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An entrepreneur's external social capital, innovation capability, and fundamental resources in their startup community

An analysis of Finnish startups in the
knowledge-intensive sector

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Abstract

Providing various social and economic benefits at national and global levels, entrepreneurship becomes a prominent topic in various aspects of academic research. According to resource-based view and knowledge-based view, it regards relational knowledge immersed into interactions among a startup community's members as a good solution for young ventures to overcome difficulties of resource limitation. Based on literature review, the author explores how knowledge is transmitted across member actors in a defined collective. The central part of the model reflects relationships of a startup's external social capital, innovative capability and entrepreneurial resources. These relationships are confirmed by hypotheses testing by an empirical research with 68 Finnish startup participants.

According to the results, social networks can improve a firm's innovative capability and have directly positive influences on all three types of organisational resources (namely finance, human and production). However, a firm's capability to innovation supports only their human and financial resources but is surprisingly not related to their production resource. Lastly, the innovative capability can mediate partly only the relationships between external social capital and financial resources.

According to the research's findings, it concludes that the problem with young ventures is not because they are small, but because they are isolated. Therefore, new ventures' founders are advised to have proper strategies in their relationship and resource management to broadens their relational knowledge and interactive channels through their selective participation and collaboration in the community.

Key words: social capital, entrepreneurship, innovative capability, startup community, relational knowledge, social interactions.

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1. Introduction

1.1. Research background

Since the late twentieth century, the uncertainty and changes in various aspects of society and economy nationally and internationally have generated recessions and stagnations towards large corporations, but opportunities and competitive advantages towards small entrepreneurial ventures (Burn, 2011). Depending on their flexibility and quick responsiveness under uncertain circumstances, those small but high-growth enterprises have been increasing in quantity and quality, resulting in an entrepreneurial revolution. It has also contributed to the national economic development by offering job opportunities, fostering dynamic competitions, innovating technological and market knowledge, and diversifying lines of business (Burn, 2011).

Thanks to that, entrepreneurship becomes a prominent topic in both academy and business world. Entrepreneurship-related courses, seminar, clubs, and activities are available in most of the Finnish educational institutions. At a macro level, entrepreneurship is considered as a national asset, which generates employment, increases national income, promote social changes and community development. Moreover, Finnish developed startup community has been assisting startup firms, especially in high-technology and knowledge-intensive fields, to bloom. Investment from the government, domestic and foreign venture capitalists and private angles are easily approachable for the companies at their early stage of establishment. According to FiBAN, there were 21 million euros from 200 Finnish angles invested in 238 start-ups (FiBAN, 2016), of which one third is in the mobile and clean-tech sector. However, are those entrepreneurial successes are achievable for every enterprising founder?

Resource restriction is the biggest challenge to any young firm, especially in the beginning of an entrepreneur's journey. In fact, essential resources for entrepreneurship are not only from a founder's capitals but also from his external social networks. Consistently with this point, in a resource-based view, relational knowledge acquired and exploited from social interactions is believed to be a source of sustainable competitive advantages (Yli-Renko et al., 2001; Kogut &

Zander, 1992). According to social capital theory in knowledge-based view, the knowledge-specific assets can be approached by investing into a firm's social capital embedded into its relationship networks in a supportive community of practice (Lane & Lubatkin, 1998). A synthesis of the two views provides a theoretical foundation to explain a startup's ability to generate relational community knowledge into competitive edges over others by increasing its external social capital, and hence internal capability of innovation.

Additionally, social capital is no longer a long-ignored capital, but becomes a framework to explain how knowledge is created and transferred within a specific sharing context. In the age of information, it is visible that the amount of relationships embedded into an individual's social capital is proportional to the amount of information and knowledge that the one can obtain from his external environment. Therefore, a local startup community tends to be a possible environment for firms to expand their networks and access to varied and diverse essential resources. As a result, they can improve the efficiency, depth, and breadth of relational knowledge for their multi-dimensional innovations and high business performance. (Lane & Lubatkin, 1998).

Being inspired by the entrepreneurship science and social capital theory, the author attempts to clarify the relationships between social capital and owning resource. In specific, this thesis aims to draw up a conceptual model that explains how knowledge as an asset of social capital is transferred and obtained by people in a community of practice as their resources and capitals.

Another motivation for the author to do her thesis is to enrich the academic research in a new trend of combining relating factors, namely social capital, innovation, and entrepreneurship. From searching keywords "entrepreneurship", "innovation", and "social capital" in Web of Science under categories of management, business economics, planning development, business finance, the results show that there have been already researchers paying attention to the trend of this combination, although the relationships of each two of these factors are more popularly studied by previous researchers.

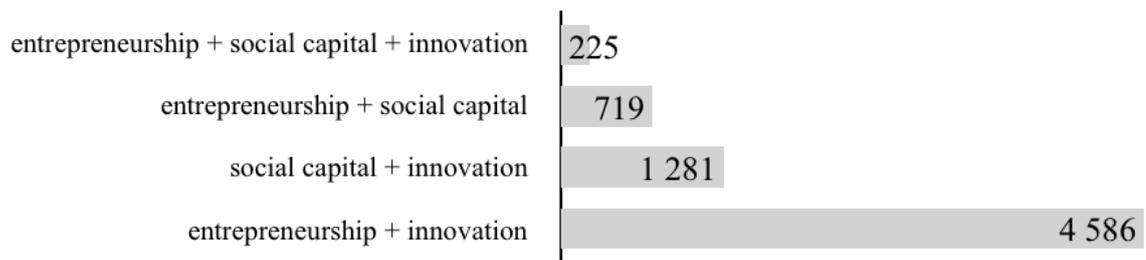


Figure 1. The result of the research's key words in Web of Science

The research makes a contribution to the literature of both entrepreneurship science and social capital theory. First, most of the prior studies in the field of entrepreneurship have usually examined a startup firm's externally physical resources (Shane & Cable, 2002; Rosenbusch et al., 2012). The thesis is, however, to focus on relational knowledge as intellectual resources, and inter-organizational relationships as organizational resources in order to generate innovations and competitive advantages. So it sheds light on the vital role of external knowledge and relationships in the startup context. On the side of social capital, instead of analysing each dimension of social capital and their relevant issues or outcomes (Widen-Wulff et al., 2007; Nahapiet & Ghoshal, 1998; Larson, 1992; Gabarro 1978; Tsai & Ghoshal, 1998), the study regards three dimension as a channel storing and transferring knowledge in order to provide a new and different angle to approach the social capital theory, in which an organisation's knowledge inflows and outflows within its community is clearly demonstrated.

1.2. The overall aim of the thesis and research questions

According to the current studies adopting knowledge-based and resource-based views, it concludes that a shortage of resources forces startup to seek for innovative solutions by combining their knowledge and relational knowledge, and cooperating with partners in a preferable startup community. Therefore, the purpose of the thesis is generally to delineate the influence of external knowledge on organizational resources with and without a meditative effect of innovation. In other words, it mainly tests how social capital raised from external relationships

affects startup firms' resources directly or indirectly through their innovative capability. Thanks to that, the author introduces a conceptual model illustrating transmission of knowledge between startup firms and their community. The grounded theoretical model is established according to previous studies investigating the relationships between social capital and innovation, innovation and resources management, and social capital and resource management. The empirical research is quantitatively designed and statistically analyzed, in which target population is Finnish startups doing business in the knowledge-intensive sectors.

This study is designed to explore the following questions:

Main question:

- (i) What is the relationship between external social capital and access to fundamental resources amongst entrepreneurial companies?

Sub-question:

- (ii) What is the relationship between external social capital and innovative capabilities amongst entrepreneurial companies?
- (iii) What is the relationship between innovative capabilities and access to the fundamental resources amongst entrepreneurial companies?
- (iv) Does innovative capability act as a mediator in the relationship between a startup's external social capital and resource accessibility amongst entrepreneurial companies?

1.3. Structure of the thesis

For answering the above questions, the thesis firstly introduces the resource-based view of relational knowledge and knowledge-based view of social capital theory as a premise for the research framework. Then, literatures of entrepreneurial resources, social capital, innovative capabilities, and community of practice are reviewed for better understanding of the topic. Next, the conceptual model of knowledge flows is built up from the previous studies of relationships between startup firms and their community. In this model, the inner flow of knowledge is a

central route stimulating the outer flow of knowledge. That is why relationships among a startup's external capital, entrepreneurial resources, and innovative capability in the inner flow of knowledge are focused and hypothesized for examination. Finally, an overview of Finnish startup community and the knowledge-intensive sector is stated right before these hypotheses are tested empirically by quantitative research with 68 Finnish startup ventures. The research's methodology and results are presented to for further discussion and implication. After that, the study's limitation as a suggestion for future research is also discussed before giving a conclusion for the whole research process.

Therefore, in addition to the introduction (chapter 1) and conclusion (chapter 8), this study consists of six chapters divided into two main parts : the theoretical part including two chapters ((2) Literature review, and (3) Hypotheses), and the empirical part including the remaining chapters ((4) Research methodology, (5) Model assessment and results, (6) Findings and implication, and (7) Limitation and future research). The outline of the study is illustrated in Figure 2 below.

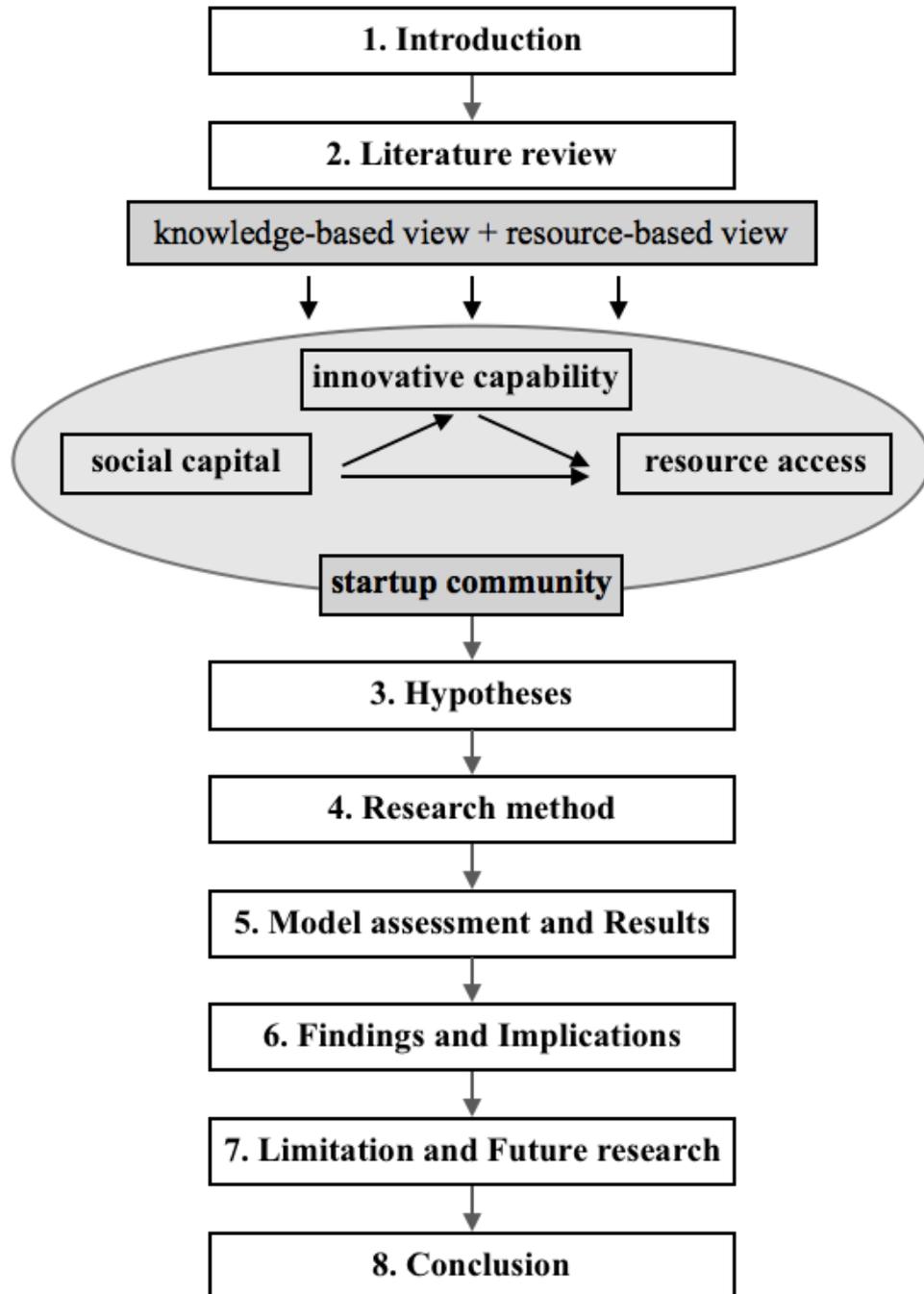


Figure 2. Thesis structure

2. Literature review

As mentioned in the thesis structure, this literature review aims at helping the readers get familiar with the topic before building up the theoretical framework and later the conceptual model of knowledge transfer. First, a premise is founded on the knowledge-based and resource-based view. Then the acting factors of the focal relationships, namely entrepreneurial resources, external social capital, innovative capabilities, and startup community are defined and explained respectively. The theoretical framework as the stimulating factor for the conceptual model is introduced at last.

2.1. Founding perspectives for the theoretical framework

The triangle-relationship of social capital, innovative capability and resource accessibility are established by a premise that synthesizes two perspectives: the resource-based view focusing on relational view and the knowledge-based view focusing on social capital theory. It explains how startup firms maintain their advantages to survive and grow up despite their constraints on resources.

First, the resource-based view on firm performance, particularly relational view, claims that competitive advantages originate in the company's resources and from their capability of differentiation, which is involved in their network relationships (Lane & Lubatkin, 1998). Typically, an entrepreneurial firm cannot succeed only by the founder's financial and human capital, but other significant external resources must be accessed and utilized. In fact, through active networking, companies gradually improve relational-specific assets, routines of knowledge sharing, and relational procedures for relationship networking (Yli-Renko et al., 2001). As a result, it can maximize their network and their relational resources to explore, gain and utilize the external knowledge to generate advantages in product innovation and market expansion so that firms can survive and grow for a long-term development despite their initial shortage of resources. The resource-based view suggests that entrepreneurial firms should focus on the accumulation of relational resources for growth.

Second, the social capital theory claims that an organization's external networks contribute significantly to its performance success, especially when competitive advantage is a measurement for success levels of the performance. This knowledge-base view argues that knowledge-based view defines firms as "repositories of knowledge and competencies," in which their advantages over markets are developed through knowledge creation and innovation. The advantages are, in fact, an exchange and a combination of their own experience and other knowledge resources beyond the firm. This combination is implicitly regulated by the power of social capital embedded in their external relationships. At a firm level, social capital from external networks enables firms to acquire knowledge resources through efficient and effective interactions with their partners, ideally within a mutual-interest community of practice. Moreover, Nahapiet and Ghoshal claimed that "the fundamental proposition of the social capital theory is that network ties provide access to resources" (Nahapiet & Ghoshal, 1998, p.252). Therefore, knowledge-based view implies that entrepreneurial firms should develop their social capital through networking to approach more external resources to succeed.

The two perspectives explain the success of startup firms, in which resource-based view emphasizes on the accumulation of relational resources, and knowledge-based view emphasizes on social relationships with external knowledge. Resources are restricted, and thus startups seek to acquire resources from their environment through strategic alliances for complementary resources (Wu, 2005). Consequently, relational knowledge, as a result of the cooperated complementary resources, becomes their sustainable competitive advantages (Spender, 1996), which is captured through social capital embedded in firms' relationships. The two radical views provide a conceptualizing foundation to explain how startup organizations are capable of utilizing their networks (external social capital) to access to relational resources for knowledge advantages and innovative achievements.

In the era of information and technology, entrepreneurship and innovation become an integral term, which is increasingly mentioned in all areas of government, business, and education. To survive in a market, startups must find new

opportunities, then obtain and redirect resources to create innovative products to become a pioneer in a niche market. In fact, an entrepreneurial firm can be seen as an innovative product created by the founder in response to society's or individual's particular demands or specifically defined customers. On the contrary, innovation is considered a primary entrepreneur's characteristic trait (Schumpeter, 1934). It is also noteworthy that in most of the studies of intellectual capitals, innovation is commonly used as an outcome of knowledge exploitation (Tsai & Ghosal, 1998; Subramaniam & Youndt, 2005). Hence firm's capability to innovation should be included when discussing entrepreneurship in both the resource-based view and knowledge-based view. Therefore, in the context of this research's empirical part targeting on knowledge-intensive startups, the innovative capability is introduced as a mediator in the relationship between an entrepreneurial firm's external social capital and resources accessibility.

