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Learning from Accelerator Programs

A framework to analyse the success of FinTech Accelerator Programs for traditional banks

Master Thesis

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Summary

In this study the factors which determine the success of accelerator programs (APs) for banks are analysed. The financial market is a rapidly changing market with many new entrants. Banks risk losing market share, customer relationships and revenues to disruptive financial technology (FinTech) start-ups, because they are stuck in rigid business models. To avoid disruption, learn from and work with these innovative start-ups and become more innovative, banks are participating in APs. APs are programs where a selected group of start-ups can fine-tune their businesses and prepare for investment in about 100 days. APs are considered successful for a bank when (I) by participating in APs new knowledge can be produced by start-ups and (II) the bank is able to integrate this knowledge into their main business. This study provides new scientific insights into the effect of different factors on learning and integration of new knowledge from APs by banks.

To analyse and investigate the factors which determine the success of APs, a conceptual framework is developed based on several scientific theories. This framework includes factors that are important for knowledge development during APs and the implementation of this knowledge into the bank. This study focusses on traditional banks in the Netherlands that participate in FinTech APs. The different propositions contained in the conceptual model are evaluated by using qualitative interviews with employees of these banks, AP directors, start-up founders and an expert. Afterwards, a focus group is organised to explore certain aspects of knowledge integration in further details.

The results show what factors influence the success of APs. In the AP phase, two factors have influence on the successful knowledge production of start-ups, namely (I) that it is important to use both team and product criteria to select start-ups for an AP, and (II) banks should become actively involved as mentor during the AP. The analysis of the implementation phase indicates that the knowledge of start-ups is exclusively externally integrated by banks, because of the (I) large cognitive distance between the knowledge of the bank and the start-up, and (II) the high resistance against changing routines and the influence of regulations. The external organisation of knowledge integration leads to a decreased integration of knowledge into the main business of a bank in comparison with internally integration, thereby leading to less successfully learning from APs. The managerial implications of these results for banks are further elaborated in this study.

Keywords: accelerator programs, banks, start-ups, knowledge implementation, innovation, financial technology.

Table of Content

Used abbreviations

AP	Accelerator Program
B2B	Business-To-Business
B2C	Business-To-Consumer
EIR	Entrepreneur in Resistance
FinTech	Financial Technology
MVBP	Minimal Viable Business Product
MVP	Minimal Viable Product
SBC	Startupbootcamp

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1. Introduction

The financial payments market is changing rapidly the last years, which can be seen as a digital revolution (Accenture Research, 2014; Ensor, 2014; Skan, et al., 2014). New entrants – such as social media companies and IT providers - are rapidly gaining market share from traditional banks (hereafter called 'banks') by entering the payment market with new digital financial technologies (FinTech) (Ensor, 2014; Holland Fintech, 2014). With the development of new FinTech products, banks risk losing market share, customer relationships and revenues to rapidly growing entrants. Disruptive organisations threaten the profitability of the banks by bridging undiscovered gaps in the value chain (Accenture Research, 2014; Sullivan, Garvey, Alcocer, & Eldridge, 2014). This is because banks are stuck in rigid business models and routines, which make it more difficult to innovate or implement new knowledge and skills in their organisation (Koen, et al., 2011; Teece, 2010).

To adapt their business models, banks should (I) should keep close attention to the developments brought by new disruptive organisations, (II) should be open to changes and (III) need to devote more energy to other ways of innovation (Ensor, 2014). Recent studies have shown that an appropriate way to gain access to the ecosystem of the new entrants, to stimulate knowledge development and to obtain new skills is to collaborate with rapidly growing entrants (Accenture Research, 2014; Clarysse, Wright, Bruneel, & Mahajan, 2014). This often happens through participation in business incubators, where incumbent organisations help to further develop the ideas of innovative start-ups. Business incubators create a business environment for start-ups to help them with funding, knowledge development and network resources (van Huijgenvoort, 2014). This led to the term business accelerator, which is in this study referred to accelerator programs (APs) (Clarysse et al., 2014; Ensor, 2014; Spelier, 2014).

APs are 'fixed-term and cohort-based' programs, which means that start-ups enter and exit the programs in groups at the same time, 'including mentorship and educational components, that culminates in a public pitch event or demo-day' (Cohen & Hochberg, 2014, p. 4). The aim is to 'help entrepreneurs to bring their technologies, ideas, or products into the marketplace and ideally lead entrepreneurs to develop viable businesses' (Dempwolf, Auer, & Ippolito, 2014, p. 7). APs originated from the United States, but have grown substantially in Europe during the past few years (Miller and Bound, 2012; Cohen and Hochberg, 2014). This is primarily due to the success of the popular Y Combinator AP, the first AP that started in the United States in 2005 (Cohen & Hochberg, 2014; Dempwolf et al., 2014). In this AP successful companies like Dropbox and AirBnB graduated (Miller & Bound, 2011).

Learning from start-ups which participate in APs provides a different way of innovation compared to internal development within traditional organisations (Teece, 2010). In APs, the start-ups develop new knowledge about their ideas or products, in which they are helped by other organisations (Dempwolf, Auer, & Ippolito, 2014). Gaining access to new knowledge developed by start-ups in APs is relatively easy, but it is a challenge for traditional organisations to (I) implement the knowledge in their own organisation, (II) convert this knowledge into capabilities, and (III) to adapt their (outdated) business models (Lavie, et al., 2010).

The implementation of new, externally acquired knowledge is difficult for traditional organisations for two reasons. First, the acquired knowledge is mostly on a large cognitive distance from the knowledge of the bank, which can lead to misunderstanding. Second, changes in routines can evoke internal resistance from the employees and the management (Eisenhardt & Martin, 2000). This large cognitive distance and internal resistance must be resolved in order to become an ambidextrous organisation, in which new and existing techniques can be better combined with each other (Tushman & O'Reilly, 1996). However, research is needed to find out whether and under what conditions banks can learn from start-ups participating in APs and how to implement this knowledge in their own organisation, without invoking too much resistance in the organisation to convert to new routines and capabilities.

In addition, there is limited research that has investigated the factors that influence the success and effectiveness of APs (Barrehag et al., 2012; Cohen & Hochberg, 2014). Chan & Lau (2005) have developed an assessment framework containing factors which a technological incubator program must fulfil to have a chance of success. But there is a gap in the literature, as no framework has been developed and tested for APs specifically. Therefore, the aim of this study is to find out what factors determine the success of APs for banks participating in these programs. In this study, APs are considered successful for a bank when (I) new knowledge can be produced by start-ups in APs in which banks participate, and (II) the bank is able to integrate this new knowledge in their core business. By identifying these success factors, banks can learn more effectively from APs. This leads to the research question of this study: *What factors determine the success of accelerator programs for traditional banks?*

For successful learning from start-ups that participate in APs, banks should pass two phases successfully; the AP phase where new knowledge is produced and the implementation phase, in which that knowledge is integrated. The different steps that should be taken are divided over those two phases, which together contain the whole process.

AP phase:
In order to successfully learn from start-ups which participate in an AP, the selection of start-ups for an AP is one of the most important factors in the success of an AP (Hoffman & Radojevich-Kelley, 2012; Nesta, 2014). This selection is based on certain selection criteria in a specific selection process (Nesta, 2014). Besides the selection of the start-ups in an AP, the help provided to the start-ups during an AP is important, because the right support is needed to further develop the ideas of start-ups (Nesta, 2014). Help can be provided by different roles which differ in the degree of involvement (Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012). So, by selecting the start-ups with the highest potential and giving the right support, start-ups are provided with the opportunity to develop new knowledge. Two sub-questions are formulated to determine the influence of these two factors on the production of new knowledge by start-ups in APs.

1. *What kind of selection criteria are used for selecting start-ups before participating in the APs?*
2. *What role(s) should a bank perform during an AP to contribute the most to the production of new knowledge of start-ups?*

Implementation phase:
If the newly produced knowledge by start-ups is valuable for the bank, it can be integrated in the bank after an AP. For the integration of this new knowledge in the bank there are two critical factors of interest: (I) the cognitive distance between the start-ups and the bank and (II) the acceptance of new knowledge within the bank (internal resistance). The technological cognitive distance and the resistance are important factors which determine whether the knowledge will be integrated in the bank and in what way. Two sub-questions are formulated to determine the influence of these two factors on the production of new knowledge by start-ups in APs.

3. *What influence does the cognitive distance between the start-up and the bank have on the integration of knowledge in the bank?*
4. *What influence does internal resistance have on the integration of knowledge in the bank?*

To give a preliminary answer to the research question and sub-questions, a conceptual model is developed based on scientific literature. This framework includes the different factors which are important for knowledge development during the APs and the integration of this new knowledge into the bank afterwards. This model is tested by means of qualitative case studies of the largest Dutch banks. This research focuses on the FinTech industry, because new entrants with disruptive financial technologies pose the biggest threat to banks (Accenture Research, 2014). FinTech accelerators are relatively new since they exist about 3 years, but are a convenient way for banks to gain specific knowledge about FinTech (Laroche-Gray & Conway, 2014).

This study provides new scientific insights into learning and integration of new knowledge from start-ups participating in APs by traditional banks, eventually leading to an adaptation of their internal business models. This is another way of organising exploration next to exploitation within an organisation in order to become an ambidextrous organisation as described by Tushman et al. (2010). They focus on exploration based on internal knowledge development, which is implemented in current business models. This study, on the other hand, focuses on exploration based on external knowledge development which is integrated into current business models. The practical relevance of this research is that banks gain insights into how they can make use of APs to develop and integrate new knowledge.

This research is organised as follows. Section 2 presents the theoretical framework of this research. Section 3 presents the research methodology. Section 4 gives an overview of the results. Finally, the paper finishes with a conclusion and a discussion.

2. Theoretical framework

The theoretical framework starts with some background information about APs and is followed by three sections in which a framework is build based on the sub-questions stated before. Section 2.1 is about the production of new knowledge, the AP phase. Section 2.2 is about the integration of new knowledge, the implementation phase. Section 2.3 presents the conceptual model.

Comparison with other business incubators

This part gives an extended explanation of the main characteristics of APs based on existing literature (Cohen & Bingham, 2013; Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012; Miller & Bound, 2011). An AP expires in a fixed-term period of three to four months. In this period a group of approximately 10 start-ups develop their businesses, products or ideas further. The programs are mentorship-based and have different kinds of mentors, which intensely accompany the start-ups. During the AP, the start-ups receive education and technical assistance by a wide variety of seminars. The AP finishes with a demo-day. During this day, start-ups pitch their business to potential investors to receive further investments. The start-ups do not pay a participation fee, but give up between 5-8% of their shares to the program. In return the start-ups receive seed funding, the seminars, a temporary working space, network events and other resources. APs are funded by investments from different companies. In exchange for their investment these companies are allowed to play roles in the program. Section 2.1.2. describes these roles. The described characteristics are summarised in table 1.

Table 1: Characteristics of APs (Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012; Miller & Bound, 2011)

Characteristic	Value in AP
Duration	3-4 months
Cohort based	Yes, approximately 10 start-ups
Equity	Yes, around 5-8%
Participation fee	No
Start-ups phase	Minimal beta-product
Education and technical assistance	Different seminars
Working space	Yes
Final	Demo-day
Business model	Mainly investment

Banks prefer to participate in APs, because they can obtain new knowledge on emerging technologies and combinations in the FinTech industry by cooperating with a group of start-ups in a relatively short period of time (Clarysse et al., 2014; Ensor, 2014; Spelier, 2014; Cohen, 2013).

2.1. AP phase

In the AP phase, two factors are important for the successful development of new knowledge by start-ups in APs. These two factors are, according to literature, the selection of the start-ups in an AP and the guidance that start-ups receive from banks and other organisations during an AP (Miller & Bound, 2011, Nesta, 2014). The first step is that the AP organisation together with their stakeholders select the most suitable and motivated start-ups in the AP. By not making the right selection of start-ups, the chance that start-ups successfully complete the program, produce new knowledge and receive follow-up funding is reduced (Nesta, 2014). The amount of new knowledge that start-ups develop also depends on the guidance that the start-ups receive during an AP.

By correctly guiding the start-ups, start-ups can develop their idea or product better and faster than they can do it independently (Idealog, 2014). This is partly because the helping organisation often knows better what kind of knowledge is needed in their industry. On the other hand, it is interesting for an organisation (i.e. a bank) to actively participate in AP, because it enables them to implement the new knowledge in their main business afterwards.

The AP phase section starts with an explanation of the production of new knowledge, followed by another two parts. Section 2.1.2. describes the selection criteria that are used to select start-ups in APs. Section 2.1.3. gives a description of the different roles which can be performed by banks (and other mentor-organisations) during an AP.

2.1.1. Production of new knowledge

The development of new knowledge by the start-ups in an AP can be considered successful if the start-ups are able to attract venture capitalists (or angel investors) to finance their business development after an AP (Cohen & Hochberg, 2014). Venture capitalists (and angel investors) are investors who scout and filter talented start-ups, provide seed capital and give advice to start-ups (Cohen & Hochberg, 2014; Miller & Bound, 2011). Start-ups mostly attract investors by giving an excellent sales pitch during the demo-day at the end of the program (Cohen & Hochberg, 2014). If start-ups are not able to turn their newly acquired knowledge during an AP into a commercial success – and thus find no investor – start-ups are also not able to collaborate with banks. This is because banks are one type of organisations that can fund a start-up after an AP. The extent to which successful start-ups produce knowledge relevant for banks influences the integration of that knowledge in the bank too.

2.1.2. Criteria to select start-ups in APs

When a bank has decided in which AP it will participate, the next step is to select together with the AP organisation team the group of start-ups for the program during the selection process. The criteria used to select start-ups for participation in the programs and the weight of each criterion differs slightly per AP (Bergek & Norrman, 2008; Hoffman & Radojevich-Kelley, 2012). Nevertheless, there are certain criteria that usually play a role according to the literature.

Table 2 and 3 summarise the main selection criteria which start-ups must meet to be eligible for participation in an AP, to grow and to get funding for their product[1] (Barrehag et al., 2012; Grimaldi & Grandi, 2005; Hartgers, 2014; Hoffman & Radojevich-Kelley, 2012; LearnLaunch, 2014; Malek, et al., 2014; Miller & Bound, 2011; Phillips, 2002; Startupbootcamp, 2015). The start-up selection criteria distinguish between what qualities the founders and employees (i.e. start-up team) should have (table 2) and what is expected of the product of the start-ups (table 3) (Bergek & Norrman, 2008). The literature indicates that start-up team criteria are more important for AP selection than business ideas, because the product may still 180 degrees change, but the team cannot change that much (Fishback, et al., 2007; Hoffman & Radojevich-Kelley, 2012).

[1] These general criteria are also applicable for selecting FinTech start-ups.

