings in this field, despite the fact that the extant body of literature is relatively small. Pointing out how few studies exist on this topic may furthermore motivate other scholars to study this phenomenon more closely. This article therefore provides in a concise manner a comprehensive tour d'horizon on the current state of open innovation in the financial services sector with particular emphasis on banking.

The main objective of this article is to investigate the following two questions based on the extent of the covered body of literature: Firstly, why is open innovation so little applied in the banking, wealth management and insurance sector? Secondly, should the financial services sector use open innovation more widely?

Innovations can be classified into four main types: product, process, organizational, and marketing innovations (OECD and Eurostat, 2005). This study focuses on the service aspect of product innovation. Due to the small number of studies on open innovation in the banking, wealth management and insurance industry, other industry sectors will be explored as well in order to provide a more accurate perspective of the process of open service innovation and its potential benefits in the field of financial services.

As innovation typically not only spans across organizational boundaries but also across geographic regions (Asheim, Coenen, Moodysson and Vang, 2007; Ernst, 2002; Gertler and Levitte, 2005), this study intentionally applies a transnational view. In this literature review we therefore take into account works from scholars across the globe and covering any nation.

The structure which was chosen for this paper is the following one. First, a description of the methodology is presented that is used for selecting and analyzing the articles on which the literature review is based. This is followed by a descriptive section which provides further information about the main articles used in this study. It provides details on the main objective of the articles, the methodological approach applied and the sample used etc. This is followed by the conceptual analysis section which sums up the main findings of those works. The paper continues by presenting the theoretical and managerial implications of this literature review. Next, limitations as well as further research directions are presented in the subsequent section followed by a section with conclusions.

2. Research Methodology

Investigating why open innovation is so scarcely applied in the banking and insurance sector and whether financial services firms could benefit from applying it more widely, this paper attempts to shed light on problems that are of both highly practical as well as theoretical nature. To identify the articles underpinning our research a combined research in online databases as well as on the Web was conducted.

First, the information was searched for in bibliographic databases (Emerald, JSTOR, Springer Link, Taylor and Francis, EBSCO as well as Wiley Online Library), using the following key words: “open innovation” (in/for banks, financial services and insurance companies), “service innovation”, “user innovation” and “collaborative innovation”. Second, these terms were also used to search for additional sources on the Web. These searches have proven to be relatively effective in generating a large number of articles which contained (in their title/abstracts) those keywords.

Using these documents as a starting point we determined the final number of articles to be reviewed, using five criteria proposed by Rialp, Rialp and Knight (2005). The articles had to: (1) appear in the period 2000–2014; (2) be in English, to facilitate comparison; (3) be theoretical and/or empirical academic papers; (4) be closely related to the topic in discussion, and finally (5) be major works that were systematically listed as key references in other selected studies with a quite similar focus. The time frame was selected based on two main assumptions. First, the concept of open innovation is a rather young notion in itself and most works focusing on this topic have been published after the year 2000. Second, we assumed that any research that is older than 15 years and that could be relevant to this study has been referred to and cited in subsequent studies.

We deliberately omitted any geographical restrictions in our research as this would be counter intuitive to the research topic of open innovation as the Internet nowadays provides fast and efficient means to collaborate across national borders (Van Ryssen and Godar, 2000; Wagner and Leydesdorff, 2005). Moreover, hardly any industries and markets are as globally interconnected as the financial services industry (Cetorelli and Goldberg, 2012) and the securities markets they cater for (Beine, Cosma and Vermeulen, 2010). We therefore expect that open innovation in this area would purposely be carried out across national boundaries. Accordingly, our research takes a global perspective.

In addition to bibliographic databases, alternative searches were conducted to identify supplementary information on the Internet, e.g., by using Google Scholar. These searches, which were also based on the criteria described above, were conducted in order to detect other possible sources of knowledge, such as books, press clippings, magazine articles, reports, web entries, conference papers, presentations, etc.

The above mentioned selection criteria yielded a total of 59 documents. Only 17 of them have a direct association with our research subject and were therefore identified as adding value to our analysis and enhancing the understanding of the process of open service innovation in financial services. The remaining 42 articles had a strong focus on other research topics not directly related to open service innovation in the financial sector, such as articles about the concept of open innovation in general (Chesbrough, 2003; Dahlander and Gann, 2010; Huizingh, 2011; Lee, Park, Yoon and Park, 2010); about open innovation proclivity (Chen and Hsu, 2013; Hung and Chiang, 2010); about collaboration using the Internet (Bell and Loane, 2010; T. Huang, W. C. Wang, Y. Ken, C. Y. Tseng and C. L. Lee, 2010; O'Reilly, 2004; Sawhney, Verona and Prandelli, 2005); or about innovation policies and regulations (Asheim et al., 2007; Wagner and Leydesdorff, 2005), etc.

As we applied a rather broad approach for our review to identify relevant pieces of literature the selection of works on open innovation includes numerous articles, reports and books that demonstrate both the importance and the consideration that is currently attributed to this subject by academic and practitioners alike. Yet it also highlights the lack of information available on this topic in the financial services sector.

3. Descriptive overview

As mentioned, all analyzed sources have a strong focus on the financial services sector. Since naming conventions may differ from country to country, we explicitly included in our literature review any works that deal with retail banks, savings banks, commercial banks, corporate banks, wealth managers, investment banks and insurance companies.

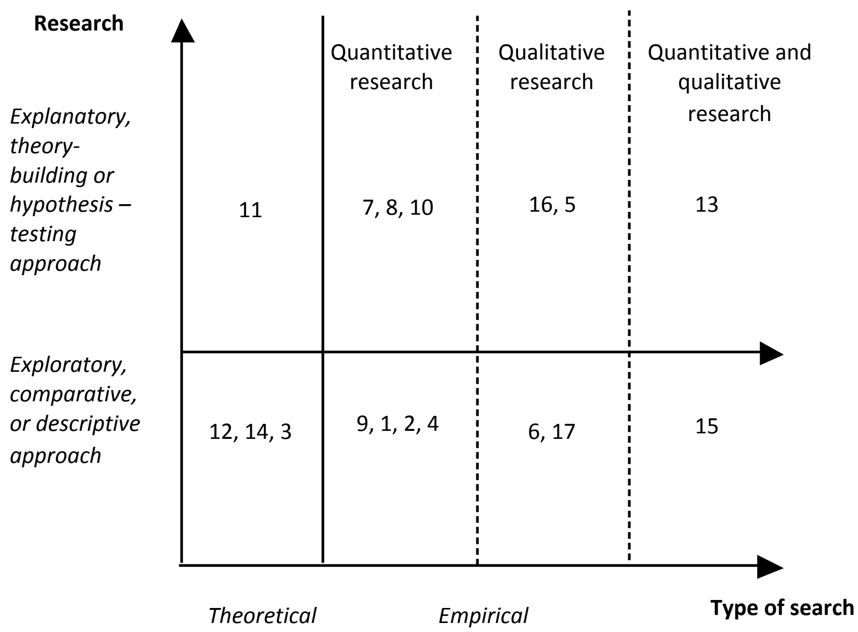
Our final sample of relevant contributions to the topic of open innovation in banking and insurance comprises 17 articles. They are the following ones:

Table 1. The sample of sources used in the literature review

Id	Author(s)	Year	Title	Publication	Publication type
1	Martovoy and Mention	2015	Patterns of new service development processes in banking	International Journal of Bank Marketing	Journal article
2	PWC	2014	Breaking the rules: Achieving breakthrough innovation in financial services	PWC	Report
3	Al-Sharieh and Mention	2013	Open Innovation And Intellectual Property: The Relationship And Its Challenges	The dark side of technological innovation	Book
4	Martovoy, De Smet, Mention and Torkkeli	2013	Role of clients in fostering innovation in services	The XXIV ISPIM Conference	Conference paper
5	De Smet, Mention and Torkkeli	2013	Involving customers in the innovation process: The acquisition capability of knowledge intensive companies	The XXIV ISPIM Conference	Conference paper
6	Martovoy and Dos Santos	2012	Co-creation and co-profiting in financial services	International Journal of Entrepreneurship and Innovation Management	Journal article

7	Martovoy, Mention and Torkkeli	2012	Role of the inbound open innovation in banking services	Public Research Centre Henri Tudor	Conference paper
8	Chaston	2011	Independent financial advisors: open innovation and business performance	The Service Industries Journal	Journal article
9	Oliveira and von Hippel	2011	Users as service innovators: The case of banking services	Research Policy	Journal article
10	Gerstlberger, Kreuzkamp and da Mota Pedrosa	2010	Innovation management in the German savings banks	Innovative Marketing	Journal article
11	Fasnacht	2009	Open Innovation in the Financial Services: Growing Through Openness, Flexibility, and Customer Integration	Springer-Verlag	Book
12	KPMG	2007	Banking on Innovation? The challenge for retail banks	KPMG	Report
13	Bátiz-Lazo and Woldesenbet	2006	The Dynamics of Product and Process Innovation in UK Banking International	International Journal of Financial Services Management	Journal article
14	Akamavi	2005	A research agenda for investigation of product innovation in the financial services sector	Journal of Services Marketing	Journal article
15	Athanasso-poulou and Johne	2002	Effective communication with lead customers in developing new banking products	International Journal of Bank Marketing	Journal article
16	Vermeulen and Dankbaar	2002	The Organisation of Product Innovation in the Financial Sector	The Service Industries Journal	Journal article
17	Jayawardhena and Foley	2000	Changes in the banking sector - the case of Internet banking in the UK	Internet Research: Electronic Networking Applications and Policy	Journal article

In order to assess the 17 theoretical and empirical studies as systematically as possible, each study was analyzed and categorized following two dimensions: 1. research focus (explanatory vs. exploratory) and 2. type of research (theoretical vs. empirical) (Rialp et al., 2005). This taxonomy was designed to obtain a high-level overview of the studies included in our sample. The results are depicted in the following paragraph.



Legend:

Id	Author(s)	Id	Author(s)
1	Martovoy and Mention, 2015	10	Gerstlberger et al., 2010
2	Wilkes et al., 2014	11	Fasnacht, 2009
3	Al-Sharieh and Mention, 2013	12	KPMG, 2007
4	Martovoy et al., 2013	13	Bátiz-Lazo and Woldesenbet, 2006
5	De Smet et al., 2013	14	Akamavi, 2005
6	Martovoy and Dos Santos, 2012	15	Athanassopoulou and Johne, 2002
7	Martovoy, et al., 2012	16	Vermeulen and Dankbaar, 2002
8	Chaston, 2011	17	Jayawardhena and Foley, 2000
9	Oliveira and von Hippel, 2011		

Fig. 1. Two dimensional analysis of sources

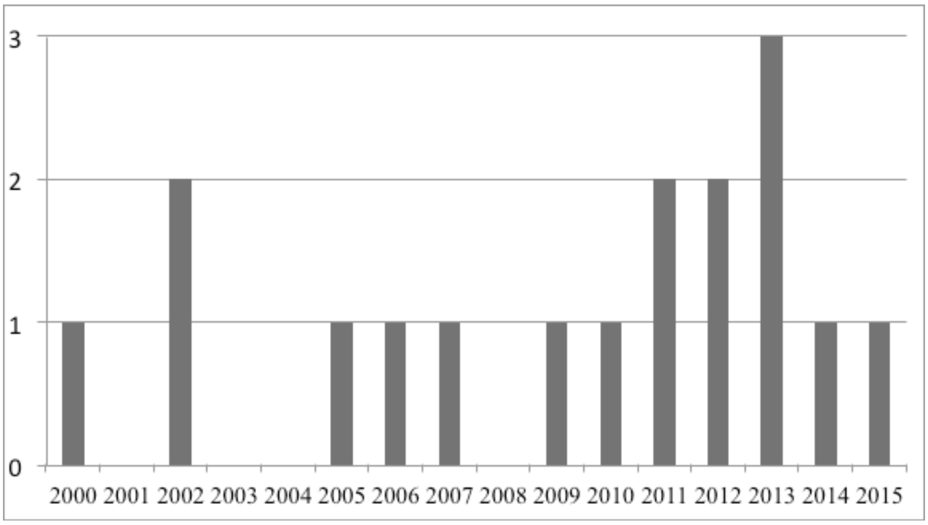


Fig. 2. Number of occurences of sources per year

The following table sums up the basic details of all 17 articles in our review sample. Further details on the conceptual findings of these articles are provided in the subsequent conceptual analysis section.

Table 2. Content overview of the sources used in the literature review

Id	Author(s)	Year	Research objective	Type of research	Sample, if empirical	Key findings
1	Martovoy and Mention	2015	Explores the patterns and openness of NSD processes in the context of financial service firms.	Empirical: dedicated survey	25 Luxembourg – based banks	Observation of four individual patterns of the NSD process. For these patterns banks strike balance between open and closed innovation.
2	PWC	2014	Explains how innovation can thrive in the long-run, to growth revenues and profitability in financial sector.	Empirical: dedicated survey	Survey of 223 financial services executives	Gaining a sustainable competitive advantage requires the right mix of innovation connected to business strategy and to management support.
3	Al-Sharieh and Mention	2013	Identifies and analyzes the challenges of IP law that are associated with inbound and outbound open innovation, and experiences made by financial firms.	Theoretical: literature review, content analysis	n/a	IP protection is capable of playing its traditional role of rewarding and stimulating innovation even in an open innovation environment.

4	Martovoy, De Smet, Mention and Torkkeli	2013	Discusses the role that clients play in innovation in services based on the example of financial services.	Empirical: dedicated survey	25 Luxembourg – based banks	Clients of financial institutions can be a valuable source of valuable and original ideas.
5	De Smet, Mention and Torkkeli	2013	Focuses on the acquisition capabilities of financial services companies in the context of open innovation.	Empirical: semi-structured interviews	5 interviews of innovation managers	The policy of promoting intrapreneurship enlarges the acquisition capability of open innovation by the financial services providers.
6	Martovoy and Dos Santos	2012	Analyzes the role of customers in financial innovation.	Empirical: semi-structured interviews	9 Luxembourg – based financial companies	Financial institutions tend to select "lead users" open for cooperation (in retail markets) and with whom they have long relations and common focus (in corporate markets).
7	Martovoy, Mention and Torkkeli	2012	Explores the sources of knowledge and the modes of its inflow for innovation in financial services.	Empirical: survey based	Based on 30 banks from Luxembourg	Members of a bank's group, suppliers, professional/industry associations and government/public are the most important external sources of knowledge for innovation.
8	Chaston	2011	Examines the involvement in open innovation of small independent financial advisors.	Empirical: hypothesis – testing approach	Surveys of 131 independent financial service advisors	Innovative and entrepreneurial oriented IFAs are more successful in business. Knowledge exchange between firms increases business performance.
9	Oliveira and von Hippel	2011	Studies the role of user-innovators in service development focusing on commercial and retail banking services.	Empirical: Cross-sectional study (screening method)	36 US firms – sample based on corporate and retail banking services	Users often develop and self-provide what they need before banks or non-bank financial service producers offer commercial services to serve their needs.
10	Gerstlber-ger, Kreuz-kamp and da Mota Pedrosa	2010	Investigates the innovation management of the European public financial services	Empirical: quantitative survey	114 Germany entities – sample based on savings banks	Top management influences the degree of innovation in financial service companies and how customers focus on