Furthermore, there should be an ideal environment storing the resources and fostering the innovation-oriented flows of knowledge and information among startup firms. In other words, entrepreneurial networks producing external social capitals must be framed by a community of practice, usually a geographically local startup-community, which is conducive to gathering and attaching startup companies with similar interests and knowledge bases.

2.2. Entrepreneurial resources

Resource limitation is often the biggest challenge for young firms, making them vulnerable to market competition, market change, and innovation restriction (Amburgey et al., 1993). During a whole process of startup development, it is vital for a founding team to increase their accessibility to external knowledge resources through efficient networks, which determines startup's fundamental capitals at first and shapes its performance for growth and survival at subsequent stages (Barney & Hansen, 1994; Lee et al., 2001).

Numerous studies based on the resource theory toward an entrepreneurship's performance indicate that financial capital, human capital, and social capital are primarily pre-founding resources, also known as fundamental capitals, determining

an entrepreneurial level of successes (Wu, 2005; Subramaniam & Youndt, 2005). Except for financial capital which is tangible, the others are intangible and in the form of an organization's knowledge (Nahapiet & Ghoshal, 1998). Because liquidity constraint is a common obstacle to any entrepreneur (Wasserman, 2012), financial capital (such as cash, inventory, equipment, office) from different sources is an essential investment, which is obligatory to the whole entrepreneurial process and more urgent in the early stage. Human capital is reflected in knowledge, skills, and capacities that an individual accumulates and utilizes through his experiences. It is enriched by the founder's and employees' employment and experience through recruitment, training, and retainment (Subramaniam & Youndt, 2005). Social capital is reflected in knowledge which is available through, embedded within, and utilized by individuals' interactions and networks of their relationships (Nahapiet & Ghoshal, 1998). It is formed by relationships and is the center of entrepreneurial access to doing business. In addition to a necessary solid financial foundation, knowledge-based startup ventures require intellectual capital, that is human and social capital, to promote credibility in networks of potential resource providers including partners, investors, customers, and talents. The level of three initial capitals determines the size of the business, resulting in an entrepreneur's decisions on which types of resources are required, how and when to obtain them at each stage of their startup development. That is illustrated in Figure 3.

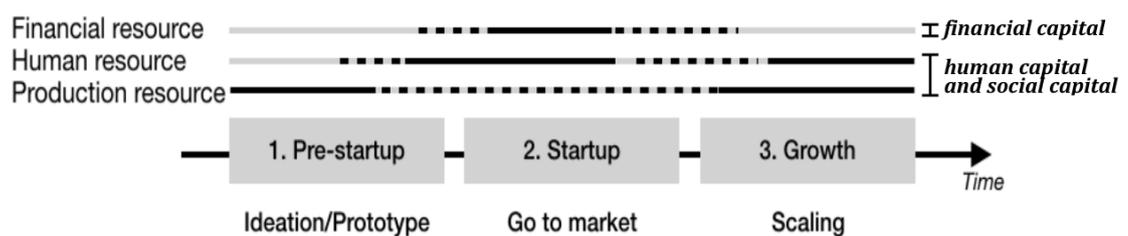


Figure 3. Resource demands at each stage of the startup development

Below are the types of essential external resources to which startup firms may access for knowledge acquisition, exploitation, and creation.

(social capital) through a core process of human resource development corresponding to the startup's resource demand at each stage of growth. The process includes selection and recruitment, training, performance assessment and compensation under the supportive working environment (Subramaniam & Youndt, 2005). So the entrepreneurial human resource is determined by a firm's abilities to recruit and retain top talents who have significantly formal education and previous startup experience, and capacities to increase their current employees' quality of human capital and social capital.

Production resource

The utilization of production resources for profits and market expansion demonstrates internal organizational capabilities to coordinate financial, human and social capital, which aims at accelerating knowledge innovation for some competitive advantages. It refers to the firm's availability and accessibility of market information (including suppliers, customers, and competitors), talent pool, and updated technology, which a startup firm explores, acquires, and utilizes through their community networks, contributing to their process of market development and product innovation.

2.3. External Social capital

2.3.1. The focus on external social capital

Originated from sociological, political and economic literatures since the end of the eighteenth century, the modern concept of social capital has been recognized and developed by three influential sociologists, namely James Coleman, Robert Putnam and Pierre Bourdieu (Robert & Hornburg, 1998). In recent years, social capital becomes a prominent topic in contemporary research of social relations at several analytical degrees from the narrowest level to the broadest level. For example, at an individual level, Fukuyama (1995) aims at a person's ability to collaborate for common goals; or Loury (1977) emphasizes an individual's social characteristics and locations. Other researchers approach social capital at the broader context of relationship's structure and content at the level of organization (e.g., Burt, 1992; Larson, 1992; Nahapiet & Ghoshal, 1998), interactions between organizations (e.g., Baker, 1990), and society (Putnam, 1995). In addition to being a source of

sustainable competitive advantage inhered in networks (Nahapiet & Ghoshal, 1998), social capital acts as an explanatory mechanism for knowledge and relationship management based on information and human interactions (Dalkir, 2005).

Despite its increasing popularity in scientific studies of inter- and intra-organisation (Burt, 1992), there is still no single unified definition for the concept of social capital. It results from the fact that social capital is defined dependently and divergently by the research's context and level, and the researcher's angle of view. In other words, social capital is defined differently by specific research purposes according to its focus whether on external relations, called "bridging" or "communal" (Woolcock, 1998), or on internal relations, called "bonding" or "linking" (Woolcock, 1998; Adler & Kwon, 2002); or on both types. Accordingly, studies of external social capital stress on the relations between an actor and its other related actors, while studies of internal social capital stress on the relations' structure among actors within a collectivity or an organization (Alder & Kwon, 2002). Appendix 1, adapted from Alder and Kwon (2002), lists significant definitions of social capital classified into internal, external and both types.

In this study, the focus is not the relationships between employees within a startup firm, but the relations between a whole entrepreneurial firm and other stakeholders in their entrepreneurial community, leading the firm to easier access to beneficial external resources. Taking entrepreneurial firms as the primarily investigated subject, the social capital in this discussion is, hence, external social capital derived from community networks that a startup firm possesses. Together with the application of the resource-based view and the knowledge-based view into the research which was discussed in Section 2.1, the social capital here is defined as:

'the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network.'

(Nahapiet & Ghoshal, 1998, p. 243)

Moreover, the social capital is different from the other types of capital (i.e., financial and human capital) in the fact that it exists in social relationships while the other capital types exist in the individual (Robison et al., 2002). Consequently, social capital is intractable in open market but “inheres in the structure of their relationships” (Portes, 1998, p. 7; Gant et al., 2002), which implicates its dependence on social contexts facilitating potential relationships. Broader relating to the resource-based view in this research, the external social capital should be conceptualised as a group of social resources immersed in relationships (Burt, 1992, Nahapiet & Ghoshal, 1998) and social contexts (Tsai & Ghoshal, 1998), including social ties, trust and trustworthiness, and shared values and vision (Coleman, 1990; Putnam, 1995; Tsai & Ghoshal, 1998).

2.3.2. Dimensions of social capital

However, it is challenging to measure this type of capital because of its complicatedness in both conceptualization and characteristics (Halpern, 2005). Firstly, the definition of social capital is based on a startup’s context of relationships, in which a specific startup tends to have different levels of interaction, network ties, and relationship quality with other stakeholders in their startup community. Secondly, the nature and stakeholders of a startup community can change over time, which causes poor predictive validity of defining qualitative differences among different organization types. Lastly, the external capital in question exists in forms of relationships, which belongs to an individual, but resides in a community of practice.

Consequently, it claims that the sum of external knowledge that young firms obtain from their entrepreneurial community to overcome their resource constraints depends on the quantity and quality of the external social capital built up from their relationships in the community social networks. Therefore, the external entrepreneurial social capital should not be measured directly but should be approached from a content perspective regarding three-dimensional model

suggested by Nahapiet and Ghoshal (1998), which consists of structural dimension, relational dimension, and cognitive dimension.

Table 2. Dimensions of Social Capital

Structural dimension	Relational dimension	Cognitive dimension
Network ties	Trust, Trustworthiness	Shared codes, shared vision, shared values
Network configuration	Obligations, Norms	Common language
Interacting channels	Identification	Common narratives and collective culture

Structural dimension:

This dimension refers to social interactions between a focal startup firm and different stakeholders in the entrepreneurial community (Nahapiet & Ghoshal, 1998; Larson, 1992). It includes network ties (relationships' quantity and intensity), configurations (weak, strong or conflicting relationships) and approaching channels (online, offline, or events) among members of a community. The position of a startup firm in its community's social structure provides the firm with particularly beneficial access to other individuals, participants, or organizations through their direct or indirect ties in communication networks (Widen-Wulff, 2007; Tsai & Ghoshal, 1998).

Relation dimension:

This dimension refers to assets, namely trust and trustworthiness, based on collective goals and mutual interests, and embedded in relationships between a focal firm and its community's participants (Coleman, 1988; Tsai & Ghoshal, 1998). From that, it generates obligations and norms, and identify the community (Nahapiet & Ghoshal, 1998; Hazleton & Kennan, 2000). A relationship is attributed to trust, while an individual's participation in the relationship is attributed to trustworthiness (Barney & Hansen, 1994). Frequent interactions allow firms to share knowledge and create mutual interest and communication, which makes

their relationships more trusting and the actors in the relationship more trustworthy (Gabarro, 1978; Widen-Wulff, 2007).

Cognitive dimension:

This dimension refers to resources of interpretations and representations, and systems of values among entrepreneurs to form and employ the community's social capital (Nahapiet & Ghoshal, 1998, Widen-Wulff et al., 2007). It includes shared codes, shared visions, shared language and implicit narratives and culture, which facilitates individuals' common sets of shared values and shared understandings for their community's collective goals (Tsai & Ghoshal, 1998). In other words, this dimension reflects how a startup firm perceives their presence and contribution when participating into the principal communication functions in the community such as information exchange, behavior regulation, problem identification and conflict management (Hazleton & Kennan, 2000).

All three dimensions of external social capital promote directly and indirectly network ties, social interaction, and relationship quality between the focal entrepreneur and other members of his startup community. It, consequently, assists him to realize goals, identify potential opportunities and advantageous negotiations, and strengthen their influence and power in the community (Alder & Kwon, 2002).

2.4. Innovative capability

2.4.1. Definition and types of innovative capability in entrepreneurship

In the knowledge-based perspective, innovation is implicitly an outcome of knowledge communication and combination through an organizational learning process (Schumpeter, 1934; Kogut and Zander, 1992). The source of knowledge for innovation is dependent on the organization's innovation strategy, which startups tend to follow an open model (open innovation) instead of a closed model (traditional innovation) existing mostly in big companies (Jolly, 2008; Schumpeter, 1934). In the closed model, new knowledge is developed internally and retained within the business. On the contrary, in the open model, a company actively pursues externally generated knowledge and bring it into the business, then allows

internally generated knowledge to flow outwards, which increases the speed and the capacity of innovation in the business (Jolly, 2008). Struggling with resource constraints, startup owners tend to take advantages of open data sources and outsourcing (i.e., the open model of innovation strategy) through their social capital to increase their relation-specific knowledge acquisition required for new knowledge creation (Yli-Renko et al., 2001). In the knowledge and resource-based perspective, innovation reflects entrepreneur's characteristic trait (Schumpeter, 1934) and becomes ideal outcomes of knowledge exploitation (Tsai & Ghosal 1998, Subramaniam & Youndt, 2005). So why do some startups succeed in innovation, but some do not?

Bessant and Tidd (2015) argue that innovation success not be basically to turn ideas into reality. However, it is, in fact, under the influence of external and internal factors that regulate the innovation's possibility and emergence (Bessant & Tidd, 2015). Among these influencing factors, innovative behavior acts as a critical element of the organizational innovation development (Martinez-Roman et al., 2011). Nevertheless, an innovative behavior is too complicated to evaluate in practice. On the other hand, innovation is also dependent on a firm's innovative capabilities to approach and combine knowledge variables, that is internal resources gained from their own experiences and external resources gained from their networks, to generate newly useful and marketable ideas and concepts (Forsman, 2011). Hence innovative capability contributing mainly to the firm's innovative behavior becomes a prominent subject in the study of innovation success in entrepreneurship (Cohen & Levinthal, 1990; Martinez-Roman et al., 2011).

An innovative capability is defined as a significant factor facilitating organization's innovative culture and capability to advancing internal processes and responding appropriately to the external environment (Akman & Yimaz, 2008; Neely et al., 2001). In other words, that innovative outcomes, which result from the synthesis of internal and external knowledge, should adapt to the environment is the primary goal guiding innovative capability in a startup firm (Martinez-Roman et al., 2011; Guan & Ma 2003; Neely et al., 2001). Furthermore, the environment adaptability

determines a firm's flexibility over market changes and levels of innovative capability. However, the types of intellectual capitals accumulated in the innovation process determine the types of innovative capability, namely incremental or radical innovative capability (Subramaniam & Youndt, 2005). Accordingly, incremental innovative capability is the ability to use "reinforced prevailing knowledge" to create innovations which "refine and reinforce existing products and services"; while radical innovative capability is the ability to use "transformed prevailing knowledge" to create innovations which "significantly transform existing products or services" (Subramaniam & Youndt, 2005, p. 452). In simple terms, the former generates innovative ideas by exploring and improving an existing technological course, but the latter breeds innovative ideas by destroying the base of an existing technological course to transform it into something new. By selecting appropriate types of innovative capability to adapt for market and technological environment changes, startup firms can recognize opportunities, find suitable resources, develop new ideas and capture values to achieve strategic competitiveness, acquire competitive advantages, and improve business performance (Bessant & Tidd, 2015; Sher & Yang, 2005).

2.4.2. Dimensions of innovative capability

Furthermore, in the similar perspective of innovative knowledge and external environment, Martinez-Roman et al. (2011) recommend a multi-dimensional approach to the concept of innovative capability, consisting of dimensions of knowledge, organization and human factor (see Table 3).

Table 3. Dimensions of Innovative Capability

Knowledge dimension	Organisational dimension	Human dimension
Incorporation of new members	Autonomy (level of decentralisation)	Staff training and attitude
Learning and capacitation	Liaison/communication resources (workgroups)	Criteria for promotion and rewards
Research and development	Hierarchical power (supervision and control)	Risk-taking
	Market focus	

Source: Adapted from Martinez-Roman, Gamero, and Tamayo (2011).

Knowledge dimension

Firstly, knowledge dimension of innovative capability describes the fact that an innovative success is a desirable outcome of knowledge exploration and acquisition within and beyond an organization (Tsai & Ghosal, 1998; Subramaniam & Youndt, 2005). A startup's capability of innovation depends on a process of collective research and technological development based on the combined knowledge. It is acquired externally in collaboration with other and new members in community networks (Cohen & Levinthal, 1990), and internally from the firm's learning and capacitation (Guan & Ma, 2003).

Organisational dimension

Secondly, happening within an organization for its benefits, innovative capability indeed depends on the organizational structure, including autonomy, communication resources, hierarchal power, and market focus (Sher & Yang, 2005). In entrepreneurial cases, these factors are respectively decentralization of management, informal systems of communication and resources among the startup team members, a low level of hierarchical control, and a high level of market orientation. They facilitate knowledge exchange inside and outside the firm at a content-focused level to generate preferably innovative knowledge.

Human dimension

Lastly, there is a clear connection between innovative success and factors in the human dimension such as staff training and attitude, promotion, and rewards, and risk taking. All of these factors support the knowledge workers' capability of learning, technology and creativity to generate an innovative culture mainly, and a flexible and learning organization generally (Forsman, 2011).