Table 2: Start-up team selection criteria of APs

Start-up team criteria	Description
Potential	The AP organisation wants to see potential for further investment in the start-up.
Cede shares	The start-up should be prepared to cede a part of shares to the incumbents in exchange for participation.
100% committed	The start-up must have full focus and complete availability for the AP, it cannot be combined with another activity (i.e. another job or study).
Team	Only start-ups which are with more than two people are selected in APs. The team should be well adapted to each other, so they know what they can expect from each other.
Coachable	The team should be coachable and willing to listen to other peoples' input/criticism.
Resilient	The team must be resilient and prepared to change the idea/product if it is necessary.
Experience/ acquired knowledge	Everyone in the team should have sufficient experience and knowledge to run a start-up and should know the business' needs.
Network/support	The team should interact and network with other teams to support each other.
Motivation/ Enthusiasm	The team should be motivated and committed entrepreneurs who are passionate about their start-up and should demonstrate enthusiasm.
Multidisciplinary	The team should exist about people with different skills.

Table 3: Product selection criteria of APs

Product criteria	Description
Development process phase	The start-up is in a later stage of the product development process and has already a working prototype (minimal viable product), which is ready for sold to clients.
Growth	The product should be able to grow, is scalable and create sustainable value in the future.
Uniqueness	The product should be unique and creative.
Impact	The product should have impact on society and industry.
Product fit	The product should match to the theme and objectives of the AP.

For a successful AP, it is important to select start-ups with the highest potential for participating in the AP, because then only start-ups are selected that can produce the most new knowledge (which can lead to further investments and collaborations after the AP). In the selection of the best (FinTech) start-ups the AP team (together with partners[2]) can make a distinction between team and product criteria and individual weights can be added. By adding individual weights on the team and product criteria, important criteria can receive more weight in the selection process. The selection process for start-ups will usually be done via an application review, an interview and/or a video pitch (Hoffman & Radojevich-Kelley, 2012). Which steps are used in the selection process, differs per AP.

Proposition 1

Selecting the right start-ups will result in the most novel knowledge, which subsequently results in production of new knowledge, further investments - and therefore success of APs. This choice can be made only when correctly weighted selection criteria - both team and product criteria - are used in the selection process to select start-ups. In this way the high potential start-ups emerge and are separated from the less talented start-ups. This leads to proposition 1, based on sub-question 1:

[2] Described in section 2.1.3.

P1: The extent to which both team and product related selection criteria are used in the selection process has a positive effect on the production of new knowledge by the start-ups participating in the APs.

2.1.3. Roles during APs

External organisations or supervisors (people who are initially not involved in the organisation of an AP) can guide the start-ups during an AP in different roles. If banks act as external supervisors, they can influence the direction in which knowledge of start-ups will developed. They can also learn more from the start-ups, because they understand the knowledge of start-ups better because they were present during its development.

In this section it is explained what roles these external supervisors can perform best during an AP in order to (I) have influence on the production of knowledge, (II) understand the production of knowledge and (III) gain access to the new knowledge of the participating start-ups afterwards. The different roles which an external supervisor can perform in an AP are that of a partner, mentor, entrepreneur in residence (EIR), providing education and technical assistance, sharing its network, providing resources or seed funding or as an investor afterwards (Barriball & While, 1994; Cohen & Hochberg, 2014; Dempwolf et al., 2014; Hoffman & Radojevich-Kelley, 2012; Miller & Bound, 2011; Spelier, 2014). These different roles are summarised in table 4.

Table 4: Different roles of an external supervisor within an AP

Role	Description
Partner	Partners are – together with the coordination team – responsible for the organisation of the AP. Most partners are/were entrepreneurs themselves or came from a large organisation. They provide seed funding, make their network available, providing EIRs and are mentor of one or more start-ups. Partners are usually looking for collaboration possibilities after an AP.
Mentorship/ coaching	Mentors accompany the start-ups throughout the AP. Often this is an intensive and long-term relationship, in which knowledge and personal experiences are shared. Besides progression, reflection, feedback and advice are central elements. Start-ups can be guided by multiple mentors, each with their own expertise. APs select mentors based on their experience, level of expertise, profitability, and desire to help new entrepreneurs succeed.
Entrepreneur in Resistance (EIR)	A former entrepreneur, which is much present during an AP in order to help the start-ups and observe them. EIR is an informal and usually temporary position.
Education and technical assistance	Guiding start-ups with additional workshops, seminars and specific questions. They are key experts with whom start-ups have often contact.
Investors	Invest in high potential start-ups during or after the demo-day.
Sharing network	Making available the network of the organisation, so that the start-ups can use it.
Seed funding	Helping start-ups through seed funding. The amount can vary per AP.
Resources	Providing additional resources, such as office spaces.
Coordination team	People who can answer daily questions, coordinate the program, handle organisational activities and are accountable to the partners. This is often organised by the AP themselves, and is therefore no role of an external supervisor.

The roles performed by external supervisors (such as banks) differ with their degree of involvement. The degree of involvement varies with the degree of knowledge exchange and the time and money invested[3]. An overview of the involvement of each role is displayed in table 5, which is based on Bluestein & Barrett (2010), Cohen & Hochberg (2014) and Miller & Bound (2011).

Table 5: Involvement, knowledge exchange, time and money investments for the different AP roles (where 1 means very low – 5 means very high, I=(K+T+M)/3)

Role	Involvement (I)	Knowledge exchange (K)	Time (T)	Money (M)
Partner	5 (5,0)	5	5	5
Mentorship/coaching	4 (3,7)	5	5	1
Entrepreneur in Resistance (EIR)	3 (3,3)	4	5	1
Education and technical assistance	3 (3,0)	5	3	1
Investors[4]	3 (3,0)	2	2	5
Coordination team[5]	3 (3,0)	3	4	2
Sharing network	3 (2,7)	3	3	2
Seed funding	2 (2,3)	1	1	5
Resources	2 (1,7)	1	1	3

High involvement roles: mentor & partner

The literature indicates that being a partner or mentor is the most involved role during an AP (Bluestein & Barrett, 2010; Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012). These two roles show the highest score on involvement in table 5. As a partner, you are highly involved in the whole process through the various roles you perform, via a high degree of knowledge exchange and large investments of time and money in start-ups (Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012). The bank has in its role as partner several advantages above the other roles. First, the partner has influence on the selection process. Second, they know what kinds of start-ups participate in the program. Third, they can have a high influence on the direction in which the knowledge of start-ups will develop. Last, they have the possibility to understand the knowledge of the start-ups better. These advantages will lead to more successful development of new knowledge by the start-ups in an AP for banks.

Mentorship is seen as the essential ingredient of an AP; it is the cornerstone and a primary reason for start-ups to participate in an AP (Cohen & Hochberg, 2014; Hoffman & Radojevich-Kelley, 2012). Research shows that through high quality mentorship the success rate of start-ups becomes higher (Katz & Green, 2009). As a mentor, you have a high involvement role in an AP, deliver a high degree of knowledge exchange and invest a lot of time (see table 5). This results in a close experience of the growth of start-ups. The other roles are less intensive so that their involvement in an AP is lower.

Proposition 2:

A high involvement role (partner of mentor) of a bank in an AP makes its influence on the knowledge development of the start-ups larger and makes it possible to derive relevant knowledge. This enables

[3] The degree of knowledge exchange and time (and money) to be invested are partly interdependent on each other, because - for example - exchanging a large amount of knowledge also takes a lot of time.
[4] Investors have only influence after the demo-day of an AP.
[5] The coordination team is mostly an external party.

a bank to influence the selection process and have frequently contact during an AP. This increases the likelihood that banks understand the knowledge developed by the start-ups. As a result, the final product of the start-up is more useful for implementation in their own organisation and the chance of forming alliances afterwards becomes higher (Gulati, 1998). More general, the start-ups will have a larger chance to receive further investment afterwards. Thus, the more intensively banks participate in an AP, the more influence the bank has on the start-ups' production of relevant new knowledge. This leads to proposition 2, based on sub-question 2:

P2: A high involvement role of a bank in an AP will contribute to the production of new knowledge by the start-ups in an AP relevant for that bank.

2.2. Implementation phase

This section describes how the newly produced knowledge can be effectively implemented into the bank. Therefore, the way of integrating this knowledge is important, which can be organised internally or externally. How the knowledge integration is organised depends on two factors; (I) the distance between the new knowledge of the start-up and the existing knowledge of the bank (the cognitive distance) and (II) the internal resistance within the bank against change. The implementation phase section starts with an explanation of the integration of new knowledge (section 2.2.1.). Section 2.2.2. describes the cognitive distance and section 2.2.3. the internal resistance.

2.2.1. Integration of new knowledge

The degree of integration can be seen in practice as whether the knowledge integration is organised internally or externally. The strategy of the bank determines whether the new knowledge obtained from an AP will be internally or externally integrated in collaboration with a start-up (Nooteboom et al., 2007). Whether new knowledge is further developed internally or externally depends on its technological distance (cognitive distance) from the existing knowledge of the bank and the internal resistance within the bank against this new knowledge.

Closely related technological knowledge should be developed internally (by using acquisition), because then it can be implemented easier in the bank (Nooteboom et al., 2007; Tidd & Bessant, 2009). Remotely related technological knowledge is harder to integrate in the main business, which makes it wise to develop this knowledge externally in a subsidiary or separate business unit (Tidd & Bessant, 2009). This separate unit or subsidiary is responsible for the development of the new knowledge into a new business. A subsidiary contributes through profit sharing to the revenues of the bank, and when the knowledge is further developed, it can be sold or integrated into the main business (Birkinshaw, 1997).

The start-ups which participate in an AP usually have developed remotely related technological knowledge, as they are otherwise are not distinguishable from their competitors. Banks would like to integrate this knowledge internally, because in this way banks can learn the most and it has the most effect on the main business (Tushman et al., 2010). However, banks fail to do this because of a large cognitive distance and high internal resistance against this knowledge. Therefore, banks often create external collaborations with start-ups to implement this remotely related knowledge (Crockett, et al.,

2013; Gilbert & Bower, 2002; Tushman & O'Reilly, 1996). External integration of knowledge leads according Tushman et al. (2010) to less efficient learning than an internal collaboration. In addition, there is a lower chance that the knowledge can be successfully integrated in the main business of the bank, because of high integration costs and technological and business inexperience (Mcdermott & Connor, 2002; Tushman et al., 2010). Therefore, internal implementation of new knowledge has a more positive effect of the integration of new knowledge in the main business of the bank than external implementation.

2.2.2. Cognitive distance

After an AP, collaborations can be concluded with formerly participating start-ups by forming technology-based alliances to integrate the newly obtained knowledge (Tidd & Bessant, 2009). Banks collaborate with other organisations for strategic and tactical motives. Strategic motives result in strengthened network positions and enhanced learning. Tactical motives lead to risk reduction, cost reduction, learning and speeding up product development (Tidd & Bessant, 2009). Especially learning from start-ups is important for banks, because they want to integrate the new knowledge within the bank.

To integrate new knowledge which contributes to the already available knowledge of the bank, it is important that only collaborations are established between organisations with an optimal cognitive distance[6] (Bryman, 2005; Nooteboom, et al., 2007). To achieve an optimal cognitive distance between a bank and a start-up, it is important to bridge the knowledge gap and to avoid misunderstanding (Nooteboom et al., 2007).

How much organisations can learn from each other depends on their absorptive capacity and the novelty value of the knowledge exchanged (Nooteboom et al., 2007). The absorptive capacity is defined as 'a firm's ability to recognise the value of new information, assimilate it, and apply it to commercial ends' and declines when the cognitive distance increases (Cohen & Levinthal, 1990, p. 128). The novelty value of the knowledge exchanged increases with the cognitive distance. So, the cognitive distance is about the novelty and type of knowledge that new knowledge provides. The relation between learning, absorptive capacity and novelty value of the knowledge exchanged is represented in figure 1 (Nooteboom et al., 2007).

[6] Next to cognitive distance, Boschma (2005) distinguishes other forms of proximity, which are sufficiently present in this context.

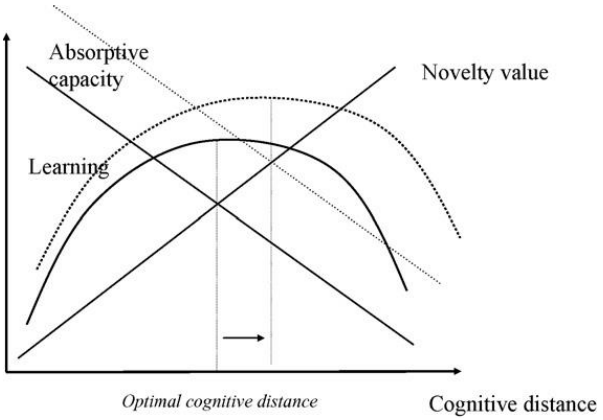

Figure 1: Optimal cognitive distance (Nooteboom et al, 2007)

To determine the novelty of the knowledge, the novelty of both market and technology are important (Tidd & Bessant, 2009). Banks that are looking for disruptive FinTech innovations are looking for new technological products for an existing financial market (also called disruptive substitute technologies). Tidd & Bessant (2009) called these products technological innovations. By technological innovations organisations are looking for new solutions to existing problems (Tidd & Bessant, 2009). In this study, a technological innovation is based on technological knowledge.

Proposition 3:
An optimal cognitive distance has positive effects on the integration of the newly produced knowledge, which contributes to the already available knowledge of the bank. The goal for a bank is to learn something new from a start-up, but the knowledge of the start-up should not be so far away from the banks' core business that they cannot understand it (Nooteboom et al., 2007). The more optimal the cognitive distance, the more it stimulates obtaining new knowledge. If the cognitive distance is larger than optimal, it becomes technically more difficult to combine the newly produced knowledge with the already available knowledge of the bank. Accordingly, the bank will be inclined to implement the newly produced knowledge externally from its main business. This leads to proposition 3, based on sub-question 3:

P3: A large (small) cognitive distance between the newly produced knowledge and the already available knowledge of the bank results in an external (internal) integration of knowledge in the bank.

2.2.3. Resistance
Implementation of new technological knowledge into a bank leads to converting the knowledge into new capabilities and business models (Lavie et al., 2010). This can evoke internal resistance from the employees and the management of the bank, because it is often accompanied with changes of routines and sometimes reorganisations (cultural resistance) (Tushman & O'Reilly, 1996). The hard to change routines are reinforced by the strict legislation banks should to comply with. For this reason, a change is also less easy to establish, which leads to a higher formal resistance. Therefore, both cultural and formal resistance negatively affect the integration new knowledge within the bank (Tushman & O'Reilly, 1996).

Propositions 4 & 5

The degree of resistance also depends on the cognitive distance of the bank. When the cognitive distance is too large, it is wise to develop the knowledge in an external organisation. This will avoid misunderstanding of the main business and reduce resistance (Nooteboom et al., 2007). Especially with remote technological knowledge, when the resistance against and risk of implementing an innovation in the organisation are both high, it is wise to develop the product externally, further away from the main business (Mcdermott & Connor, 2002). When the cognitive distance is small, the knowledge is relatively close to the already available knowledge of the bank (Nooteboom et al., 2007). In this case, the resistance will be low, because the knowledge will not lead to radical changes in the routines of an organisation. If the resistance is low, it is wise to implement the new knowledge internally, because within an internal organisation knowledge can be more successfully integrated in the main business of the bank (Tushman et al., 2010). This leads to proposition 4 and 5, based on sub-question 4:

P4: A large (small) cognitive distance will lead to a high (low) internal resistance.
P5: A high (low) internal resistance will lead to an external (internal) integration of knowledge in the bank.