			industry.			these companies.
11	Fasnacht	2009	Investigates the innovation levels in the financial service industry	Empirical: case studies	Based on corporate, retail banks and insurance companies	Financial industry shifts from a closed to an open innovation approach. This approach is considered the best way of creating value for operational excellence and profitable growth.
12	KPMG	2007	Assesses the state of innovation in retail banking and its potential to further enable the entire sector.	Theoretical: descriptive approach	n/a	Retail bank are lagging well behind the trend in the way they manage their innovation processes.
13	Bátiz-Lazo and Woldesen-bet	2006	Analyzes the innovation behavior in service organizations.	Archival research and semi-structured interviews	11 UK firms – interviewees came from commercial and investment banks	Banks engage especially in incremental innovation and rarely in radical innovations.
14	Akamavi	2005	Provides an overview of new service development activities in the financial services sector.	Theoretical: literature review, content analysis	n/a	Companies should create value with the customer and incorporate the customer's value creation into new product development.
15	Athanas-sopoulou and Johne	2002	Identify communication skills associated with success in new service development.	Empirical: case study	9 UK-based on commercial banks	Successful companies create innovative services and products mainly following a customer-driven new service development (NSD) strategy.
16	Vermeu-len and Dankbaar	2002	Focuses on the organization of innovation processes in the financial services sector.	Empirical: semi-structured interviews	Product managers and IT personnel in 14 banks and 25 insurance companies	Most companies adopt the concept of multi-disciplinary project teams to develop new services and products; however, the idea generation stage is mainly the task of a single department.
17	Jayaward-hena and Foley	2000	Analyzes the changes brought onto the banking sector by the Internet evolution.	Empirical: case studies	Analysis of 12 UK Internet banking systems	Companies that use the Internet can reap cost savings, enhance the bank's reputation and collaborate with customers for services and products innovation.

4. Conceptual analysis

After providing a brief descriptive overview of the extant literature on open innovation in financial services followed by further details on each article, we will provide in this section a more detailed analysis on the conceptual implications of these findings. We structured this section of our research using the three key components of our research topic. Hence, we will first analyze the relevant output on the topic of innovation, followed by an investigation of the notion of openness and third by examining the specificities of these items in the context of product and service development the financial services sector.

4.1. Innovation

Definitions of the term 'innovation' are in abundance (Garcia and Calantone, 2002). For the purpose of this paper we adopt the definition of Vermeulen and Dankbaar (2002) who define innovation as a new product, process, distribution method, or a new combination of existing products (or product components), processes or distribution methods, perceived as new by the stakeholders. Defined as such, a long list of prominent innovations emerged in the financial services industry over the past decades: from the ATM to phone-initiated money transfers, and peer-to-peer lending solutions, over tablet-supported advisory to new service offerings such as art advisory (Mention and Torkkeli, 2012).

Innovation is generally accepted as being of vital importance to obtain and maintain competitive advantage in any industry sector (Bátiz-Lazo and Woldesenbet, 2006; Jayawardhena and Foley, 2000; Rehder and Levi, 2011). Building on the works of Chaston (2010), Coelho and Easingwood (2008), and Huang et al. (2010), Chaston (2011) argues that innovation along with strategies of creating new products and services can be decisive for companies to grow from an economic downturn into a position outpacing their competitors. Despite these findings, the financial services industry and especially banks are often considered to be low performers when it comes to innovation (KPMG, 2007; Rehder and Levi, 2011). The lack of innovation in this sector is generally associated with the conservatism or rigidity of this sector (KPMG, 2007), which may be explained by a lack of openness and the absence of an entrepreneurial orientation.

It is an established fact that implementing strategic innovations permits companies to respond rapidly to fast changing market opportunities (Akamavi, 2005; Chaston, 2011; Fasnacht, 2009; Rehder and Levi, 2011). Yet, according to Bátiz-Lazo and Woldesenbet (2006) and Chaston (2011) severe obstacles exist that prevent financial services firm from adopting technological innovations. Among those are resistance to change organizational structures, cultural inertia, internal politics, fear of cannibalizing existing products, fear of destroying existing competencies, satisfaction with the status quo, and in general, a lack of incentives to abandon the certainty of the current way of doing things and to embrace the uncertainty of future rewards. This posture hampering open innovation is further reinforced by a traditional approach to innovation which strives to retain ownership and confidentiality of proprietary knowledge by adopting a "closed approach" to NPD and NSD (Martovoy et al., 2012, p.12). On a related note PWC (2014) identified the following five items as the most severe innovation challenges for financial institutions: "Taking innovative ideas to market quickly and in a scalable way", "Finding and retaining the best talent to make innovation happen", "Establishing an innovative culture internally", "Finding the right external partners to collaborate with" and "Having the right metrics to measure innovation progress and track ROI" (PWC, 2014, p.9).

As far as the financial services sector is concerned, Vermeulen and Dankbaar (2002) argue that the innovation process can be divided into four phases: (1) the idea generation stage, (2) the specification of features stage, (3) the product building stage and (4) the implementation stage. Typically, the idea generation stage is a task given to a single department (Vermeulen and Dankbaar, 2002). By doing so, financial services firms tend to neglect some significant potential sources of new ideas, most notably from front office personnel who are regularly in close contact with customers (Martovoy and Dos Santos, 2012; Rehder and Levi, 2011). The second most neglected source of new ideas is typically the outside world (Vermeulen and Dankbaar, 2002).

Chesbrough (2003) pointed out the importance of collaborating with other organizations and individuals in order to sustain business performance in today's business environment. For this type of collaborative NPD and NSP the author coined the term "open innovation" (Chesbrough, 2003). The open innovation concept is commonly defined as: "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively" (Chesbrough, 2011, p. 69). Subsequent empirical research showed that firms adopted this type of collaboration with external entities in order to improve their innovation capabilities and to achieve competitive advantage (Chesbrough, 2011; Martovoy and Dos Santos, 2012).

According to the findings of Huang, Wang, Yun, Tseng and Lee (2010) open innovation makes firms indeed more effective in creating added-value results by leveraging many more ideas from a variety of external sources. In addition Chaston (2011) found out that involvement in open innovation represents a critical factor in the successful development of new products and technologies.

Fasnacht (2009) and Chesbrough (2011) agree that open innovation represents the most effective way of generating value required to achieve operational excellence and to generate profitable growth. According to KPMG (2007) major challenges arising from open innovation are those which emerge from disruptive innovations, whether these focus on new technology, new business processes or completely new business models. These disruptive innovations even have the potential to destroy existing businesses and are often hard to predict.

Data from the Community Innovation Survey 2008 indicates that financial institutions engage in open innovation by collaborating with external partners to build products, services and processes (Eurostat, 2012). They engage with suppliers (37%), other enterprises within the enterprise group (28%), customers (23%), consultants and research labs (21%), competitors (19%), higher education establishments (11%), and public research institutes (7%).

According to studies by Mention and Martovoy (2013) and Martovoy, et al. (2012) banks mostly rely on themselves as the most important source for knowledge leading to innovations. This is followed by other entities belonging to the same corporate group and followed by consultants, clients, and suppliers as the third. In addition private research institutes as well as other non-government organizations also play a significant role for innovation in the banking area. Martovoy and Dos Santos (2012) suggest that co-creation with customers provides the potential to develop more transparent and less complex financial services which are highly relevant to customer needs.

