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"Equity Crowdfunding: Signaling in European Crowdfunding Platforms"

**Master Thesis** 

Key words: Crowdfunding Equity Crowdfunding Signaling Theory Information Asymmetry Alternative Financing Entrepreneurs

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## ABSTRACT

This paper investigates the types of information that could be identified as signals to influence investors' decision to invest in private equity financing through equity crowdfunding platforms. As an expanding topic, little is known which type of information could be conveyed as signals to investors through limited means of communications. The study involved sample from multiple equity crowdfunding platforms across Europe. The relationship between each type of signal and level of funding success in equity crowdfunding was empirically tested using binary logistic regression and ordinary least square regression analysis. Empirical results showed the importance of social networks and human capital. On contrary to prior prediction based various academic paper in other type of private equity financing, variables of intellectual properties, financial information, and other information did not provide conclusive results.

# Abbreviations

CF	Crowdfunding
CFP	Crowdfunding Platform
EC	Equity Crowdfunding
ЕСР	Equity Crowdfunding Platform
VC	Venture Capitalist
VCF	Venture Capital Financing
ESMA	European Securities and Markets Authority

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# **Chapter 1: Introduction**

#### 1.1 Background and Problem Statement

Young ventures go through several stages of financing, typically starts with funds from entrepreneurs' own money and business angels (Wilson, 2001) to bank loans, venture capitalist, and public equity financing through an IPO. Studies show (e.g. Turan, 2015a; Turan, 2015b) that it becomes increasingly difficult for young ventures to obtain outside financing including banks and venture capitalists (VC). The demand for alternative source of financing has been on the rise in past years, especially in post-2008 financial crisis after which VCs tend to be more selective in investing in small young ventures. In addition, many governments are found to have reduced their subsidy for small businesses in order to cope with their high-accumulated governmental debts (Bielefeld, 2009; Ferrera, Hemerijck, Rhodes, 2011; Lehner, 2011). Some literatures argue crowdfunding could fill in this financing gap. Crowdfunding is an emerging alternative source of financing that has been gaining an increasing popularity both practically and academically in past couple of years (Gierczak et al., 2016). The main idea of crowdfunding is to pool money from a broad audience through integrated online platforms in return of certain rewards (Schwienbacher and Larralde, 2010). With the introduction of crowdfunding, more affordable and accessible funds are available from a combination of a large group of professional and amateur investors (crowd) through online platforms to reduce the funding gaps between early and later stage of venture financing Belleflame, Lambert, Schwienbacher (2014).

Crowdfunding is typically categorized into reward-, donation-, lending-, and equity-based. There has been an immense growth as reported by Massolution, a consulting firm, in which funds raised in worldwide crowdfunding platforms bolstered by 167% in 2014 and valued at \$16.2 billions from \$6.1 billions in previous year (Massolution, 2015). The financial value is expected to keep increasing for foreseeable future. Massolution (2015) further reported that the US still holds the largest market share for crowdfunding, while latest figure show EU is the second. Report form European Commission (2015) stated that total value of crowdfunding markets in all EU stood at  $\leq 4.2$  billion, of which  $\leq 4.1$  billion raised for crowdfunding categories entailing financial returns (loan-, and equity-based).

The relevance of equity crowdfunding research as an academic topic grows simultaneously with its increasing popularity in practice. Equity crowdfunding and public equity financing work in similar manners. The central differences are the medium to which both work, the types of investors, regulatory level. For investors, the worst default risk is total loss of their investments. Thus investors need to assess the default probability of their investment portfolio. In order to estimate the risk, investors need to cultivate all information necessary that would mirror the quality of their (potential) investment. However asymmetrical information arise between investors and companies, as top management team of the company is always assumed to hold superior knowledge about their own company' quality relative to investors (Stiglitz, 2002). In public equity financing, investors are better protected and companies' information disclosure is tightly regulated (Kreps, 1990). Yet, information asymmetry remains a big concern, and subsequently clearing paths for financial and information intermediaries such as banks and news agencies to be involved (Kreps, 1990). On contrast, in private financing for small ventures in particular, the availability of such financial intermediaries is often vacated and information disclosures are often not required by laws (Butler, Kraft, and Weiss, 2007). The nascent nature young ventures and the absence of critical information for investors to assess the probability of the default risks of their (potential) investments, making investing in young small ventures particularly riskier. To minimize the risk of investing in private equity financing such as venture capital financing, both venture capitalist and ventures typically undergo several arduous screening process or contract negotiation (Moritz and Block, 2016). However these options are not available through online equity crowdfunding platforms.

One other solution to address information asymmetry issue, entrepreneurs and management teams can send signals about their companies' quality to (potential) investors (Connelly et al., 2011). There have been extensive amount of research directed at signaling between companies and investors in public equity financing (e.g. Amir and Lev, 1996; Certo et al., 2003; Cohen and Dean, 2005) as well as private equity financing such venture capital financing (e.g. Audretsch, Bonte, and Mahagaonkar, 2012; Baum and Silverman, 2004). However, as a relatively new topic, signaling topic has not been put in much regard in equity-based crowdfunding (Moritz and Block 2016). The simultaneous growth of equity crowdfunding in many countries as well as the increasing needs for young ventures to find alternative sources of financing will make equity crowdfunding a particularly interesting case.

#### 1.2 Objective

The very few existing empirical literatures concerning investors-entrepreneurs relationship in equity-based crowdfunding has prompted my interest for conducting research in this field. The objective of this research is to find which signals that trigger investors to invest in ventures with virtually limited information though online equity-based crowdfunding platforms. Identifying

relevant signals that are affecting investors' decision is believed can make valuable contribution on this continuous-growing alternative financing method though online crowd. Thus in order to conclusively answer the intended objective of this research, the following research question is formulated:

"What ventures' signals in equity crowdfunding platforms influence investors' decision to invest?"

#### 1.3 Findings

The paper investigates the types of information, which could potentially facilitate investors' decision to invest through equity crowdfunding platforms, measuring variables of intellectual property, human capital, social networks, financial information, and other non-financial information which were not previously studied in specifically in crowdfunding platforms. Empirical results confirmed social networks and human capital to be most influential factors. While other variables of intellectually property, financial information, and other non-financial information, which have traditionally considered as important in other types of financing did not show conclusive results.

#### **1.4** Contributions

Signaling theory has been extensively studied many fields including public equity financing and venture capital financing. However there is very limited studies covering signaling theory in equity crowdfunding context. This study contributes to academic and practical research in the following manners. Firstly, a large share of research dedicated to equity crowdfunding has been focusing on the process, regulations, and its potentials (Moritz and Block, 2016). To my knowledge currently there are only 2 papers studied signaling in equity crowdfunding topic. Vismara (2016) extended his researched on regulations role for equity crowdfunding and signaling roles towards equity retention and social capital. While Ahler et al. (2015) gave higher attention to signaling theory itself using an early set of data from Australian-based equity crowdfunding platform. Thus this paper will supplement both papers by providing a wider set of variables and expanding our understanding of quality signals that ventures can provide through limited interactions in online platforms. Second this paper elucidates the potentially crucial and intellectual properties to stimulate crowd's investments. Subsequently this paper explicates academics and practical implications online financing for entrepreneurs, investors, and academia.

#### 1.5 Structure

The rest of the paper is structured as follows. A theoretical background is developed by firstly introducing crowdfunding in general, which is followed by critical review of the concept of information asymmetry and signaling. Subsequently, I will go further by developing hypothesis from related existing literatures. The next chapter presents statistical methods of the study, measurement of the variables, and data collection. Afterwards, I will exhibit the empirical results along with discussion. The following chapter will end the paper with conclusion, limitation of the research, and direction and recommendation for future research.

#### **Chapter 2: Theoretical Backgrounds**

Chapter 2 is divided into 3 different parts. The outset of this chapter introduces the concept of crowdfunding in general and equity-crowdfunding in detail. It will be followed by how the financing process in equity-crowdfunding works, and current condition of equity-crowdfunding market in Europe and cross-border transaction between EU countries. The second part discusses the core issue of the topic, information asymmetry between investors and ventures. While the last part discusses the concept of signaling.

#### 2.1 Crowdfunding

#### 2.1.1 Crowdfunding: an Introduction

The idea of crowdfunding originated from various concept of financing, including crowdsourcing (Poetz and Schreier, 2012) and micro-finance (Morduch, 1999). Although the idea of collective fundraising from big crowd to finance a project has been around from sometimes, the application of Web 2.0 allows it to develop in a more unique way that a transversal way of interaction between investors, entrepreneurs, and technological platforms could create values for all involved parties (Danmayr, 2014; Nasbaradi, 2016; Ordanini et al., 2011). In linear to the growing number of websites devoted to crowdfunding, the concept has captured significant interests in recent years by scholars. As a relatively new and evolving topic, the conception of the word 'crowdfunding' is particularly limiting and elusive (Mollick, 2014). For simplicity purpose, this paper follows broad definition of crowdfunding as defined in one of the early research of the topic by Schwienbacher and Larralde (2010) who stated crowdfunding as:

"An open call, essentially through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of reward and/or voting rights in order to support initiatives for specific purposes"

This particular definition has been mentioned in various crowdfunding papers, nonetheless as Mollick (2014) argued, the expansive definition of crowdfunding proposed by Schwienbacher

and Larralde (2010) could still potentially count out what some scholars in other fields exemplified and labeled as 'crowdfunding' such as fundraising in music industry that was initiated by fans (Burkett, 2011) or internet-based peer-to-peer lending (Lin, Prabhala and Viswanthan, 2013).