2.3. Conceptual model

The postulated propositions lead to the conceptual model shown in figure 2. This figure shows the two phases; the AP phase and the implementation phase. The dependent variables of both phases together indicate the success of participation in APs for banks.

In the AP phase it is important to make use of the right selection criteria to select the start-ups with the highest potential to produce relevant new knowledge. Therefore, a positive relationship between the extent to which selection criteria are applied and the production of new knowledge is expected (P1+). The different roles in an AP can also influence the production of new knowledge of start-ups. If a bank takes a high involvement role in an AP, this will contribute positively to the production of new knowledge (P2+).

In the implementation phase two factors contribute to the integration of new knowledge within the bank. This integration can be internal or external. Compared to an internal organisation of new knowledge, an external organisation leads to less integration of the new knowledge in the main business of the bank. Newly produced knowledge that is far away from the existing knowledge (large cognitive distance) of the bank leads to an external organisation of knowledge, because of the technological difficulties of integration encountered (P3-). A large cognitive distance also leads to a high internal resistance (P4+). This high internal resistance also causes an external organisation of integrating new knowledge (P5-).

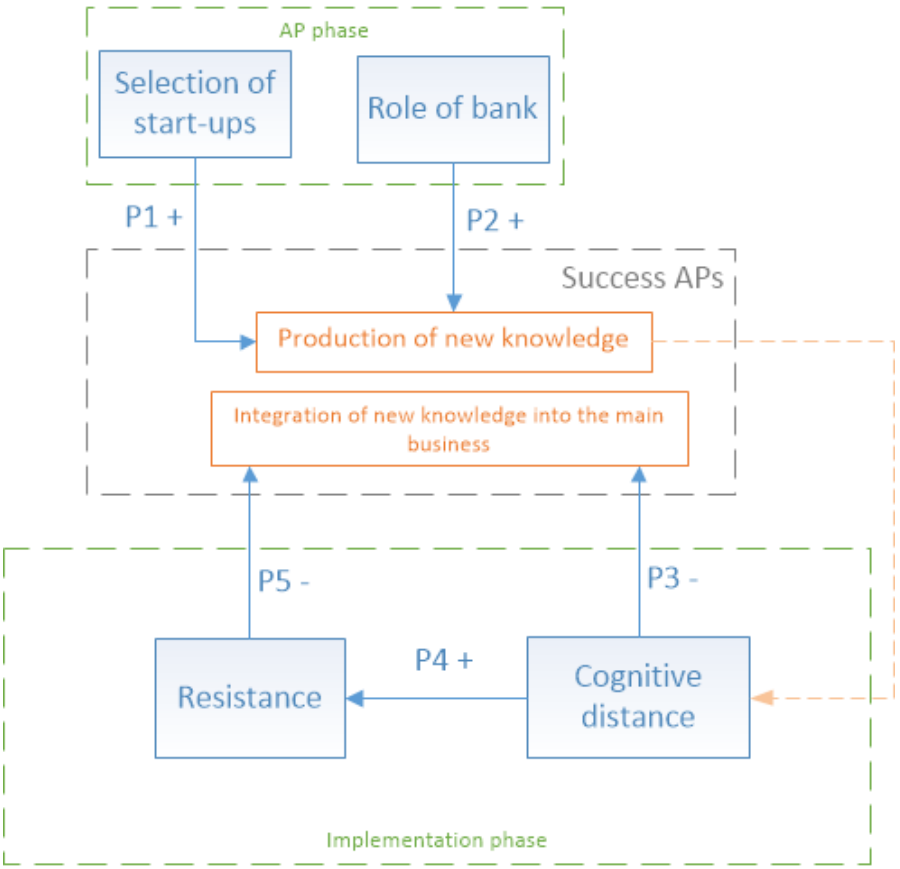

Figure 2: Conceptual model

3. Methodology

This section describes the research method which is used to gather and analyse the data that are necessary to answer the research question and sub-questions. The research design is explained and followed by the case selection, data collection, operationalization and data analysis. This section concludes with the reliability and validity of this study.

3.1. Research design

To gain insight into the factors influencing the success of APs for banks, a qualitative multiple case study is conducted. A case study is according to Yin (2009) a suitable method when a contemporary phenomenon in a real-life context is examined, which in this study is the case. A multiple case study is an ideal method to identify the influence factors of different APs in the FinTech industry, because it supports a deeper and more detailed investigation of these factors (Rowley, 2002). Different cases are compared with each other to strengthen the results and conclusions with a deeper analysis than if the results would be based on only one case (Yin, 2009).

This study is exploratory in nature, because of the relative new field of FinTech APs. The lack of data induces the need to explore in-depth insights of which factors influence the success of APs for banks. This leads to a better understanding of the situation, which is according to Sreejesh, Mohapatra, & Anusree (2013) in line with an exploratory research design. A qualitative research is a regularly used method for an exploratory study (Bryman, 2012). Accordingly, this is also the most appropriate method for this research, because qualitative research gives the possibility to analyse results in-depth and compare several cases with each other. It may also give new insights and a better understanding of the factors which determine the success of APs.

3.2. Case selection

This study focuses on the production of new knowledge by start-ups and on the integration of this knowledge into the bank. Three types of involved actors - banks, APs and start-ups - are analysed. For each of the types, a number of actors are observed: the four largest banks of the Netherlands, four selected APs and three start-ups that have participated in one of the selected APs.

Banks

This study focuses on traditional banks in the Netherlands, because the financial sector is one of the largest industries in Europe (Banken, 2012). The largest traditional banks in the Netherlands are ING, Rabobank, ABN AMRO and SNS bank, which are included in this research (Banken, 2012, 2014). These large banks are all threatened by emerging FinTech companies and participate in various APs (except SNS) to acquire new knowledge and experiences (Accenture Research, 2014; Clarysse et al., 2014; Ensor, 2014; Spelier, 2014). The respondents of the banks are selected, because of their involvement in one or more APs.

APs

ABN AMRO, ING and Rabobank participate in different APs. Only FinTech related APs are included in this research, which are programs of Startupbootcamp (SBC) (FinTech, NFC & Contactless and E&M Commerce) and Rockstart (Web & Mobile). Those selected APs are compared with each other as

described in the general results section (section 4.1.4.). Table 6 gives an overview of the relevant APs in which the banks participate.

Table 6: Overview banks participating in APs

Bank/AP	SBC FinTech (London)	SBC NFC & Contactless (Amsterdam)	SBC E&M Commerce (Amsterdam)	Rockstart Web & Mobile (Amsterdam)
ABN AMRO	X	X	X	X
ING			X	
Rabobank	X	X	X	X

Start-ups

Also three start-ups - which have participated in the APs - are involved in this study in order to analyse their experiences with the APs and collaborations with banks, to create a complete overview of the process. The interviewed start-ups remain anonymous for privacy reasons. They have participated in SBC NFC & Contactless and Rockstart Web & Mobile. An overview is shown in table 7.

Table 7: Start-up participation in different APs (source: interviews and websites)

Start-up/AP	SBC FinTech	SBC NFC & Contactless	SBC E&M Commerce	Rockstart Web & Mobile
S1		Oct 2013		
S2				March 2012
S3		Oct 2013		

3.3. Data collection

This research consists of three types of data collection; interviews with the different groups described above, an expert and a focus group. First, interviews are held with the respondents from banks involved in APs, AP directors and start-ups' founders to analyse the concepts of the theoretical framework and to clarify the AP process. Then a focus group is organised to clarify and strengthen the concepts in the implementation phase, because this was not perfectly obvious from the interviews. Finally – after analysing the data from the interviews - the overall picture is presented to an expert, to discuss if the model and the results are plausible.

The use of different sources of data collection allows for data-triangulation. Data-triangulation leads to the development of converging lines of inquiry, which strengthen the validity of the interpretations of research findings (Dubois & Gadde, 2002; Yin, 2009).

3.3.1. Interviews

The data is collected by conducting semi-structured interviews, because there is still too little data and knowledge about the subject available for doing surveys. Semi-structured interviews make it possible to react freely to the answers of the interviewee and create the possibility to ask extra questions, which leads to more complete answers (Bryman, 2012). It is a suitable technique to explore the underlying motives of banks to participate in APs and which factors will lead to a

successful participation of banks in these programs (Barriball & While, 1994). In this way the relations among the variables are assessed. A disadvantage of using a limited number of semi-structured interviews is - due to the specific nature of the information gathered from interviews - that the research findings cannot be generalised to a broader population. Furthermore, it is possible to receive subjective or social desirable answers from the interviewee. By asking more detailed related questions and asking for examples, these disadvantages are reduced (Bryman, 2012). Face-to-face interviews are held whenever possible, to explore the responses of the interviewees to gather more and deeper information about the influencing concepts (Sincero, 2012). If it was not possible, the interviews are taken via Skype, which was the case for three interviews.

Interviews are conducted with FinTech experts of the four selected banks, program directors/co-founders of the FinTech related AP programs, founders of start-ups and one industry expert which is unrelated to APs. These interviews are held in order to assess the conceptual model and to determine the success factors of APs. For each group (except for the expert interview) minimal three interviews are conducted in order to enable data triangulation (Yin, 2009). The expert interview was held to validate the results.

In total, fourteen interviews are held. Seven interviews are held with banks (1 with ABN AMRO, 1 with ING, 4 with the Rabobank (which are combined to one interview) and 1 with SNS bank), three with program directors/co-founders of different APs (2 within SBC programs and 1 within Rockstart), three with start-ups and one expert. The used interview questions can be found in Appendix 1.

3.3.2. Focus group

Additionally a focus group will be organised in order to expand on certain aspects of the study which may not become clear from the interviews. A focus group is '*an interview with several people on a specific topic or issue*' (Bryman, 2008, p. 473). It gives the possibility to explore a specific topic in depth (in this case implementation of knowledge into the bank) (Bryman, 2008). The focus group consists of five people with different backgrounds within the Rabobank, which have to deal with the implementation of knowledge, and one person from SBC. The session is organised with a small group in order to easy guide the discussion, to keep overview and to give everyone the opportunity to express his/her options within a two hours session. The used questions for the focus group can be found in Appendix 2.

3.4. Operationalization

3.4.1 Dependent variables

The operationalization (table 8) explains how the independent and dependent variables are measured. The dependent variables are the factors which influence the success of APs, namely the production and integration of new knowledge into the main business of banks.

The first success indicator (production of new knowledge) is measured by the degree in which the start-ups are able to attract investors to finance their business development after an AP. This is measured by the average funding rate of start-ups after an AP (the percentage of start-ups that receive funding after an AP). If the funding rate is higher than 50% (for example 7 out of 10 start-ups

receive further investments), one may speak of successful development of new knowledge by start-ups. If the funding rate is lower than 50% (for example 4 out of 10 start-ups receive further investments), one may speak of unsuccessful development of new knowledge by start-ups. The (un)successful production of new knowledge by start-ups is related to the selection criteria applied and the role performed by the bank.

The second success indicator (integration new knowledge) is measured by the organisational form in which banks are integrating new knowledge. Because internal integration of new knowledge has a positive influence on the main business, this will valued as (+). If banks organise their knowledge integration externally, this will have a less positive influence on the main business and will valued as (-) (see Tushman et al., 2010). The integration of new knowledge produced by start-ups is influenced by the cognitive distance between the new knowledge and the already available knowledge of the bank and the internal resistance within the bank against changes in current routines necessary for the integration of the new knowledge into the main business of the bank.

3.4.2. Independent variables

In the conceptual model four concepts have been defined that influence the transfer of new knowledge via APs to banks. These concepts are the independent variables in this research. The independent variables are operationalized to assess their relationships with the dependent variables. Every concept is measured on one or more indicators as explained in table 8. The various indicators in table 8 are valued on different scales.

Selection criteria

The selection criteria which are important to select start-ups are assessed. Team and product criteria have an influence on the successful selection of start-ups. The different criteria can have a positive (+) or negative (-) influence on the selection of start-ups. If an indicator is not used, it scores an M (missing). By giving a score on the individual indicators, it is analysed if the selection criteria vary positively or negatively with the production of new knowledge.

Roles bank

For each role that a bank can fulfil the level of involvement is investigated. The roles are rated from a very low (1) to a very high (5) involvement role. The involvement score depends on the degree of knowledge exchange, time investments and money investments. The roles which are not performed by banks (or not mentioned in the interviews) are rated with an X. A high involvement role should coincide with successful production of new knowledge by start-ups and a very low involvement role should coincide with unsuccessful production of new knowledge by start-ups.

Cognitive distance

Cognitive distance is measured by the degree of learning, which depends on the absorptive capacity of the bank and the novelty value of the new knowledge. If the former is low and latter is large, the cognitive distance is large, which results in a barrier to the integration of new knowledge
(-). If the former is high and latter is low, the cognitive distance is small, which results in an incentive of the integration of new knowledge (+).

Resistance

Internal resistance consists of two parts: formal and cultural resistance, which both have an influence of the integration of new knowledge into the bank. A high resistance results in a barrier to the internal integration of new knowledge (-) and a low resistance in an incentive for the internal integration new knowledge (+).

Table 8: Operationalization table

Variable		Theory	Concept	Indicator	Value
Dependent variables		Factors which determine the success of APs	Production of new knowledge	Further investments	%
			Integration of new knowledge	Organisation of knowledge (internal/external)	+/-
Independent variables	Production of new knowledge	Selection criteria	Team criteria	Potential	+/-/M
				Cede shares	+/-/M
				100% committed	+/-/M
				Team	+/-/M
				Coachable	+/-/M
				Resilient	+/-/M
				Experience/ acquired knowledge	+/-/M
				Network/support	+/-/M
				Motivation/enthusiasm	+/-/M
			Product criteria	Development process phase	+/-/M
				Growth	+/-/M
				Uniqueness	+/-/M
				Impact	+/-/M
				Product fit	+/-/M
		Role of bank	Involvement	Partner	1-5/X
				Mentor	1-5/X
				Entrepreneur in Resistance	1-5/X
				Sharing network	1-5/X
				Resources	1-5/X
				Seed funding	1-5/X
				Investor	1-5/X
	Integration of new knowledge	Cognitive distance	Learning	Absorptive capacity	+/-
				Novelty value	+/-
		Resistance	Formal resistance	Regulations	+/-
			Cultural resistance	Openness to change	+/-

3.5. Data preparation and analysis

The theories, concepts and indicators in the operationalization table are assessed in interviews. The conducted interviews are recorded and transcribed. Subsequently, the transcript is send to the interviewee to confirm that the transcript is complete and represents the interview. For privacy reasons, the data is made anonymous. A1 up to A3 refer to the AP directors/founders, B1 up to B4 refer to the bank employees E1 refers to the expert and S1 up to S3 refer to the start-up founders.

The different interviewed groups of this study (banks AP directors, start-ups) are analysed separately and then compared with each other, based on the obtained data. The differences and similarities (in the indicators) between groups are assessed by using a coding process that is described in the next paragraphs. To analyse the data, the interviews are coded by using the program NVIVO. By using NVIVO, eventually a systematic analysis of qualitative data can be made.

The coding process exists of different stages (Corbin & Strauss, 1990). The data analysis starts with open coding (Corbin & Strauss, 1990). Open coding is used to break down the data into categories and to express the data in the form of theoretical concepts (Flick, 2009; Corbin & Strauss, 1990). Using open coding can provide the researcher(s) with new insights into the researched aspects, because it breaks with standard ways of thinking.