In short, in the era of information and technology, the majority of startup knowledge-intensive firms following the open model strategy of innovation makes their innovative capability an indicator of how they utilize internal capacities and

external capitals to adapt to environment changes effectively. Therefore, dimensions of innovative capability, namely knowledge, organizational structure, and human factors, enable startup firms to either reinforce (incremental innovation) or transform (radical innovation) their knowledge. As a result, it causes distinctions in an innovative process of startup firms by their ways of accumulating and mediating intellectual capitals through their relationship networks.

2.5. Startup community

From the point of knowledge-base and resource-based view, startup firms with highly innovative capabilities tend to overcome their shortage of resources by using relational knowledge from their external networks, especially from whom they interact with more often (Shane & Cable, 2002). It results in an increasing role of their local startup community whose entrepreneurial members share common goals and learn from each other. It is also because startups from the same geographic location have priorities due to similar languages, cultures, scientific and technological bases, or business regulations that a participant beyond the region might find difficult for integration. So what is a startup community? How can it act as a catalyst promoting the relationships among an enterprise's external social capital, innovative capability and resource accessibility?

2.5.1. Definition

In the theoretical aspects, a startup community is primarily a community of practice. It is defined as a group of people who “informally bound together by shared expertise and passion” and “share knowledge in free-flowing, creative ways that foster new approaches to problems” (Wenger & Snyder, 2004, p. 123). With the aim of maximizing their entrepreneurial capabilities through creating and sharing knowledge together, participants in the startup community improve their learning together by directly solving their relevant and current problems. This learning process makes their entrepreneurship more effective in the short term and increases an amount of social capital among the members to build a stronger startup community in the long term. Besides, a community is an influencing environment for a process of new knowledge creation including the interchange of

explicit and tacit knowledge during the members' spiraling process of interactions in socialization, externalization, combination, and internalization (Nonaka & Konno, 1998). In a view of knowledge and information as an asset, community environment becomes a potential information culture shaping communication climate and covering all elements of both entrepreneurs and community (Widen-Wulff, 2007). In this culture, knowledge as an innovative resource is created, transmitted and made accessible for all the members of the startup community. However, it is noteworthy that a startup firm's level of knowledge collaboration and resource accessibility is varied, and mainly determined by their perceptions towards the community and their usage of networks and relationships within the community. Then who are the startup community members?

In fact, since a startup community is an outcome of active and frequent social collaboration, anyone can participate at any time, which defines their goals of participation, networks of relationships as well as his or her availability and accessibility of knowledge resources. Feld Brad, a famous author of the international bestseller "Startup Communities: Building an Entrepreneurial Ecosystem in Your City," divides the startup community members into two classes: leaders and feeders. Leaders are ones founding a business (founders or co-founders). Also, feeders are ones supporting local entrepreneurship (individual or organizations from universities, governments, investors, funders, mentors, or large companies) (Feld, 2012, p. 31-40). The leaders (i.e., entrepreneurs) must lead the community and make a long-term commitment (Feld, 2012) so that the community can maintain continuous drivers of social capital through regular physical or virtual activities. Thanks to that, it attracts more participation and produces social outcomes for their region's social and economic development as well as innovative advances in their members' success in innovation and business performance. The increasing quantity and quality of collaborative relationships between leaders and feeders have caused the prominence of social capital in the startup community as an explaining mechanism for an origination's external knowledge adoption and relational resource identification.

2.5.2. Community social capital

Being built from and aiming for collective and collaborative knowledge through network ties and cooperative relationships, community social capital plays a significant role of facilitating “certain actions of individuals who are within the structure” (Coleman, 1988, p. 302) and “coordination and cooperation for mutual benefit” (Putnam, 1995, p. 67). This valuable intangible capital rooted from social collaboration is built but not possessed by any individual. It belongs to and stays in the community, in which the quantity and quality of the participants (causing actors) keep changing over time. So the main characteristics of the community capital are context-dependence, and flexibility and diversity in resource offered. Therefore, the community capital allows young and small enterprises to enter into new markets at lower cost and fewer obstacles, and to access to new or alternative opinions and stimulates flows of ideas and advantages within the context of community (Burt, 2005, p. 23).

The community social capital also has three dimensions, that is structure, relation, and cognition, which is characteristically similar to organizational social capital, but at bigger scales and by more creating actors. First, the structural dimension covers information environment facilitating the social structure of the whole community as a channel for its members’ communication and networking (Burt, 1992). Second, relational dimension reflects the community identity of relatedness, willingness and responsibility to share and help. It is built on trust, motivations, collaborative attitudes embedded into the members’ engagement in cooperation with others (Tyler & Blader, 2001). Last, cognitive dimension refers to shared goals that everyone can access to useful knowledge. It results in the voluntary participation and motivation of information exchange through their own shared languages and narratives.

2.5.3. Drivers of community social capital

The startup community as an evolutive form of a community of practice has successfully maintained critical drivers of social capital, namely stability, closure, interdependence, interaction (Nahapiet & Ghoshal, 1998), to exist within the community, and to affect the participating startup firms’ internal and external

social capital partly. Stability is the time that community members spend on developing their strong interrelationships, sharing experiences leading to same vision and goals, and building trust and norms. Closure refers to the density of social networks among the community members which is based on same shared codes, languages, trust and identity. Interdependence is relevant to shared goals, cooperativeness, concerns for others' successes. Lastly, interaction promotes the frequency of communication between a member with each other, reflecting the quality and quantity of social ties to increase positive outcomes resulting from social capital creation and maintenance. So how can those driving factors affect each of community social capital dimensions, namely structure, cognition, and relation?

As for the structural dimension, stability, closure, and interaction contribute positively to an enabling information-sharing environment, because closure facilitates network ties by defining group members, and stability and interaction define network timing and configurations between the members. As for the relational dimension, closure, interaction and interdependence are conducive to mutual reliability, motivations for collaborating and sharing, and information behaviors, by which identifying and maintaining the community by commonly shared goals, norms, trusts, and obligations. As for the cognitive dimension, stability, closure, and interaction affect mostly by allowing the community members to involve into an accumulated and continuous creation of tacit knowledge and collective experiences, by which promotes shared codes, languages, and values for the community, and accelerate innovation processes for the members through knowledge and technological collaboration.

2.6. Theoretical framework

Based on the conceptual foundation of the relationship between external knowledge and resource accessibility in the context of entrepreneurship (which will be discussed further in the hypothesis proposal) and the definitions of an enterprising founder's external social capital, innovative capability, and entrepreneurial resources in his community, the research's theoretical framework is recommended and illustrated in Figure 4. The more in-depth explanation of the

relationships' directions in the model will be discussed when the research hypotheses are constructed.

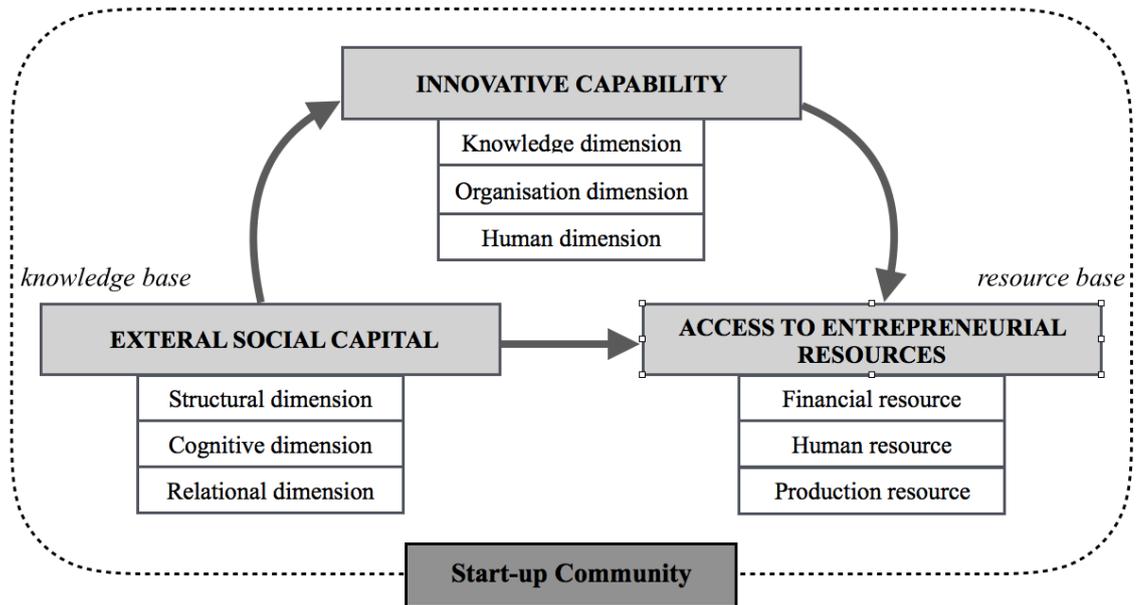


Figure 4. Theoretical framework

2.7. The model of knowledge creation and transition across startups in their community

The growing role of startup community has altered the ways companies doing business and manage their relationships. Despite being small in size and limited in the capital, entrepreneurial firms achieve their success by taking advantages of relational knowledge accumulated from their broad networks in the startup community. Instead of traditional business where a firm approaches all potential prospects to make them his customers, young enterprises tend to firstly seek opportunities of investment and consultancy for their innovative products, and then attract specific customers by their unique advantages over other competitors. So the products offered by a startup company, especially whose business run on technology and knowledge, are outcomes of knowledge exploited, transferred and combined within and beyond the company.

In the perspective of knowledge and resource theories discussed at the beginning of this chapter, the innovative knowledge is transferred, filtered and transformed in a sequence of relationships from the external environment (bridges) to internal settings (bonds) and vice versa. Then it becomes entrepreneurial resources and capitals required for a startup's growth of competitive advantages and successful performance. Bonds (i.e., internal social capital) enable startup team members to build trust, share beliefs and exchange tacit knowledge within their startup organization. Bridges (i.e., external social capital of a startup firm) create information-transmitting channels linking founding team with other partners in their startup community for broad critical knowledge (Adler & Kwon, 2002). Therefore, social capital exploitation through a wise mix of bonds and bridges helps entrepreneurs drive strategy, add new lines of business, solve business and technological problems quickly, transfer best practices, develop their employee's professional skills, and recruit and retain top talents their field (Wenger & Snyder, 2004; Adler & Kwon, 2002).

According to Maznevski and Athanassiou (2007), the internal and external knowledge, which are transferred through an organization's internal (bonding) and external (bridging) social capitals respectively, should be distinguished for planning a suitable relationship strategy to access the most valuable knowledge at a particular phase of their entrepreneurial process. The first reason is that the knowledge from external sources has greater scope and breadth, hence innovative potential, than the one from internal sources. The second reason is the fact that methods for controlling external flows of knowledge (i.e., beyond the firm's boundary) are more restricted than are methods for controlling internal flows of knowledge (i.e., within the firm's boundary). Therefore, to succeed in exploiting external resources leading to the higher amount of intellectual and financial capitals, startup founders should build efficient networks of relationships to accelerate the knowledge flows inwards and outwards their ventures. These relationship networks support directly through a startup's strategy of growth and innovation by identifying a source of external knowledge, providing earlier and easier access to essential and non-public explicit knowledge, and transferring tacit knowledge through personal relationships and collective contexts.

From a perspective of organizational capitals, the flow of knowledge through a founder’s social relationships and networks creates “stocks of social capital” (Maznevski & Athanassiou, 2007, p. 74). Thus the amount and value of tacit knowledge that a startup firm acquired from their community depends on their external relationships, or more specifically the relationships’ level of strength, transferability, and flexibility.

So how is it possible for the knowledge to be transferred through bonds and bridges, transformed into capital and resources, and exploited into innovation? As an outcome of the discussion, Figure 5 illustrates the model of knowledge transfer based on the literature review of entrepreneurial resources, external social capital, innovative capability, and community social capital, which was explained earlier in this chapter.

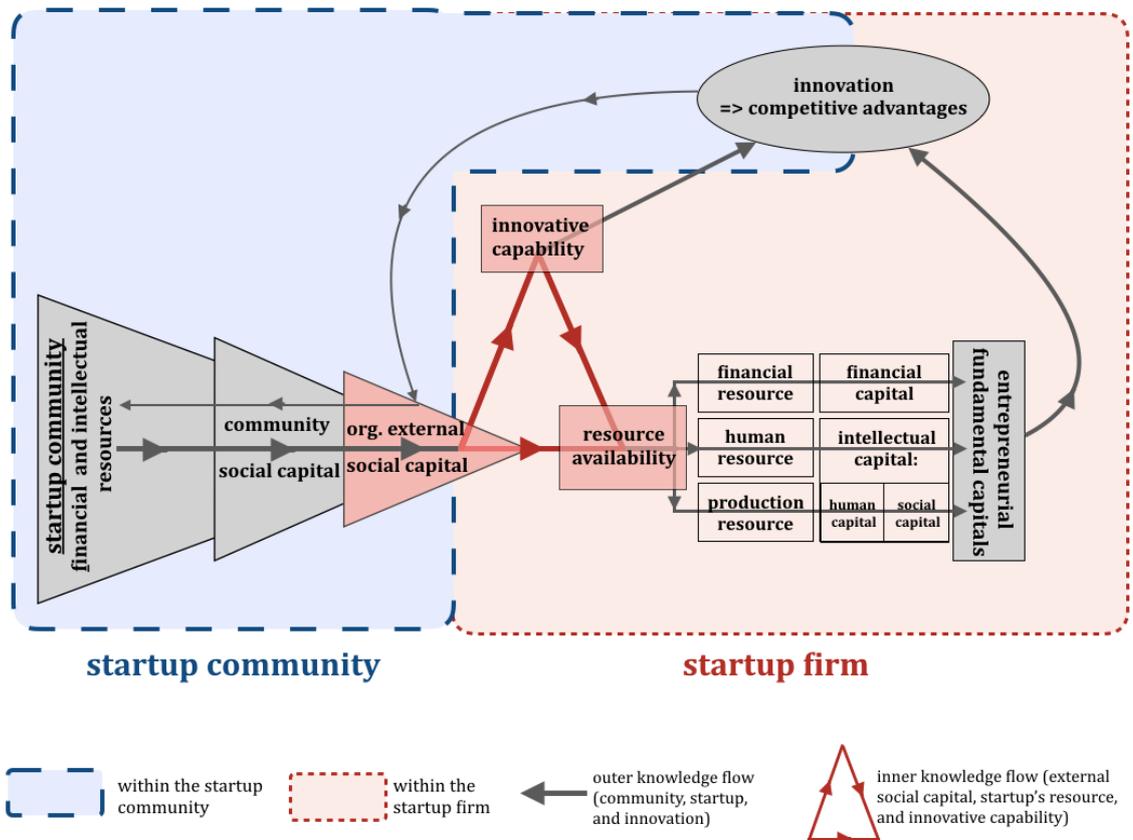


Figure 5. The model of knowledge creation and transition across actors in a community

According to the model (Figure 5), here are two primary flows of knowledge: the outer flow (in grey) and the inner flow (in red).

The outer flow of knowledge

It is remarkable that the outer flows of knowledge is characteristically a complete and repetitive cycle linking three key acting factors, namely community, entrepreneurial firm and innovation, throughout which knowledge as useful resources is transmitted in smaller quantity but higher quality. Since members including both leaders and feeders in the startup community come from diverse backgrounds, the prevailing knowledge produced from their sharing, collaborating and creating is enormous in volume and complex in content. It is embedded into community social capital, refined and transmitted selectively into a startup firm through their organizational external capital. A part of this refined external knowledge and financing opportunities then combines with the firm's internal capabilities to become their entrepreneurial resources of finance, human, or production; and later turns into the startup's original capitals. These capitals together with the firm's innovative capability transform the collaborative mix of the outer and inner knowledge into an innovative outcome (hence creating their competitive advantages). Because the startup founder is participating into the startup community, all three dimensions of the community social capital, to some extent, encourage his trust and motivation of sharing his innovation success through favorable network ties and relationships in the startup community. It means that the firm's innovative knowledge is selectively codified to become potential assets of their external social capital, and then be partly transferred into their community social capital. In fact, this shared knowledge is immediately immersed into the vast community pool of prevailing knowledge, and later is possibly exploited by other community members, or even by the same sharing firm. Then the similar outer knowledge flows repeat to make a circle of knowledge transfer in the community's information sharing environment.