As an alternative financing, the aim of crowdfunding is to gather a large group of people (crowd) with a combination of individual professional or amateur investors and organizations, to raise enough money to finance a project or new venture through online social platforms instead of raising money exclusively from professional and institutional investors (Belleflame et al., 2014). There are three main stakeholders involved in the crowdfunding process namely the financial backers (investors), financial seekers (entrepreneurs, startups, individual/organizational project initiators, and/or artist), and crowdfunding platforms. Often, the backers and seekers involved are limited to private individuals instead of institution (Mollick, 2014). Albeit it is varied in different types of crowdfunding, especially equity crowdfunding where financial seekers are young ventures (Gerber et al., 2012; Verstein, 2011). Additionally, the exponential growth of funds raised through crowdfunding platforms along with simultaneous legalization of equity crowdfunding in many countries such as the JOBS Act in the US (Belleflame et al., 2014) and in UK, France, Germany and other EU countries (European Commission, 2016) have attracted the involvements of many profit and non-profit organization (Mollick, 2014; Schwienbacher and Laralde, 2012). For consistency purpose, bearing in mind the nature of this research, I will use the term 'entrepreneurs' for financial seekers and young ventures, as well as 'investors' for financial backers the rest of the paper. The relationship between these three stakeholders can be descriptively illustrated in the following figure:



Figure 1. A Framework of relations between three main stakeholders (Adopted from Valanciene and Jegeleviciute (2014))

Crowdfunding platforms merely act as an intermediary between ventures and investors. In contrast to banks and venture capitalist, platforms do not lend or invest in the ventures or projects. Although some similarities between crowdfunding platforms and venture capitalist emerge, especially equity crowdfunding platforms, as more platforms get more involved in screening and evaluating process ventures prior funding campaign. There are four types of crowdfunding platforms. Each is categorized based on the type of returns that investors will receive. The subsequent part delves further into it.

#### 2.1.2 Types of Crowdfunding

#### **Rewards-based**

In reward-based crowdfunding, financial returns are not the main objective of investing. Investors do seek rewards in returns as a primary motivation to participate, but in form of tangible returns instead of financial returns (Kuppuswamy and Bayus 2013; Gerber et al., 2012). The degree of rewards that investors received varied in accordance to their perspectives, and it is rather difficult to draw a precise dividing line between what are considered rewards or not to investors. This due to the rewards often being tailored-made depending on the amount of the contribution. Belleflame et al. (2015) gave an example video game case in which rewards could come in form of a personalized game, or simply a copy of the game.

#### Donation-based

Similar to reward-based crowdfunding, investors in donation-based crowdfunding are not expected to receive financial rewards or stake in the project in returns. However investors act in a charitable manner to a particular project in order to unpretentiously contribute in achieving a certain result to community (Gierzczak et al., 2016). Belleflemme et al. (2015) pointed out that investors are regarded as philanthropists and their voluntary contributions are compensated in form of community recognition. Donation-based crowdfunding platforms, due to its nature, quite often act as intermediaries for non-governmental organization and charities although still charge a certain percentage of the contributions pledged to the projects once the projects have been successfully funded (Belleflemme et al., 2015; Lehner, 2013).

#### Lending-based

Contrast to reward-based and donation-based crowdfunding, the primary motive of investors in lending-based crowdfunding is to receive financial returns. Returns are usually offered in form of percentage had the project been successful. Funds offered here is in form of loans similar to that of banks (Mollick, 2013). The distinctions between lending-based and traditional banks, lay in the

role of the platforms as they do not screen projects but let investors judge with the decision. In addition to the patronage model elements of investors that could be included where investors' interests might be skewed towards social goods boosted by the venture instead of purely financial motive (Belleflemme et al., 2015; Mollick, 2013).

#### Equity-based

Equity crowdfunding (EC) or also sometimes called crowdinvesting is a type of crowdfunding where businesses make an open call to attract investment from investors in crowdfunding platforms, in returns of a certain amount of bond or equity-like shares (Mollick, 2013). Unlike other types of crowdfunding such as donation-based where 'investors' simply donate their money, EC requires a more extensive legal basis and in many countries the legality of EC has not been explicitly regulated (Hagedorn and Pinkwart, 2016). Although works in the same manner as public equity financing, the main differences are the role of the platforms, the much smaller size of investments, and the type of investors involved. Investors involved can be both amateurs and professional, whereas investment size can be as little as  $\in 10$  depending on the platforms (Bellefleme et al., 2015). EC platforms intermediated transaction between entrepreneurs and investors by providing standardized legal contract, settling the transaction, and screening and evaluating both parties involved (e.g. requirement of only accredited investors allowed in some EC platforms, the standardized information that should be provided about the ventures, etc.) The following figure illustrates the different risk associated with each stakeholders involved in EC. Similar as in traditional public equity financing and venture capitalist, one of the prime risks is different information that entrepreneurs and investors have. Entrepreneurs as 'insiders' arguably posses more information about their ventures. However, investors as the 'outsiders,' are expected to posses less information, which would increase their risk. More about informational differences between investors and entrepreneurs will be further discuss in the later part of this chapter.



*Figure 2*. Level of risk associated to each stakeholder in equity crowdfunding process (adopted from Turan (2015b)).

#### 2.1.3 Financing Process in Equity Crowdfunding

Investors are shown to face the highest risks. Subsequently, to make it more attractive for investors to invest, crowdfunding platforms often act as venture capitalist especially prior the start of the financing campaign. While in VC financing, venture capitalist as the potential investors have flexible choices of communication with their potential investments directly, investors in equity crowdfunding are typically only able to communicate through the online platforms with limited data as presented in through the platforms. Hagedorn and Pinkwart (2016) constructively designed the financing process in equity crowdfunding. The process is divided into seven phases; application, screening and selection, contracting, roadshow, subscription, holding, and exit (Hagedorn and Pinkwart, 2016). The first four phases involve only ventures and platforms, when platforms receive the application of ventures in forms of documents that are obligated to be presented in the campaign (roadshow) stage, evaluate these offerings and future values, and select which ventures pass on their criterion. The next stage involves negotiating any terms and conditions for both parties until a contract is signed (Hagedorn and Pinkwart, 2016). Subsequently, ventures begin their financing campaign through the platforms for a fixed period of time agreed in the contracting phase. This phase is the most crucial phase it oversees the involvement of potential investors for the first time. 'Roadshow' phase is also crucial as it is the only window where ventures can raise capital, thus heavy marketing activities are also involved (albeit very limited compare to public equity financing). Most equity crowdfunding platforms adopt a threshold-pledge-system (Hemer et al., 2011) during this phase, in which a minimum set amount of investment is required within the campaign period. Consequently, if a threshold agreed upon is not met until the financing campaign ends, the invested shares will be cancelled thus investors would receive their money back. The next phase deals with contracts between investors and ventures regarding the holding of the shares. Contracts can be varied depending on the ventures and how it is regulated in each country. The next phase are holding phase, in which investors are shareholders of the ventures, and exit phase where investors exit the invested ventures. However Hagedorn and Pinkwart (2016) stated it is too early to provide any empirical data for the last two phases. There are also no literatures that studied equity crowdfunding after the financing campaign is finished.

#### 2.2 Equity crowdfunding Market: a European Perspective

I introduced crowdfunding in general, equity-crowdfunding and its financing process, this part deals with the more relevant theoretical background in relation to the problem statement. An empirical research conducted by Agrawal et al. (2011) using Amsterdam-based crowdfunding platform Sellaband found investors involved to be from continent-wide. Report published by European Commission on 'Crowdfunding in the EU Capital Market Union' mentioned that cross-border funding is in someway limited, though on the other hand they also found a large degree of funds from UK-based ECPs come from outside UK (European Commission, 2016). This limitation could be due local regulator that favors the needs of local investors and market, albeit European Commission is favoring closer integration of regulatory approaches within EU by setting up European Crowdfunding Stakeholder Forum (ECSF). Legal regulatory of crowdfunding is developing simultaneously with its growth, European Commission stated only 7 EU members have explicitly introduced legal frameworks for CF activities while several other members are planning to introduce it as 2016. In addition, European Commission documented an increase in values of equity-based campaigns within all EU countries, with total funds raised at €422,039,462 from 836 campaigns in 60 ECPs (European Commission, 2016).

European Commission further reported a jumped in funds raised through crowdfunding involving financial returns within EU to be  $\in$  4.1 billion in 2015. European Commission recorded the number of CFPs operating within EU member states to be 502, of which reward-based CFP represents the majority of 30% followed by equity-based (23%) and loan-based (21%). Specifically for equity-based crowdfunding, the UK leads among other EU countries measured by total fund raised followed by France, and Germany between 2013-2014 (European Commission Report, 2016). While EU-wide growth in EC markets reached 167% within the same period.