From the first analysis, a list of codes based on the concepts is drawn up. These codes are then axial coded to get a deeper understanding of the data, by categorising the codes and if necessary create subcategories or combined categories (Flick, 2009). In this way, relationships can be explored (Corbin & Strauss, 1990). The categories are analysed once again and categories irrelevant for this study are removed.

The next step is selective coding, in which the theoretical concepts are used as core categories. The coded categories are systematically related to these core categories and the categories that need further refinement are filled in (Corbin & Strauss, 1990). In this way, the availability and influence on a concept is assessed. Based on the analysis of these data, it can be determined whether the dependent and the independent variable co-vary positively or negatively. In this way, empirical support for the propositions can be assessed.

The process of collecting and analysing the data has been iterative in order to understand the knowledge development by start-ups in APs and the implementation thereof in banks. After the data analysis, the results and the framework are presented to an expert and the focus group, to check if the information is plausible and to receive additional information. After this check, conclusions are drawn (I) whether APs are successful in providing new knowledge that can be integrated and (II) which factors affect the integration of this knowledge within banks.

3.6. Validity and reliability

In order to establish and assess the quality of this study, both the (internal/external) validity and the (internal/external) reliability should be evaluated (Bryman, 2008).

Internal validity refers to whether causal relations are valid (Bryman, 2012; Yin, 2009). A conceptual model has been developed, which is derived from different validated theories. Related to this model, propositions are developed to be assessed in semi-structured interviews with different actor groups and a focus group. Semi-structured interviews are suitable to ask extra questions whether an answer can be clearly matched to the theoretical concepts. By making use of different cases, findings are checked between these cases and possible biases are reduced. By comparing the interview data with the conceptual model it can be analysed whether the empirical relations between concepts match with those specified in the theoretical model (Bryman, 2008).

External validity refers to the degree in which the results can be generalised to a broader context (Bryman, 2008). The generalisability of this study is limited, because the results specifically focus on a limited sample of three banks that participate in APs.

Internal reliability refers to the subjectivity of the researcher in the data analysis (Bryman, 2008). To ensure internal reliability, multiple interviews are held for each actor type to allow triangulation of the data. Also the presentation of the results to the expert and the focus group contribute to the internal reliability of this study.

External reliability refers to the stability of the measurements and the degree to which a study can be replicated (Bryman, 2008; Hancké, 2009). To ensure the reliability of this study, several steps are taken. First, I have developed clear interview questions with guidelines for possible follow-up questions. Second, the interviews were recorded and transcribed. Third, the transcripts were sent to the interviewees to check the interviews. Fourth, other data has been documented. Fifth, the analysis and coding of the data is done by clear steps which are documented in detail, so that other researchers can perform the same research.

4. Results

This section presents the results of this study and the analyses of the propositions. The results section consists of four parts. The first part describes the general results, the second part describes the results on the AP phase and the third part describes the results on the implementation phase. The result section concludes with a summary of the main results.

4.1. General results

The general results include background information about APs and banks. First, five reasons why banks participate in APs are described. The SNS bank does not participate in APs; the next part describes the reasons for that decision. The third part describes why APs would have involved banks in their programs. Finally a comparison is made between the different AP cases of this study.

4.1.1. Reasons of AP participation by banks

The banks - which participated in APs (ABN ARMO, ING and Rabobank) - give different reasons why they participate in an AP related to FinTech. Those reasons are commonly consistent for the banks, when learning is a central element (B1, B2, B3). Also, the AP directors indicate these reasons.

The main reasons are:

(I) To learn the start-ups methods
(II) To get access to the start-up ecosystem
(III) To learn from the speed of innovation
(IV) To collaborate with start-ups
(V) To get exposure

(I) To learn the start-up methods

The start-ups use the lean start-up method in which they use the '*build, measure, learn*' principle (A1). This principle means that start-ups listen to the problems of their clients, quickly build a minimal viable product (MVP), test this MVP with the client and improve the product subsequently based on feedback of the clients (A1, B3). Banks would like to learn how to apply this method within their own organisation, to learn to work more efficiently and cheaply, but also to start a cultural change (stimulate entrepreneurship within the bank).

> *'As banks, we find it super awesome that start-ups can change direction so quickly, because in the past we developed something and afterwards it was not yet what the client wanted. We need to change as banks, and that kind of insights will be able to help us.'* (B2, translated from Dutch)

(II) To get access the global start-up ecosystem

Banks find it important to get insights in (I) what is happening in the financial markets, (II) what kind of innovations and trends arise there from FinTech start-ups, (III) to know the most promising start-ups and (IV) to become familiar with the start-up culture. By connecting themselves to the start-up ecosystem, a bank may also prevent disruption in the future.

(III) To learn from the speed of innovation

Banks are interested in the speed of innovation of start-ups. An AP gives banks access to the best innovative ideas in the industry and they get the opportunity to understand the business models.

(IV) To work together with start-ups

Banks can scout strategic collaboration opportunities; they can connect start-ups to the bank or to their wealthy clients.

(V) To get exposure

'*For a bank it is good to be recognised as an organisation that deals with innovation and renewal*' (B3, translated from Dutch) and '*that you have to show to the outside world that you invest in the start-up ecosystem and the future of BV Nederland*' (B3, translated from Dutch). Therefore it is strategically beneficial to participate in AP.

> *'During the first years at SBC we have had good exposure mainly. It's just literally PR [..] And it results in some interesting relationships.*' (B1, translated from Dutch)

4.1.2 SNS Bank

The SNS bank states not to participate in the large accelerators like SBC and Rockstart, because *'if we do more of the same, then the results will be the same*' (B4, translated from Dutch). They keep an eye on the programs and start-ups that participate in these programs, but they are not affiliated with these APs as a partner. They also like to have a challenging role, to challenge the market, to embrace new initiatives and search for interesting start-ups by themselves. By searching for innovations in other places, they can operate more quickly. SNS knows where to find the right start-ups and the start-ups find SNS bank, therefore they also gain access to the start-up ecosystem. However, they will not exclude that they will participate in APs in the future.

> *'We see that as a challenge, how can we establish against those giants as the smallest system bank. That is in my opinion to be able to react quickly to changes in the world.'* (B4, translated from Dutch)

4.1.3. Why APs collaborate with banks

The reason why APs want to collaborate with banks, is actually similar to the reason why banks do participate in APs. Interviewee A2 states: 'we *want to collaborate with banks, because the start-ups and the banks world are very far apart. We want to be in the middle*'. The goal of APs is that they can link multiple corporate partners to their program. It is important to connect big brands to their program, because this also attracts start-ups and other partners to an AP. A partner is funding a program for at least three years.

> AP program director A2 explains the gap clearly: *'Our mission is to change the industry. Our mission is to build a platform were start-ups can work easier with institutions like banks, MasterCard or other big players of the industry. [..] We want to make a conversation happen when we see the need to bring everyone around the table; regulators, investors, start-ups, banks. We know it is really tough for banks to innovate. It is not easy for banks to have*

actually access to innovation. Our role is important to actually make innovation happen. [..] We think we are the glue or connector between banks and the start-ups. We try to make the bridge and see what makes sense.'

AP program director A3 told: *the value we see in having banks involved is that it is interesting for the start-ups that work in the field of FinTech*[7].

4.1.4. Comparison of programs

Case studies are conducted on four APs, namely SBC NFC & Contactless, SBC FinTech, SBC E&M Commerce, Rockstart Web & Mobile, which are compared in this section. In those FinTech related programs the three largest Dutch banks participate (see table 9). These APs have a lot of similarities, but there are also some differences. Table 10 gives an overview of these characteristics of the SBC and Rockstart programs.

Table 9: Banks in different programs as a partner (P) and/or mentor (M) (sources: Rockstart (2015), Startupbootcamp (2015), interviews)

Bank/AP	APs	SBC FinTech	SBC NFC & Contactless	SBC E&M Commerce	Rockstart Web & Mobile
ABN AMRO*	4	M	P+M	P+M	M
ING	4			P+M	
Rabobank	3	P+M	P+M	P+M	P+M
SNS	0				

* Was a partner of SBC Amsterdam (which included E&M and NFC) in the last 3 years.

There are few differences between the different programs. The main differences between the APs are (green in table 10):

- Some programs have been executed more often than others.
- SBC has many more programs than Rockstart.
- There is a slight difference in the alumni programs.
- There is a slight difference in the selection process, which is further described in section 4.2.2.

A3 describes the difference between SBC and Rockstart as follows; '*we are more product and team oriented and usually more focused on B2C* (business-to-consumer) *than B2B* (business-to-business)*, as SBC invests more in B2B'* (A3).

Table 10: Comparison of SBC and Rockstart (sources: Interviews, Rockstart (2015), Startupbootcamp (2015))

	SBC	Rockstart
Founded	2010	2012
Number of programs	11	3
Acceleration start-ups	210 (worldwide)	49 (worldwide)
Focus	Mainly Europe, each city has a different focus	The Netherlands
Duration	100 days	150 days + 50 days follow up program

[7] Rockstart has no specific FinTech program; this is a more general Web & Mobile program.

Mentorship	100-150 mentors in each city (successful entrepreneurs and subject matter experts)	100/program different skill sets from a variety of backgrounds
Education and technical assistance	Yes, in 3 phases (shape, built, sell)	Yes, a lot
Funding	€ 15,000 living expenses € 450,000 in free services from partners Exposure to 200+ Angels & venture capitalists	€15,000investment 200+ local and international investors
Equity	8%	8%
Working space	4 moths	4 months
Start-up phase	Fine-tuning business At least a MVP Some clients	Fine-tuning business At least a MVP start-up phase (during their first 3 years)
Selection	Application (Skype) interview 2-4 day selection days (top 20) select top 10	Application (Skype) interview Selection day
Final	Demo-day 400+ mix of national and international investors, partners, mentors, press	Demo-day 300+ mix of national and international investors, partners, mentors, and press 3-weeks International Programs twice a year
Cohort based	10	10
Alumni	Alumni Growth Program 4 times a year alumni meetings	Alumni Program that includes fundraising advice, PR & marketing support, legal & administrative services and access to exclusive deals
Funding rate[8]	71%	71,4%

The banks are involved in three SBC programs. The main differences between those programs are summarised in table 11.

Table 11: Differences between SBC APs (source; interviews, Rockstart (2015), Startupbootcamp (2015)

	SBC FinTech (London)	**SBC NFC & Contactless (Amsterdam)**	**SBC E&M Commerce (Amsterdam)**
Founded	2014	2013	2014
Number of programs	2: 2014, 2015 (summer)	1: 2013	2: 2014, 2015 (summer)
Selection	Application (Skype) interview 4 day selection days (top 20) select top 10	Application (Skype) interview 2day selection days (top 20) select top 10	Application (Skype) interview 2 day selection days (top 20) select top 10
Alumni	Alumni Growth Program 4 times a year alumni meetings Setting up an FinTech alumni program	Alumni Growth Program 4 times a year alumni meetings	Alumni Growth Program 4 times a year alumni meetings Monthly hangout

[8] Average over all programs (so also included not analysed APs).

4.2. Results on production of new knowledge: AP phase

In this section the results on the production of new knowledge in the AP phase are described. This section starts with the analysis of the dependent variable, the production of new knowledge (section 4.2.1.). Followed by an analysis of the first two sub-questions about the selection criteria (section 4.2.2.) and the roles performed by the banks (section 4.2.3.).

4.2.1. Production of new knowledge

This section gives an overview of the funding rates of start-ups after participating an AP. Table 12 gives a summary of the start-ups that receive further investments after participating in an AP. This analysis is based on the four analysed APs. This data is obtained from the websites of SBC and Rockstart and from the interviews with the AP directors (A1, A2, A3).

Table 12: Overview of start-ups that receive further investments after participating in an AP (SBC, 2015; Rockstart, 2015, A1, A2, A3)

AP	Year AP	Funding rate	Percentage (%)	Average funding rate (%)
SBC FinTech	2014	10 out of 10	100%	100%
SBC NFC & contactless	2013	9 out of 10	90%	90%
SBC E&M Commerce	2014	7 out of 10	70%	70%
Rockstart Web & Mobile	2012 2013 2014	8 out of 10 9 out of 10 10 out of 10	80% 90% 100%	90%
Total		53 out of 60	88,3%	88%

Table 12 shows that almost all start-ups have received further investments after participating in an AP, with an average funding rate of 87% for the SBC APs and 90% for the Rockstart APs. This leads together to an average funding rate of 88%. Because all the start-ups' after AP funding rates are far above the 50%, it can be concluded that all APs can be considered as successful developers of new knowledge (by the start-ups that participated in those Aps).

4.2.2. Criteria to select start-ups in APs

This part describes the influence of the selection criteria and the selection process of the different APs on the production of new knowledge and provides an analysis of proposition 1 based on sub-question 1.

Because there are differences between the ways in which SBC and Rockstart select the start-ups for their programs, a distinction is made between these two different programs. As indicated in section 4.1.4., the SBC programs expire in the same way. However, each SBC program makes its own selection and has its own responsibility. Not only the criteria, but also the selection process is an important part of the selection. Not all interviewees know well how the selection process works, because some people have never been present during the selection process. Nevertheless, there is a clear selection process with selection criteria, which is explained below.

4.2.2.1. SBC

Selection process SBC

The selection process will take months (B3). First, the AP directors have a meeting with all partners to determine what topics are interesting to focus on (B3). In this way, partners have influence on what kind of knowledge will be produced by the start-ups during an AP (where they subsequently can learn from). Then they can get in touch with potential start-ups in various ways, namely:

(I) by active recruitment; there is a AP team continuously traveling and looking for new start-ups (worldwide) on a specific topic,
(II) partners, mentors and alumni can put forward interesting start-ups,
(III) start-ups can sign up themselves,
(IV) there is much attention that a program is open for enrolment via social media (A1, B2, B3).

Registration is done by filling in the application form (on www.f6s.com), where start-ups must satisfy certain requirements (A1, B2, B3). SBC executes the first selection by assessing the application forms. Then, the AP team travels around the world to meet the start-ups and give them a chance to pitch their ideas by: (I) visiting different start-up events and (II) organising fast tracks, where per region 12 start-ups are invited (A1, B3). The partners of the program may also be present to pronounce their preference during the fast tracks (which sometimes take place at the banks). This has influence on the selection of start-ups and indirectly on the type of knowledge that will be produced by the start-ups (B3).

The top 25 of start-ups is invited for an interview with the AP managers, after which 20 start-ups are selected for the final selection days (A1, A2, B3, S1). The final selection days are 2 to 4 days at the office of SBC, where start-ups have 'speed dating' interviews with 60 to 70 mentors and partners. The start-ups also receive workshops and pitch trainings (A2). The partners and mentors are thereafter allowed to give their opinion; (I) whether they want to be a mentor of the start-up and (II) whether the start-up should be selected (A1).

Eventually, the partners have a big voice in the selection process, which has a positive effect on the production of new knowledge that is also useful for the partners (B2, B3, S1, S3). The final selection days end with the selection of 10 start-ups (A1, A2, B2, B3). A2 explains that '*It is really important to select start-ups with the partners together, so they can potentially work with these start-ups'*. An overview of the various steps in the selection process of SBC is shown in table 13.