These results show that, generally speaking, financial institutions primarily rely on internal sources of knowledge and a rather limited group of external knowledge providers such as other banks. Bigger crowds of clients and suppliers are perceived as a less significant source of knowledge (Martovoy et al., 2012; Mention and Martovoy, 2013).

A closer look at the internal knowledge providers reveals that the most important internal sources of knowledge for innovations are CEOs/Board of directors, frontline employees, and the dedicated NSD team (Martovoy et al., 2012). Banks furthermore attract the inflow of knowledge by the means of hiring new personnel, purchasing of machinery, and interacting informally with personnel.

Building on the works of Chesbrough (2011) as well as Martovoy and Dos Santos, 2012, Martovoy, et al. (2012) synthesize in their article the advantages that banks gain from collaborating with members of the own organization as well as external partners. Banks consider cooperating with external partners advantageous to the development of new technologies, the acquisition of new skills by employees, and to gaining access to ideas, knowledge, expertise, and technologies. Furthermore, banks tap into external knowledge sources in order to obtain knowledge on how to decrease costs, increase customer satisfaction, shorten time-to-market, identify new approaches on problem solving, and to accelerate internal innovation processes (Martovoy et al., 2012). The major disadvantage of sourcing knowledge from the outer world is considered to be the high cost associated with this type of collaboration (Martovoy et al., 2012).

Further disadvantages as presented by Martovoy et al. (2012) include a heightened dependency on partners, difficulties in balancing co-operation for innovation with daily tasks, and problems in allocating internal resources to an outside co-operation. Additional problems may arise from the question on how to fairly share contributions and outcomes of the co-operation. Moreover a persistent corporate culture at the bank may prevent the organization from acquiring existing external knowledge because of their foreign nature. Other difficulties may stem from difficulties in choosing and combining numerous alternative knowledge sources. In addition organizational resistance at the bank and the fear of losing control over a proprietary knowledge or solution as well as bureaucracy and conflicting rules among partners may hamper the usage of external knowledge. Finally, the fear of cannibalization of existing products and services may inhibit the usage of external knowledge sources (Martovoy et al., 2012).

4.2. Openness

The European financial service industry has undergone major changes over the past years largely due to the effects of the international financial crisis. In view of decreasing assets, tightening regulations and a zero interest environment, competition intensified significantly (Gerstlberger et al., 2010). In order to meet these new challenges and to benefit from these dynamic changes (Bell and Loane, 2010; Chesbrough, 2003; Gerstlberger et al., 2010; Vermeulen and Dankbaar, 2002), financial services firms ought to become more flexible. Only a heightened level of flexibility will allow them to respond to new market conditions and to incorporate innovative technologies and processes into their corporate strategies.

The challenges generated by new rules of collaboration and innovative technologies (Bátiz-Lazo and Woldesenbet, 2006) increased the pressure upon management of financial firms. Against this background it is likely that the entrepreneurial orientation and openness displayed by a firm’s top management team will be a decisive factor distinguishing successful from less successful firms (Athanassopoulou and Johne, 2002; Bell and Loane, 2010; KPMG, 2007).

Previous research furthermore suggests that highly innovative financial service companies differ from less innovative firm in the support that the top management team provides for innovation development activities (Fasnacht, 2009; Tao Huang, Wen-Cheng Wang, et al., 2010; Martovoy et al., 2012) and in the degree of customer focus displayed by the firms (Martovoy and Dos Santos, 2012; Mention and Martovoy, 2013; Sawhney et al., 2005).

According to Bátiz-Lazo and Woldesenbet (2006) there is a wide gap between managers' discourse and their ability to implement or to support innovations. In a similar vein, Bose and Sugumaran (2003) found out that a gulf exists between normative contributions by academics and those measures managers actually apply.

Bose and Sugumaran (2003) argue that the primary objectives of knowledge management have to be especially oriented towards leveraging the organization's knowledge, by creating new knowledge, promoting innovation and exploiting internal (Chaston, 2011) and external collaboration (Chesbrough, 2011; Martovoy and Dos Santos, 2012) to improve employee skills. Wong and Aspinall (2004) consider that knowledge management could be essential when an organization is based upon entrepreneurial behavior to overcome major market threats.

According to Rehder and Levi (2011) leading companies across industries encourage a culture of innovation and open entrepreneurship by using support from top-level management and structuring internal processes to promote risk-taking, networking (Martovoy and Dos Santos, 2012) and collaboration among employees (Akamavi, 2005; Athanassopoulou and Johne, 2002; Fasnacht, 2009).

The internal and external impact of regulatory changes, the developments in information communication technologies (ICT) (Bell and Loane, 2010; Chesbrough, 2011; Fasnacht, 2009), changes in customer needs and novel ways to price risk (Rehder and Levi, 2011) cause banks managers to make much needed investments to modernize infrastructure, to provide innovative products and services, and to improve operational efficiencies (Bátiz-Lazo and Woldesenbet, 2006).

Lichtenthaler (2008) assumes that the degree of organizational openness is closely related to the emphasis an organization puts on the development of radical innovations which are especially relevant for commercializing new technologies externally. Two reasons can be offered for this proposal: first, commercializing knowledge which would not otherwise be used by the firms can generate additional revenues (Bátiz-Lazo and Woldesenbet, 2006; Martovoy and Dos Santos, 2012; Wong and Aspinall, 2004). Second, open innovation is helpful for stimulating the market acceptance for a new product or service as potential users have been involved in developing them (Bell and Loane, 2010; Chesbrough, 2011; Dahlander and Gann, 2010; Hienerth et al., 2013). In this context it also has to be noted that firms which focus on radical innovation are at times not able to internally develop the required knowledge (Chaston, 2011; Lichtenthaler, 2008).

By empowering employees to participate in a firm's innovation process, innovative companies regularly take advantage of new ideas from internal sources (closed innovation) (Akamavi, 2005; Bátiz-Lazo and Woldesenbet, 2006; Chaston, 2011; Gerstlberger et al., 2010; Jayawardhena and Foley, 2000; Lee et al., 2010) and from external sources (open innovation), inviting outsiders to help resolve innovation challenges (Athanassopoulou and Johne, 2002; Chesbrough, 2003; Fasnacht, 2009; Martovoy and Dos Santos, 2012; Martovoy et al., 2012; Mention and Martovoy, 2013; Sawhney et al., 2005). Both approaches represent powerful methods for generating innovations and can result in successful initiatives.

Vermeulen and Dankbaar (2002) found out that in most financial companies organizational structures are still based on the traditional principle of functional specialization. In general, companies form multi-disciplinary project teams to develop new products (KPMG, 2007; Martovoy et al., 2012), especially when in need of radical product innovations. The members of these teams typically come from various functionally specialized departments (Vermeulen and Dankbaar, 2002). Often it can be observed that team members predominantly act as representatives of their respective departments and thus teams oftentimes do not function as a group with a shared understanding of its mission (Tao Huang, Wen-Cheng Wang, et al., 2010; Vermeulen and Dankbaar, 2002; Wong and Aspinall, 2004). What is more, according to Vermeulen and Dankbaar (2002) managers acting as leaders or product champions are rare in the financial services sector and many problems tend to originate in a lack of communication between departments.

Fasnacht (2009) considers open innovation to be more than just a new business model to acquire intellectual property. It is rather a mindset defined by openness, flexibility, and customer integration. According to Gerstlberger et al. (2010) the role of the customer is of growing importance as one the most important external stakeholder in the innovation management process of financial services firms. This fact along with an intensified usage of information and communication technology is considered a necessary condition for a further spread of open innovation in financial services companies (Gerstlberger et al., 2010). In an empirical study among financial institutions in Luxembourg Martovoy, De Smet, Mention and Torkkeli (2013) furthermore established that clients of such firms can indeed be an important source of valuable and original ideas.