#### 2.2.1 Crowdfunding and Spatial Disparity

European Commission reported cross-border transactions between EU countries have been increasing in crowdfunding in general. Compare to VC financing, crowdfunding has the potential to eliminate distant-related issues usually limiting small ventures seeking financing from VCs. Researches on venture financing topic including Sorenson and Stuart (2001) found that investors in early venture financing tend to be local, while distant investors are more commonly found in publicly traded firms. One of the reasons is while in traditional equity financing investors provide financial inputs; VCs' roles in venture financing further include providing strategic and operational issues and generally act as management consultant (Bygrave and Timmons, 1992). As the result, Sorensen and Stuart (2001) found VCs spend considerable amount of time for monitoring their portfolio companies as post-investment activities that require frequent visits, thus favoring spatial proximity of their portfolio companies. On the other hand, crowdfunding greatly reduced the needs for spatial proximity between investors and entrepreneurs by eliminating some distance-sensitive costs, as suggested by Agrawal et al. (2011). Same research by Agrawal et al. (2011), which was conducted in crowdfunding in Music industry, found that the average spatial distance between entrepreneurs (artists in Agrawal et al. (2011) study) and investors stood at 5000 km, suggesting that proximity effects as in Sorenson and Stuart's (2001) study on VCs financing to be significantly reduced. One important note that Agrawal et al. (2001) used Amsterdam-based CF as their sample, while investors are found to be in other continents as well, a large number are local Dutch investors. Some functions of CFPs have allowed a wider spatial disparity between investors and entrepreneurs. Nonetheless, though the need of physical interaction is reduced, investors still pose the highest risk when investing in equity crowdfunding (figure 2). The wider spatial disparity in ECF, compare to the traditionally closer distance between investors and ventures in VC financing, increase the information gap between both parties as the means of communication is fairly limited.

The following sub-chapters delve into the core problem of this paper, which is to identify types of signals that influence investors' decision to fund entrepreneurs' through CFPs. Firstly exploring the concept of information asymmetry that exist, followed by introduction of the theory of signaling.

#### 2.3 Information Asymmetry

Information is used by individuals in businesses, households, and governments or at virtually any levels of activities that involve decision-making process. Some information is available publicly and some are obtained privately. The occurrence of information asymmetry is the result of different people involve in the same process but posses different knowledge (Stiglitz, 2002). Information asymmetry can occur in all decision making process. In capital market, Akerlof (1970) greatly illustrated the concept of information asymmetry by what he called 'lemon law'. It states that investors are unable to appropriately distinguish companies of 'low' qualities and those of 'high' qualities (Akerlof, 1970).

To understand the concept of asymmetrical information, Stiglitz (2000) first differentiated two types of information. The first one deals with information about quality where one involved party is not fully aware about the value and characteristics of the other (the companies). The second type put regards about the intent of the information, as one of the involved parties is questioning the other's behavior and intention of their behavior (Elitzur and Gavious, 2003; Stiglitz, 2000). The first one is also known 'adverse selection'; the true value and characteristics of the companies do not change after the transactions between entrepreneurs and investors. While for the later also known as 'moral hazards', the value might change (Kirmani and Rao, 2000). Both types of information asymmetries are solved by different methods (Kirmani and Rao, 2000). However this paper will only focus on addressing 'adverse selection' side of information asymmetry, which is solved by sending signals to (potential) investors.

Concluding the logic of Elitzur and Gavious (2003), Kirmani and Rao (2000), and Stiglitz (2000), the quality of companies does not change once investors understand the current state of quality. Although it still remains one of the prime barriers in capital markets. In capital markets, whether it is in public equity financing or private equity financing like VC financing, the occurrence of this information asymmetry can be particularly alarming. Asymmetrical information between investors and companies may clout the market value of that company (Healy and Palepu, 2001; Brealey, Leland and Pyle, 1977). The basic idea is that entrepreneurs and top management teams presumably hold better knowledge about their companies' values and tend to overstate those values (Akerlof, 1970; Stiglitz, 2000). This could lead to mis-valuation of a company's value, thus would potentially disrupt the functioning capital markets. Healy and Palepu (2001) exemplified by stating that when investors fail to distinguish the 'bad' and 'good' ideas

(companies), it would result in investors valuing both ideas on an average level, thus lead to under-valuation of the 'good' ideas and over-valuation of the 'bad' ideas. Kreps (1990) further added due to this mis-valuation, there is a strong demand for financial and information intermediaries such as banks venture capitalists, financial analysis, news agencies, and rating agencies to overcome entrepreneurs and top management teams' information prevalence.

For small ventures, Butler et al. (2007) stated, small ventures may not be required to disclose some specific firm information publicly, as contrast to companies in public equity financing where information disclosure is tightly regulated. In addition to having nascent organizational history, information asymmetry tends to be higher than those of larger more mature companies in public market. In equity crowdfunding, information asymmetry between investors and entrepreneurs is arguably higher than both in VCs financing and public equity financing. Venture capitalist can overcome information asymmetry by undertaking a tighter screening and evaluation process with direct communication with the ventures. However the means of communication between potential investors and is almost exclusively through crowdfunding platforms. Screening process is in fact first conducted by the platforms. Platforms typically require standardized documents such as business plans or financial forecast for ventures to be presented on the campaign page. However I noted not all platforms obligate ventures to publically present these documents, some platforms allow venture to have its preference on presenting document such as business plan publically, or privately by providing direct contact information instead. This however does not change the fact that potential investors still possess limited ability to evaluate their potential investments. Although many crowdfunding platforms actively involve in screening and evaluation process, they pose gap between investors and ventures such as the lack of imperative information to estimate likelihood of a venture success such as abilities of the management team. It would be rather difficult, especially if the venture is a start-up, to estimate its future state. For comparison, venture capitalist sometimes involve heavily in operating process and act as an experienced consultant rather that a mere financial provider. Investors' inability to control their investment (Belleflame et al., 2015) may further pose treat to investors. For example depending on the type of contracts that investors and ventures sign on, because of communication-related factor between both parties, and the lack of public information exposure (as opposed to public equity financing), investors may lose control on how ventures would spend their money. Though Hagedorn and Pinkwart (2016) noted some contracts may require ventures to constantly update investors regarding their activities. Further, the lack of experience for amateur investors (which accounts a large number of people in crowdfunding platforms) may

result in them entering into the market in high default risks. However, this will not be discussed in the study.

To overcome this adverse selection, entrepreneurs and top management teams must send related information to their (potential) investors. One possible solution is signaling. The following subchapter will extensively explains the concept of signaling as the results of information asymmetry.

#### 2.4 The Theory of Signaling

#### 2.4.1 Definition

Previous chapters delved into theories behind CF concept and integrated it with current real world situation, followed by the introduction of information asymmetry concept. This sub-chapters discloses signaling theory as the background of this paper' main research problem. Informational differences between investors and entrepreneurs occur as investors may hold less knowledge about a project or a company. This asymmetrical information is the results of managerial failure to deliver the intended information about a company's values to potential investors. Consequently managers and entrepreneurs must try to disclose information that can address its value to potential and current investors. However the degree to which investors perceive this intended information about ventures' values and the ability of managers and entrepreneurs to deliver their intended information are varied. Subjectivity of investors may further complicate this information to be conceived as valued. These assumptions are backed by the theory of signaling. Signaling theory was first theorized in the early 1970's with the publishing works of Arrow (1972) and Spence (1973), of which its applications are now subject to various other fields such from corporate communication (Danielli, Bini, Giunta, 2013) to anthropology (BliegeBird et al., 2005). The work of Spence (1973) as one of an introductory paper of signaling theory, which provoked numerous precedent papers in various fields, differentiated job market for potential employees that are prospectively 'high' quality and 'low' quality by looking at their educational levels.

The base of signaling theory concerns about minimizing asymmetrical information between two involved parties (Spence, 2002). There are several elements that are part of the signaling theory. Firstly, the senders of signals, who are those insiders of companies that posses the knowledge and information of organization, products, or individual that outsiders do not possess (Connelly et al., 2011; Spence, 1973; Ross, 1977). Secondly, the signal receivers or outsiders (e.g. potential

investors, customers) are also crucial elements in signaling theory. (Potential) Investors as the receiver of signals could alienate the meaning of signals from entrepreneurs' or managers' intention as its receptivity depends on receivers' individual experience, knowledge, and abilities (Ndofor and Levitas, 2004). The other element is signal features, as signaling theory focuses on communicating imperceptible, and positive quality features of insiders to outsiders (Connelly et al., 2011).

Busenitz et al. (2005) defines signal as information that could potentially alter the understanding of a future state. While Kirmani and Rao (2000) delineated signals as 'observable attributes' from individuals that could transfer information or change the beliefs of other individuals about intention and 'unobservable features'. 'Unobservable features' as explained by multiple scholars including Connelly et al. (2013), Janney and Folta (2000), Kirmani and Rao (2000) mean that prior signals transfer, information about some 'insiders'' values are unknown or 'unobserved' to 'outsiders', thus it is communicated through many forms until these hidden abilities are revealed or 'observed'. Example of 'unobservable features' by outsiders that insiders posses are early-research projects and pending lawsuits. This information is 'unobserved' by investors until the companies disclose them. Nonetheless, not all information can be used as signals with some may even negatively impact for the underlying value of the companies.