The inner low of knowledge

The inner flow of knowledge is a triangle relationship of three factors, namely external social capital, innovative capabilities and organizational resources; each of

which has relation with one corresponding factor in the outer flow, namely community, innovation, and entrepreneurial firm respectively. It explains the process of knowledge transmission through the startup's bridges and bonds within their organization and in broader community networks. In details, the startup firm explores external knowledge and blend it with their internal capabilities (that is, innovative capability) for purposes of innovation by reflecting the interrelationships among external social capital, entrepreneurial resources, and innovative capabilities in the firm's process of innovating their products and overcoming their resource limitation. The prevailing knowledge, as the community's social capital, is approached by the startup founder's external relationships (that is, external social capital). This knowledge resource enriches the firm's innovative capabilities, and both of them combine to expand the fundamental entrepreneurial capitals of the firm for possibly current innovation and upcoming opportunities.

By active and continuous movements of inner and outer knowledge flows in an organisation setting, the model implies value chains of social capital and resources, by which an enterprising founder can promote his knowledge exchange and combination with his community members. In their community networks, weak social ties reflect relationships with weak value chains, helping them scan and filter their external knowledge. On the contrary, strong social ties provide relationships with strong value chains. These strong social bridges reside in a supportively matured startup community and accelerate its members' interactions to gain their social capital, hence both explicit and tacit knowledge

2.8. Conclusion

To sum up, the model suggests an exploratory mechanism of the entrepreneurial inflows and outflows of knowledge in the startup community, in the perspective of knowledge-based and resource-based view. In this conceptual model, the inner flow of knowledge is the central object of this study, because it is conducive to smooth flow of the outer knowledge route. The relationships among factors in this flow will be discussed in the next chapter for establishing the study's hypotheses.

With a purpose of maintaining steady transmission of knowledge in a chain of relationships and capitals, there should be an ideal environment storing the resources and fostering the innovation-oriented flows of information among startup firms. In other words, entrepreneurial networks producing external social capitals must be framed by a community of practice, usually a geographically local startup-community, which is conducive to gathering and attaching startup companies with similar interests and knowledge bases. According to the model and characteristics of transferred knowledge beyond a startup firm, it suggests that the startup founder's external social capital reflecting his firm's value chain relationships and knowledge flows in the startup community supports an increase in their internally entrepreneurial capitals and innovative capability.

3. Relationships and Hypotheses

From the model, it states that the inner flow of knowledge is a central factor determining the stability and continuation of the outer flow, because it is the frontier between the startup firms' internal capitals and external resources, and bridges the gaps between entrepreneurs and the startup community. Therefore, inner flow of knowledge is the primary foundation to built up the whole model. The structure of this flow describing the relationships of external social capital, resource accessibility and innovative capability is also the primary theoretical framework of this research, which was presented previously by the synthesis of resource-based view and knowledge-based view (Figure 4 in section 2.6).

Those relationships in the inner flow of knowledge will be explained and hypothesized in this chapter.

3.1. Social capital - Innovative Capability

Investment in social capital can assist a startup to reduce transaction costs of a new market entrance and external knowledge acquisition and to accelerate information flow and knowledge creation (Burt, 2000; Nahapiet & Ghoshal, 1998; Lin, 2001). Hence it increases the number of fundamental capitals preserved for business operation and innovation, by which increase the firm's innovative capabilities. In fact, resulting from a research about influences of an organisation's organisational intellectual capitals on its innovation capabilities, conducted by Subramaniam and Youndth (2005), the researcher conclude that individual interaction and social capital have positive influences on the innovative organisational capabilities thanks to the creation and codification of knowledge through their networking, channelling and sharing in particular communities or relationships. Moreover, an entrepreneur's external social capital links his young firm to a big community where provides a dynamic environment for the firm's to acquire and exploit knowledge through interactive channels and motivation to trust and to share. This external knowledge acquisition enriches the firm's innovative capabilities by increasing diversity in innovative resources, encouraging their employees to collaborate internally and externally, and shortening the time for products design and development. Similar to this argument, Larson (1992)

proves that norms of reciprocity (relational dimension of social capital) provide entrepreneurs with power and freedom to exchange knowledge, take risks, and innovate with one another in their community. Therefore, a founder's external social capital have a positive influence on all three dimension of his firm's innovative capability. Specifically, it improves the organization's knowledge transmission and learning environment (knowledge dimension), employee's networks, attitudes, and skills for innovative readiness (human dimension), and open-to-share and innovative working culture (organizational dimension).

Hypothesis 1. External social capital has a positive influence on innovative capabilities

3.2. Innovative capability and entrepreneurial resources

By conducting a study of German entrepreneurship with massive participation of 2000 Bavarian startups, Bruderl and Preisendorfer (2000) found out that innovation is the most powerful predictor for a firm's internal capability to grow fast and access to more essential resources. Without the capability to generate innovation, it is challenging for young firms to do business and attract customers in traditional ways because of a shortage of financial capitals, experience, and competitiveness. (Lee et al., 2001). Innovative capability requires rich, varied and diverse knowledge which need to be acquired and accumulated from external sources for a long term. So it implies that the more capable of innovation a firm is, the more resources the firm can access or obtain. In an aspect of physical capital needed for establishing and sustaining a new enterprise, internal innovative capabilities assist the founder to gather external financial resources, since potential investors preferably cooperate with the startups having a high degree of innovativeness (Lee et al., 2001). While intellectual capitals are accumulated mainly by increasing human and production resources, a startup's innovative organizational culture encourages the employees' learning and risk-taking attitude. As a result, they become innovation-oriented and actively search for favorable resources and collaborative opportunities in their social relationships to achieve the firm's innovative success, which is, at the same time, to improve the quantity and quality of the firm's entrepreneurial resources.

Hypothesis H2. The innovative capability has a positive influence on entrepreneurial resource access

Hypothesis H2 generates three sub-hypotheses H2.A, H2.B, H2.C, corresponding to three types of entrepreneurial resources in the theoretical discussion and model.

Hypothesis H2.A. The innovative capability has a positive influence on financial resource access

Hypothesis H2.B. The innovative capability has a positive influence on human resource access

Hypothesis H2.C. The innovative capability has a positive influence on production resource access

3.3. External social capital and entrepreneurial resources

A startup is hardly built up by the entrepreneur's financial and human capital alone. However, it requires his external contacts to acquire more resources and capitals attached to larger inter-organizational networks (Burt, 1992) as well as to identify more entrepreneurial opportunities (Wu, 2005). Additionally, in the resource-based view, knowledge is a source of competitive advantage (Spender, 1996) and social capital is regarded as a driver of long-term success to strive against the capital limitation. Through frequent interaction and cooperation with other companies in the startup community, enterprising founders increase their organization's network ties, trust and trustworthiness, and shared norms and visions with others in the community (Uzzi, 1996). As a result, they have more chances to access to external supports and guidance, discover opportunities of partnership or sponsorship, and possibly collaborate with others to approach innovation and competitive values (Larsson et al., 1998). Hence,

Hypothesis H3. External social capital has a direct positive influence on entrepreneurial resource access

Furthermore, apart from enterprising founders, the startup community also contain other financing agents, who work for government funding, venture capital or private investors. Therefore, effective networking with them results in higher access to financial resources. Uzzi (1997) claims that enterprise founder who possesses higher social capital possibly have easier and earlier access to financial support, at surprisingly lower interest rates. Hence,

Hypothesis 3.A. External social capital has a direct positive influence on financial resource access

The social capital embedded into the community networks attaches its members by mutual feelings of attachment, trust, motivation, and willingness to share and to learn from each other (Uzzi, 1996). Thanks to that, it improves knowledge exchange and decreases the cost of accessing information, which is conducive to creating a collaborative learning environment where startup employees (that is, also members of the community) can expand their connections, improve their professional skills and find solutions for their problems in entrepreneurship.

Hypothesis 3.B. External social capital has a direct positive influence on human resource access.

In the community, some startups could be other startups' suppliers or partners. So strong social interaction ties between the startup community members increase chances of cooperation for better production technology and higher innovation rates. In an aspect of market expansion, social capital affects positively on a firm's sales growth (Lee et al., 2001; Bruderl & Prenerdof, 1998). Moreover, it also helps entrepreneurs identify business opportunities regarding customers, market, and production.

Hypothesis 3.C. External social capital has a direct positive influence on production resource access

3.4. Mediating effect of innovative capability

The hypothesis H1 and H2 (including three sub-hypotheses) connect external social capital with innovative capability, and link innovative capability with three types of primary entrepreneurial resources. These connections implicitly recommend that external social capital has effects on startup resources via its effect on innovative capability. In fact, entrepreneurial firms with more social capital usually obtain higher returns to their innovative capabilities, hence attracts more cooperative opportunities from investors and partners collaborate, which increase their accessibility to a more significant amount of resources (Lee et al., 2001). Thus, it proposes that innovative capability mediates the relationship between external social capital and each type of entrepreneurial resources that a firm can access and obtain.

Hypothesis H3M. Innovative capability can mediate the relationships between external social capital and entrepreneurial resources.

The mediation of innovative capability is tested with all three types of entrepreneurial resources, so the three sub-hypotheses are correspondingly stated below.

Hypothesis H3M.A. Innovative capability can mediate the relationships between external social capital and financial resource.

Hypothesis H3M.B. Innovative capability can mediate the relationships between external social capital and human resource.

Hypothesis H3M.C. Innovative capability can mediate the relationships between external social capital and production resource.

In conclusion, a summary of hypotheses can be referred in Table 4. These hypotheses will be examined by empirical research of Finnish startup companies doing business in knowledge-intensive sectors. Still, the Finnish startup community and entrepreneurship in the Finnish knowledge-intensive sector will

be discussed in the next chapter first, then next is the presentation of the practical research.

Table 4. List of hypotheses

Hypotheses' code	Description
H1	External social capital has a positive influence on innovative capability
H2	Innovative capability has a positive influence on entrepreneurial resources
H2.A	Innovative capability has a positive influence on financial resource
H2.B	Innovative capability has a positive influence on human resource
H2.C	Innovative capability has a positive influence on production resource
H3	External social capital has a directly positive influence on entrepreneurial resources
H3.A	External social capital has a directly positive influence on financial resource
H3.B	External social capital has a directly positive influence on human resource
H3.C	External social capital has a directly positive influence on production resource
H3M	Innovative capability can mediate the relationships between external social capital and entrepreneurial resources
H3M.A	Innovative capability can mediate the relationships between external social capital and financial resource
H3M.B	Innovative capability can mediate the relationships between external social capital and human resource
H3M.C	Innovative capability can mediate the relationships between external social capital and production resource

4. Research method and material

4.1. Overview of Finnish entrepreneurial ecosystem

Before continuing with the empirical research of Finnish knowledge-intensive startup firms to justify the earlier suggested mode, it is better to get familiar with Finnish startup community in general and knowledge-intensive sector.

Finnish startup community consists of participants from various and diverse backgrounds and business positions. They are not only startups (i.e., community leaders) searching for opportunities, but also other “community feeders” such as big companies, universities, investors, or advisors from both domestic and foreign nations. Within the community, there are sub-communities organised by Finnish universities (such as LauraES from Laurea University of Applied Sciences, Aalto Entrepreneurship Society from Aalto University, and so on), government (such as TE startup programs, TEKE, or Finpro), and other startup services providers (such as TheShortcut, thehub.fi, Startup Sauna and many). The Finnish fast-growing startup ecosystem has changed various social and economic aspects by generating technology and knowledge innovation, economic renews, and employment for the national economic development. This system which is supported hugely by Finnish governments and other private organizations has nurtured a highly supportive community, by which the startup firms are conditioned to bloom. In fact, there are two new forms of organization administrated by “community feeders” increasing their role in promoting domestic entrepreneurship, namely accelerator and incubator. Accelerators aim at connecting existing startups with critical influencers to advance their growth under a set timeframe (usually, for some months). In return for initial capital investment, accelerators will take predetermined some percentage of the startup’s equity. Some popular ones are xEdu, Startup Sauna, Boost Turku, NewCo Helsinki, Vertical, Hub13, VTT Ventures, or Kiuas. On the contrary to accelerators, incubators do not invest capital in exchange for equity, they aim to provide advice with business models and strategic directions to pre-startup firms. Some common ones are Ukipolis, TE startup program, Maria01, Aalto Startup Centre, or entrepreneurship clubs from universities. Due to the high demand for financial capital at the first startup phase, Finnish startups favorably apply for accelerator programs, which increases more accelerators than incubators

in the community. Moreover, the Finnish startup members interact actively in community events and programs in both physical and virtual platforms. There are huge events connecting startups with potential investors, customers and business advisors such as Slush, Arctic 15, Upgrade Life Festival, Nordic Digital Business Summit; or small meet-up events for sharing interests in a particular topic taken place in community houses for startups, namely Maria01 and Microsoft Flux. Also, online communication applications are used actively by startups and other community participants to share and communicate with groups or individuals such as StartupHelsinki on Slack, Startup Finland group on Facebook, and others. According to FiBAN, as one of the most dynamic startup land in the Nordics, Finnish startups raised 349 million euros in venture capital as the highest record in the year 2017. Figure 6 shows that Finnish startups' financial sources are currently from foreign business angels, Finnish venture capitals, Finnish business angles and crowdfunding. From 2010 to 2017, investments in Finnish companies have been increasing significantly from foreign investors who accounted for 20 percent in 2010 but raised up to 60 percent in 2017. Together with an increase in crowdsourcing, it proves Finnish startups are born-global development and attractiveness in the eye of investors, especially the ones working in knowledge and technological sectors, preferably following new trends like artificial intelligence, blockchain, or cybersecurity.

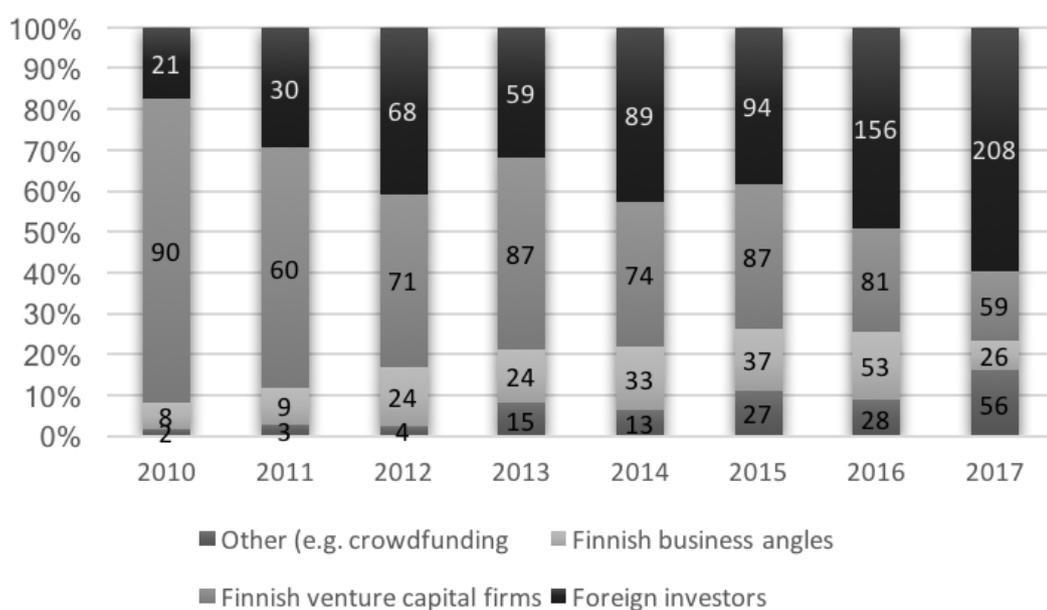


Figure 6. Finnish startup investment from the year 2010 to 2017

Source: Data collected by FiBAN Finnish Business Angles Network. (2018).

As the target population of this research is startups in the Finnish knowledge-intensive sector, the overview of this business sector will be covered then. According to Eurostat's aggregation of services (NACE Rev. 2, see Appendix 2), there are four sub-sectors including knowledge-intensive market services (excluding high-tech and financial services), high-tech knowledge-intensive services, knowledge-intensive financial services and other knowledge-intensive services.