Table 13: Selection process SBC (based on A1, A2, B2, B3, S1, S3)

Who	Activity	How
AP team + partners	Determine focus topics for next AP	By a meeting before AP
AP team	Get in contact with potential start-ups	By active recruitment of start-ups of AP team By mentors, partners and alumni By start-ups themselves By social media
AP team	First selection of start-ups	By assessing the application forms
AP team	Meet the start-ups	By visiting start-up events By organising fast tracks
Partners	Fast tracks	By giving their opinion
AP team	Interviews with top 25	By select top 20 for final selection days
Partners + mentors	Final selection days	By speed dating By give their opinion of the start-ups
AP team + partners	Selection	By select the final 10 start-ups

Selection criteria SBC

The criteria on the application form are shown in appendix 1 (SBC) and appendix 2 (Rockstart) (F6s, 2015). There is a small difference between the criteria of SBC and Rockstart. In the application form, a distinction is made in the criteria between the team, product and company. The application form leads to a first selection of start-ups. Further selection is made based on interviews and the final selection days. During the interviews and final selection days, start-ups' team and product elements are central in the assessment by the AP team, partners and mentors. By being involved in the selection, partners and mentors have influence on which start-ups are selected for an AP and thus which knowledge will be produced during the program.

Start-up team

The selection criteria '*focus on the 4Ms: Management, Model, Market and Momentum. Of which management is the most important. The team is by far the most important factor*' for developing successful new knowledge during an AP and thus to receive further investments afterwards (A1, translated from Dutch). The start-ups may have a great product, but if the team does not work, it leads to nothing (B3). The start-up team must have the ability of furthering an idea in 100 days and produce new knowledge, otherwise it will not lead to further investments (B3). The results show that start-up teams have the best chance for follow-up funding when the team exists of a multidisciplinary team of three people, which can collaborate well together. This team should ideally exist of someone who is responsible for the product, someone who is responsible for the development and someone who is responsible for the business (A1, B3). Single founders are not accepted. The team can be expanded further during the AP when the start-ups have found product and market fit (A1). During the selection the AP team will also consider whether a start-up has the willingness to go to a specific country, will work 100 days 24/7 and not to see family in that time, because also this has influence of the success afterwards (B3, S1).

Product

Besides the start-up team, the product is important. It is expected that the start-up 'has *a Minimal Viable (Business) Product (MVBP). A MVBP means that you can show that your model works and that*

you already can earn money with it' (A1). In order to be selected, a start-ups should have minimal one client or launching customer. These product criteria are used because in this way it is for the start-ups easier to expand and test their new knowledge during the AP. Eventually, this will lead to more newly produced knowledge and further funding of start-ups.

4.2.2.2. Rockstart

Selection procedure Rockstart

Potential start-ups are approached by Rockstart or can register themselves. Then, the start-ups must complete the application form (see appendix 2). Start-ups must meet certain criteria to be selected for the next round. After the screening of applications a first selection is made by Rockstart. An application call follows, usually two months before the deadline (A3). In this call they want to figure out whether the start-up has a good multidisciplinary team or not. Based on that application call, the AP team invites a part of the start-ups for the selection days. During these days, the 10 participating start-ups are selected.

> '*The founders of the AP and also the program director are responsible for the selection of the start-ups. We involve program investors but also mentors in the last selection days'* (A3).

Program investors (partners) and mentors have influence on what kind of knowledge is selected in the AP, and thus on what kind of knowledge will be developed further by start-ups during APs. An overview of the various steps in the selection process of Rockstart is shown in table 14.

Table 14: Selection process Rockstart (based on A3, B3, S2)

Who	Activity	How
AP team	Get in contact with potential start-ups	By active recruitment of start-ups of AP team By mentors, partners and alumni By start-ups themselves
AP team	First selection of start-ups	By assessing the application forms
AP team	Interviews with start-ups	By an application interview
AP team, partners, mentors	Final selection days	Select the final 10 start-ups

Selection criteria Rockstart

During the selection process of start-ups by Rockstart, also a number of criteria are important to select the high potential start-ups that can produce the most new and relevant knowledge during the AP.

Start-up team

The interviews show that the start-up team is the most important criterion for developing new knowledge and thus to receive further investments after an AP. '*The whole skillset of the team is important, if they know about the industry and the problem they try to solve'* (A3). The AP team should have confidence that the start-up team is able to produce new knowledge. It is also important that the team can pitch, because then it is more likely that a start-up acquires follow-up funding.

Product

Besides the team, traction of the product and the business proposition are important factors for producing new knowledge. The AP team is looking for a scalable product and a product that has worldwide potential, because this increases the chances of follow-up funding (A3). The final requirement is that the start-up team has a MVP and one or a few clients, because then it is for the start-ups easier to expand and test their new knowledge during the AP. Also these criteria will eventually lead to further investments and useful knowledge afterwards.

4.2.2.3. Conclusion

The differences in selection between the two programs are small. The selection process of the different APs is somewhat different, but the used selection criteria are the same. The results show that the start-up team and then the product criteria are the most important criteria in the selection of the start-ups. The most important team criterion is that the start-ups should exist of a multidisciplinary team of three people. The most important product criterion is that the start-ups have a MVP. The use of these criteria lead to start-ups that can develop relevant new knowledge during an AP, which leads to further investments.

In the selection process, banks have (as partner) influence (I) on introducing start-ups, (II) on what theme they recruit, and (III) on the selection of the start-ups. Therefore, partners have influence in what kind of knowledge is selected in an AP and thus also what knowledge will be further developed during the AP. This can lead to successful knowledge development.

As table 12 shows that a large part of the start-ups - that have participated in the analysed APs - received follow-up funding (with an average of 88%) on the basis of their produced knowledge, a positive relationship (+) between the production of new knowledge and the extent to which team and product related selection criteria are used in the selection process seems in place.

Therefore, there is no evidence found that ***P1: The extent to which both team and product related selection criteria are used in the selection process has a positive effect on the production of new knowledge by the start-ups participating in the APs*** should be discarded.

4.2.3. Roles of banks during APs

This section describes the influence of the roles performed by banks during APs on the production of new knowledge and provides an evaluation of proposition 2 based on sub-question 2.

As described in the theoretical framework, there are different roles in the programs that can strengthen the successful knowledge production of start-ups in APs. A part thereof may be carried out by banks. Tables 15, 16 and 17 provide an overview of the different roles and indicate what role banks can play (indicated by banks, AP directors and start-ups). Based on the interviews, there are three additional roles derived that are not described in the theoretical framework, namely that of executive in residence (but very similar to an entrepreneur in residence), launching customer and client.

The tables are structured as follows. In the first column (Role), the different roles in an AP are described. The second column (Mentioned in interview) shows which interviews (with banks/AP directors/start-ups) mention a certain role. The third column (Role performed by banks) shows the interviews which mention that banks can perform a role. The fourth column (Role valuable for banks) shows the interviews indicating that a role is valuable for banks to perform. The last column (Role valuable for start-ups) shows the interviews indicating that a role is valuable for start-ups. Then all roles are briefly described. The influence on the production of new knowledge is also explained.

4.2.3.1. Banks

Table 15 provides an overview of the different roles and indicates what role banks can play according to themselves. These roles are further discussed below and the section concludes with what role has the highest involvement according to banks.

Table 15: Different roles performed by banks according to banks

Role	Mentioned in interview	Role performed by banks	Role valuable for banks	Role valuable for start-ups
Partner (investor in AP)	B1, B2, B3	B1, B2, B3	B1, B2, B3	-
Mentor	B1, B2, B3	B1, B2, B3	B1, B2, B3	B1, B2, B3
Educational + technical assistance	-	-	-	-
Investors	B2, B3	-	-	B2, B3
Sharing network/matchmaker	B1, B2, B3	B1, B2, B3	-	B1, B2, B3
Coordination team	B2	-	-	-
Seed funding	-	-	-	-
Resources	B3	B3	-	B3
Entrepreneur/executive in residence	B2, B3	B2, B3	B2 ,B3	-
Launching customer	B1, B3	B1, B3	-	B1, B3
Client	B2, B3	B2, B3	-	B3

Partner

All banks (except SNS) are partners in one or more APs (B1, B2, B3). Being a partner is seen as a valuable role for banks, because partners can give a direction to the knowledge developed by start-ups (B1, B2, B3). This makes it more likely that the knowledge of a start-up is developed in such a way that afterwards a collaboration with the start-up can be entered.

As partner, you are an investor in an AP. To become a partner you have to buy a certain package (B3). In return, a partner is a shareholder in the program and thereby shareholder of start-ups (around 1% equity). In addition, as a partner you can fulfil different roles in an AP (B3). Equity in start-ups is not the reason why banks are a partner of APs (B1). '*The advantage [..] is that you have the first right to develop a collaboration with a start-up further*' (B3, translated from Dutch). As already explained in the section before, partners have major influence on the selection of the start-ups, '*you're kind of in the board*' (B3). Partners support in networking (matchmaking), funding, exposure, expertise and knowledge (B3). Banks as partners can learn a lot from an AP and the start-

ups, because partners are closely involved with start-ups in different roles (mentor, sharing network/matchmaker, resources, entrepreneur in residence, launching customer and client). Partners are not often present in APs, but they are always available for questions (B2). A partner can therefore contribute in several ways to the development of new knowledge by a start-up; (I) by selecting the start-ups that can develop the most relevant knowledge during the AP and (II) to help start-ups with this knowledge development by fulfilling different roles. This should lead to a successful follow-up investment in the start-up.

Mentor

All banks are mentor in several APs (B1, B2, B3). It is seen as a valuable role for banks to be a mentor (B1, B2, B3). As a mentor you help start-ups in a program, by delivering knowledge and expertise (B3). Banks are often a mentor as part of the partnership, but it is also possible to become a mentor if you are not a partner of the AP. A mentor is a free role, it is important to talk with start-ups to see what they need, if there is a connection and if you can help them (B3). '*A start-up does not have 10 mentors'*, but every start-up is free to ask several mentors for advice (B3, translated from Dutch). When employees of the bank want to become a mentor, they can sign up themselves (B3). Then the AP team examines if your expertise is needed and what you can contribute to the knowledge development of the start-ups in an AP. If you do not contribute enough then you are removed from the list (B1). Mentors may decide for themselves how often they are present, but the more often they are present, the more efficient their contribution to start-ups is and the more they learn from them (B1, B2, B3). Mentors have a large influence on which and how start-ups develop their knowledge. Because mentors have frequent contact with the start-ups, they can push the development of knowledge in a direction relevant for the bank. This can result in follow-up investments of the start-up.

Investor

Due to the strict regulations that a bank must meet, it is very difficult to invest in start-ups. '*We do not invest in start-ups, because this facility is not possible'* (B3, translated from Dutch). Therefore, this is not a role for a bank (despite the fact that they would like it) (B2, B3). However, investors are very valuable for start-ups to receive follow-up investments after an AP.

Network

As a partner and mentor of an AP, banks share their national and international network and mediate in matchmaking (B3, B2). This is very interesting for start-ups, because banks are large organisations and have a large network (B3, B2). By connecting start-ups at the right level, a bank can add real value (B1). Banks also connect start-ups to wealthy clients (B3). Sharing the network does not have much influence on the direct knowledge development, but increases the probability that a start-up receives further investments.

Coordination team & Seed funding & Education + technical assistance

The coordination team, providing seed funding and education and technical assistance are not roles of the bank, but these roles are performed by others.

Resources

Another role of the bank (as a partner) is to provide services such as bank accounts. B3 states; '*It sounds silly but apparently start-ups - especially foreign start-ups - do not know what to do with the financial services and that can take a long time. So we just have people on the floor who just hands-on help start-ups'* (translated from Dutch). Providing resources does not have much influence on the direction of knowledge development, but can strengthen the connections with the bank, because for example start-ups feel more familiar with the bank.

Entrepreneur/executive in residence

Entrepreneurs or executives in residence are people who are often present on the floor (4 days/week), talk with start-ups and help them, to see high potential start-ups and to connect those to the bank (B3). An EIR is present at meetings with the AP management where all start-ups are discussed (B2). The difference between an entrepreneur and executive in residence is that an entrepreneur in residence is someone who has been an entrepreneur and thus knows what a start-up is experiencing. An executive in residence is someone from the bank, but has not been an entrepreneur (B2, B3). The difference between a mentor and an EIR is that a mentor comes and goes and an EIR is constantly present (B2). As a partner of an AP you have the choice to fulfil this role, and it is seen as very valuable to do this. You'll be immediately involved in the program, you know exactly what is going on and you can see what interesting start-ups participate (B2). An EIR has a large influence on how start-ups develop their knowledge. This is because EIRs have a lot of contact with the start-ups and they help the start-up with their knowledge development during an AP.

Launching customer & Client

A bank also can act as a launching customer or client for a start-up. B3 indicates the difference; '*as a client you really buy services, and as a launching customer the bank is more a testing ground*' (B3). These roles are very valuable for a start-up. If start-ups are a bit younger they appreciate the launching customer role more. If start-ups are further in development then the role of client is more attractive for them (B3). For a bank, these are also interesting roles, because banks can easily test if a start-up fits to the bank. Because start-ups can in this way test their assumptions about their product, they can develop their knowledge better. This will lead to more new knowledge, which can also be relevant knowledge for a bank. This makes it more likely that a collaboration with the bank can be established and that start-ups will receive follow-up investment.

Involvement according banks

What role is the most involvement role depends on how you behave yourself. B1 notes aptly '*what you get out, is the sum of the time you put into it*'. '*You see that if you are very active [..] then you're simply closer*' (translated from Dutch). As a result, you have more influence on what knowledge is produced and that the produced knowledge is also relevant for your own organisation. According to the banks, a bank which takes the role of a mentor gets the most involvement in an AP.

4.2.3.2. AP directors

Table 16 provides an overview of the different roles and indicates what role banks can play according to the AP directors. The main additions to section 2.2.1 (banks section) are discussed and the section concludes with what role has the highest involvement according to AP directors.

Table 16: Different roles performed by banks according to AP directors

Role	Mentioned in interview	Role performed by banks	Role valuable for banks	Role valuable for start-ups
Partner (investor in AP)	A1, A2, A3	A1, A2, A3	A1, A2, A3	A2, A3
Mentor	A1, A2, A3	A1, A2, A3	A1, A2, A3	A1, A2, A3
Educational + technical assistance	A1, A2, A3	-	-	A3
Investors	A1, A2, A3	-	-	-
Sharing network/matchmaker	A3	A3	-	A3
Coordination team	A1, A2, A3	-	-	-
Seed funding	-	-	-	-
Resources	A3	A3	-	A3
Entrepreneur/executive in residence	-	-	-	-
Launching customer	A2	A2	-	A2
Client	A2	A2	-	A2

Partner

The partner role is seen as a valuable role for banks (A1, A2, A3). There are several partners participating in an AP (A1). The partners will be contacted by the AP team, because they know people from previous relationships (A1, A2). According to interviewee A1, it is important for banks to be a partner in an AP, because banks know that they no longer exist after 10 years if they do not adapt to the market. Banks want to try to embrace innovations (from start-ups) to avoid disruption (A1). By being a partner in an AP, banks have influence on the direction of knowledge produced by the start-ups, which can lead to useful knowledge for the banks.