Existing papers on signaling theory often use the term 'quality' to differentiate the 'good' and the 'bad' signals. As quality is often attributed as a separating characteristic that can be interpreted in many different ways (Connelly et al., 2011), managers then must carefully consider which information to be released as signal. For example, releasing design plans or prototype may send positive signals to potential investors regarding the companies' knowledge quality (Audretsch et al. (2012), while at the same time exposing them to appropriation of knowledge by competitors (Ndofor and Levitas, 2004). Quality signals in the eyes of investors should therefor be difficult and costly for other companies to imitate (Folta and Janney, 2006; Keasey and Short, 2010). Additionally, information asymmetry among investors can result in investors' failure to distinguish higher quality companies with those of lower quality. Consequently, investors may then over-value 'lower' quality companies for growth (Healey and Palepu, 2001; Brealy et al., 1997; Spence, 1974).

Connelly et al. (2011) refers quality signals should have two main characteristics, namely signal observability and signal cost. Oberservability represents the extent to which potential investors can receive the signals (Connelly et al., 2011). Because even though quality signals can be transferred in many forms, investors as the receiving end of signals are the ones who will observe and interpret them. Likewise, signal cost is another essential characteristic of quality signals as explained by Connelly et al. (2011). While the first one focus on the signal receiver, the later weights more for competitors. Signal cost is referred as the cost associated to imitate signal, as managers or entrepreneurs of 'higher quality' holding better value should be able to send signal less costly.

#### 2.4.2 Signaling in public equity financing

Levy and Lazarovich-Porat (1995), claimed that it is near impossible to empirically test signaling theory in other areas due to inability to hold all variables constant (e.g. preconceived notions and characteristics of investors). Nonetheless, there have been extensive amount of literatures documented how financial and non-financial information are used as a signals of potential stock return. It is a well-known fact that investors' activities on trading floor are largely influenced by information released about listed companies. For example, financial information such as past financial activities (Healey and Palepu, 2001), corporate debt (Barclay and Smith, 1995), financial ratios (Lewellen, 2004) and accounting disclosure rules (Bertomeu and Magee, 2015) have traditionally been used as indicators of signals to investors. However substantial amount of literatures found that even though financial information is highly over-looked, non-financial disclosures represent highly informative sources that could potentially be looked as positive (negative) signals about future state of companies by investors, especially when they are combined with financial information (Amir and Lev, 1996; Danielli et al., 2013). Large number of literatures had their focus on certain source of non-financial information such as board members structure (Certo, 2003; Cohen and Dean, 2005), and strategic alliances partners (Stuart, Hoang, and Hybels 1999). Certo (2003) found board members reputation to be positively correlated with share price performance, especially during IPO. While Certo et al., (2003), and Stuart et al., (1999) found that companies going for an IPO to pay premium price to work align with reputable auditors and investment banks. Companies' willingness to pay premium for reputable investment banks prior IPO emphasized Connelly et al.'s (2011) main characteristics of signals to be its observability and costly, as reputable investment banks and auditors are reluctant to align with companies of 'lower quality' (Folta and Janney, 2006).

#### 2.4.3 Signaling in VC financing

For young ventures in both EC and VCF, transfer of signals could potentially be intricate especially during the early stages of financing. Compare to public equity financing through an IPO, VCF frequently requires multiple stages of examination and evaluation before VC's final decision process. Busenitz et al. (2005) pointed out the importance of signals during the early screening, valuation, and due diligence process of VCF, with the later often involves in evaluating tangible and intangible assets. However, Baum and Silverman (1999) expressed that even though the process takes time, alignment with a well-established VCs can overshadow young ventures' liabilities of being small and inexperience while gaining valuable access to knowledge and capital. Subsequently, Folta and Janney (2006) found that involvement of reputable VCs to be an effective signal for (potential) investors, showing that strategic alliance as asserted by Certo (2003) and Stuart et al. (1999) within equity financing also applicable in VC financing. Ndofor and Levitas (2004) gave an example on strategic alliance of a new venture with a key external partner would increase the chance of it being attractive to others.

As the capital market of small young ventures is not as highly regulated as those in public equity financing, entrepreneurs have relative freedom on what kind of information they regard as 'quality' signals to be send to VCs. Nonetheless, some literatures including Alveraz and Busenitz (2001) expected it to be unrealistic for entrepreneurs to transfer all information they possess, as leaking some unfavorable information could potentially jeopardize the entire funding process and increase the cost of equity (Alveraz and Busenitz, 2001; Busenitz et al., 2005). Folta and Janney (2006) argued that as environment constantly changes, increasing signal *frequency* by delivering more observable signals and boosting the number could improve effectiveness, Balboa and Marti (2007) added repetitive signals of same message via different channels enhances its effectiveness. On the other hand, Fischer and Reuber (2007), and Gao et al. (2008) argued sending multiple and conflicting signal would only confuse them. Nonetheless, as in equity financing, signaling is also highly importance in VC financing. Entrepreneurs are likely to transfer more information to VCs as VCs are much more involved in young ventures developments compare to individual and organizational investors involved in equity capital market.

#### 2.4.4 Signaling within equity crowdfunding

As an evolving and developing field, there is still a lack of academic literatures exploring EC in general. Nonetheless, there are some empirically tested literatures such as Hagedorn and Pinkwart (2016) on financing process of EC, Turan (2015a) on stakeholders' risk, and Ahler et al. (2014) on signaling.

Signaling in EC is more challenging compare to that in public equity financing, since communication is almost exclusively made online and entrepreneurs have limited capabilities to interact with (potential) investors. This is the main difference between signaling in EC and public equity. Thus asymmetrical information is likely to be higher than in public equity market. An example from strategic alliance, many literatures have expressed that having strategic alliances with reputable investors, investment banks, venture capitalists, and creditors are seen as quality signals to (potential) investors particularly prior an IPO. However such strategic alliance may not available for entrepreneurs raising capital through, as they are most likely to be first-time entrepreneurs (Vismara, 2016). The first round of financing has arguably been crucial for new ventures not only for growth resource, but also a determinant for the subsequent financing rounds, the involvement of experienced investors during the first financing round might overcome the lack of strategic alliances with reputable intermediaries. Folta and Janney (2006) have indicated that professional involvement increases the chance of ventures' ability to attract more capital injection in subsequent financing rounds. Moreover, in public equity financing, information is rather easily obtainable. For example any information especially for big companies can be released by many sources including company's press releases, news reports, journalists of various media, rating agencies, stock market reports. In equity crowdfunding, investors only rely to information provided during the '*Roadshow*' (refer back to financing process on chapter 2.1.3). When referring to signaling in VCs financing, though both types of financing involve private investors and small ventures, private investors in EC practically have very limited role once ventures have accumulated the capital. VCs is known to be involved not only in providing capital, but also management roles and usually require strict screening, evaluation, and due diligent process. It could also potentially be harder for investors to conduct due diligence to confirms all facts provided in platform page as it involves evaluating tangible and intangible assets of the ventures whereas investors may only be left with 'soft' information provided in the platform page.

#### Concluding remarks

Outlining all the abovementioned papers, as although EC is expected to grow considerably in the future, it is apparent that signaling theory is an eminently important aspect of equity-based crowdfunding and more research will need to be done in this field. The likely higher presence of asymmetrical information between entrepreneurs and (potential) investors and limited

communication capabilities making signaling in EC more challenging than that in public equity market. Following several papers investigating signaling theory (Busenitz et al., 2005; Connelly et al., 2013; Kirmani and Rao; 2000) this paper defines signal to be any information released by the entrepreneurs for (potential) investors that could possibly change (potential) investors view of the future state of the business. While following Connelly et al.'s (2011) comprehensive review on several signaling theory papers, to define 'quality' as "unobservable ability of signaler to fulfill the demands of an outsider observing the signal" (Connelly et al., 2011).

The following chapter develops hypothesis based of several information that have been empirically tested as signals in public equity and venture capitalist financing that can be associated in equity crowdfunding. This chapter then followed by methodology and data used to empirically test the corresponding hypothesis.

## **Chapter 3: Hypothesis Development**

Previous chapter argued how asymmetrical information between (potential) investors and entrepreneurs/managers exists in both conventional and alternative financing. Signaling theory was developed to overcome this issue. I have defined what signal is and which signal could be seen as 'quality' signal. However as only a handful of literatures have empirically tested this theory within equity crowdfunding, the extent to which types of signals could potentially be prominent for entrepreneurs' funding success in ECP is still obscure. This chapter will argue certain types of potentially influential signals based on empirically tested signaling theory literatures from conventional and venture capitalist financing. Subsequently, hypothesis is to be developed at the end of the chapter.

Based on available literatures, I formulated several types of these signals into 5 categories. Namely (1) Intellectual Property (Audretsch et al., 2012; Baum and Silverman, 2004; Hoenen et al., 2014; Ndofor and Levitas, 2004), (2) Human Capital (Baum and Silverman, 2004; Certo, 2003; Davidson and Honig, 2003; Shane and Cable, 2002; Spence, 1973), (3) Social Networks (Belliveau, O'Reilly, Wade, 1996; Lin et al., 2013; Ghoshal and Nahapiet, 1998; Ndofor and Levitas, 2004; Stuart et al., 1999), (4) Financial Information (Barclay and Smith, 1995; Bertomeu and Magee, 2015; Danielli at al., 2013; Healey and Palepu, 2001), and (5) Other Non-Financial Information (Cassar, Cavalluzzo, Ittner, 2015; Deephouse, 2000). It is expected that each category will positively influence funding success of a venture in equity crowdfunding. The relationship between each signal category is depicted in the following figure:



#### Figure 3

Now I will argue the relevance of each category on funding success on EC along with each corresponding signals.