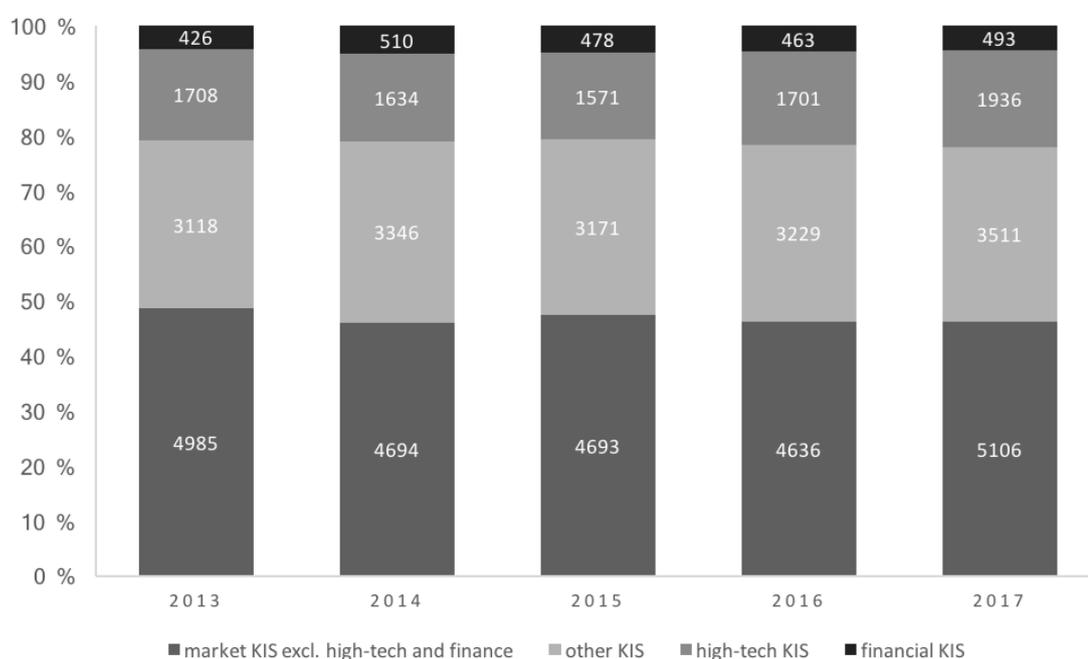


Figure 7. Enterprise openings from 2013 to 2017 by sub-sectors.

Source: Data collected by Statistics Finland (2018).

According to the data collected by Statistics Finland (Figure 7), the number of companies starting a business in knowledge-innovative as a whole and by each sub-sector is quite stable from the year 2013 to 2017. The sub-sector “knowledge-intensive market services“ is the highest choice of company establishment, following are other services, high-tech services and lastly financial services.

Referring to Appendix 3, the most common field of business in each sub-sectors are below:

- knowledge-intensive market services: activities of head offices: management consultancy activities
- high-tech knowledge-intensive services: Computer programming, consultancy, and related activities
- knowledge-intensive financial services: Financial service activities, except insurance and pension funding
- other knowledge-intensive services: Education

Moreover, startup founders and other participating organisations and individuals are main actors stimulating and controlling the knowledge transferred within their community. In Finnish entrepreneurial ecosystem, most of those actors, particularly in knowledge-intensive sectors, are well-educated in their business field and have much experience in entrepreneurship. Hence they provide various and diverse sources of knowledge to the other community members during interactions, communication and collaboration.

In conclusion, under a mature startup community, Finnish startups, especially in knowledge-intensive sectors, are believed to increase their role in supporting domestic economy continuously. Moreover, in the research's aspect, Finnish supportive community conditions its startup members to interact frequently and collaborate for the mutual interest of innovation and global growth.

4.2. Sampling and data collection

The primary purpose of the empirical research is to examine the conceptual model of knowledge transfer in an entrepreneurial community (Figure 5) by practically assessing the causal links in the chain of knowledge-based and resource-based factors. In fact, it analyses the hypothesized relationships between critical factors (that is, external social capital, innovative capability, and entrepreneurial resources) in the inner flow of knowledge. It is because the inner flow determines the outer flow of knowledge, hence the complete model as the focus of the study.

As defined, the target population is a set of elements possessing the information that the researcher searched to draw inferences (Malhotra et al., 2017). The target population in this study was composed of all Finnish startup companies that meet the following conditions, which are recommended by Business Finland:

- The company is registered in Finland.
- The company is less than five years of age.
- The company is categorized as small. It means the maximum number of personnel is 50, and the maximum annual turnover or maximum final balance is €10 million.
- The company is doing business in the knowledge-intensive sector, which is based on NACE Rev. 2 codes at 2-digit level, defined by Eurostat's indicators on knowledge-intensive services (See Appendix 3).

Moreover, the respondents who directly received and completed the survey should be founders, co-founders, or at least senior managers of the participated companies, because the survey completion required their hands-on acknowledgment of their business situations and experience with Finnish startup community.

About sampling procedures, to represent those defined elements of the target population, a sample frame consisting of a list of 278 Finnish knowledge-intensive SMEs was created by the assistance from Finnish startup's supporting organizations, including thehub.fi, Microsoft Flux, MOW, and Nordic Digital Business Summit 2017. The list included prospects' names, position, company names, and email address, although those details would not be shared or asked in the survey to maintain confidentiality and objectivity. Then there are two conventional techniques in sampling: non-probability and probability sampling (Malhotra et al., 2017). Because of being less expensive, less time-consuming, and ideal for exploratory research, judgemental sampling known as a form of convenience sampling, was applied into the sample frame (Malhotra et al., 2017). The participating companies from the sample frame were judgmentally selected based on their business field (i.e., in a knowledge-intensive field), and year of

commencement (i.e., less than five years) which were displayed on the company website. As a result, the final sample list of 204 background-eligible prospects was created for the following step, that is survey distribution.

The survey was distributed online by Typeform questionnaire tool (www.typeform.com). The questionnaire was available in English. The email invitations embedded with the hyperlink to the survey were sent to the prospects in the finalized sample list. It contained the research's purposes, estimated time for completion, and appreciation for their participation. Moreover, the survey was available online from November 24th of 2017 to January 26th of 2018. During that time, there was a total of 140 visits with 79 responses, in which 68 responses were valid; the completion rate was 56.4%, and the average time to complete was 4 minutes 52 seconds.

4.3. Measures

All these constructs were measured using scales based or developed from the previous studies (see Appendix 4). Measures are briefly mentioned below.

- **External social capital.** The external social capital was measured formatively by three social capital's dimensions, namely structural dimension (social interaction ties), relational dimension (trust, norms of reciprocity, and identification), and cognitive dimension (shared vision and shared language). The three-item scale used to measure each of them was adapted from the original study of social capital and knowledge sharing in virtual communities, conducted by Chiu, Hsu and Wang (2006). In this study, the "BlueShop virtual communities" was replaced by "the startup community" due to general similarities in defining social capital and its dimensions in the context of community (Chiu et al., 2006).
- **Innovative capability.** The innovative capability was measured with four-item scale examining the firm's capability to innovate new ideas. It was based on the measurement of the construct "organizational creativity" in the discussion conducted by Lee and Choi (2003) about how knowledge is created and managed to improve an organization's innovation and hence performance.

- **Financial resource.** This construct reflects a founder's ability to get capital for his venture from personal or external financing sources. It was measured with a two-item scale, which is adapted with word alternation from early research of entrepreneurial performance through their accessibility of resources (Fornomi et al., 2013).
- **Human resource.** This construct reflects the startup employee's expertise and networks supporting their tasks in an entrepreneurial environment. The three items assessing human resources was adapted from Subramaniam and Young's prior study of effects of a firm's intellectual capitals including human and social capital on its innovative capabilities (Subramaniam & Young, 2005).
- **Production resource.** The production resource reflects information accessibility and availability leading to product and market development, covering market, talent pool, and technology. Despite being developed based on the study of social capital's effect on an entrepreneur's performance by Fornomi, Arribas, and Vila (2013), the measures with three items in this study was designed with word alteration to fit the research context better.

4.4. Questionnaire and measurements

In this case study, the questionnaire included three groups: social capital (sub-groups: structural, relational and cognitive dimensions), innovative capability and resource accessibility (sub-groups: finance, human, and production). Each of them contained two sections. The first section consisted of constructs, also known as latent variables, representing their respective group. The second section contained selected questions, which is known as scale items or indicators, representing their corresponding construct. All the indicators were measured with a 7-point Likert scale, with 1 indicating "Strongly disagree," and 7 indicating "Strongly agree." Moreover, to avoid duplication, responses from the same network ID addresses, which was automatically collected and displayed by the typeform.com survey platform, was removed. Furthermore, the online questionnaire showed only one question per screen to reduce the respondents' abandonment while they were answering the survey. (Schonlau et al., 2002). The illustration of the empirical framework for hypothesis testing can be referred in Figure 8.

It is noteworthy in the hypothesized model (Figure 8) that the three first-order constructs, namely “structural dimension,” “relational dimension” and “cognitive dimension,” have a reflective measurement. While the second-order construct “Social capital” have a formative measurement, in which the first-order constructs are assumed to function as indicators of the second-order construct (Hair et al., 2010).

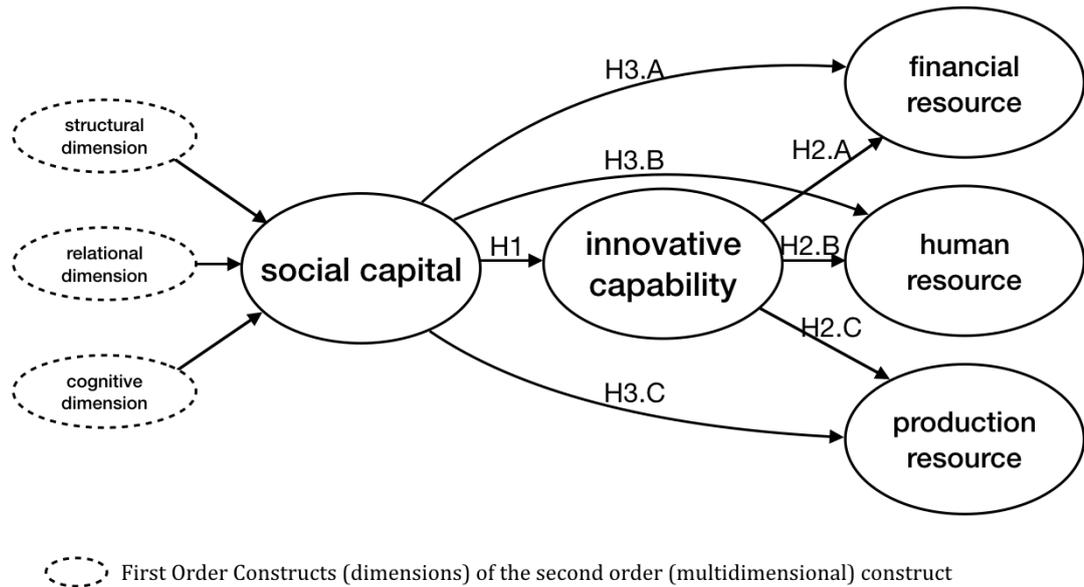


Figure 8. Hypothesised model

Note. This is a simplified version of the actual model, which does not show the indicators of the latent constructs. The mediating effect describing hypotheses H3M (including H3M.A, H3M.B, H3M.C) is not directly visible in the model.

4.5. Data analysis

Theoretically, there are two structural equation modeling (SEM) based techniques commonly used to analyze relationships in a structural model with multiple variables. They are covariant based SEM (CB-SEM), and partial least squares based SEM (PLS-SEM). The second one was selected to explore the direct and indirect effect of social capital on entrepreneur’s access to fundamental resources. The data was validated, and hypotheses were tested by SmartPLS 3.0 software, while the variables’ descriptive calculation (i.e., mean and standard deviation) was interpreted by SPSS. Theoretically, the data assumption in PLS approach is less restrictive than in the other SEM models (Hair et al., 2011). Consequently, the

normality test for the normal distribution is not required in PLS analysis, but bootstrapping is applied to practically estimate standard errors and evaluate its parameters (Gefen et al., 2011). Thus the PLS approach has analytical advantages towards theoretical development whose a sum of scale items indicating each construct is small. As, in this case, six over seven of the constructs have only two to three items. This study applied Bias-Corrected and Accelerated (BCa) bootstrapping which is the default setting in SmartPLS software to calculate confidence intervals with two-tailed test type, 5 000 samples at the 0.5 significance level.

5. Model assessment and Results

There are two steps of assessment in PLS analysis. The first one is to assess the measurement model, or called outer model, to evaluate the validity and reliability of the model's constructs and their indicators. The second step is to assess the structural model, or called inner model, to examine the proposed hypotheses of the relationships among social capital, innovative capability and resource accessibility (see Figure 8 in section 5.3). It is also noteworthy that measuring goodness-of-fit criterion and overall model fit, which is normally seen in CB-SEM, is not presented in the analysis of PLS-SEM path model (Hair et al., 2012; Henseler et al., 2012).

5.1. Measurement model

Since there are both formative and reflective measurements in the mode, the assessment of the measurement model will be as follows - reflective measurement, and formative measurement.

5.1.1. Reflective measurement

In this first assessment, the measurement model results are used to examine the validity and reliability of the indicators measuring their construct (Chin et al., 1998).

Firstly, the initially main focus in the reflective model is its indicators' outer loading values, which reflect the contribution of the indicating items to its own construct. The closer to 1.0 those values are, the more reliable the construct is. The outer loadings should be, by convention, greater than 0.60 (Henseler et al., 2012). In the reflective model, the construct is assumed to be the "reality" and indicators are a set of possible measured variables indicating that reality. Accordingly, it implies that dropping one indicator may not affect the whole model since the other indicators can represent the construct as well. (Hair et al., 2011). Therefore, in this research model, the indicating items "str2", "cog3", "rel1", and "hum3" were dropped because of their low outer loading values

Table 5 shows the measurement statistics of constructs and their reflective indicators after dropping the inappropriate items whose loading value are smaller than 0.60.

Table 5 . Measurement statistics of constructs and reflective indicators.

Construct / Indicators	Mean	Standard Deviation	Indicator Loadings	t-value*	Composite Reliability	Average Variance Extracted (AVE)
structural dimension	5.41	1.88			0.73	0.57
str1	5.57	1.47	0.81	5.46		
str3	5.25	1.18	0.70	3.06		
relational dimension	5.42	1.85			0.91	0.84
rel2	5.79	1.13	0.92	46.03		
rel3	5.04	1.47	0.91	33.93		
content dimension	5.09	1.85			0.86	0.75
cog1	5.19	1.27	0.87	16.14		
cog2	4.99	1.34	0.87	24.33		
human resource access	4.56	2.14			0.91	0.83
hum1	4.71	1.64	0.93	44.08		
hum2	4.41	1.37	0.88	20.57		
financial resource access	5.28	2.22			0.86	0.75
fin1	5.37	1.52	0.88	7.54		
fin2	5.19	1.62	0.85	7.83		
production resource access	4.82	2.24			0.84	0.63
pro1	4.66	1.30	0.77	7.16		
pro2	4.54	1.17	0.87	9.50		
pro3	5.27	1.41	0.74	4.70		
Innovative capability	5.66	2.51			0.89	0.67
inn1	5.59	1.23	0.83	17.98		
inn2	5.56	1.14	0.80	10.55		
inn3	5.74	1.36	0.88	23.84		
inn4	5.77	1.28	0.76	13.26		

*t-values: the bootstrapping of 5000 sample and the significant level of 0.05

The next step is to examine the constructs' reliability (indicator's reliability and consistency reliability) and validity (convergent validity and discriminant validity).

About indicator reliability, all the indicator loadings are higher than the 0.60 cut-offs (Henseler et al., 2012; Chin et al., 1998). As it is academically believed that composite reliability is more accurate than Cronbach's alpha when assessing consistency reliability in PLS models (Henseler et al., 2012), constructs' composite reliability was calculated and reported in Table 5. As shown, the constructs'

composite reliability ranges from 0.73 to 0.91, which are more than the threshold value of 0.70 (Bagozzi & Yi, 1988). Therefore, the constructs' reliability is established.

About constructs' validity, the convergent validity was firstly examined by calculating average variance extracted (AVE) value of each construct (Fornell & Larcker, 1981). As seen from Table 5, the AVE results, ranging from 0.57 to 0.84, support the convergent validity because all of them exceed the recommended value of 0.50 (Hair et al., 2011). Next, the discriminant validity of all the constructs is confirmed according to Fornell-Larcker criterion (1981), because each construct had its square root AVE (bold values, Table 6) greater than its correlations among the other constructs.