Over the years, financial companies have understood that in order to be competitive they needed to anchor their operational activities around customer needs rather than products or services (Akamavi, 2005; Chaston, 2011; Gerstlberger et al., 2010). This can be achieved by insurance companies through improved collaboration (Fasnacht, 2009; Rehder and Levi, 2011; Vermeulen and Dankbaar, 2002) and by service delivery as well as information provisioning across individuals, departments, brokers, intermediaries and agents, within and outside of the organization (Akamavi, 2005; Fasnacht, 2009). In this context a study by Mention (2015) among Luxembourg based banks revealed out that banks tend to strive for a balance between open- and closedness in their NSD process.

The Internet with its inherent openness is both an important accelerator for change and a challenge for the heavily regulated market players, especially the incumbent ones (Akamavi, 2005; Bell and Loane, 2010; Chesbrough, 2011). The IT-platform provider Cordys, for instance, argues that in the 1990's the British insurance market suffered severely from the transformation which was caused by the creation of a direct insurance market. This industry transformation led to the emergence of new, purely Web-based insurers and to the development of innovative aggregator platforms, allowing easier price comparison for consumers (Cordys, 2013).

4.3. Product and service development

In the financial services industry, new communication and collaboration technologies have not only enabled and increased the transactions among employees (Athanassopoulou and Johne, 2002; Chaston, 2011; Oliveira and von Hippel, 2011), but also between employees and customers (Gerstlberger et al., 2010; Jayawardhena and Foley, 2000; Martovoy and Dos Santos, 2012). They furthermore opened up a variety of opportunities for new processes that can be used for developing innovative services and products (Vermeulen and Dankbaar, 2002). Yet, the new communication and collaboration technologies also add to the pressure of financial services firms. Banks and insurance companies nowadays have to meet rising organizational standards, higher demands for speed and flexibility of their operations, a broadening of distribution channels, new types of competition (Vermeulen and Dankbaar, 2002), as well as novel means for creating service and products innovations (Akamavi, 2005; Bátiz-Lazo and Woldesenbet, 2006; Huizingh, 2011; Lee et al., 2010; Mention and

Martovoy, 2013).

According to the extant body of literature, both practitioners and academics regularly vary in usage of the terms “products” and “services”. According to Akamavi (2005) economists use the term “products” which are also called “goods” and intangible products often labeled as “services”. Some scholars consider services to be the first step in the process of developing products (Chesbrough, 2003; Sawhney et al., 2005; Vermeulen and Dankbaar, 2002). The discussion on the differentiation between goods and services has its origin in the attempts to unmistakably classify services. Akamavi (2005) describes a service as an act which is performed if one party offers another one an essentially intangible, perishable, inseparable, and heterogeneous good, which does not result in the ownership of anything. Furthermore Akamavi (2005) posits that the process of developing new unsophisticated services is strongly related to intuition, flair, hypothesis and luck. However, the author also points out that the development of new services or intangible products has often been given lower priority in service industries than has been the case with physical goods in the manufacturing sector (Akamavi, 2005).

Various authors point out that the process of new service development (NSD) is fundamentally different from new product development (NPD) (Athanassopoulou and Johne, 2002; Bátiz-Lazo and Woldesenbet, 2006; Vermeulen and Dankbaar, 2002). NPD typically represents a more rigorous and formal process involving “new product strategy, idea generation, idea screening and evaluation, business analysis, development, testing and commercialization” (Akamavi, 2005, p.369). According to Akamavi (2005), a repetitive process is recommended for designing and developing a new service rather than a linear process which is specific to tangible products. Following this approach, customers may become key clients supporting new service development by getting involved in key aspects of the process. These activities could include designing new service concepts and testing specific aspects (Athanassopoulou and Johne, 2002; Martovoy and Dos Santos, 2012; Sawhney et al., 2005; Vermeulen and Dankbaar, 2002). Customers and employees working in repetitive activities could thus play a significant role in the development of new services (Akamavi, 2005).

The NPD model includes different kinds of changes in the features of the product, such as: improvements to existing products, cost reductions, repositioning, additions to existing product lines, or style changes and new product lines (Akamavi, 2005). Martovoy, et al. (2012) sustain that the NSD model applied in financial services may well be similar to the one used by manufacturing firms. Yet, Athanassopoulou and Johne (2002) point out that the NSD process for financial services must integrate the role of the customer. Consequently, companies should no longer follow a process of creating value for the customer, but should rather investigate the possibilities of creating value with the customer (Hienerth et al., 2013; KPMG, 2007; Martovoy and Dos Santos, 2012; Oliveira and von Hippel, 2011; Sawhney et al., 2005). For an efficient NSD in the financial services sector, the customers’ needs for value creation should actively be used for developing new products and services (Akamavi, 2005; Athanassopoulou and Johne, 2002; Chaston, 2011; Fasnacht, 2009; Martovoy et al., 2012; Mention and Martovoy, 2013).

Users and producers will tend to develop different types of innovations. Users generally have a more accurate and more detailed conception of their needs than producers have. Producers at the same time have a better notion of how to fulfill needs than do the clients. As a consequence, users may spark innovations that are functionally novel. By contrast, manufacturers typically tend to develop innovations that are improvements on well-known needs and that require a rich understanding of the solution for their further development (Oliveira and von Hippel, 2011).

According to Oliveira and von Hippel (2011) many of the most important new services are developed by users for their usage and are only commercialized in the field thereafter. The authors define the term "service users" as institutional or individuals that expect to benefit from using a service (Oliveira and von Hippel, 2011). Compared to that, "service producers" are firms or people that expect to benefit from selling a service. According to Oliveira and von Hippel (2011) a service innovation is therefore "user-developed" if the developer expects to benefit from its use, and "producer-developed" if the developer expects to benefit from its sales. As examples for such user-developed new services the authors list payroll processing services, sweep services between different banking institutions, merchant services and card solutions, invoice processing services. (Oliveira and von Hippel, 2011).

Numerous authors use the term "lead users" for customers that are particularly important for innovative NSD and NPD (Martovoy et al., 2012; Oliveira and von Hippel, 2011). Lead users are described by Oliveira and Hippel (2011) as an exclusive group of the user population which is characterized by two attributes: (1) they are ahead of the bulk of the market with respect to an important trend and; (2) they expect to gain major benefits from new solutions fulfilling their needs. Their high expectations are likely to let them engage in innovation and the newly created products or services could represent significant commercialization opportunities for companies (Martovoy et al., 2012; Oliveira and von Hippel, 2011).

The concept of lead users centers around the assumption that the richest understanding of potential new services/products is held by just a few clients (Akamavi, 2005; Chesbrough, 2003, 2011; Martovoy and Dos Santos, 2012; Oliveira and von Hippel, 2011). Athanassopoulou and Johne (2002) consider that lead users are those rare members of the client population who have the strongest need for new products or services.

At the same time it is not entirely clear what roles customers play and how and when customers are appropriately involved in the NSD process (Athanassopoulou and Johne, 2002). Yet, these gaps are being narrowed by the newly emerging Web 2.0 applications, which enhance the connection and collaboration possibilities between a firm and its environment (Bell and Loane, 2010; Chesbrough, 2011; Rialp et al., 2005; Sawhney et al., 2005). Open innovation platforms help companies to use outside sources to generate and implement ideas for developing innovative (incremental or radical) (Sawhney et al., 2005) products or services (Chesbrough, 2011; Dahlander and Gann, 2010; Jayawardhena and Foley, 2000; Lee et al., 2010; Oliveira and von Hippel, 2011).