#### **3.1 Intellectual Property**

Intellectual property is one of the most valued attributes of a venture. It is crucial for a company regardless its age to keep innovating in order to maintain their competitive position among their competitors and to sustain its growth and survival (Stuart et al., 1999). Naturally speaking, entrepreneurs and managers need to show to their stakeholders that they are able to innovate. Investors as outsiders may not know companies' internal innovation process such as early-research projects or early product development especially for young ventures (Kirmani and Rao, 2000), however entrepreneurs can show this by, for example, applying a patent or demonstrating a product prototype. Based on related literatures, I limit the extent of intellectual property definition into ownership of patent.

It is a well-known fact that ventures are racing to innovatively produce outputs from their R&D's departments. Blind et al. (2006) noted that R&D process has increasingly become specialized since 1990s, directing ventures to be more differentiated in their R&D process, thus leading to higher number of patented inventions especially in tech-related industries. A patent gives the venture a legal right to exclusively use its patented invention(s) against the used by their competitors and/or other unauthorized individuals. The motives of patenting itself have significantly varied from its traditional intention of offensive blockade (prevent others to use) to increase reputation and image of the venture, give higher negotiation leverage to its stakeholders,

use as internal performance indicator, give future technology options, increase income by licensing, expand market, reduce competition (Blind et al., 2006; Hoenen et al, 2014).

Baum and Silverman's (2004) study on VC financing requirements for new biotechnological ventures showed that patent ownership to be a crucially determinant factor for these ventures to obtain subsequent financing. Additionally Bloom and van Reenen (2002) demonstrated that patents had shown to have statistically and economically substantial impact on market value and company-level productivity. However Hoenen et al. (2014) recently found that the signal values of patents ownership will diminish in the subsequent financing rounds as information asymmetry is reduced in VC financing. Which means its value as a signal has relatively little effect in fund raised when compare it with first-round financing, albeit as of now, no similar research has been conducted for second-round financing in EC.

With that being said, many of young ventures are not able to patent their inventions. The increasing number of patent applications led to a more intensive reviewing process of patent granting and cost (Bloom and van Reenen, 2002; Ndofor and Levitas, 2004), thus a venture's patent portfolio should signals outside stakeholders of the venture's ability to convert its R&D resources into valuable knowledge and innovations. Nonetheless, some literatures empirically found that ownership of patented innovations could echo a venture's improving performance corresponding to its future development and market value (Bloom and van Reenen, 2002; Hall, Jaffe, and Trajtenberg, 2005; Hoenen et al., 2014).

Conclusively, based on these literature this paper argue that patents could potentially be seen as a quality signal to investors as ventures with ownership of certain patents are seemed to be more 'superior' than those who do not. However it is rather difficult to distinguish the different qualities that each patent possesses, particularly for those that are owned by small ventures. I would argue that some patents would be valued more than others. Nonetheless, a venture's ownership of patent prior funding campaign through ECP is expected to be positively associated to its funding success.

# H 1: The presence of intellectual properties such as patent positively influencing the funding success of young ventures in ECPs.

#### 3.2 Human capital

It is a common knowledge that companies will not exist without capable people working behind it. Majority of companies, especially those operating in knowledge-intensive and high- tech industries, unequivocally rely on human capabilities. Human capital, along with intellectual property, is often among the most frequently looked criteria for early venture financing (Meyer and Zacharakis, 2000). Ventures that considered of having 'higher' human capital are expected to be more productive and efficient (Schultz, 1962; Davidsson and Honig, 2003). With that being said, despite the famous examples of 'drop-out-of-college' individuals who founded some eventually large enterprises like Facebook, Burton, Sorensen, and Beckham (2002) noted that most entrepreneurs have prior employment and educational experiences. These experiences give entrepreneurs' organizational skills that provide them abilities to face challenging or unfavorable situations for their eventual ventures (Freeman, 1986; Hsu, 2007).

There are several indicators to separate 'higher' and 'lower' human capital as signals. Two of the most overlooked indicators of human capital are working experience and educational level. The sense of experience to be seen as a good signal is based on the assumption that experienced entrepreneurs and top management team can arguably hold better negotiation skills and their longer learning span is corresponding to a better ability to deal with unfavorable situation (Hsu, 2007). Similarly, in a wider context, Gulati and Higgins (2003) found that top management team career experiences to have an effect on investment banking behavior in public equity financing. It needs to be stressed though that experiences do not only include working experience, but also individuals' life experiences and other socially oriented experiences. However these types of experiences are rather hard to measure, thus tend to be 'under-looked' in literatures.

While experiences of top management team and entrepreneurs might be a compelling human capital signal, it is not the most commonly looked. Davidsson and Honig (2003) stated that formal education of top management team is as essential as experience. Further, as mentioned earlier, one of the earliest studies of signaling theory by Spence (1973) differentiated potential employees into 'high' and 'low' quality based on their formal educational level. Spence (1973) argued that educational level could signal the quality of human capital.

Analogous to VCs' favoritism of higher human capital quality of young ventures, companies in public equity financing have also been noted to signal their human capital to investors. Having prestigious board structures is often association with 'good' signals for companies prior going on

an IPO (Certo, 2003). Although on contrast to bigger companies in public equity financing, many young ventures may not have separate board structure, Certo (2003) founding's supported that human capital is still an important criterion on funding success. Some literatures further linked education level and experience with venture's growth (Colombo and Grilli, 2005) and ability to sustain venture's survival (Gimeno et al., 1997).

However, Honig (2003) noted that some biases arise when overlooking at human capital. For example highly educated individuals with many certifications may be overly careful with decision they make, discouraging them from taking risk and subsequently under-invest. Honig (2003) further noted social systems of individuals also play role despite their formal education and experiences. He gave an example of the role of close family and friends who gave constant encouragement as one of a factor.

These literatures have empirically tested the effectiveness of human capital signals such as education level, board and management members, and experiences in related fields. When looking at these signals in the context of equity crowdfunding, its observeability level might be lower compare to that in VCF and public equity financing due to limited information availability that could be provided in online platforms. Subsequently, it could reduce its effectiveness as quality signals. However, entrepreneurs in typically send signals of their human capital through other means than crowdfunding platforms. For example, by providing a link to external platforms such as social networks or company's website. Nonetheless, human capital is arguably still a crucial signal to young venture valuation. Based on mentioned empirically–based arguments that weighted more on positive relationship between human capital and venture financing, I expect the same relationship is applied to equity crowdfunding for the second signal category. Thus the second hypotheses is formulated as follow:

H 2a: Management education is positively associated with the funding success of new ventures in ECP

H 2b: Experience of the CEO is positively associated with the funding success of new ventures in ECP

H 2c: Board size is positively associated with the funding success of new ventures in ECP

H 2d: Size of the management team is positively associated with the funding success of new ventures in ECP

H 2e: Involvement of professional investors is positively associated with the funding success of new ventures in ECP

#### **3.3 Social Networks**

The effect of social context of individuals and collective individuals within a company on performance has been broadly studied in many fields (Belliveau, O'Rilley, Wade, 1996; Chow and Chan, 2008; Ghosal and Nahapiet, 1998; Gulati and Higgins, 2003). Previous literatures typically use the term 'social capital' (e.g. Chow and Chan, 2008; Ghoshal and Nahapiet, 1998), while some use the term 'alliance capital' (e.g. Baum and Silverman 2004). Due to the nature of this research and that I only incorporated social media elements of the entrepreneurs, I will use the term 'networks' instead as it is more relevant in crowdfunding topic. However, both terms are interchangeable in this sub-chapter. Previous human capital theory provides understanding of an individual value, while social capital resolves around relationship values between individuals and its influences.

Early studies of social capital focus on the influential effects of top management networks. Belliveau et al. (1996) refers social capital as available resources within the social networks and ties of the companies that would advance their positions. Although Belliveau et al. (1996) focuses on social capital influence of CEOs to their compensations, their simultaneous study on both social capital and human capital gave a clear view that social capital has more significant effect than human capital when both are accounted for. Giving an example of social capital attained from affiliation with prestigious universities might be more valued by others that what human capital in term of the degree attained represents (Belliveau et al., 1996). Social capital may have many forms (such as trust, reputation, number of networks, and affiliation to prestigious names) (Ghosal and Nahapiet, 1998), but there are two characteristics that each form has in common. First they comprise of aspects of social structure, and secondly they facilitate individuals' action (Coleman, 1990; Ghosal and Nahapiet, 1998). As an aspect of social structure, social capital abides the relationships among individuals, and contrast to human capital and intellectual property, social capital cannot be exclusively or single-handedly owned (Ghosal and Nahapiet, 1998), implying that social capital is facilitating coordination and corporation for mutual benefits (Putman, 2000).