Table 6. Discriminant validity based on Fornell-Larcker criterion (1981)

Constructs	1	2	3	4	5	6	7
1. structural dimension	0.76						
2. relational dimension	0.24	0.91					
3. cognitive dimension	0.33	0.61	0.87				
4. financial resource	0.25	0.34	0.41	0.86			
5. human resource	0.16	0.49	0.44	0.43	0.91		
6. production resource	0.10	0.36	0.42	0.41	0.57	0.79	
7. innovative capability	0.36	0.31	0.34	0.42	0.41	0.39	0.82

bold numbers: the square roots of the AVEs

The discriminant validity was further tested by all indicators' cross-loadings on different constructs (Hair et al., 2010). The results in Table 7 represent that the constructs are discrete because the indicator's loadings on their corresponding construct (factor loading) was higher than its cross-loadings with any other constructs.

Table 7. Factors loadings (bold) and cross loadings

	structural dimension	relational dimension	cognitive dimension	financial resource	human resource	production resource	innovative capability
str3	0.70	0.14	0.24	0.20	0.15	0.10	0.09
str1	0.81	0.22	0.26	0.18	0.10	0.05	0.43
rel2	0.21	0.92	0.63	0.31	0.47	0.40	0.29
rel3	0.23	0.91	0.48	0.31	0.43	0.24	0.27
cog1	0.28	0.52	0.87	0.33	0.42	0.43	0.30
cog2	0.29	0.54	0.87	0.38	0.35	0.31	0.30
fin1	0.24	0.27	0.36	0.88	0.35	0.35	0.41
fin2	0.19	0.33	0.39	0.85	0.40	0.36	0.30
hum1	0.24	0.48	0.54	0.42	0.93	0.59	0.38
hum2	0.03	0.40	0.37	0.36	0.88	0.43	0.37
pro1	0.22	0.20	0.27	0.28	0.47	0.77	0.37
pro2	0.04	0.29	0.32	0.24	0.51	0.87	0.30
pro3	-0.02	0.35	0.44	0.44	0.38	0.74	0.26
inn1	0.33	0.36	0.43	0.44	0.34	0.44	0.83
inn2	0.24	0.21	0.24	0.23	0.29	0.22	0.80
inn3	0.33	0.28	0.40	0.40	0.38	0.35	0.88
inn4	0.23	0.06	0.14	0.17	0.33	0.17	0.76

In conclusion, the assessment confirms the reliability and validity of all the constructs in the reflective model.

5.1.2. Formative construct “Social Capital”

The formative construct “Social Capital” is a second-order construct. As similar to the assessment of the first-order items, the quality assessment of the second-order constructs was carried out at the first-order construct level, and at the second-order construct level (Chin et al., 1998).

The assessment of the first-order constructs has been already accomplished in the earlier part, as all of them are reflective constructs.

At the second level, the first-order constructs function as the second-order construct’s indicators (Hair et al., 2010). As shown in Table 8 all the weights of the first-order constructs are above 0.10 and significant at the level 0.5. It means that the first-order constructs are relevant to the second-order construct, which

indicates its validity towards theoretical conception and empirical data (Hair et al., 2011). Collinearity statistics further examines the first-order constructs' validity. Since avoiding excessive multicollinearity between the constructs leading to redundancy, the variance inflation factor (VIF) was calculated (Hair et al., 2011). The results ranging from 1.123 to 1.681 are lower than the suggested threshold of 5 (Hair et al., 2011). Lastly, the nomological validity, which means that the formative construct has intended meaning towards the proposed hypotheses, is proved by the significant relationships between the construct "social capital" with other constructs in the model (see Table 9).

Table 8. Weights of the first-order constructs on the second-order constructs

2nd Order Construct	1st Order Constructs	Weight	t-Statistic
Social capital	Structural dimension	0.20	3.43*
	Relational dimension	0.53	10.90*
	Cognitive dimension	0.49	11.19*

*Significant at the level 0.05 based on 5000 bootstraps

Table 9. Structural estimates between second-order constructs and other constructs in the model

Path	Coefficient	t-Statistic
Social capital -> Financial resource	0.32	2.11*
Social capital -> Production resource	0.31	2.54*
Social capital -> Human resource	0.41	4.06*
Social capital -> Innovative capability	0.41	4.20*

*Significant at the level 0.05 based on 5000 bootstraps

5.2. Structural model

After the examination of the validity and reliability of the reflective and formative constructs in the measurement model, the structural model concentrates on the proposed hypothesized relationships between external social capital and each component of startup's resource access under the mediation effect of innovative capability. Their relationships without the effect of the mediator (that is, innovative capability), is also demonstrated to compare with the mediation model for further clarification.

To test the hypotheses, we used t-value calculated by bootstrapping of 5000 samples at the significant level of 0.5, that is the hypothesis is accepted when t-value is greater than 1.96. T-values associated with the coefficients are marked (*) by significance in Table 10 which represents direct, indirect and total effects among the tested constructs. Furthermore, the hypothesized relationship model with the significant paths is illustrated in Figure 9.

Table 10. Direct, indirect and total effects among the constructs

Hypothesis Codes	Paths	Direct	Indirect	Total	t-statistic
H1	Social capital -> Innovative capability	0.41*	-	0.41*	4.31
H2.A	Innovative capability -> Financial resource	0.29*	-	0.29*	2.27
H2.B	Innovative capability -> Human resource	0.24*	-	0.24*	2.07
H2.C	Innovative capability -> Production resource	0.27	-	0.27	1.83
H3.A	Social capital -> Financial resource	0.32*	-	0.32*	2.11
H3.B	Social capital -> Human resource	0.41*	-	0.41*	4.06
H3.C	Social capital -> Production resource	0.31*	-	0.31*	2.54
H3M.A	Social capital -> Financial resource	0.32*	0.12*	0.43*	2.88
H3M.B	Social capital -> Human resource	0.41*	0.10	0.51*	5.63
H3M.C	Social capital -> Production resource	0.31*	0.11	0.42*	3.87

*Significant at the level 0.05 based on 5000 bootstraps

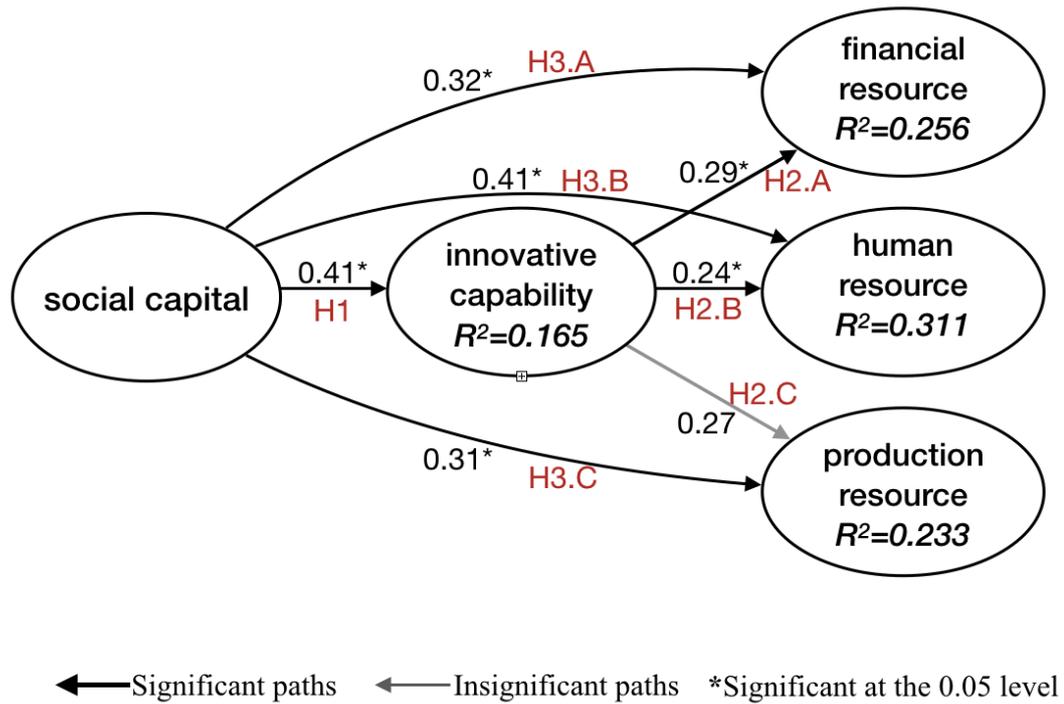


Figure 9. PLS analysis results

Hypothesis H1 predicts that the external social capital of an entrepreneur has a positive effect on his firm’s innovative capability. For supporting the hypothesis, Table 10 indicates that the social capital is positively related to innovative capability.

The second set of hypotheses (H2.A, H2.B, H2.C) supporting hypothesis H2 are about influences of innovative capability on each particular type of entrepreneurial resources. According to the results shown in Table 10, the innovative capability is positively related to financial and human resource accesses but not to production resource access. Therefore, the hypothesis 2.A and hypothesis 2.B are supported, and hypothesis 2.C is rejected.

Next, concerning the proposed hypothesis that external interactions affect each particular type of entrepreneurial resources positively, it statistically shows what external social capital to be significantly related to all the types of a startup’s resources, namely finance, human and production (see Table 10). Therefore, it

provides support for Hypothesis H3 and its three sub-hypotheses H3.A, H3.B, and H3.C.

The last set of hypotheses (H3M.A, H3M.B, H3M.C) is to test mediation for the relationship between social capital and each aspect of resource access. As guided by Baron and Kenny (1986), there are three conditions need examining to validate the mediation for these particular relationships. They are:

- The independent variable (social capital) must significantly affect the mediator (innovative capability)
- The mediator (innovative capability) must significantly affect the dependent variables (financial, human and production resource accesses)
- The independent variable (social capital) must significantly predict the dependent variables (financial, human and production resource accesses) before mediation effect is introduced. So this relationship should be removed or considerably reduced when the mediator (innovative capability) is present.

The first condition that the independent variable predicts the mediator is satisfied by a significant t-value for the direct effect of social capital to innovative capability (that is, hypothesis H1). When examining the second condition of recommended significant relationships between the mediator and dependent variables, column 3 (i.e., direct effect) in Table 10 shows that the innovative capability is significantly related with only an entrepreneur's financial and human resource, but not production one (H2.C). So hypothesis H3M.C suggesting that innovative capability will mediate the relationships between external social capital and production resource access is rejected.

As for the third condition of valid mediation, social capital should significantly affect the access of financial, human, and production resources before introducing innovative capability as a mediator (see Table 11), and those effects should be reduced in the mediation model (see the last three rows, column 3 of Table 10).

Table 11. The effect of social capital on each resource before introducing the mediator

Path	Direct	t-statistic
Social capital -> Financial resource	0.43*	3.01
Social capital -> Human resource	0.43*	4.21
Social capital -> Production resource	0.52*	5.98

*Significant at the level 0.05 based on 5000 bootstraps

So the third condition regarding casual relationships between independent and dependent variables before and after an introduction of the mediator is satisfied when comparing the results in Table 11 and Column 3 (direct effect) in Table 10.

Column 4 (indirect effect) in Table 10 shows that under the influence of the mediator (innovative capability), the indirect effect of social capital on financial resource (that is, hypothesis H3M.A) is statistically significant, but this effect on human resource and production resource is insignificant. Therefore, the hypothesis H3M.A is supported, but H3M.B is rejected. Although the relationship between social capital and financial resource access is still significant, the relationship's strength and significance level are smaller than they are without the presence of innovative capability. It indicates that innovative capability partially mediates the relationship between social capital and financial resource access.

The summary of the hypotheses' results is shown in Table 12.

Table 12. Summary of the hypotheses's results

Hypotheses' code	Description	Result
H1	External social capital has a positive influence on innovative capability	Accepted
H2	Innovative capability has a positive influence on entrepreneurial resource	Accepted
H2.A	Innovative capability has a positive influence on financial resource	Accepted
H2.B	Innovative capability has a positive influence on human resource	Accepted

H2.C	Innovative capability has a positive influence on production resource	Rejected
H3	External social capital has a directly positive influence on entrepreneurial resource	Accepted
H3.A	External social capital has a directly positive influence on financial resource	Accepted
H3.B	External social capital has a directly positive influence on human resource	Accepted
H3.C	External social capital has a directly positive influence on production resource	Accepted
H3M	Innovative capability can mediate the relationships between external social capital and resource accessibility	Accepted
H3M.A	Innovative capability can mediate the relationships between external social capital and financial resource	Accepted
H3M.B	Innovative capability can mediate the relationships between external social capital and human resource	Rejected
H3M.C	Innovative capability can mediate the relationships between external social capital and production resource	Rejected

6. Discussion

6.1. Findings

The empirical model is the central part, i.e., the inner flow of knowledge, of the theoretical model of knowledge transfer in to and out of a startup firm (Figure 5). Consistent with the resource-based and knowledge-based view, the author focused on external entrepreneurial resources that might accrue to a young startup firm via its innovative capability resulting from the firm's social networks and interaction in the startup community. The proposed hypotheses were tested with surveying 68 companies in the knowledge-intensive sector in Finland. The results from empirical research indicates that social capital in external networks is positively related to innovative capability. So as expected, this type of intellectual capital also has direct effects on all types of entrepreneurial resources. Moreover, it shows that innovative capability has positive influences on a firm's financial and human resources, but surprisingly not on its production resource. The results confirm a mediating role of innovative capability only between social capital and financial resource.

The positive association between external social relationships and innovative capability is implicitly corresponding to the synthesis of resource-based and knowledge-based perspectives, and consistent with previous studies focusing on the relationship between inter-organizational interactions and innovative output (Yli-Renko et al. 2001, Lee et al. 2001). Since innovation is an expected outcome of knowledge exploitation (Tsai & Ghosal, 1998; Subramaniam & Youndt, 2005; Schumpeter, 1934; Kogut & Zander, 1992), startup firms are believed to overcome their problems from resources limitation by combining relational knowledge accumulated from their external social relationships and their own capabilities into innovative ideas. The high number of participants (explicit or implicit) into a defined startup community produces variety and diversity in relational knowledge offered to its startup members. As a result, a startup with higher external social capital can access the community sources of knowledge for innovation easier and have higher chances of knowledge exchange and collaboration with other startup members. Hence it possibly has higher internal innovative capabilities at a faster rate, especially in the knowledge and human dimensions. Therefore, it is

undeniable that the startup's innovative capability is dependent on quality and quantity of social relationships between its employees and other members of the startup community. Hence it is impossible to be easily imitated by competitors (Lee et al., 2001). Although this study supports the positive relationship between social capital and innovation, some researchers have warned a danger of losing its innovativeness when a firm depends too much external knowledge from one or a few partners in the community to neglect other sources of information (Yli-Renko et al., 2001, p.608). This dependence may reduce the employee's creativity and confidence in creating distinctive ideas for radical innovations. Therefore, it is recommended that in the short term, young firms can improve their innovativeness from accumulating external knowledge from their community social networks, but they should at the same time build up their internal innovative capabilities for their innovative success in the long term.

The findings supporting the hypothesis that social ties and interaction have a direct and positive influence on all types of an enterprise's fundamental resources are consistent with the social capital theory and supported by similar results from previous researchers in this field (Shane & Cable, 2002; Yli-Renko et al., 2001; Fornomi et al., 2013; Lee et al., 2001). It indicates the fact that intensive and frequent interactions with other members in the community can help an entrepreneur expands his connections and increases his trustworthiness to access to and take advantages of various and diverse resources supporting financial, human and production aspects. It is possible because the startup community includes not only the entrepreneur's firm, but also other enterprises, universities and research organizations, venture capitalists and venture associations. They provide the firm with opportunities of partnership linkages sponsorship linkages to exchange and combine prevailing resources into their fundamental capitals for business growth. In the community of shared vision and collaborative goals, external network ties are believed to be channels transmitting entrepreneur's fundamentally productive resources (Tsai & Ghoshal, 1998). The strength of these knowledge channels indicates the strength of the founder's relationships, hence represents the strength of accessibility to critical entrepreneurial resources, especially at the beginning of his startup journey.

The results provide support for the suggestion that innovation capability is related to entrepreneurial resources, particularly in the aspect of finance and human. It indicates that a startup who possesses enormously innovative capabilities tends to attract more financial investment, talents' participation and networking opportunities, which enriches their innovative capabilities and guarantees favorable outcomes of their innovation process. Additionally, the firm's employees have more chances to improve their technical and professional expertise and expand their business connection with other members of the startup communities.