Bell and Loane (2010), Chesbrough (2011) and Fasnacht (2009) suggest that financial companies should not only involve clients in the co-creation process for NPD or NSP, but should also tap into the knowledge of other larger groups of entities such as, user communities, suppliers, partners, competitors, universities, venture capitalists and other resources.

Akamavi (2005) argues that benefits from launching new products or services should be more widely defined than just financial benefits. Potential extra benefits should be considered, such as improved company reputation, increased consumption of existing products, and a heightened awareness of the value added by the products or services as perceived not only by customers, but also by the community or the environment. This may result in developing a culture based of transparency and collaboration between the outside world and the company (Fasnacht, 2009; Martovoy et al., 2012; Mention and Martovoy, 2013).

The research results produced by Athanassopoulou and Johne (2002) emphasize the role of the development teams that are able to learn from customers and to disseminate the acquired knowledge throughout their organization and to embody it in new products (Martovoy et al., 2012). In order to accomplish this different kinds of communications methods (extensive and cross-functional communication with customers) should be used, as well as new ICT in order to expand the ability of developer-teams to learn from the market (Athanassopoulou and Johne, 2002).

The cost and time advantages resulting from the usage of new ICT can furthermore create a competitive advantage for pioneering companies (Athanassopoulou and Johne, 2002; Bell and Loane, 2010; Dahlander and Gann, 2010; Jayawardhena and Foley, 2000; KPMG, 2007; Sawhney et al., 2005). If used intensively a wider range of communication methods (open innovation platforms, Broadcast, interactive Web sites, Webcasting, streaming audio, virtual chats etc.) would furthermore enhance the interaction between companies and their environments (Athanassopoulou and Johne, 2002; Bell and Loane, 2010; Chesbrough, 2003, 2011).

Athanassopoulou and Johne (2002) and Bátiz-Lazo and Woldesenbet (2006) moreover agree that communicating with customers during the NPD or NSD process has been identified as a critical success factor for companies in rapidly changing and highly competitive environments such as the financial services industry.

5. Discussion

After analyzing the conceptual underpinnings of the covered body of literature we will point out the implications of these research findings. In the next two sub-sections we will present the theoretical implications as well as the managerial implications that can be derived from the investigated body of literature.

5.1. Theoretical implications

Compared to other industry sectors innovation processes are in general less pronounced in the financial services industry (Akamavi, 2005; Gerstlberger et al., 2010; KPMG, 2007; Rehder and Levi, 2011). Yet, and as mentioned afore the players of this industry sector have a strong incentive to improve their innovation performance due to the adverse economic situation they are facing. In this context, legal and compliance constraints are considered to be two of the most important barriers to innovations. Yet, these obstacles have only mildly hampered innovation in other heavily regulated sectors, such as pharmaceuticals, airlines and the food industry. Hence they should not represent insurmountable hurdles to implementing a more effective innovation strategy (KPMG, 2007). Moreover Al-Sharieh and Mention (2013) established that intellectual property rights can indeed reward and stimulate innovation in an innovation environment in the banking industry.

In addition to highlighting the continued importance of open innovation, this review suggests that open innovation in itself is not a perfect solution which guarantees success (Fasnacht, 2009). However, it should be noted that the most successful and competitive companies from other sectors integrated open innovation in their corporate strategy in such a fashion that it became an integral part of doing business (KPMG, 2007).

Moreover, the literature analysis revealed that highly innovative financial service companies differ from less innovative companies in the way the top management supports the innovation development activities of the firms and in the degree of customer focus displayed by those companies (Gerstlberger et al., 2010).

It is furthermore noteworthy that companies with executives that are open to innovative approaches become excellent learners of their marketplace and customers and typically develop the ability to develop products and services around emerging needs (Athanassopoulou and Johne, 2002; KPMG, 2007; Vermeulen and Dankbaar, 2002). The openness of their staff in turn yields a clear understanding of the company’s core capabilities, of its partners, and of the joint efforts that need to be spent to develop innovative products and services (Chaston, 2011; KPMG, 2007). In this context it is important to point out that these findings suggest a linkage between individual openness (George and Zhou, 2001) and organizational openness (Laursen and Salter, 2006): the openness of individual managers apparently induces further members of staff to become more innovative themselves, which eventually renders the organizational boundaries more open.

At the same time, these companies typically use simple and effective pipeline approaches to gather, analyze, develop and then quickly launch new products and services. A prerequisite for this however, in a corporate, the core inside the company, the roles, responsibilities and culture all support innovation, while evaluation methods are used to measure and reward successful innovation (Bátiz-Lazo and Woldesenbet, 2006; Fasnacht, 2009; KPMG, 2007; Oliveira and von Hippel, 2011).

5.2. Managerial implications

The findings of our literature review are useful for managers in the financial services sector because they do not only provide an overview of the current state of affairs with regard to open innovation in the financial services industry, but also contain normative statements made by academics and practitioners alike.

By knowing the most important sources and modes of knowledge inflow, executives may want to design specific measures to facilitate innovation activity in the financial services industry (Martovoy et al., 2012).

According to KPMG's (2007) report senior executives typically do recognize their companies' limitations, especially in the light of increasing challenges faced in the future. Yet, they often do not know how to overcome these limitations (KPMG, 2007).

This literature review fleshes out some of the actions that could be taken by managers and experts from the financial services sector in order to succeed in a market which is becoming increasingly global and competitive.

Bell and Loane (2010), for example, suggest to encourage users to contribute in NSD / NPD processes using Web 2.0 technology. Web 2.0 provides firms with entirely new opportunities to create and integrate services developed by third parties. Open Innovation reinforces relationships, both internally between departments and externally with users. By the means of Web 2.0, ideas from inside as well as outside can equally be converted into new business opportunities (Bell and Loane, 2010). Managers of financial institutions could therefore, for instance, more often employ open innovation platforms and tools to engage employees and managers alike in innovation contests.

In order to efficiently use open innovation strategies, managers have to invest in resources and tools to conduct research, to develop business models, and to understand their interactions with customers, employees, suppliers, partners, communities, universities, and competitors. The insights gained from these actions will allow the firms to distinguish themselves from competitors by introducing superior products and services to the market (Akamavi, 2005; Chesbrough, 2003, 2011; Fasnacht, 2009; Martovoy et al., 2012; Mention and Martovoy, 2013; Rehder and Levi, 2011; Vermeulen and Dankbaar, 2002). Building on these findings it would be recommendable to decision makers not only to heavily use open innovation platforms and tools, but also to collect the corresponding meta-data that provides a deeper insight on who used when these tools for which purpose and with which outcomes.

Another noteworthy finding is that executive management needs to promote a culture of innovation and intrapreneurship, and to structure internal processes to accommodate, promote and reward risk-taking, networking and collaboration among employees (Athanassopoulou and Johne, 2002; Bátiz-Lazo and Woldesenbet, 2006; Gerstlberger et al., 2010; Tao Huang, Wen-Cheng Wang, et al., 2010). In a similar vein De Smet, Mention and Torkkeli (2013) suggested a linkage between the attention paid to intrapreneurial behavior and the absorptive capacity of a financial institution. More specifically they found out that the more intrapreneurial an organization is the higher is its acquisition capability in the context of open innovation. Consequently we suggest that senior management should foster intrapreneurship by promoting new business ventures as well as by encouraging innovation, self-renewal and proactiveness (Antoncic and Hisrich, 2001).