Prior entering the financing stage, Davidsson and Honig (2003) presented a robust correlation between entrepreneurs' higher probability of entry to any types of financing with strong social bonds of the entrepreneurs. While entering the financing stage, Useem and Karabel (1986) outlined that social capital to have myriad importance in terms of networks ties and personal

contacts of the professional and organizational advancements. Strong social capital in terms of networks ties and personal contacts provide entrepreneurs with valuable resources in in early stages. This could include critical financial assistance from the entrepreneurs' affiliated contacts as business angels (Davidsson and Honig, 2003), critical advises and information from affiliated people in related industry (Shane and Venkataraman, 2000), marketing diffusion within an efficient network (Belleflame, Lambert, Schienbacher, 2014; Davidsson and Honig, 2003). In the later stage of financing, such as an IPO, ability of entrepreneurs and top managements to demonstrate a solid social network contributes to investors' decision-making process (Certo, 2003). For example, top managements' social 'status' within their networks is likely to be an indicator of their companies' quality. Although social capital provides crucial information as mentioned earlier, Coleman (1990) argued it is also not a 'universally beneficial' resource. He exemplified that strong mutual relationship, while serves as a powerful influence, could potentially lead to dreadful consequences in form of 'collective blindness' as the results of limiting openness to other information and alternate ways of doing business (Coleman, 1990). In addition to individual's networks, Stuart et al. (1999) found young venture's network ties to prominent institutions is seemed as a signal of quality by investors.

#### Social networking sites and crowdfunding

When talking about social networks in online funding platforms like crowdfunding, we cannot diminish the increasingly important role of 'online' networking sites. There are however some contradicting views about Internet and social capital. While Putman's (2000) pre-social networking era study suggested that Internet decreases social capital, Wellman et al. (2001) implied that Internet supplements social capital. Albeit I noted that both studies were conducted prior the social networking era and studied Internet as a whole.

Within peer-to-peer financing context, Lin, Prabhala, and Viswanathan (2013) found a robust relationship between 'friends' and a better credit quality, stressing the importance of network in this alternative financing method. Additionally Giudici et al. (2013) highlighted that high social capital in form of large social contacts in individual social networks works in favor of financial seekers (entrepreneurs) within crowdfunding case. Mollick (2014) further suggested that there are connections between social networking sites of an entrepreneur and their ventures with funding success. The emergence of social networking sites such as Facebook, Twitter, and LinkedIn has made it easier to broaden relationships and networks between individuals.

In recent study, social networking sites has emerged to be one of the most powerful marketing tool that its usage could have significant impact not only to a company's reputation and sales, but

also its survival (Kietzman et al., 2011). Kietzman et al. (2011) explained what they called 'social building blocks' of social networking site, which in order to effectively use it, entrepreneurs would require different efforts and measurements (Kietzman et al., 2011; Hoffman and Fodor, 2010). For example professional networking site such as LinkedIn provides us not only a place to meet people and make friendship, but also a virtual community for exchanging information, knowledge and jobs searching (Chiu, Shu, Wang, 2006).

Prior measuring the role of social media, we can identify different functionality of each type of social media. Kietzman et al. (2011) categorized these functionalities into *identity* (revelation of user's information), *presence* (the extent of user's notoriety), *relationships* (the extent of how users relate to each other), *reputation* (social standing of users, other, and content), *groups* (formation of communities and sub-communities), *conversations* (the extent to which users communicate to each other), and *sharing* (exchange, distribute, and receive contents). According to this functionality, each social networking site has some functionality that more important than other. For example, LinkedIn most important functionalities are Identity, Relationship, and Reputation; while for Facebook it would be Presence, Reputation, Conversation, and Relationship.

There are different measurements that could relate social networks to funding success. An effective use of Facebook or Twitter for example could be interpreted as good signals for investors when ventures are able to generate large amount of followers. Effective use of social networking sites may further allow entrepreneurs to increase their brand awareness, brand engagement, word-of-mouth (Hoffman and Fodor, 2010), while also provide some kind of signals to (potential) investors about their social influences in form of social buzz or E-WOM (Electronic-Word of Mouth).

In addition to Twitter and Facebook of the ventures, I expect effective use of LinkedIn would serves as an effective signal to investors. Compare to VCF where venture capitalist typically request professional information of entrepreneurs within one of the offering documents (business plan), such option may not available in EC. However, LinkedIn could serve as an effective substitute. Entrepreneurs in most cases provide external link to their LinkedIn profile on the platform page, in which they provide an extensive amount of information regarding their professional and educational backgrounds. Thus LinkedIn profile matches criterion of quality signals, which are easily observable but costly to imitate as the content, is based on personal and professional information.

Conclusively, I expect positive relationship between social networks of entrepreneurs and ventures to better funding success. Thus the next hypothesis is stated as:

H 3a: Connectivity of entrepreneur's LinkedIn profile is positively associated with funding success

H 3b: Connectivity of entrepreneur's Twitter profile is positively associated with funding success

H 3c: Connectivity of venture's Twitter page is positively associated with funding success.

H 3d: Connectivity of venture's Facebook page is positively associated with funding success

### 3.4 Financial Information

Financial information has traditionally been the most sought-after information for (potential) investors, regardless which financing stage a venture is in. There are a hefty amount of literatures studying the extent to which financial information as signals that influence investors such as corporate debt (Barclay and Smith, 1995), accounting disclosure rules (Bertomeu and Magee, 2015), past financial activities (Healey and Palepu, 2001), dividend policy (Kale, Kini, Payne, 2012), financial disclosure in small businesses (Cassar et al, 2015), and earning forecast (Penman, 1980). I will, however, not go into detail of these specific types of financial information as most of them are irrelevant for EC and found only in public equity market.

Companies disclose its financial information through different channels, though annual report is generally sought as a main information source. Many literatures associate certain types of information such as financial ratios to be positively correlated with higher stock return for investors in public equity financing (e.g. Lewellen, 2004). Similarly, for small business financing, presenting more lucrative financial information would reduce information asymmetry (e.g. Busenitz et al., 2005; Cassar et al., 2015). As for young ventures in very early financing stage, business plan typically contains financial information needed. In public equity financing, financial disclosure is highly regulated by legal regulatory body (e.g. Security Exchange Committee in the US) and are subjected to mandatory audit for its credibility (Berger and Udell, 1998). However young ventures are typically not subjected to mandatory financial disclosure and its regulations varied between countries (e.g. for ventures in crowdfunding, European Securities and Markets Authorities mandated a certain set of financial information to be published for ventures valued above  $\in$  5million, but the rests are regulated at national level<sup>1</sup>). For comparison, Masolution (2013) reported the average campaign size in EC to be substantially lower at \$190,000. For young small ventures, the level of financial information can vary greatly it term level of sophistication as they are strictly regulated. Financial information reports can be

<sup>&</sup>lt;sup>1</sup> Buysere and Hooghiemstra (2016)

<sup>&</sup>lt;sup>2</sup> http://www.ncfacanada.org/wp-content/uploads/2012/10/Massolution-Full-Industry-Report.pdf

presented from tax return and bank statement to a higher standard accounting reports applying generally-accepted accounting principles (Cassar et al., 2010).

Based on the abovementioned reasons, I will look at other type of financial information, which is typically found even in the smallest young ventures. Healy and Palepu (2001) suggested that management forecast to be a credible signal for young venture. Pownall and Waymire (1984) further indicated that financial forecast voluntarily published by management to be comparably as credible as audited financial information to investors. Similar to tax reports in previous example, the forms of financial forecast also varied greatly. Although most equity crowdfunding platforms mandate ventures to present a financial forecast, they typically do not have specified rules regarding on how it should be presented.

In addition, pre-money valuation can further be regarded as an influencing factor. In other private equity financing like venture capitalist, pre-money valuation typically depends on negotiation power of both entrepreneurs and venture capitalist (Gompers and Lerner, 2000; Hsu, 2007). However, in equity crowdfunding, pre-money valuation is usually determined entrepreneurs prior the funding campaign.

Nonetheless, regardless its forms, financial information could still crucially contribute in ventures' ability in any financing stages to obtain external funds. Thus I expect the following hypothesis to stand:

H 4a: The presence of financial forecast positively influences the funding success of new ventures in EC.

H 4b: Higher pre-money valuation of ventures positively associated with funding success

#### 3.5 Other non-Financial Information

Financial information is particularly important when they are systematically presented with nonfinancial information (Dainelli et al., 2013). However, apart from intellectual property, human capital, and social networks, there are a number other non-financial information that previous literatures considered to be important as well. For young ventures, information such as adequate business plan (Karlsson and Honig, 2009), media coverage (Deephouse, 2000), reports from financial analyst, business press, and credit rating agencies could potentially be seen as indicators for its future states. However I would only incorporate business plan and media coverage in this sub-chapter, as they are more relevant for EC.

Business plan is generally known as an essential part of young ventures. However there has been contradicting views regarding the actual value of business plan. Literatures as such Karlsoon and

Honig (2009), Poon (1996), Wickham (2006) all suggested that business plan to be crucial for young ventures to be presented to (potential) investors in early stages of financing. On the other hand, literatures such as Delmar and Shane (2004), Ford et al. (2003) implied that the correlation of business plans and performance is questionable. Giving an example of ventures that went on to be successful like Microsoft, and Calvin Klein that did not use business plans in the early process (Bhide, 2003). Nonetheless, I will follow the arguments about importance of business plans in early financing stage to test the subsequent hypothesis. In line to business plan, ventures' market analysis report is also expected to enhance funding success as both documents are typically almost simultaneously.