APs are looking for partners who '*have interest in innovation, that know how to handle innovation […] and have some kind of innovation activity internally*' (A2). To attract the right banking partners, APs attract interesting start-ups (A2).

Banking partners have different functions which lead to more knowledge production of start-ups:

(I) '*To give very quick feedback to the start-up' via 'the mentors from the bank*' (A2).

(II) '*To set up a pilot with the start-up if is there is a connection, to have the product tested within the bank*' (A2).

(III) Finally, the partners in the program are also '*responsible for appointing their own mentors who are active during the program, because they could be a kind of support for start-ups within the organisation*' (A1, translated from Dutch). In appointing mentors, it is important that they look for different business lines and expertises (A2). As a partner, you may bring in 3 or 4 mentors (A1).

Mentor

All AP directors explain that a mentor is a valuable role for a bank to learn from start-ups and to help start-ups produce more new knowledge. Mentors can be put forward by partners, but they can also come from the AP network (A1). If someone wants to be a mentor there is a first interview with an AP person who is responsible for the mentors. During this meeting, it is assessed (I) whether the person fits in the group of mentors, (II) if that person can add something to the group and (III) whether (s)he has the right motivation (A1, A2). Subsequently, there is a mentor masterclass where a number of workshops will be organised '*to show what mentors do during the program, but also to show how you should behave as a mentor*' (A1, translated from Dutch). Mentors are expected to add know-how and expertise and show that they want to help start-ups with their knowledge production (A3).

> Interviewee A2 indicates *'it is very important in FinTech to have experts in our mentorship program who have different skill sets and expertise from the banking sector*'.

Network

It is important for all mentors and partners to share their networks. In this way, an AP can connect different parties with each other (A3). So, sharing their networks is definitely a role for banks, and it contributes to the probability that a start-up will receive follow-up investments afterwards.

Involvement according AP directors

Interviewee A2 states *'the most important role I think.. it depends on the start-up as well. It depends on the start-up, it depends on the product'*. AP directors agree that a mentor role has the most influence. This is the roles in which a bank can learn a lot, and can add value to the knowledge production of start-ups.

4.2.3.3. Start-up owners

Table 17 provides an overview of the different roles and indicates what role banks can play as indicated by the start-ups. The main additions to sections 4.2.3.1 and 4.2.3.2 (banks and AP directors sections) are discussed and the section concludes with what role has the highest involvement according to the start-ups.

Table 17: Different roles performed by banks according to start-ups

Role	Mentioned in interview	Role performed by banks	Role valuable for banks	Role valuable for start-ups
Partner (investor in AP)	S2, S3, S1	S3, S1	S1	S1
Mentor	S2, S1, S3	S3, S1	-	S1, S2, S3
Educational + technical assistance	-	-	-	-
Investors	-	-	-	-
Sharing network/matchmaker	S1, S3	S3	-	S1
Coordination team	S1	-	-	S1
Seed funding	-	-	-	-

Resources	S3	S3	-	-
Entrepreneur/executive in residence	S1, S3	S1	-	-
Launching customer	-	-	-	-
Client	-	-	-	-

Partner

Partners have several additional tasks to bring the needed skills and expertise, such as hosting the demo-day and providing resources (S1). Partners are also invited to sneak previews, where they can see the start-ups with whom they may want to start business relations after an AP (that results in a higher funding rate of the APs). Interviewee S1 states '*the contact with the partners was very good. [..]They are always available if we needed them. They are really helpful; you can call them and ask help'*. Interviewee S3 states: '*for me, the mentors were from the partners*'. S3 stated they had more contact with the mentors from the partners, but this was well balanced. At the Rockstart AP banks are more indirectly involved, because interviewee S2 indicates that they didn't see banks during their program.

Mentor

Also alumni (former participants of a previous AP) can be a mentor, which is seen as very valuable and instructive for start-ups (S1). '*Anyone can apply to become a mentor. They go through a masterclass training, learn on a high level what the start-ups are going through. You will get training about how to help people. Everyone who gets through the masterclass can become a mentor*' (S1). At SBC, they have introduced a buddy system in 2014. '*Buddies are there for everything that is not related to your business'* (S1). Start-ups perceive mentors as one of the most valuable elements of an AP, who therefore definitely contribute to the direction and success of new knowledge production by start-ups.

'*Mentors are everything, they help you, are investors, make your business*' (S3)

Involvement according start-up owners

The start-ups believe that a mentor has the largest influence on the knowledge development and production of start-ups.

4.2.3.4. Conclusion

There are many different roles performed in an AP, and a part thereof is carried out by banks. As the interviewees state: you get what you invest. So when a bank has a high involvement in the AP, its influence on the knowledge production of start-ups is larger. Besides that, a bank will understand the knowledge of start-ups very well and can make a better choice with what start-up they want to continue their collaboration.

The involvement rates of the different roles, which stimulate to the production of new knowledge are summarised in table 18 (based on the interviews). In this table, first the involvement scores indicated by the banks is given, followed by the values given by the AP directors and lastly the values

given by the start-ups. These involvement values given per actor type are averaged to produce an overall value.

Table 18: Measuring the degree of involvement on the production of new knowledge (per case and overall value)

Role	Value by banks	Value by APs	Value by start-ups	Overall value
Mentor	5	5	5	5 (5,0)
EIR	4	X	4	4 (4,0)
Partner	4	4	3	4 (3,7)
Launching customer	3	4	3	3 (3,3)
Client	3	3	X	3 (3,0)
Sharing network	3	3	3	3 (3,0)
Resources	2	3	2	2 (2,3)

The results of the banks and AP directors show that the roles of a mentor or partner are the most valuable roles for banks, since those allow them to see the new knowledge production of start-ups. Furthermore, all the interviewed actors (including the start-ups) agree that especially the role of a mentor is most valuable for a start-up by helping them with the production of new knowledge during the AP. Partners are less visible for the start-ups, only in the form of mentors they will become visible for them. The influence of high involved partners becomes visible from the high involvement mentors that they provide. So, despite being a partner is not a direct high involvement role, but it is advantageous for a bank to perform a partner role, which allows them to provide several mentors. These mentors have a large influence on the start-ups' knowledge production.

So, as indicated by tables 15, 16 and 17, a high involvement role as a mentor is perceived by all interviewed actors as very valuable for the production of new knowledge. Therefore, being an actively involved mentor is the only high involvement role which contributes to the new knowledge production of start-ups. Because 88% of the start-ups are successful in the production of new knowledge, there is a positive relationship (+) between the degree of involvement and the production of new knowledge of start-ups seems to exist. However, this result is only valid for the role of a mentor and not for the role of a partner.

Therefore, there is partly support for ***P2: A high involvement role of a bank in an AP will contribute to the production of new knowledge by the start-ups in an AP relevant for that bank***.

4.3. Results on the integration of new knowledge: implementation phase

In this section the results on the integration of new knowledge in the implementation phase are presented. The section starts with the analysis of the dependent variable, i.e. the integration of new knowledge (section 4.3.1.). Next, the analyses of sub-questions 3 and 4 on the cognitive distance (section 4.3.2.) and resistance (section 4.3.3.), which both influence the implementation of new knowledge in the bank, are presented.

4.3.1. Integration of new knowledge

Banks try to collaborate with start-ups after an AP. They do this for strategic reasons, namely to integrate newly obtained knowledge, experience and technology in traditional banking (B4). The results show that banks usually enter an external (market) relationship with start-ups to integrate new knowledge into the bank, because this is the safest and easiest way in terms of regulations (A2). Banks want to implement collaborations with start-ups internally in their main business, because in this way they can learn more from the knowledge of start-ups. However, this is very difficult in practice and the success rate is quite low (E1). This difficulty is caused by the large cognitive distance and the high internal resistance. The implementation of new knowledge in an external organisation makes the integration of new knowledge in the main business of the bank more difficult, which leads to less positive (-) results of knowledge integration.

External collaboration forms

The observed banks have entered into a number of (external) collaborations with start-ups:

- B1 has started collaborations with approximately ten start-ups from different APs.
- B2 has started collaborations with three start-ups from one AP.
- B3 has started collaborations with minimal eight start-ups from different APs.

These collaborations are carried out in various external forms, which are described below. Which form is chosen depends on the degree of cognitive distance between the knowledge of the start-up and the knowledge of the bank and the internal resistance against integrating this new knowledge.

Market relation: client

Banks are often clients of a start-up (via a service level agreement) and use their products (A1, B1, B2, B3). This is a pretty simple collaboration. Becoming a client of start-ups is better for start-ups than receiving equity investments from banks, because then the start-ups have more freedom to develop their own business and do not have to comply with the regulations of the bank (E1). However, market relations result in very limited new knowledge integration and little changes in the main business of a bank, because with a market relation the bank is at a large distance from the start-up.

Market relation: launching customer

Becoming a launching customer enables start-ups to do experiments with banks. This is an often mentioned external collaboration. This role is convenient, because the bank is not attached to structural costs as with being a client.

Revenue sharing model

Occasionally a revenue sharing model is established wherein the bank provides data and/or customers to the start-up and the bank receives a part of the profit revenues back (B3, Focus group).

Corporate venture: separate business unit (+ equity investments)

When a collaboration with a start-up works out really well, banks sometimes make investments in a start-up. However, this will never happen in the beginning of a collaboration, because it is very difficult in terms of regulations (A1). Sometimes a separate business unit is created if the start-ups

have remote technological knowledge, which can become important within two years. Then you can start experimenting with it, until you are ready to implement the knowledge internally (Focus group). For example, the start-ups Facturis and MyOrder came to Rabobank a few years ago as separate business units (a corporate venture). Entering the bank as a corporate venture results in more new knowledge integration and changes of the main business, compared to other forms of external collaboration.

4.3.2. Cognitive distance

This section describes the influence of cognitive distance on the integration of new knowledge within banks and provides an analysis of proposition 3 based on sub-question 3.

Banks are not consciously concerned with the cognitive distance between a bank and a start-up when they start a collaboration. Cognitive distance causes banks to learn only a little from those collaborations. Banks enter into collaborations with start-ups because they find the knowledge or the people of a start-up interesting (Focus group). However, banks have too few FinTech industry experts, which make it difficult for banks to estimate the value of the knowledge and to understand the knowledge (Focus group, E1). Furthermore, it is also not clear where knowledge can make a difference, because the employees also do not understand the knowledge (Focus group). A lot of employees of a bank forget that current small start-ups can be major organisations in the future (E1).

There is often a small group of people who are interested in innovation within the bank and these few people do see the value of the knowledge of start-ups. Only they know what is happening in the outside world (B1, B2, B3, B4). The Block Chain technology - the technology behind the Bitcoin - is a frequently used example (B3). People inside the bank that do not notice external innovations, do not expect that this technology will disrupt the business models of the bank, but their innovation-involved people see the importance of this technology. Often external projects are started by these innovative departments in order to see if specific knowledge has potential in the organisation and to learn from this knowledge. Understanding the knowledge about a technology is often difficult for many people within the bank, because this new knowledge is often far away from the main business. Therefore, projects and collaborations with start-ups are mostly organised externally.

> '*The more radical the knowledge, the less direct effect it is having on your service provision. That makes it more difficult for those people who are not directly involved in the subject to understand the innovation.*' (B3, translated from Dutch)

Conclusion

The interviews show that the cognitive distance between the knowledge of the bank and the newly produced knowledge of start-ups is high due to two problems. The first problem is the large novelty value of the knowledge of start-ups, which therefore causes difficulty for banks to integrate this knowledge close to the main business. Secondly, the absorptive capacity of banks is low due to the lack of industry experts. This large cognitive distance results in the external integration of new knowledge by performing projects and collaborations far from the banks' main business. As already explained before, external integration of knowledge leads to less positive results (-) regarding the

expansion of the knowledge base of the bank. As a result, the bank learns less from the integration of new knowledge of a start-up than might be possible with internal integration.

Therefore, it seems that ***P3: A large (small) cognitive distance between the newly produced knowledge and the already available knowledge of the bank results in an external (internal) integration of knowledge in the bank*** cannot be discarded.

4.3.3. Resistance

This section describes the influence of internal resistance within the bank on the integration of new knowledge and provides an analysis of proposition 4 and 5 based on sub-question 4. This section exists of two parts, the cultural and formal resistance. Both parts have a large influence on the internal resistance. The internal resistance of the employees and the management of the bank against changes in routines play an important role in the external integration of new knowledge. This is described in the part on cultural resistance. The large amount of regulations also has a very large influence on the internal resistance, which is described in the section about formal resistance.

4.3.3.1. Cultural resistance

There is a lot of cultural resistance to change within the banks which negatively influences a fluent integration of new knowledge in the bank, but it is better than a few years ago (B3).

> Interviewee B3 expressed this nicely; '*In principle, people do not like to change quickly, it is not in the DNA of a banker. [..] They focus very much on risk prevention. No risk implies no change. If you think your processes are good, you would not prefer to change. But the world moves so fast and the technological changes bring such a big disruption along with it that you should be open for new business models and also for a model in which you collaborate with small parties to prevent this disruption'* (translated from Dutch).

The Executive Boards of banks all have their own goals, projects and budgets, with which internal collaborations with start-ups and the implementation of innovations do not fit (B3). This leads to a large cultural resistance against change and the internal integration of new knowledge. To reduce this resistance the innovation managers enter into dialogues with the Executive Board and they invite the Executive Board at the APs (B3). As a result, the Executive Boards have started to see the possibilities of more close collaborations with start-ups in the future. Banks can do projects with the start-ups and maybe start a corporate venture if they see real value in the knowledge of the start-up. The Executive Boards realise that the bank indeed can learn things from these innovative start-ups and that they should change to prevent disruption in the future. In the focus group it is argued that when the Executive Board of the bank is convinced, the resistance of the whole bank will reduce. Despite improved awareness, there is still a big challenge for banks to lower this internal resistance (B3). If this internal resistance becomes lower, internal integration of knowledge might become possible in the future.

The employees show less resistance than the Executive Board of banks, but here improvement is also needed to integrate knowledge from start-ups better. Some employees do understand that the bank needs to change, but others do not want to change because they do not foresee problems (B3).

Employees do also not see that changes in routines and existing knowledge can lead to improvements for the bank, because they do not understand the knowledge of start-ups as a result of the large cognitive distance. As a result, the large cognitive distance influences the level of resistance of employees in a negative way.

For employees, it is important that they get a mandate to innovate and develop projects with start-ups (focus group, E1). To lower the cultural resistance which makes the integration of new knowledge easier, employees need to be better informed about changes in the main business and the new knowledge which is available outside the bank.

4.3.3.2. Formal resistance

Internal and external regulations also play a significant role in the high internal resistance against integration of new knowledge. While a bank must provide certainty, collaboration with innovative start-ups is too risky, because these start-ups can quickly go bankrupt. Banks must do certain checks if they want to enter into an internal or external collaboration or launch a new product to market (B3, B4). This must be approved by departments such as Compliance, Procurement, Legal affairs and Risk (B4, focus group).