Openness helps companies to generate new ideas not only from internal sources by enabling the employees to participate in the innovation process but also from external sources by inviting outside parties to help resolve concrete innovation challenges (Chesbrough, 2003, 2011; Fasnacht, 2009; Jayawardhena and Foley, 2000). Both processes represent important approaches and can result in successful initiatives (Rehder and Levi, 2011). The collaboration between an innovation unit at a financial services firm and outside knowledge sources guided by an innovation strategist will most likely advance new ideas and shorten time to market (Martovoy and Dos Santos, 2012; Rehder and Levi, 2011).

Very broadly speaking, Akamavi (2005) suggests that managers and executives should acknowledge the more fundamental shift from being a pure-bread service provider catering to clients to becoming a co-creator that actively co-produces services and products with its clients. They should become aware of the potential advantages they may gain by integrating a larger group of stakeholders in the NSD process. In this context Oliveira and von Hippel (2011) specifically suggest that to be on the constant look-out for self-service innovations created by lead users.

6. Conclusions and contributions

The current study is the first identifiable literature review on open innovation in the financial services industry. It has outlined the current research on open service and product innovation in the financial services sector. Moreover, it has pointed out the different knowledge sources and the modes of knowledge flow for the development of innovative services and products in this sector. Numerous academics and practitioners consider effective, fast and productive innovation strategies as key to survival for banks and insurance companies as the industry evolves (Akamavi, 2005; Bell and Loane, 2010; Chesbrough, 2011; Fasnacht, 2009; KPMG, 2007; Oliveira and von Hippel, 2011).

The literature pertaining to innovative service and product development in the financial industry shows a number of gaps and deficiencies. One of the most obvious ones is the lack of attention received from academics and practitioners regarding the role of open innovation.

The starting point of our investigation was the question of why open innovation is so scarcely applied in the financial services sector. Some articles of our sample were able to shed some light on this problem and identified organizational structure, cultural inertia and costs related to the cooperation (money, time, etc.) as the most prominent ones (Bátiz-Lazo and Woldesenbet, 2006; Chaston, 2011; Martovoy et al., 2012). The lack of consistency among managers' instructions and their failure to implement and support innovations (Bátiz-Lazo and Woldesenbet, 2006; Martovoy et al., 2012) were given as additional reasons.

The findings of this literature review show that by far not all financial companies invite customers to participate in their innovation process. One reason for the lack of client involvement, brought forward especially by small financial institutions, is that the integration of clients in the innovation process is seen as a complex and time consuming undertaking. The second reason, provided mainly by larger firms, is that branches of international financial institutions prefer to use the knowledge and experience possessed by other affiliates belonging to the identical corporate group (Martovoy and Dos Santos, 2012; Martovoy et al., 2012). By doing so, these firms only adapt services to local needs which were otherwise developed in a different context and without the involvement of clients.

Legal and compliance constraints are also considered important barriers, but these have not been obstacles to innovation in other heavily regulated sectors and should thus not deter any bank or insurance company from implementing a more effective innovation strategy (KPMG, 2007).

The second question we attempted to answer by our literature review was the one asking whether financial services firms should use open innovation more widely. Building on the articles in our literature sample we can conclude that banks and insurance companies should indeed adopt open innovation more widely. The positive effects will be seen in various areas, such as speed and flexibility of operations and a broadening of distribution channels (Vermeulen and Dankbaar, 2002). Moreover, companies using open innovation strategies will benefit from enhanced NPD / NSD capabilities by leveraging large quantities of ideas from a variety of internal and external sources (Chaston, 2011; Huang, Wang Yun, Tseng and Lee, 2010).

There is a large discrepancy between the academic knowledge available on the topic of open innovation in banking, wealth management, and insurance and the influence that this new paradigm may have on this industry sector. In the medium run, only those financial institutions keen to quickly adapt to new market requirements and to develop profitable new services, products and efficient sales channels will succeed (KPMG, 2007). Open innovation may be one of the few chances they may have left.

7. Limitations and future research directions

No research is free of limitations and the effort to understand how the financial services sector adopts open innovation clearly has its boundaries. This paper has several limitations of which the comparably small number of articles considered is the most severe one. The rather small number of sources resulted from a rigorous selection process which ensured high relevance and comparability of the selected works for the research topic. Yet, the selection principles applied to this research may have also led to the exclusion of additional articles, which may have been useful. The results presented may thus only partially characterize the relatively unexplored field of innovation in the financial sector.

Potentially strong relationships between open innovation on the one side and business performance on the other that were identified throughout this research can only be seen as preliminary, as they are based on a relative small number of sources. In order to overcome this shortcoming, a larger longitudinal study in the financial service sector would be required in order to explore the potential business impact of open innovation on the entities of this sector.

According to the results of our study, only very few banks and insurance companies are involved in open innovation at present (Athanassopoulou and Johne, 2002; Bátiz-Lazo and Woldesenbet, 2006; Chaston, 2011; KPMG, 2007). Further research would therefore be needed to identify hard facts on why open innovation is so little applied in the banking and insurance sector. Whilst we answered the question of why open innovation is so scarcely applied in the financial services sector based on the extant of literature, more empirical work ought to be carried out with regard to this question.

Qualitative studies may yield additional valuable insight on why open innovation is still been neglected in the financial services. In a similar way additional empirical information would be desirable on the question of why some companies prefer to use a closed innovation approach and ignore the added benefits of collaborating with third parties (Chesbrough, 2003, 2011; Martovoy and Dos Santos, 2012; Martovoy et al., 2012).

Exploring the effects on openness on individual, as well as organizational and meso level holds promise for further fruitful and rewarding research. As individual openness may influence organizational openness it still remains unclear what happens on a departmental or divisional level, especially when it comes to financial institutions which are often compartmented in silos. On an organizational level it could be worthwhile investigating empirically how openness beyond clients plays out for financial institutions. This also resonates with the research call of (Mention and Torkkeli, 2012) who suggest more research to be carried out with regards to stakeholders other than clients, such as service providers, trade organizations, regulators etc.

Future research could furthermore aim at investigating which types of incentives (e.g., intrinsic or extrinsic) are most suitable to motivate corporate and retail customers to contribute to co-creation in financial services.

8. References

Akamavi, R. K. (2005). A research agenda for investigation of product innovation in the financial services sector. *Journal of Services Marketing, 19*(6), 359-378.

Al-Sharieh, S., & Mention, A.-L. (2013). *Open innovation and intellectual property: the relationship and its challenges*. Charlotte: Information Age Publishing.

Antoncic, B., & Hisrich, R. D. (2001). Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing, 16*(5), 495-527.

Asheim, B., Coenen, L., Moodysson, J., & Vang, J. (2007). Constructing knowledge-based regional advantage: implications for regional innovation policy. *International Journal of Entrepreneurship and Innovation Management, 7*(2), 140-155.

Athanassopoulou, P., & Johne, A. (2002). Effective communication with lead customers in developing new banking products. *International Journal of Bank Marketing, 22*(2), 100-125.

Bátiz-Lazo, B., & Woldesenbet, K. (2006). The Dynamics of Product and Process Innovation in UK Banking International. *International Journal of Financial Services Management, 1*(4), 400-421.

Beine, M. A. R., Cosma, A., & Vermeulen, R. (2010). The dark side of global integration: Increasing tail dependence. *Journal of Banking & Finance, 34*(1), 184-192.

Bell, J., & Loane, S. (2010). 'New-wave' global firms: Web 2.0 and SME internationalisation. *Journal of Marketing Management, 26*(3-4), 213-229.

Bose, R., & Sugumaran, V. (2003). Application of knowledge management technology in customer relationship management. *Knowledge and Process Management, 10*(1), 3-14.