Media, including TV, magazines, newspaper, and Internet, have traditionally been sources of information, providing outsiders with information to reduced information asymmetry (Deephouse, 2000). McCombs and Shaw (1972) proposed that exposure to public media about certain issues will increase awareness and as an indicator of publics' opinions and knowledge about the corresponding companies. Deephouse (2000) documented three sources of information reported by the media from previous literatures. These include press releases by the companies (Shoemaker and Reese, 1991), government and or rating agencies (Fombrun, 1996), and reporters, journalists and editors (Deephouse, 2000). It is not uncommon that some young firms, especially those involved in high tech industry, are featured in online and offline media (e.g. reviews on tech magazines and websites). While several literatures (e.g. Deephouse, 2000) suggest positive relationship between media coverage and stock return, Fang and Peress (2009), on the other hand, found strong negative correlation. They implied that stock portfolio with intense media coverage to have significantly lower returns than those that do not have media coverage. Fang and Peress (2009) reasoned that too much information dissemination by the media would broaden investors' recognition of the portfolio. However noted that they did not differentiate companies that face constant 'bad' coverage and constant 'good' coverage, as conflicting information is not uncommon news that appears (Deephouse, 2009). Further, this type of coverage might only be applied for companies in public equity financing, as media tend to not give much attention on small young ventures.

Nonetheless I would expect a positive relationship between other non-financial information of ventures with its funding success.

#### H 5a: The presence of business plan is positively associated with funding success

H 5b: Media coverage is positively associated with the funding success

H 5c: The presence of market analysis is positively associated with funding success

# **Chapter 4: Methodology and Data**

Based on theoretical backgrounds and hypothesis development addressed in chapter 2 and chapter 3, this chapter presents the research methodology that will be used to empirically test the corresponding hypothesis. First I will introduce the statistical methods to be adopted onward with the models specification. Following, I will specify how dependent variables (funding success) and independent variables (types of signals) are measured. Subsequently, I will justify with how data are collected, along with sample size and data collection period.

## 4.1 Statistical methods

Considering different types of dependent variables used as measurements of funding success, different regression methods will be used accordingly. I measure 'funding success' using three dependent variables, (1) Fully Funded/Non-Fully Funded, (2) Funding Amount, (3) Number of Investors, (4) Funding Time. (See table 1 for measurement of the variables).

When looking at different types of the dependent variables, it is inadequate to use a single estimation technique. The 4 dependent variables include binary and continues data that require a different estimation technique as briefly described in the following.

For dependent variable *FUNDED* as measured in *Fully Funded/Non-Fully Funded*, binary logistic regression is considered most suitable because the variable the observation will fall into either one of the dichotomous variables. The basic equation of binary logistic regression is as follow:

Prob {Y = 1|X} = [1 + exp(-X\beta)]<sup>-1</sup>.

Where P is the probability of the event occurring (dichotomously defined as fully funded and not fully funded), while X $\beta$  stands for  $\beta 0 + \beta 1X1 + \beta 2X2 + ... + \beta nXn$ .

 $\begin{aligned} \text{FUND} &= \beta_0 + \beta_1 PTNT + \beta_2 MNG\_EDU + \beta_3 CEO\_EXP + \beta_4 BOARD\_SIZE + \beta_5 MNG\_SIZE + \\ \beta_6 PROF\_INV + \beta_7 CEO\_TWI + \beta_8 CEO\_LIN + \beta_9 VEN\_Fb + \beta_{10} VEN\_TWI + \beta_{11} FNC\_FOREC + \\ \beta_{12} PRE\_VALUE + \beta_{13} BUS\_PLANi + \beta_{14} MED\_COV + \beta_{15} MARKET\_AN + \beta_{16} OFFERINGS + \\ \beta_{17} SIZE + \beta_{18} AGE\_MONTHS + \beta \end{aligned}$ 

Next, dependent variable *Total Funds Raised (RAISED)* is measured in term of percentage of fund received relative to funding target. To test the effect of the independent variable, standard ordinary least square regression (OLS) will be used following Baum and Silverman (2004). The following shows model specification

 $\begin{aligned} RAISED_{it} &= \beta_0 + \beta_1 PTNT_{it} + \beta_2 MNG\_EDU_{it} + \beta_3 CEO\_EXP_{it} + \beta_4 BOARD\_SIZE_{it} + \\ \beta_5 MNG\_SIZE_{it} + \beta_6 PROF\_INV_{it} + \beta_7 CEO\_TWI_{it} + \beta_8 CEO\_LIN_{it} + \beta_9 VEN\_FB_{it} + \beta_{10} VEN\_TWI_{it} \\ &+ \beta_{11} FNC\_FOREC_{it} + \beta_{12} PRE\_VALUEit + \beta_{13} BUS\_PLANi_t + \beta_{14} MED\_COV_{it} + \\ \beta_{15} MARKET\_AN_{it} + \beta_{16} OFFERINGSit + \beta_{17} SIZEit + \beta_{18} AGE\_MONTHSit + \varepsilon_{it} \end{aligned}$ 

#### 4.2 Measurements of the Variables

#### 4.2.1 Dependent Variables

As mentioned in the objective of this paper, I will measure the level of funding success of ventures that raise capital through equity-based crowdfunding. There are only few papers have empirically tested in such manners. Thus I distinctively categorize the funding success into the following categories:

Firstly, I will use the term *FUNDED* as a measurement. I will develop dichotomous variables in which **1** indicates that the ventures have received their targeted funding during my sampling period, and **0** if those ventures failed to received its targeted funding. This measurement is similar with Ahler et al., (2015) who studied same topic using samples from Australian-based equity crowdfunding platforms. As I exercise the extent to which signals that are send by entrepreneurs with limited options through EC platforms, I expect ventures that receive its targeted funding to have shown its ability to minimize information asymmetry thus indicating their ability to channel their quality. This is consistent with literatures on quality signals by e.g. Audretsch et al. (2012), Connelly et al., (2011), Folta and Janney (2006), and Healy and Palepu (2001). Second, *percentage of funding amount (RAISED%)* is analyzed using the percentage of total funds received relative to the target funding. I argue that ventures that send more credible signals would attract more capital regardless of their targeted funding.

#### 4.2.2 Independent Variables

This sub-chapter defines which variables that influence the funding success. Although since I have extensively described illustrated the relationships between these corresponding variables in chapter 3, I will not go into much details in this sub-chapter. I have categorized the determinant variables into 5 distinct categories as followed:

#### Intellectual Properties.

The one indicator used is *patent ownership*, which represents ventures' ability to demonstrate their innovative capabilities to (potential) investors. Consistent with Baum and Silverman (2004), Bloom and Reenen (2002), and Ndofor and Levitas (2004), the presence of patent ownership increase ventures' market value thus increasing their chances of obtaining funds. A binary variable is created with (1) indicated that the ventures own at least one patent or (0) when the ventures do not own any patents prior entering funding campaign through EC platforms.

#### Human Capital

Quality of owner and top management team mirrors the their ability to manage the ventures. There are several proxies of human capital can be measured with data provided on crowdfunding platforms. Spence (1973) implied that educational level reflects a quality signal as those with higher level of education posses not only knowledge but also other skills deemed necessary for ventures' survival. Although educations do not necessarily have to be formal, formal education represents the most explicit knowledge of human capital aspects (Davidsson and Honig, 2003). It has been proven in many previous literatures that correlated higher level of education with increasing companies' performances. There are a number of proxies to can be measured; however I will use master degree The first proxy called *Management Education* is measured by the percentage of top management team that hold at least a master degree. The second proxy is related to management team's experiences. Following Hsu (2007), I use experiences of entrepreneurs and top management team as a proxy. CEO Experiences is measured by average total years of formal working experience within the management team. The last proxy of human capital is measured by the size of the management team. A bigger number of management team may provide ventures with higher human capital as well as social networks (Baum and Silverman, 2004). Thus I add proxy *Management Size* in term of absolute total number of the top management team. The fourth proxy is **Board Size**, which is measured as absolute total number of board members. The last proxy is involvement of *Professional Investors* in which (1) indicates

the disclosure of information about professional investors involvement and  $(\mathbf{0})$  when professional investors are not involved or information is non-disclosed (Folta and Janney, 2006).

#### Social Networks

A number of proxies can be used as measurement of social networks. However in the context of online financing like crowdfunding, following Giudici et al. (2013), Lin et al. (2013), and Mollick (2015), I will in particular use networks within social networking sites as it is the most explicit measurements of social context in online platforms. According to Hoffman and Fodor (2010), and Kietzman et al. (2011), depending the aims of the companies, there is variety of ways to maximize and measure social networking sites' effect on companies. Nonetheless, I will use 2 measurements, *Twitter followers* of the CEO, and *LinkedIn* connections of the CEO. Lastly, I will use the number of likes of the ventures *Facebook Page* and *Twitter Followers* of the venture's Twitter account as another proxies (Hoffman and Fodor, 2010)

#### Financial Information

As small and young ventures are not subjects to tightly regulated and audited financial disclosures as companies in public equity financing, I will not use higher standard financial information such as financial reports using generally-accepted accounting principles. On the other hand, I will use less complex proxy that is as crucially important for young ventures such as financial forecast. Healy and Palepu (2001), Pownall and Waymire (1984) indicated that the inclusion of financial forecast, which voluntarily published by management, to be comparably as credible as audited financial information to investors. There is no standard way in which venture should present financial forecast within ECF, as platforms typically give ventures freedom to determine whether to provide forecast or how they will present it.