Just an external proof of concept for a project is almost impossible, because permission should be asked a long time before the project starts (B3, B4). This is annoying, because the innovators want to start a project on the short term to see if an external collaboration with a start-up is interesting in the first place (B4, focus group). Start-ups are different than other - often large - organisations with which banks establish partnerships. Start-ups are (I) small, (II) have different business models than the bank, (III) use other business processes than the bank, (IV) have other products than the bank and (V) are risky. This leads to a large cognitive distance and thus to a high resistance. This also results in that new knowledge can only be externally integrated, far away from the main business.

Banks indicate that a solution should be found for this problem. Interviewee E1 states that a change is going on already regarding compliance and regulations, but collaboration with start-ups remains difficult. One of the solutions which are put forward by interviewees B1 and B3 is that banks need an external venture capital fund. With such a fund they can easily enter collaborations with start-ups in different forms (not only by market relations but just in a corporate venture or equity based collaboration) and invest in them.

> '*We have to go through a process where we have to ask for approval if we want to enter into a collaboration with a start-up. That process takes maybe 6 months where we create an enormous amount of documents and have a lot of discussions. We just want to do an experiment to determine whether it is interesting.'* (B3, translated from Dutch)

4.3.3.3. Conclusion

Banks do not understand the knowledge of start-ups, which leads to a large cognitive distance. Because of this misunderstanding, employees of banks do not want to change their current routines and implement this knowledge in the bank. This leads to a large resistance against this new

knowledge. So, there is a positive (+) relationship between cognitive distance and the internal resistance within banks.

Therefore, ***P4: A large (small) cognitive distance will lead to a high (low) internal resistance*** cannot be discarded.

The high resistance depends not only on the cultural resistance of employees against change, but also on the formal resistance. The high formal resistance is caused by the strict regulations which banks should comply with in order to provide certainty for their clients. As a consequence of this high resistance, new knowledge is integrated externally, far away from the main business. This is the only way collaborations with start-ups can be organised at this moment. External collaborations of banks usually take place in pilots, or by performing the role of becoming a client or launching customer of a start-up. So, a high internal resistance results in the external integration of knowledge. This external integration has a less positive effect (-) on the expansion of the knowledge base of the bank than internal integration.

Therefore, it seems that ***P5: A high (low) internal resistance will lead to an external (internal) integration of knowledge in the bank*** also cannot be discarded.

4.4. Summary of the results

After the analyses of the different independent variables, a summary can be given of the influences affecting the dependent variables; production and integration of new knowledge. Support seems to exist for four of the five propositions (and for one proposition partly support), making the conceptual model a useful initial framework for studying the factors that can make APs for banks successful.

The most high-potential start-ups are selected primarily based on team critiria (and also on product criteria), which has a positive influence on the production of new knowledge during an AP by the start-ups. By performing the role of an actively involved mentor, the bank has an appropriate role to help the start-ups develop new relevant knowledge and to understand this produced knowledge. This results in a positive relation between the role of the bank and the production of new knowledge. So, using both team and product criteria and performing a role as mentor leads to the most new knowledge produced by the start-ups (AP phase), that is measured by the degree of follow-up investments (88%). However, it is very important that the bank is actively involved in this role, otherwise it yields nothing.

However, banks do not learn enough from start-ups and APs. This is shown by the problematic and slow integration of new knowledge in the main businesses of the banks (implementation phase). The reason for this is that the integration of new knowledge in the bank is carried out in external organisations. This is the result of a large cognitive distance and a high internal resistance both due to a lack of knowledge within each bank aout the FinTech knowledge produced by start-ups in APs. Banks learn less from external integration new knowledge than from an internal integration, because an external organisation leads to less change in the main business processes and routines. These collaborations are often based on market relations, from which less can be learned by the bank than with a corporate venture (or equity stake) organisation, because in this way no insight in the

knowledge of the start-ups' product is obtained. Banks only buy a product or service from the start-up.

5. Conclusion

This study analyses several factors that determine the success of APs for banks. Interviews with various parties involved in APs are used to get insight into the effects of APs on producing and integration new knowledge into banks. By analysing this, banks can learn more from start-ups and APs. This study specifically focused on the Dutch banks that participate in FinTech APs.

To be able to answer the research question, a conceptual model of relevant factors derived from the literature has been derived consisting of five propositions. Different theoretical backgrounds have been used to analyse the influence of these factors on the success of APs for banks. For the first part of the model, the so-called AP-phase, theoretical backgrounds about methods of selection and literature about mentorship in APs are used. These theoretical backgrounds are useful for the identification of factors that influence the production of new knowledge by start-ups and for giving insight into the selection procedure. However, the literature has not fully described all important selection criteria and mentorship roles applied by banks as some are additionally indicated by the interviewees.

For the second part of the model, the implementation phase, different theoretical backgrounds are combined to determine the knowledge integration by banks. Therefore, the theory of cognitive distance and absorptive capacity, and the theory of routines and core rigidities that result in resistance against change are used. These theoretical backgrounds are useful for analysing the internal and external organisation forms of new knowledge integration and provided a general overview of the factors that are influencing these ways of knowledge integration.

This study has found evidence for four of the five propositions stated (and for one proposition partly), thereby indicating important factors that influence the success of APs for banks. First, the results from the AP phase are discussed, followed by the results from the implementation phase. The results show that 88% of the start-ups participating in an AP receive follow-up investments, what can be considered to coincide with a high knowledge production rate. (I) The high-potential start-ups are selected primarily based on team critiria to be followed by product criteria. Selecting the most high-potential start-ups has a positive influence on the production of new knowledge (indicated by follow-up investments) during an AP by the start-ups. (II) If banks are actively involved and have a lot of contact with the start-ups, they can help the start-ups to develop their knowledge further. This new knowledge might be relevant for the bank. A high involvement role can be best achieved by being an active mentor of an AP.

The analysis of the implementation phase indicates that collaborations between banks and start-ups are all externally organised. Literature shows that the external integration of new knowledge leads to a decreased integration of knowledge compared to internally organised knowledge integration, because it has less effect on the main business. There are two barriers inducing knowledge integration to be organised externally. (I) The large cognitive distance between the knowledge of the bank and the start-up, make banks not understanding the knowledge of start-ups. (II) The high internal resistance against changing routines and the influence of regulations, making internal knowledge integration not possible.

Internal integration of new knowledge is problematic for banks because of these barriers. Even entering an external collaboration organised in a separate business unit is difficult, mainly because of the strict regulations applied. Banks often enter a market or client relationship with a start-up, from which little new knowledge can be gained. This is because banks - as a client of a start-up – are not close enough to the development of the knowledge in order to learn from it. As a result, the cognitive distance and resistance are not reduced. By organising collaborations in this (external) way, the main business of the bank is hardly affected and the threats of disruption remain. This means that banks achieve less effective learning from APs than they are aiming for.

For banks, participation in APs can be an appropriate way to learn from the start-ups methods, to get access to the start-up ecosystem, to learn from the speed of innovation, to collaborate with start-ups and to get exposure, but this participation has to be addressed and executed in the right way. Banks need another attitude than they currently have. Innovations often come from external sources, and banks should not have the ambition to develop innovations themselves. Start-ups are much better in innovation than banks. Banks should ensure that they select mentors with sufficient FinTech knowledge to help start-ups. In this way, banks can influence the knowledge produced by the start-ups to become more relevant to the bank. If this knowledge fits better to the knowledge of the bank the cognitive distance becomes less and employees understand the knowledge better making its (internal) integration easier. In this way it is possible for banks to achieve more benefits from participation in APs. Advice on how to overcome barriers is given in the managerial implications (discussion).

6. Discussion

The results of this study have several implications. First, the theoretical implications are discussed, followed by the managerial implications and finally the limitations of this research.

6.1. Theoretical implications

Since there was no single theory to test the factors which determine success of APs for banks, a theoretical framework has been constructed from different theoretical backgrounds. This framework makes it able to provide an answer to the researched question. The combination of different models resulted in an answer to the research question and new insights. The analyses showed that all used theoretical backgrounds have their merit, because for four of the five propositions (and partly for one proposition) support seems to exist. As a result, the framework is a good starting point to learn from APs and analyse the barriers of APs. However, some minor adjustments would improve the framework, since the framework is inadequate or incomplete on several points.

Firstly, a bank can play more roles (described in section 2.1.3.) in an AP than identified in the studies from Cohen & Hochberg (2014), Dempwolf et al. (2014) and Miller & Bound (2011) to help the start-ups produce new knowledge. For example, the bank can also become an executive in residence, launching customer or a client of a start-up during or after an AP, which are often tasks of a partner. Those roles should be included in the potential roles of the bank. In the above-mentioned studies, three roles are described that banks or other external organisations could perform, namely giving educational and technical assistance, providing seed funding and being an investor. However, the data analysis showed that these roles were not applied by the banks. Giving educational and technical assistance is the least suitable as a role of the bank, because the AP team asks for experts or do it themselves. Providing seed funding and being an investor are also unsuitable roles for banks, because banks are limited by the regulations. The strict regulations indicate that banks are not allowed to invest in risky organisations (such as start-ups). As a result they may be more limited in the performance of roles than other (non-financial) organisations, what should be taken into account in further research.

The regulations lead to a second point for improvement, since the results show that banks have a more complex structure than other organisations. In banks, the resistance to change is much higher than previously assumed. This is mainly due to the internal and external regulations (formal resistance) banks have to comply with. The influence of the regulations did not play a large role in the framework initially (described in section 2.2.3.), but determines the (not investment and external integration of knowledge) strategy of the bank for a large part. Therefore, the formal resistance should be playing a large role in the theoretical framework applied in further research. In further research, the type regulations that are the biggest barrier for knowledge integration and the possibilities to adjust these regulations should be analysed. An analysis of the risk posed by start-up products should also be conducted, because this is probably also a barrier to knowledge integration.

Thirdly, the high resistance to change causes that collaborations with start-ups are mainly organised externally, at a large distance from the main business. According Tushman et al (2010) this leads to less efficient learning than the internal integration of knowledge. In the theoretical framework, there are no different forms of external integration of knowledge included, but the results show that

different forms of external partnerships are used. These forms can be classified in three forms: market relations, revenues sharing and a collaboration organised in a separate business unit. These three forms differ in the degree of knowledge integration and thus in learning. A follow-up study should analyse these kinds of collaborations, where the bank has, for example, a role of a customer in a market relation (on a large distance from the main business). Todeva and Knoke (2005) have conducted a literature study on strategic alliances and different models of collaboration in which they distinguish thirteen basic forms of inter-organisational relations. In a follow-up study, these different forms of collaboration and their impact on knowledge integration should be examined in more depth.

Fourthly, the results show that if you have insufficient background knowledge, you learn insufficient from others. Due to the lack of knowledge of banks in the beginning of APs, supporting roles cannot be carried out optimally. Accordingly, banks do not understand well enough how to connect the new knowledge produced by start-ups to the existing knowledge of the bank. This leads to a large cognitive distance, which also leads to serious problems with the integration. Banks assume that they learn from the start-ups by participating in APs, but they cannot absorb that new knowledge due to the lack of background knowledge. In further research, it is interesting to analyse the influence of available knowledge base on the integration of new knowledge.

Lastly, by using the framework, an analysis can be performed on how banks can better obtain knowledge from APs and how this can be optimally integrated. In further research, it is interesting to further analyse the implementation phase and to delve deeper into the various processes, influences and barriers that arise during knowledge integration. It is also interesting to make a comparison between different industries, which participated in Aps, in order to see the differences in the knowledge implementation and learning between industries. This is interesting in order to assess whether the model derived in this study is also applicable to other industries and what industry is most successful with the integration of new knowledge obtained from APs.

6.2. Managerial implications

This research identifies several managerial implications, which lead to different recommendations for traditional banks. The used framework is useful to analyse the participation of banks in APs. The case studies have shown that various aspects go well, but there also exist several barriers (large difference in knowledge and high resistance) that hamper the successful integration of new knowledge. These barriers lead to an external integration of knowledge, which results in little change in the main business of banks. APs are an interesting way to see what is happening in the outside world, but when the acquired knowledge does not change the main business, the chance of disruption remains. Therefore, it can be concluded that banks can much more learn from APs than there already is extracted.

6.2.1. AP phase

The analysis of the framework indicates that the production of knowledge in the AP phase goes reasonably well, because almost all start-ups receive follow-up funding (88%). The selection process - on which the bank has influence - is tightly organised by the AP teams, which causes that the most high-potential start-ups are selected in APs and can produce new knowledge. Banks are involved in

several high involvement roles, which give them influence in which knowledge the start-ups produce. There are a few points to improve their participation in Aps:

- **Awareness** may be much higher. As many people as possible within the bank should be involved in APs. These are both employees and the Executive Board. The awareness can be increased by organising demo days by the bank, but also by involving as many employees as possible as a mentor in an AP. This enables people to see what is happening in the outside world, what knowledge a start-up produce and what collaborations with start-ups are possible to learn from them.

- An **active attitude** of all participants of the bank is needed in an AP. The more active you are, the more relevant new knowledge is produced by start-ups and you will learn as a bank from the start-ups. Learning is the most effective when a large number of employees of the bank are involved in an AP. Their experiences can be transferred to colleagues by giving training to other colleagues, by organising an internal AP and by implementing the start-up methods in the working methods of the bank.

- The existing **FinTech knowledge** among employees should be increased. By increasing knowledge about FinTech, banks can better assist start-ups during an AP. They can also have more influence that the knowledge produced by the start-ups that is also relevant for the bank. Additionally by a better understanding of the knowledge, this reduces the cognitive distance, which makes eventual integration easier.

6.2.2. Implementation phase

The major problems occur in the implementation phase. The knowledge that is produced in the AP phase is not implemented adequately within banks, because of different barriers. This is a big problem, where improvement can be achieved. The following points can be improved to increase the success of APs and the integration of new knowledge:

- The **culture** of the bank plays a major role in the external organisation of knowledge. The hierarchical structure of the bank makes change in routines difficult. The Executive Board of banks should, however, be aware that something must be changed in the area of innovation. The Executive Board can give the employees more mandates to look for external innovations. By giving employees more mandates, they are stimulated to learn more. Also, experimentation and making mistakes must become accepted (using the lean start-up method), because this ultimately leads to better and more creative products.

- The **resistance** can be reduced. By making the regulations more flexible for working with start-ups, banks can more easily start collaborations and pilots with start-ups. Also, employees of the bank should have less resistance to change in routines. This can be achieved by increasing the awareness that the business model of the bank should change in order to prevent disruption.

- The **capacity to assess what knowledge is interesting** to implement in the bank needs to be increased (relates to the concept cognitive distance). Banks currently lack technological know-how, which results in a lower capacity to understand and integrate new knowledge. By taking the distance

in knowledge between the knowledge of the bank and that of the start-up into account, a better strategic collaboration can be established. It is also wise to have an industry expert in-house in order to improve the technological know-how within a bank.

- Finally, banks should **leave innovation** to the start-ups, instead of becoming more innovative themselves. This is because the organisational structure and the internal processes of banks are so rigid that internal integration of knowledge is very difficult. In addition, start-ups innovate more rapidly than banks. For these reasons, banks can better act as stakeholders in start-ups - for example, through an investment fund[9] then as a lender. This fund can be best organised externally, in addition to their existing business, so that it is less affected by the high internal resistance. With such an investment fund, banks can easily do experiments with start-ups and start collaborations. Hereby start-ups can not only be seen as resources to learn from, but also as investment opportunities because they can grow very quickly. As a result, banks can also make money from the integration of new knowledge of start-ups. However, it is important that start-ups have the room to keep innovating freely. Therefore, it is not wise to have too much equity in the start-ups as a bank, because this limits the start-ups in their freedom and slows down innovation by the start-up.