It is surprising that the innovative capability has no relation with production resource because it is a common sense that innovation aims at product development. It implies that companies who are capable of innovating are not guaranteed to have sufficient information of product and market development. One possible explanation based on practical situations is that in Finnish startup community, enterprising innovators tend to search for opportunities of financial and human collaborations rather than of production and market development. Finnish startups doing their business mostly with high-technology applications already have their innovative outcomes and their niche market. So their participation in the community aims for sources of investment and talents to expand their market. So they have neither demand for other's information of production and market, nor willingness to share theirs. Schumpeter (1934) claims that if a firm has innovative and feasible ideas, others will provide demanding resources. So in this case, the resource of production and market is unwanted in Finnish knowledge-intensive firms. Another explanation based on social capital theory is when the quality of relationships (that is, trust) is very high, the intensity level of information exchange and processing decreases. It leads to a decrease in new knowledge acquisition, hence a decrease in resource availability (Yli-Renko et al., 2001; Nahapiet & Ghoshal, 1998). In this case, as being a developed startup community, Finnish startup members trust each other at a high level and expects the information leading to market and product development will be given only when needed. As a result, it makes their motivation for acquiring this external

resource is reduced, hence their accessibility and acquisition of this type of resource are low at a specific time.

Lastly, the mediating role of innovative capability between external social capital and financial resources is supported by the results of this study. It is consistent with the recommendations of Shane and Cable (2002) and Lee et al. (2001) who proved in their research that social networks from external sources support innovative enterprises with easier and earlier accessibility to investment and funding. In practice, it states implicitly that investors in the startup community are more willing to cooperate with Finnish startups who is highly capable of generating innovation.

To sum up, in the scope of this study, the findings from hypothesis assessment has successfully answered to the two proposed research questions and three sub-questions. The answers to each question are briefly stated below.

- The answer to question (i): The external social capital has direct effects on financial, human, production resource. Moreover it has indirect effects on financial resource through the mediation of innovative capabilities. Entrepreneurs acquire relational knowledge and expand their networks through their community relationships, which embedded into their external social capital. This knowledge and relationships promote entrepreneurs' resources by improving their internal capabilities and opportunities of investment, collaboration, and innovation.
- Subquestions (ii), (iii), and (iv) have already been answered by the summary of hypothesis results.

6.2. Implications

The study contributes to academic research based on knowledge and resource theory in several ways. Firstly, although previous researchers have had a focus on social capital at a macro level in a specific industry (Burt, 1992; Kogut & Zander, 1996) or micro level in an organization (Tsai & Ghoshal, 1998), this study confirms the possible application of social capital in the context of inter-organization.

Second, in past studies, three dimensions of social capital are often focused and measured as causal factors for some knowledge outcome (Yli-Renko et al., 2001; Tsai & Ghoshal, 1998). This study provides new angle of approaching social capital theory, which is to see three dimensions as a whole to analyse social capital as a channel for knowledge transmitting into and out of a firm, because the three dimensions are, in practice, related to each other and all affects knowledge exploitation for generation of innovation and accumulation of resources. Furthermore, this study emphasizes the importance of external social capital (hence an organization's external relationships) in entrepreneurship, particularly in taking advantages of relational knowledge and network ties to minimize resource-constraint problems.

Moreover, in the knowledge-based literature, this study explores how knowledge transfer between a firm and their collaborative group (that is, a startup firm and their startup community) which is possibly applicable in any studies of knowledge and resource exchange. The model contributes to further understanding the process of knowledge transmission which is successfully demonstrated in Nonaka's famous model "SECI." In his model, Nonaka (1994) focuses on knowledge creation and regards it as a spiraling process of interactions in which explicit knowledge and tacit knowledge are interchanged through socialization, externalization, and combination. However, this study focuses more on a process of knowledge transmission in which new knowledge is created, transformed, exchanged, and combined continually through sequences of individuals' interactions within a defined corporate environment. In this case, the new knowledge becomes a collective asset of the group's social capital and stays in the group's context. Later particular parts of the group's intangible assets are possibly acquired by the member to become his new social capital's assets of knowledge. Furthermore, this model claims that knowledge is not only transferred but also transformed less in quantity and more condensed in content through individuals' social interaction ties in their collective group. By frequency of interactions, each has his own perceptions towards the group, which determines his social capital and hence his level of knowledge sharing with and accumulating from other members of the group.

In the area of entrepreneurship, while most of the prior studies in the field of entrepreneurship has usually focused on a startup firm's externally tangible resources (such as financial capital or manufacturing capacity), the thesis research pays more attention to their intellectual resources, particularly relational knowledge and inter-organisational relationships as organisational resources for generation of innovations and competitive advantages. It contributes to addressing the importance of external knowledge and relationships in an entrepreneur's success and innovation. Additionally, a startup member's continual inner and outer flows of knowledge in the proposed model indicate the strongest feature of the startup community called "self-perpetuating" (Wenger & Snyder, 2004, p.132). It is the fact that the community member strengthens and renews himself automatically while he generates knowledge.

From a practical viewpoint, the level of three fundamental capitals determines the size of the business, resulting in entrepreneur's decisions on what resources are required, how and when to obtain them throughout their startup development. Since entrepreneurs suffer from difficulties from capital restriction, minimizing the number of resources owned and used at each stage is a typical trend in strategic planning of startup resource management. Because owning a resource costs money, requires high commitment, increase risks, and decreases flexibility (Stevenson et al., 1985). Finnish startups are advised to participate actively and frequently into local entrepreneurial activities and programs to possibly improve their resources in financial, human and production dimension, and their opportunities to collaborate with various partners for innovative solutions. It is also highly recommended for startups to improve their innovative capabilities through learning new knowledge and practices from other members of the community. Because venture capitalist and business angels favorably invest into high-tech and knowledge innovative startups rather than the others. Moreover, the Finnish startup community is a good environment for enterprising innovators to search for their potential investors to expand their market.

7. Limitation and future research

7.1. Limitation

The limitations provide several paths for further research of social capital, innovation and organizational resources in the context of entrepreneurship.

Firstly, being consistent with the theoretical limitation, there should be longitudinal studies to find out if there are any reciprocal or reverse directions of the relationships assumed in the research model. Despite the possible theoretical barriers, the study provides future directions for more focused examinations of the relationship between the critical factors in the research model, which means entrepreneurship in aspects of networks and knowledge resource within a startup community. For instance, one such approach is, as also suggested by Adler and Kwon (2002), to examine deeper the causal relationship between social capital and innovative capability to find out what and how each social capital dimension is conducive to which types of innovation (i.e., radical or incremental innovation). If possible, an examination of quality and intensity of collaborative network ties within and beyond an entrepreneurial organization should also be included to prove if higher quality networks could provide the firm with more resources for the creation of innovation and generation of competitive advantages.

An additional approach with more control variables of participants' backgrounds is highly recommended to examine conditions under which the interaction between a startup firms' external resources and internal capabilities are exposed the most. In Finnish startup community, there is an increase in the number of incubator and facilitator, a new organizational form which provides financial and intellectual assets, and valuable networks to make startups valuable in investors' assessment of funding. An academic study in the role of incubator and facilitator in a supporting startup's business strategy and accessibility to funding are much in demand.

Lastly, the hypothesized examination was taken place only in Finland. Given the fact that entrepreneurs tend to have closer and stronger social relationships (hence, the higher amount of social capital) with individuals that they interact

frequently. Beyond this geographic concentration, future studies using the same methodology should be carried on in other industries and other country settings so that the theoretical model developed in this study can be generalized or connected to societal context. More possible approaches to this point are to include cross-sectoral, cross-sociocultural or cross-national comparisons to explore interactions of an entrepreneur's social capitals toward various factors within an institutional context.

7.2. Future research

Despite getting attention and supports from many social and economic forces locally and globally, new venture's founders are, particularly in the first phase of entrepreneurship, vulnerable to a restriction of essential resources. In a resource-based and knowledge-based perspective, an attempt to acquire and exploit relational knowledge through social capital investment is a strategic solution for firms to minimize the resource challenges and accelerate their innovation processes. Therefore, the study offers a comprehensive dissertation to conceptualize the process of knowledge creation and transmission, which embedded into social capital of startup workers and their community. Furthermore, the aim of the study was met not only by carefully reviewing the previous literature to build up the model of knowledge creation and sharing in a collective but also by successfully giving answers to the research questions by the analysis of empirically quantitative research.

Thanks to the study's findings, it can conclude that social capital in the context of entrepreneurship is regarded as a model for knowledge sharing and combining across members in a startup community. It is also seen as a strategy for venture's founders in relationship and resource management that bridges the gap between a startup firm and other community members or by which a firm can broaden its knowledge channels through their selective participation and collaboration in the community. Moreover, social capital is an essential intellectual asset to any new ventures, because it shapes sources of information and natures of knowledge they acquired from outside their organization settings. In a modern economy in which most of the entrepreneurs' business is based knowledge and relationships, a local

startup community provides collective efficiency in innovation to its member, because networks in the community can minimize possible risks and maximize the number of attempts in innovative processes. Therefore, the problem with young ventures is not because they are small, but because they are isolated (Bessant, 2012). However, it is noticeable that levels of accessibility to the community resources are different by members, which depends on the community's information-sharing environment and the firm's external network ties within the collective. So every startup firms should have their suitable and flexible strategy to approach and exploit the most of their external social capital while keeping their employee's creativity from being eroded by over-dependence of their community's relational knowledge.

8. Conclusions

Despite getting attention and supports from many social and economic forces locally and globally, new venture's founders are, particularly in the first phase of entrepreneurship, vulnerable to a restriction of essential resources. In a resource-based and knowledge-based perspective, an attempt to acquire and exploit relational knowledge through social capital investment is a strategic solution for firms to minimize the resource challenges and accelerate their innovation processes. Therefore, the study offers a comprehensive dissertation to conceptualize the process of knowledge creation and transmission, which embedded into social capital of startup workers and their community. Furthermore, the aim of the study was met not only by carefully reviewing the previous literature to build up the model of knowledge creation and sharing in a collective but also by successfully giving answers to the research questions by the analysis of empirically quantitative research.

Thanks to the study's findings, it can conclude that social capital in the context of entrepreneurship is regarded as a model for knowledge sharing and combining across members in a startup community. It is also seen as a strategy for venture's founders in relationship and resource management that bridges the gap between a startup firm and other community members or by which a firm can broaden its knowledge channels through their selective participation and collaboration in the community. Moreover, social capital is an essential intellectual asset to any new ventures, because it shapes sources of information and natures of knowledge they acquired from outside their organization settings. In a modern economy in which most of the entrepreneurs' business is based knowledge and relationships, a local startup community provides collective efficiency in innovation to its member, because networks in the community can minimize possible risks and maximize the number of attempts in innovative processes. Therefore, the problem with young ventures is not because they are small, but because they are isolated (Bessant et al., 2012). However, it is noticeable that levels of accessibility to the community resources are different by members, which depends on the community's information-sharing environment and the firm's external network ties within the collective. So every startup firms should have their suitable and flexible strategy to

approach and exploit the most of their external social capital while keeping their employee's creativity from being eroded by over-dependence of their community's relational knowledge.

References

- Adler, P. S., & Kwon, S. W. (2002). Social Capital: Prospects For a New Concept. *The Academy of Management Review*, 27, 17-40.
- Akman, G., & Yilmaz, C. (2008). Innovative capability, innovation strategy and market orientation: an empirical analysis in Turkish software industry. *International Journal of Innovation Management*, 12(1), 69–111.
- Amburgey, T. L., Keylly, D., & Barnett, W.P. (1993). Resetting the clock: the dynamics of organisational change and failure. *Administrative Science Quarterly*, 38, 31-73.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94.
- Baker, W. (1990). Market Networks and Corporate Behavior. *American Journal of Sociology*, 96(3), 589-625.
- Barney, J.B., & Hansen, M.H. (1994). Trustworthiness as a source of competitive advantage. *Strategic Management Journal*, 15(Special issue), 175–190.
- Baron, R. M., & Kenny, D. A. (1986). The Moderator - Mediator Variable Distinction in Social Psychological Research - Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Bessant, J., & Tidd, J. (2015). *Innovation and Entrepreneurship* (3rd ed). (pp. 3-42, and pp. 289-317). UK: John Wiley & Sons Ltd.
- Bessant, J., Alexander, A., Tsekouras, G., & Rush, H. (2012). Developing innovation capability through learning networks. *Journal of Economic Geography*, 12(5), 1087-1112.
- Bhide, A. (1992). Bootstrap Finance: The Art of Startups. *Harvard Business Review*, 11/12/1992. Retrieved from <https://hbr.org/1992/11/bootstrap-finance-the-art-of-start-ups>.
- Bruderl, J. & Preisendorfer, P. (1998). Network support and the success of newly founded business. *Small Business Economics*, 10(3), 213 - 225.
- Burn, P. (2011). *Entrepreneurship and small business: Startup, growth and maturity* (3rd ed.) (pp. 3-83). London, UK: Palgrave Macmillan.
- Burt, R.S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R.S. (2000). The network structure of social capital. *Research in Organisational Behaviour*, 22, 345-423.
- Burt, R.S (2005). *Brokerage and closure: an introduction to social capital*. Oxford, University Press.
- Chin, W., Henseler, J., & H. Wang. (Eds.) (1998). *Handbook of partial least squares: Concepts, methods and applications in marketing and related fields*. (pp. 655-690). Berlin, Germany: Springer.

- Chiu, C.M., Hsu, M.H., & Wang, E. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, 42 (2006), 1872 - 1888.
- Cohen, W., & Levinthal, D.A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152.
- Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.
- Dalkir, K. (2005). *Knowledge Management in Theory and Practice* (pp. 109-140). Oxford: British Library Cataloguing-in-Publication Data. Elsevier Inc.
- Eurostat. *Aggregations of manufacturing based on NACE Rev. 2. Annex 3*. Retrieved from http://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf.
- Feld, B. (2012). Participants in a Startup Community. In *Startup Communities: Building an Entrepreneurial Ecosystem in Your City* (pp. 31-46). UK: Wiley.
- FiBAN (2016). *Finnish high growth investments 2015 - Over €250M in 400 growth companies*. Retrieved from <https://www.fiban.org/news/finnish-high-growth-investments-2015-over-eur250m-in-400-growth-companies>.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Fornomi, M., Arribas, I., & Vila, J.E. (2013). An entrepreneur's social capital and performance: The role of access to information in the Argentinean case. *Journal of Organizational Change Management*, 25(5), 682-698.
- Forsman, H. (2011). Innovation capacity and innovation development in small enterprises. A comparison between the manufacturing and service sectors. *Research Policy*, 40(5), 739–750.
- Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Prosperity*. New York: Free Press.
- Gabarro, J. J. (1978). The development of trust, influence, and expectations. In A. G. Athos and J. J. Gabarro (Eds.). *Interpersonal behaviors: Communication and understanding in relationships* (pp. 290-303). Englewood Cliffs, NJ: Prentice Hall.
- Gant, J., Ichniowski, C., & Shaw, K. (2002). Social capital and organisational change in high-involvement and traditional work organisations. *Journal of Economics and Management*, 11, 289-328.
- Gefen, D., Rigdon, E., & Straub, D. (2011). An update and extension to SEM guidelines for administrative and social science research. *MIS Quarterly*, 35(2), 3-14.
- Guan, J., & Ma, N. (2003). Innovative capability and export performance of Chinese firms. *Technovation*, 23(9), 737–747.
- Hair, J. F., Black, W. C., Babin, H. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). New Jersey: Prentice Hall.

- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-151.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modelling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414-433.
- Halpern, D. (2005). Chapter 1: Introduction: Concepts, History and Measurement. In *Social Capital* (pp. 1-40). Cambridge: Polity Press.
- Hazleton, V., & Kennan, W. (2000). Social capital: reconceptualising the bottom line. *Corporate Communications*, 5(2), 81-86.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modelling in international advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of research in international advertising* (pp.252-276). Cheltenham, UK: Edward Elgar Publishing.
- Jolly, A. (2008). *The Innovation Handbook: How to develop, manage and protect your most profitable ideas* (pp. 1-41). Great Britain and the United States: Kogan Page Limited.
- Kogut, B., & Zander, U. (1995). What firms do? Coordination, identity and learning. *Organisation Science*, 7, 502-518.
- FiBAN Finnish Business Angles Network. (2018). *Finnish startup investment in the year 2017*. Retrieved from <https://www.fiban.org/news/finnish-startup-investments-2017>.
- Lane, P., & Lubatkin, M. (1998). Relative absorptive capability and interorganizational learning. *Strategic Management Journal*, 19(5), 461-477.
- Larson, A. (1992). Network dyads in entrepreneurial settings: a study of the governance of exchange relationships. *Administrative Science Quarterly*, 37, 76-104.
- Larsson, R., Bengtsson, L., Henriksson, K., & Sparks, J. (1998). The interorganizational learning dilemma: collective knowledge development in strategic alliances. *Organization Science*, 9, 285-305.
- Lee, C. Lee, K., & Pennings, J. (2001). Internal capabilities, external networks, and performance: A study on technology based ventures. *Strategic Management Journal*, 22(6-7), 615-640.
- Lee, H. & Choi, B. (2003). Knowledge management enablers, processes, and organisational performance: an integrative view and empirical examination. *Journal of Management Information Systems*, 20(1), 179-228.
- Loury, G. (1992). The economics of discrimination: Getting to the core of the problem. *Harvard Journal for African American Public Policy*, 1, 91 – 110.
- Malhotra, N. K., Nunan, D., & Birks, D. F. (2017). Sampling: design and procedures. In *Marketing Research, an applied approach* (5th ed.) (pp. 409-439). UK: Pearson Education Limited, UK:

- Martinez-Roman, J. A., Gamero, J., & Tamayo, J. A. (2011). Analysis of innovation in SMEs using an innovative capability-based non-linear model: A study in the province of Seville (Spain). *Technovation*, 31, 459-475.
- Maznevski, M., & Athanassiou, N. (2007). Bringing the outside in: Learning and knowledge management through external networks. In Ichijo, K. and Nonaka, I. (ed.). *Knowledge Creation and Management: New Challenges for Managers* (pp. 69 - 82). New York: Oxford University Press.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organisational advantage. *Academy of Management Review*, 23(2), 242-266.
- Neely, A., Filippini, R., Forza, C., Vinelli, A., & Hii, J. (2001). A framework for analysing business performance, firm innovation and related contextual factors: perceptions of managers and policy makers in two European regions. *Integrated Manufacturing Systems*, 12(2), 114-124.
- Nonaka, I., & Konno, N. (1998). The concept of "Ba": Building a foundation for knowledge creation. *California management review*, 40(3), 40-54
- Portes, A. (1998). Social capital: its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-25.
- Putnam, R.D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy* 6(1), 65-78.
- Robert, L., & Hornburg, S. (1998). What is social capital and why is it important to public policy. *Housing Policy Debate*, 9, 1-16.
- Robison, L., Schmid, A., & Siles, M. (2002). Is social capital really capital? *Review of Social Economy* 60, 1-24.
- Rosenbusch, N., Brinckmann, J., & Muller, V. (2012). Does acquire venture capital pay off for the funded firms?. *Journal of Business Venturing*, 28, 335-353.
- Schonlau, M., Fricker, R. D., & Elliott, M. N. (2002). *Conducting research surveys via email and the web*. Santa Monica, CA: RAND Corporation.
- Schumpeter, J.A. (1934). *The Theory of Economic Development*. Cambridge: Harvard University Press.
- Shane, S. & Cable, D. (2002). Network ties, reputation, and the financing of new ventures. *Management Science*, 48(3), 364-381.
- Sher, P. J., & Yang, P. Y. (2005). The effects of innovative capabilities and R&D clustering on firm performance: the evidence of Taiwan's semiconductor industry. *Technovation*, 25(1), 33-43.
- Spender, J.C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17 (Winter Special Issue), 45-62.
- Statistics Finland (2018). *001-Enterprise openings and closures from 2013 - by municipality and industrial activities*. Retrieved from http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin_yri_aly/statfin_aly_pxt_001.px/?rxid=4dcbb00a-5f65-4f24-988a-a5dfd9f1bece.

- Stevenson, H.H., Roberts, M.J., & Grousebeck, H.I. (1985). *New Business Ventures and the Entrepreneur*. Homewood: Richard D. Irwin Publishing.
- Subramaniam, M., & Youndt, M.A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48 (3), 450-463.
- Torkkeli, M., Kotonen, T., & Ahonen, P. (2007). Regional open innovation system as a platform for SMEs: a survey. *International Journal of Foresight and Innovation Policy*, 3(4), 336-50.
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: an empirical study of intrafirm network. *Academy of Management Journal*, 41(4), 464-76.
- Tyler, T.R., & Blader, S.L. (2001). Identity and co-operative behaviour in groups. *Group Processes and Intergroup Relations*, 4(3), 207-26.
- Uzzi, B. (1997). Social structure and competition in inter-firm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42(1), 598-621.
- Wasserman, N. (2012). *The Founder's Dilemmas: Anticipating and Avoiding the Pitfalls that can sink a Startup* (pp. 209-249, 331-387). New Jersey: Princeton University Press.
- Wenger, E., & Snyder, W. (2000). Communities of Practice: The organisational frontier. In Katzenbach, J., Garvin, D., & Wenger, E. (2004). *Harvard Business Review on Teams That Succeed* (pp. 123 - 142). US: Harvard Business School Publishing Corporation.
- Widen-Wulff, G., Ek, S., Ginman, M., Perttila, R., Sodergard, P., & Totterman, K. (2007). Information behaviour meets social capital: a conceptual model. *Journal of Information Science OnlineFirst*, 20(10), 1-10.
- Woolcock, M. (1998). Social capital and economic development: Towards a theoretical synthesis and policy framework. *Theory and Society*, 27, 151-208.
- Wu, L. Y. (2005). Entrepreneurial resources, dynamic capabilities and startup performance of Taiwan's high-tech firms. *Journal of Business Research*, 60 (2007), 549-555.

Appendices

Appendix 1. Summary of social capital definition by previous studies

	Authors	Definitions
External/ Bridging/ Communal	Baker (1990)	'a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors' (Baker 1990, p.619)
	Relliveau, O'Reily, and Wade (1996)	an individual's personal network and elite institutional affiliations' (Belliveau et al. 1996, p.1572).
	Bourdieu (1986)	'made up of social obligations ('connections'), which is convertible, in certain conditions, into economic capital and may be institutionalised in the form of a title of nobility' (Bourdieu 1986, p. 243) 'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition' (Bourdieu 1986, p.248)
	Bourdieu and Wacquant (1992)	'the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalised relationships of mutual acquaintance and recognition' (Bourdieu and Wacquant 1992, p.119).
	Boxman, De Graai and Flap (1991)	'the number of people who can be expected to provide support and the resources those people have at their disposal' (Boxman et al. 1991, p.52).
	Burt (1992, 1997)	'friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital' (Burt 1992, p.9). 'the brokerage opportunities in a network' (Burt 1997, p.355)
	Knoke (1999)	'the process by which social actors create and mobilise their network connections within and between organisations to gain access to other social actors' resources' (Knoke 1999, p. 18).
	Portes (1998)	'the ability of actors to secure benefits by virtue of membership in social networks or other social structures' (Portes 1998, p.6).
Internal/ Bonding/ Linking	Brehm and Rahn (1997)	'the web of cooperative relationships between citizens that facilitate resolution of collective action problems' (Brehm and Rahn 1997, p.999)
	Coleman (1990)	'social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure' (Coleman 1990, p.302)
	Fukuyama (1995, 1997)	'the ability of people to work together for common purposes in groups and organizations' (Fukuyama 1995, p.10) 'Social capital can be defined simply as the existence of a certain set of informal values or norms shared among members of a group that permit cooperation among them' (Fukuyama 1997)
	Inglehart (1997)	'a culture of trust and tolerance, in which extensive networks of voluntary associations emerge' (Inglehart 1997, p.188)
	Portes and Sensenbrenner (1993)	'those expectations for action within a collectivity that affect the economic goals and goal seeking behavior of its members, even if these expectations are not oriented toward the economic sphere' (Portes and Sensenbrenner 1993, p.1323)
	Putnam (1995)	'features of social organisation such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit' (Putnam 1995, p.67)
	Thomas (1996)	'those voluntary means and processes developed within civil society which promote development for the collective whole' (Thomas 1996, p.11)

	Authors	Definitions
Both types	Loury (1992)	'naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace. . . an asset which may be as significant as financial bequests in accounting for the maintenance of inequality in our society' (Loury 1992, p.100)
	Nahapiet and Ghoshal (1998)	'the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network' (Nahapiet and Ghoshal 1998, p.243)
	Pennar (1997)	'the web of social relationships that influences individual behavior and thereby affects economic growth' (Pennar 1997, p.154).
	Schiff (1992)	'the set of elements of the social structure that affects relations among people and are inputs or arguments of the production and/or utility function' (Schiff 1992, p.160)
	Woolcock (1998)	'the information, trust, and norms of reciprocity inhering in one's social networks' (Woolcock 1998, p.153)

Source: Adler, P. S., & Kwon, S. W. (2002)

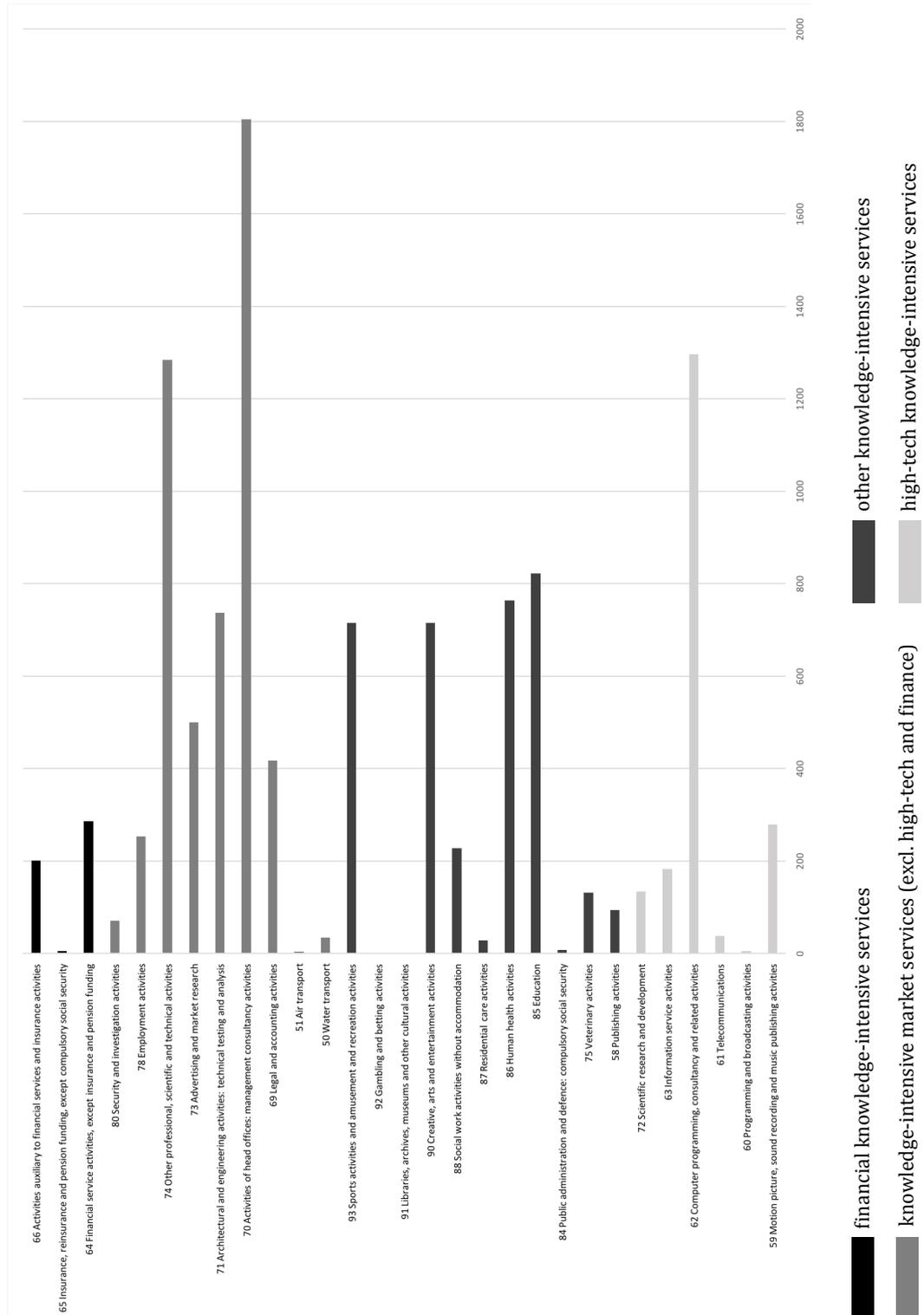
Appendix 2. Knowledge-intensive sector classification _ NACE Rev. 2. Annex 3

Types of knowledge-intensive services	Codes (2-digit level) and Description
High-tech knowledge-intensive services	59 Motion picture, video and television programme production, sound recording and music publishing activities 60 Programming and broadcasting activities 61 Telecommunications 62 Computer programming, consultancy and related activities 63 Information service activities 72 Scientific research and development
Financial knowledge-intensive services	64 Financial service activities, except insurance and pension funding 65 Insurance, reinsurance and pension funding, except compulsory social security 66 Activities auxiliary to financial services and insurance activities
Knowledge-intensive market services (excluding high-tech and financial services)	50 Water transport 51 Air transport 69 Legal and accounting activities 70 Activities of head offices: management consultancy activities 71 Architectural and engineering activities: technical testing and analysis 73 Advertising and market research 74 Other professional, scientific and technical activities 78 Employment activities 80 Security and investigation activities
Others knowledge-intensive services	58 Publishing activities 75 Veterinary activities 84 Public administration and defence: compulsory social security 85 Education 86 Human health activities 87 Residential care activities 77 Social work activities without accommodation 90 Creative, arts and entertainment activities 91 Libraries, archives, museums and other cultural activities 92 Gambling and betting activities 93 Sports activities and amusement and recreation activities

Source: Eurostat. (2017). Aggregations of manufacturing based on NACE Rev. 2. Annex 3.

Appendix 3. The number of knowledge-intensive startup firms opening in 2017

Source: Database from Statistics Finland (2017)



Appendix 4. Questionnaire Items for each construct

All the following items were measured by a 7-point Likert scale, with 1 = “Strongly disagree” and 7 = “Strongly agree”.

Groups	Constructs	Items	Source
Entrepreneurial external social capital	Structural dimension	I maintain close relationships with some members in the startup community.	Adapted from Chiu, Hsu and Wang. (2006)
		I spend a lot of time interacting with some members in the startup community.	
		I know some members in the startup community on a personal level.	
	Relational dimension	Members in the startup community will always keep the promises they make to one another.	
		I believe that members in the startup community would help me if I need it.	
		I have a strong positive feeling toward the startup community.	
	Cognitive dimension	Members in the startup community use understandable communication patterns during the discussion.	
		Members in the startup community share the vision of helping others solve their professional problems. goal of helping others solve their problems	
		Members in the startup community share the same goal of learning from each other.	
Entrepreneurial resource access	Financial resource access	When necessary, our company can access to government funds for start-ups	Adapted from Fornomi, Arribas and Vila (2013)
		When necessary, our company can access to funds from private investors or venture capitalists	
	Production resource access	Our employees can easily access to a closed market.	Adapted from Fornomi, Arribas and Vila (2013)
Our employees can easily find efficient human resources for product and market development.			
Our employees can easily access to necessary technology for our product and market development.			

Groups	Constructs	Items	Source
Entrepreneurial resource access	Human resource access	Our employees are creative and bright.	Subramaniam and Youndt (2005)
		Our employees partner with customers, suppliers, alliance partners, etc. to develop solutions.	
		Our employees are experts in their particular jobs and functions.	
Innovative capability	Innovative capability	Our company fosters an environment that encourages us to produce novel and useful ideas (services/products).	Lee and Choi (2003)
		Our company spends much time in producing novel and useful ideas.	
		Our company considers producing novel and useful ideas as being important activities.	
		Our company has produced many novel and useful ideas (services/products).	