Cetorelli, N., & Goldberg, L. S. (2012). Banking Globalization and Monetary Transmission. *The Journal of Finance, 67*(5), 1811-1843.

Chaston, I. (2010). *Entrepreneurial Management in Small Firms*. London: Sage.

Chaston, I. (2011). Independent financial advisors: open innovation and business performance. *The Service Industries Journal, 33*(6), 636-651.

Chen, H. L., & Hsu, C.-H. (2013). Entrepreneurial orientation and firm performance in non-profit service organizations: contingent effect of market orientation. *The Service Industries Journal, 33*(5), 445-466.

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business Press.

Chesbrough, H. W. (2011). *Open Services Innovation: Rethinking Your Business to Grow and Compete in a New Era*. San Francisco: Jossey-Bass.

Coelho, F., & Easingwood, C. (2008). An exploratory study into the drivers of channel change. *European Journal of Marketing, 42*(9-10), 1005–1013.

Cordys. (2013). *Driving Change and Innovation within the Insurance Industry*. Retrieved November 23rd, 2013, from http://www.opentext.com/what-we-do/industries/insurance?_ga=1.52777384.1052039783.1421840137.

Dahlander, L., & Gann, D. M. (2010). How open is innovation? *Research Policy, 39*(6), 699-709.

De Smet, D., Mention, A.-L., & Torkkeli, M. (2013). *Involving customers in the innovation process: The acquisition capability of knowledge intensive companies*. Paper presented at the The XXIV ISPIM Conference – Innovating in Global Markets: Challenges for Sustainable Growth, Helsiniki, Finland.

Ernst, D. (2002). Global production networks and the changing geography of innovation systems. Implications for developing countries. *Economics of Innovation and New Technology, 11*(6), 497-523.

Eurostat. (2012). *Science and Technology: Results of the Community Innovation Survey 2008 (CIS 2008)*. Retrieved October 10th, 2013, from http://www.epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database.

Fasnacht, D. (2009). *Open Innovation in the Financial Services: Growing Through Openness, Flexibility, and Customer Integration*. Berlin: Springer-Verlag.

Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management, 19*(2), 110-132.

George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology, 86*(3), 513-524.

Gerstlberger, W., Kreuzkamp, M., & da Mota Pedrosa, A. (2010). Innovation management in the German savings banks. *Innovative Marketing, 6*(3), 60-71.

Gertler, M. S., & Levitte, Y. M. (2005). Local Nodes in Global Networks: The Geography of Knowledge Flows in Biotechnology Innovation. *Industry and Innovation, 12*(4), 487-507.

Hienerth, C., von Hippel, E., & Berg Jensen, M. (2013). User community vs. producer innovation development efficiency: A first empirical study. *Research Policy, 43*(1), 190-201.

Huang, T., Wang, W.-C., Ken, Y., Tseng, C.-Y., & Lee, C.-L. (2010). Managing technology transfer in open innovation: The case study in Taiwan. *Modern Applied Science, 4*(1), 2-11.

Huang, T., Wang, W. C., Ken, Y., Tseng, C. Y., & Lee, C. L. (2010). Managing technology transfer in open innovation: the case study in Taiwan. *Modern*

Applied Science, 4(10), 2-11.

Huang, T., Wang Yun, W., Tseng, C., & Lee, C. (2010). Managing technology transfer in open innovation: The case study in Taiwan. *Modern Applied Science, 4*(1), 2–11.

Huizingh, E. K. R. E. (2011). Open innovation: State of the art and future perspectives. *Technovation, 31*(1), 2-9.

Hung, K.-P., & Chiang, Y.-H. (2010). Open innovation proclivity, entrepreneurial orientation, and perceived firm performance. *International Journal of Technology Management, 52*(3-4), 257-274.

Jayawardhena, C., & Foley, P. (2000). Changes in the banking sector - the case of Internet banking in the UK. *Internet Research: Electronic Networking Applications and Policy, 10*(1), 19-30.

Jung, W. S. (1986). Financial development and economic growth: International evidence. *Economic Development and Cultural Change, 34*(2), 333-346.

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right. *The Quarterly Journal of Economics, 108*(3), 717-737.

KPMG. (2007). *Banking on Innovation? The challenge for retail banks*. Retrieved Oct 10th, 2013, from http://files.welzijn-21e-eeuw.nl/BankingOnInnovation.pdf.

Laursen, K., & Salter, A. (2006). Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal, 27*, 131-150.

Lee, S., Park, G., Yoon, B., & Park, J. (2010). Open innovation in SMEs: An intermediated network model. *Research Policy, 39*(2), 290-300.

Lichtenthaler, U. (2008). Open innovation in practice: An analysis of strategic approaches to technology transactions. *IEEE Transactions on Engineering Management, 55*(1), 148–157.

Martovoy, A., De Smet, D., Mention, A.-L., & Torkkeli, M. (2013). *Role of clients in fostering innovation in services*. Paper presented at the The XXIV ISPIM Conference – Innovating in Global Markets: Challenges for Sustainable Growth, Helsiniki, Finland.

Martovoy, A., & Dos Santos, J. (2012). Co-creation and co-profiting in financial services. *International Journal of Entrepreneurship and Innovation Management, 16*(1-2), 114-135.

Martovoy, A., & Mention, A.-L. (2015). Patterns of new service development processes in banking. *International Journal of Bank Marketing, forthcoming*.

Martovoy, A., Mention, A.-L., & Torkkeli, M. (2012). *Role of the inbound open innovation in banking services*. Paper presented at the 2nd Innovation for Financial Services Summit, Luxembourg.

Mention, A.-L., & Martovoy, A. (2013). *Open and collaborative innovation in banking services: Evidence from Luxembourg*. Luxembourg-Kirchberg: Public Research Centre Henri Tudor.

Mention, A.-L., & Torkkeli, M. (2012). Drivers, processes and consequences of financial innovation: a research agenda. *International Journal of Entrepreneurship and Innovation Management, 16*(1), 5-29.

O'Reilly, T. (2004). *The Platform Revolution*. Paper presented at the Web 2.0 Conference, San Francisco, California.

OECD and Eurostat. (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data* (Third Edition ed.). Paris: OECD Publishing.

Oliveira, P., & von Hippel, E. (2011). Users as service innovators: The case of banking services. *Research Policy, 40*(6), 806-818.

PWC. (2014). *Breaking the rules: Achieving breakthrough innovation in financial services* In P. LLP (Ed.), *PwC FS Viewpoint*.

Rehder, P., & Levi, D. (2011). *Innovation Excellence: What Banks Can Learn from Top Innovators in Other Industries*. Dublin: Accenture.

Rialp, A., Rialp, J., & Knight, G. A. (2005). The phenomenon of early internationalizing firms: what do we know after a decade (1993–2003) of scientific inquiry? *International Business Review, 14*(2), 147-166.

Sawhney, M., Verona, G., & Prandelli, E. (2005). Collaborating to create: The Internet as a platform for customer engagement in product innovation. *Journal of Interactive Marketing, 19*(4), 4-17.

Van Ryssen, S., & Godar, S. H. (2000). Going international without going international: multinational virtual teams. *Journal of International Management, 6*(1), 49-60.

Vermeulen, P., & Dankbaar, B. (2002). The Organisation of Product Innovation in the Financial Sector. *The Service Industries Journal, 22*(3), 77-98.

Wagner, C. S., & Leydesdorff, L. (2005). Network structure, self-organization, and the growth of international collaboration in science. *Research Policy, 34*(10), 1608-1618.

Wong, K. Y., & Aspinall, E. (2004). Characterizing knowledge management in the small business environment. *Journal of Knowledge Management, 8*(3), 44-55.