6.3. Limitations

Some limitations regarding the interviews and the data are discussed below.

6.3.1. Validity

The internal validity is high, as evidence is found supporting almost all propositions. This shows that there seem to be positive relations between the dependent and independent variables discerned in this study. When more APs are executed and more (quantitative) data become available and banks have more experience with participation in APs, it is interesting to do a (quantitative) follow up study. Such a study makes it possible to further elaborate on the data and the propositions. Additionally, it should also be investigated what and not only that banks have learned from participation in APs.

The external validity of this study is low due to the small number of cases being used for this study. There are four different APs analysed, but there are many more FinTech APs in the world wherein banks participate. For this study, only the FinTech related APs in which Dutch banks participate are included. Therefore, the results are representative for the Netherlands, but not generalizable to other banks in the world. It is also difficult to generalise the findings to other industries. Follow-up research with more (international) cases is needed to analyse if those results are also valid for other banks which participate in APs and thus if the framework is generally applicable.

6.3.2. Reliability

To increase the internal reliability in future research it is important that more researchers code the data, because in this study the interviews are coded by only one researcher. In this way, potential

[9] Enabling an investment fund requires a change in the business strategy of banks, but it offers the possibility to do business with the start-ups that possible may disrupt your business.

subjectivity and mistakes in analysis can be decreased. Parts of the interviews have been translated from Dutch, thereby possibly affecting meanings. The focus group is carried out at only one bank. In future research it will be interesting to organise also focus groups at different banks in order to increase the reliability of the results and to be able to compare them. Because all the steps of the study are clearly described in the method section, the external validity remains high.

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Appendix 1: List of interview questions

1.1. Questions for banks

General questions

- In which APs has the bank participated and/or participates now?
- What are the reasons to participate in this AP(s)?
- What was your function in the AP?
- What are the objectives of the bank during/after this AP?
- Why has the bank chosen for participation in AP and not for another business incubator?
- How does the bank determines how much they want to invest in an AP?
- Does it make sense to participate in APs?

AP phase

Selection criteria

- Which parties are responsible for the selection of start-ups?
- Based on what team and product criteria are start-ups selected to participate in this AP?
- Can you indicate a ranking of the importance of those selection criteria?
- In which development phase should the product of the start-up be for selecting in Rockstart?
- How can start-ups apply for participation in the program? Are there different selection rounds?
- What is the average size of the participating teams?
- What characteristics should the start-up teams have?

Roles for banks

- To what extent gathers the bank knowledge from the guidance of a start-up? (reverse mentoring)?
- How does the bank ensures that the AP increases the innovative power of the bank?
- How does the bank learn from the culture and approach to start-ups?
- What roles are performed by banks
- Which roles can the bank perform during the program? Why?
- Which roles have the highest involvement rate in the program?
- What role is the most valuable one for a start-up? And for a bank?
- What support provides partners/mentors?
- What experience should a mentor have?

Extra questions

- Are there - next to the selection criteria and the different roles - other factors which are important during an AP?
- What characteristics of an AP contribute the most to the development of knowledge in start-ups (short time, mentorship, education and technological assistance, equity, office space, cohort based program, seed investment, demo-day, access to networks)?

Demo-day

- What is the goal of the demo day?
- What will happen during a demo day?
- Who are invited to visit the demo day?
- Do mentors/partners make appointments with start-ups before the demo day for further collaborations?
- What happens after a demo day?
- Does the AP stay involved afterwards with the start-ups? How?
- Do start-ups which haven't found an investor receive some support?
- In how many start-ups have the bank already invested (ratio during/after demo-day)?

Implementation phase

- If a bank invests in a start-up, how will the collaboration designed?
- Is considered what kind of innovation the start-up (radical / incremental) has?
- How are these radical and incremental innovations of start-ups further developed in the bank?
- How is the collaboration organised (intern/extern: joint venture/ corporate venture/new business unit)?
- How important is the difference in knowledge important for collaboration?
- How does a bank learn of the knowledge that is produced in an AP?
- To what extent is there internal resistance within the bank by introducing new products/processes? How can this resistance decreased?
- Is the internal resistance important by determining an internal/external strategy for collaboration?

1.2. Questions for AP directors

General questions

- Where did the idea of starting an AP come from?
- What makes this AP unique and successfully?
- Why is an AP a better choice than for example a business incubator or hackathon to participate in for a start-up?
- What are the objectives of this AP?
- Are alumni (start-ups) involved in a new program? How?
- What is the biggest difference between Rockstart and SBC?
- Why would you collaborate with banks?
- Which banks participate in the program?
- How can banks learn the most from participating in APs?

AP phase

Methods/framework used

- Do the start-ups receive training or education sessions during the program? What kind of sessions are these?

- Do the start-ups receive a big funding once at start of the program or do they receive continuous capital injections (for example, as they achieve a target)?
- How do you measure progress of the start-ups during the program?

Selection criteria

- Which parties are responsible for the selection of start-ups?
- Based on what team and product criteria are start-ups selected to participate in this AP?
- Can you indicate a ranking of the importance of those selection criteria?
- In which development phase should the product of the start-up be for selecting in Rockstart?
- How can start-ups apply for participation in the program? Are there different selection rounds?
- What is the average size of the participating teams?
- What characteristics should the start-up teams have?

Roles for banks

- Which roles can entrepreneurs/companies perform during the program?
- Which roles have the highest involvement rate in the program?
- What role is the most valuable one for a start-up? And for a bank?
- What support provides partners/mentors?
- How do you select partners for the program?
- How do you select a mentor for the program?
- What experience should a mentor have?

Extra questions

- Are there - next to the selection criteria and the different roles - other factors which are important during an AP?
- What characteristics of an AP contribute the most to the development of knowledge in start-ups (short time, mentorship, education and technological assistance, equity, office space, cohort based program, seed investment, demo-day, access to networks)?
- How – do you think - can banks learn the most from participating in APs?

Demo-day

- What is the goal of the demo day?
- What will happen during a demo day?
- Who are invited to visit the demo day?
- Do mentors/partners make appointments with start-ups before the demo day for further collaborations?
- What happens after a demo day?
- Does the AP stay involved afterwards with the start-ups? How?
- Do start-ups which haven't found an investor receive some support?

Implementation phase

- If a company invest in a start-up, how will the collaboration designed?

1.3. Questions for start-ups

General questions

- In which AP have you participated and in which year?
- Why did you choose to participate in this AP?
- What are the advantages/disadvantages of participation in this AP?
- What were the objectives of the start-up during this AP?
- Did this AP have any requirements of the objectives of the start-up?
- Did you already have clients before starting the program?

AP phase

- Do the start-ups receive training or education sessions during the program? What kind of sessions are these?
- Did the start-up receive a big funding once at start of SBC or do they receive continuous capital injections (for example, as you did achieve a target)?

Selection criteria

- Based on what team and product criteria are start-ups selected to participate in this AP?
- In which development phase should the product of the start-up be for selecting in this AP?
- How can start-ups apply for participation in the program? Are there different selection rounds?

Roles for banks

- Which roles can perform entrepreneurs/companies during the program (partner, entrepreneurial in resistance, mentor, sharing network, investor, etc.)?
- What role was the most valuable one for you as start-up?
- What support provides partners/mentors?
- How was the contact with the partners during the AP?

Extra questions

- Are there - next to the selection criteria and the different roles - other factors which are important during this AP?
- What characteristics of an AP contribute the most to the development of knowledge of Buzzoek (short time, mentorship, education and technological assistance, equity, office space, cohort based program, seed investment, demo-day, access to networks)?

Demo-day

- What is the goal of the demo day?
- What will happen during a demo day?

- Who are invited to visit the demo day?
- Do mentors/partners make appointments with start-ups before the demo day for further collaborations?
- What happens after a demo day?
- Does this AP stay involved afterwards with the start-ups? How?
- Do start-ups which haven't found an investor receive some support?
- Who has invested in the start-up during/after the AP? Collaborations?

Implementation phase

- What kind of collaboration do you have?
- In what form is organised the collaboration (acquisition/joint venture/corporate venture/new business unit or department)?

1.4. Questions for expert

General questions

- How can banks learn the most from collaborations with start-ups?

- Why would start-ups collaborate with banks?
- Why banks cannot innovate themselves?
- Is participation in APs a solution to avoid disruption?

Specific questions:

- Which cognitive distance should a start-up have in relation to a bank to implement the acquired new knowledge?
- What influence does internal resistance have on the strategy of the bank?
- Which strategy should be followed to implement obtained knowledge from APs into the organisation?
- Which kind of organisation (internal/external) is the most suitable to integrate new knowledge into the bank?

Appendix 2: Questions focus group

General questions:

- Collaborations with start-ups
    - How is it going?
    - What kind of collaborations are concluded?
    - Experiences?
    - Improvements?
- How can Rabobank learn the most from collaborations with start-ups?
- Discuss conceptual model.

Specific questions:

- Which cognitive distance should a start-up have in relation to a bank to implement the acquired new knowledge?
- What influence does internal resistance have on the strategy of the bank?
- Which strategy should be followed to implement obtained knowledge from APs into the organisation?
- Which kind of organisation (internal/external) is the most suitable to integrate new knowledge into the bank?

Appendix 3: Application form Startupbootcamp

Source: F6S Startupbootcamp (2015)

Basic information

- Short description of Start-up
- When did you start this company?
- What do you do in detail?
- What's different/interesting about your Start-up?
- How do customers use or interact with your product?
    - (Desktop, Mobile/Tablet (iOS/Android), API, Server software (i.e., databases), Hardware-wearable, Hardware-non-wearable)
- Where are you based?
- Markets
- Links
    - to website, Twitter, Facebook, LinkedIn
- Product video
- Mobile apps
- Help us understand your product usage
- Are you raising funds?

Team members

- Describe yourself
- What's your role at your company
- Your Skills
- Tell us something amazing that you have built
- Location
- Contact info

Team questions

1. Please provide an email address and Skype ID so we can get in touch with you
2. How many founders does your company have?
3. How long has the full founding team worked together (both current and past projects)?
4. Tell us about the founders - a quick background of each, their role in the company, and how they met.
5. How many total team members (founders + employees) does your company have?
6. How many total team members can locate in London for the full 3-month program?
7. How many total engineers does your company have?
8. Has the team built products together before? If so, please describe and provide a URL or video of the product.

Product questions

9. Briefly tell us what your product does?
10. How long have you been building the product?
11. If possible show us your product (URL, video, presentation, etc.).
12. What is your most recent product or traction milestone?

    a. Prototype, Closed alpha, Public beta, Customer growth - non revenue, Customer growth - revenue generating
13. What is your current customer adoption? What are your key performance metrics and how are you using these metrics to measure success?
14. What need (or problem) is being satisfied by your product? How are people currently forced to deal with this problem, and how large is the market potential?
15. What differentiates what you're building from competitors and how will you sustain your advantage? Do you have any novel or protected technology?
16. How does (or will) your product make money? How have you tested your assumptions about revenues and pricing?

Company questions

17. What date did you start this company?
18. What country is your company incorporated and what kind of entity is it?
19. What is the total amount of external funding the company has raised to date?
20. What is the equity breakdown of the company including founders, employees, and investors?
21. What are the average monthly revenues of your company?
22. What are the total monthly expenses of the company, including all salaries and other expenses?
23. Do you plan on raising capital in the future? If so how much and when? Do you have any open dialogues with investors?

A few final questions

24. Have you previously applied to any other Startupbootcamp programs? If so, please list the program(s)
25. Have you taken part in a Startupbootcamp Pitch Day? If so, please list the city and date you attended.
26. How did you hear about Startupbootcamp?

Appendix 4: Application form Rockstart

Source: F6S Rockstart (2015)

Basic information

- Short description of Start-up
- When did you start this company?
- What do you do in detail?
- What's different/interesting about your Start-up?
- How do customers use or interact with your product?
    - (Desktop, Mobile/Tablet (iOS/Android), API, Server software (i.e., databases), Hardware-wearable, Hardware-non-wearable)
- Where are you based?
- Markets
- Links
    - to website, Twitter, Facebook, LinkedIn
- Product video
- Mobile apps
- Help us understand your product usage
- Are you raising funds?

Team members

- Describe yourself
- What's your role at your company
- Your Skills
- Tell us something amazing that you have built
- Location
- Contact info

Questions

1. What's the name of your start-up?

General information

2. Please describe your business in a tweet. What problem are you solving?
3. Why did you and your team start this company?
4. Where is your company currently located?

Team

5. How many founders are there in the start-up?
6. How have the founders met? How long have you worked together?
7. Please provide a short bios of ALL the founders, LinkedIn profiles, their roles (CEO, CTO, etc.) & links to work you have done before (e.g. previous start-ups and relevant experience).
8. Are there any additional employees on the teams, if so: how many? And which roles?

Product/ Service

9. Could you please provide a more detailed short description of your company?

10. What is the URL of your website? (Please provide username and password for the above URL if you are running a private beta/ prototype product)
11. What is your current progress or traction? Please include (pilot) customers or # users & metrics, revenue, and any other indicators of progress.
12. Is there anything proprietary about the product or technology within your product, e.g. does your company own any unique IP related to your product that is protected, or has the potential to be protected?
13. What is the market for your product/service/technology? How big is the market potential for your company/product?
14. Please list your start-up's main competitors - including both corporates and start-ups - so we get an idea of the competitive playing field and how other companies are solving the same problem?
15. What is new, exciting or disruptive about what your company does? How are you different from the competition?

Incorporation & Fundraising

16. Is the company already incorporated?
17. If incorporated in other country, please list country.
18. If your company is incorporated, what entity are you using?
19. If you are already incorporated, who owns what percentage of your company? If you are not yet incorporated and have already discussed this; what will be the division of shares between the team members in your start-up and potential advisors/partners?
20. Have you raised any money?
21. If you have raised money, please state the amount in €EUR.
22. What are your future plans for fundraising?

Want to increase the chances of being selected? Stand out!

23. Leave a great impression by sending us the URL to your elevator video-pitch about 1) your team 2) your business (max. 100 seconds). Don't worry about the quality, we care most about hearing you talk about what excites you about your company. REMEMBER: If password & username are needed, please include them in the next question in this application.
24. Please list pitch video username & password (if needed)
25. Do you know any Rockstart founders, colleagues, mentors, start-ups, partners or other people in our network that would recommend you, individually or as a team? If so, please provide their names.
26. This is your chance to stand out from the masses. Add any information you would like to: e.g. why should we choose you as part of the Rockstart Accelerator program?

Contact Information & Practical Details

27. What is the name of your company's main contact person?
28. Please provide us with skype usernames + phone numbers + email addresses of ALL the founders listed above
29. As part of the selection process we invite some of our mentors to review the profiles of the applicants prior to meeting them at Selection Days on XXX. This includes the answers that

you have provided in the application. Please let us know if you would prefer that we did not provide your application information to our mentors.

30. How have you heard about Rockstart?