Thus I will create binary variable of *financial forecast* account whether (1) provided a financial forecast and (0) do not provide financial forecast. Although there are other indicators of financial information such including cash flow statement, balance sheet, and income statement, those are mandatory information that entrepreneurs should be provided in any EC platforms. Thus their inclusion might create inconclusive results. However each venture in equity crowdfunding provides information about the total number of shares they will issue for each financing round. Another proxy I will use is *pre-money valuation* of the venture using its absolute amount.

#### **Other non-Financial Information**

The last category of independent variables that are expected to give an effect on funding success through equity crowdfunding is other non-financial information that are not covered in intellectual properties, human capital, and social networks. Firstly as explained in previous chapter, the role of business plan will be examined (Karlsoon and Honig, 2009; Poon, 1996; Wickham, 2001). I will create binary variable *Business Plan* coded as (1) for ventures that provide business plan and (0) for ventures that do not provide business plan. The second proxy is media coverage, consistent with Deephouse (2000) and Fombrun (1996) that exposures to mainstream media will increase investors' awareness about companies. Thus a binary variable indicating whether the ventures have been covered in at least one of a mainstream media such as magazines and industry-related review websites. Variable *Media Coverage* is created in which (1) is coded for ventures with at least one media coverage and (0) for ventures that have not been mentioned in any media. Lastly, *Market Analysis Report* is further added with (1) coded for ventures that provide market analysis in their respective industry and (0) for ventures that do not. Lastly I will use *Market Analysis* with (1) coded for ventures that provide market analysis and (0) for those that do not.

#### 4.2.3 Additional Variables

There are a number other variables that may influence ventures' funding through equity crowdfunding platforms. I control a number of additional variables as follow:

*Equity offerings,* a number of literatures have documented the amount of shares that entrepreneurs kept, could be a strong signal to investors. The logic stands that if entrepreneurs keep a large share of their own venture, they expect the ventures to generate high value in the future. However the cost of keeping a large amount of equity is high, thus contradict with 'quality' signal theory that stated 'quality' signal should be costly for competitors. Thus I would add equity offering as additional control variable by using percentage of shares retained by owners. *Venture size* is added, as information about the total assets of ventures is not provided by many, the size of the employees will be used instead. Thus *Venture Size* is measured as the natural logarithm of employees. *Venture age* is added using the total number of months of the ventures having been in existence.

#### Summary of variables

#### Table 1.Variables Terms and Scales

#### **Dependent Variables**

ŀ	U	N.	DI	ЕL	)	

(1) Ventures completed its financing round, (0) Ventures failed to achieved targeted funding **RAISED%** 

Total amount of funds raised relative to target funding in term of %

#### **Independent Variables**

**Intellectual Properties** Binary variables of: PTNT (Patent Ownership) (1) Own at least one patent, (0) do not own any patent Human Capital MNG EDU (Management Education) Management team member who hold at least a Master degree / number of management team\* 100% **CEO\_EXP** (Management Experience) Total years of CEO experience MNG\_SIZE (Management Size) Total number of management team **BOARD SIZE** Total number of board size **PRO INV** (1) Discloses information about the involvement of professional investors, (0) no involvement of professional investors or information in non-disclosed Social Networks CEO\_TW (Number of followers of CEO's Twitter page) Natural Logarithm CEO\_LIN (Number of CEO's LinkedIn profile connections) Natural Logarithm VEN\_FB (Number of 'likes' of venture's Facebook page) Natural Logarithm VEN\_TW (Number of venture's Twitter followers) Natural Logarithm Financial Information FNC FOREC (Financial forecast) (1) Venture shows a financial forecast regardless the years, (0) Venture does not provide any financial forecast in their document offerings PRE\_VALUE Venture's valuation prior entering funding campaign Other non-financial Information **BUS\_PLAN** (Business plan) (1) Venture provides a business plan regardless the years, (0) Venture does not provide business plan in their document offerings MED\_COV (Media Coverage) (1) The venture has been featured in at least one media such as magazine, (0) the venture has not been featured in at least one media such as magazine MAR\_AN (Market Analysis) (1) Venture provides a market analysis report, (0) venture does not provide market analysis report Additional Variables **OFFERINGS** (Shares offered by the venture) Shares offered by the venture % of shares offered VEN SIZE (Venture size) Absolute number of employees VEN\_AGE (Venture age) Absolute number of months that have ventures have been in existence

#### **4.3 Data Collection**

This study primarily uses secondary data available on multiple equity crowdfunding platforms within European countries. The initial goal was to use a single platform for data collection. However none of the current equity-only crowdfunding platforms provide enough data for the study. Further no live-projects during the time period from multiple platforms of one country are enough. The size of data availability and awareness of the platforms are inconsistent in many of the currently available platforms. Additionally collecting past past/finished projects from a single platform is also not possible due to data protection by each platform. Thus multiple well-known equity crowdfunding platforms from multiple European countries are selected instead.

As mention in chapter 2.2.1, spatial distance of investors to be stood at 5000 km, suggesting cross-border barriers of equity crowdfunding investments could be minimized. Further, report from European Commission (European Commission, 2016) implied that regulatory the European Commission is working towards unified regulations for equity crowdfunding within its members. My research is primarily focused on certain types of signals that are available throughout all of the corresponding EC platforms. With that being said, I set criterion of equity crowdfunding platforms in multiple European countries that meet my data requirements.

First, each platform must have at least 10 live-projects during the data collection period. From all active European equity crowdfunding platforms, only 6 platforms had at least 10 live-projects representing 4 countries, including 3 British platforms, and 1 platform each from the Netherlands, Finland, and Sweden.

Country	Number of Cases
UK	59
Netherlands	10
Sweden	10
Findland	15

 Table 2. Sample Size

Majority of data were collected from the platforms. Nonetheless 4 data inquiries were collected from other sources. Data for variables CEO's Twitter, CEO's LinkedIn, and Venture's Facebook and Venture's Twitter were collected from the corresponding social networking sites. While variable media coverage was added from various online magazines and industry-related website reviews (if applicable). I set the study period of data collection to be from July 1<sup>st</sup> – October 31<sup>st</sup> 2016.



\*Sector classifications in Crowdfunding based on report from Massolution<sup>2</sup>. Software and internet-based businesses are by far the most common type of ventures involved in crowdfunding in general. Sectors with digital contents represent the majority of the total sample. Consumer products include apparels, and food and beverage. While 'Others' sectors include health- and other tech-based ventures.

Figure 4: Sector classification

<sup>&</sup>lt;sup>2</sup> http://www.ncfacanada.org/wp-content/uploads/2012/10/Massolution-Full-Industry-Report.pdf

# **Chapter 5: Results and Discussion**

This following chapter presents the results of the study. Firstly descriptive statistics of all variables is reported. Subsequently, I will present the statistical correlation of all variables. The empirical results of the study is then reported, followed by discussion of the results.

#### 5.1 Descriptive Statistics

Table 3 reports the descriptive statistics of dependent variables (funding success), dependent variables, and additional variables. The table presents mean, standard deviation, and minimum and maximum values of each case.

	Obs.	Mean	Std. Deviation	Min	Max
Dependent Varia	bles				
FUNDED	94	0.730	0.444	0	1
RAISED_%	94	1.219	0.706	1.000%	372.000%
Independent Vari	iables				
Intellectual Capito	al				
PATENT	94	0.070	0.264	0	1
Human Capital					
MNG_EDU	94	0.315	0.316	0.000%	100.000%
CEO_EXP	94	14.021	7.927	0	35
BBOARD_SIZE	94	1.110	1.787	0	7
MNG_SIZE	94	4.100	2.324	0	12
PROF_INV	94	0.730	0.444	0	1
Social Networks					
CEO_LIN	94	6.020	1.138	0	7.528
CEO_TW	94	3.069	3.191	0	9.845
VEN_TW	94	6.068	2.648	0	11.760
VEN_FB	94	6.356	3.308	0	12.069
Financial Informe	ation				
FNC_FORE	94	0.940	0.246	0	1
PRE_VAL	94	6,045,814.330	10,767,674.035	360000	75500000
Other non-Finance	cial Info	rmation			
BUS_PLAN	94	0.490	0.503	0	1
MED_COV	94	0.650	0.480	0	1
MAR_AN	94	0.470	0.502	0	1
Additional Varial	bles				
OFFERINGS	94	0.106	0.066	2.390%	27.010%
SIZE	94	12.630	16.615	2	111
AGE_MONTHS	94	36.470	24.602	1	132
See table 1 for def	inition o	f the variables			

#### **Table 3: Descriptive Statistics**

The first dependent variable of funding success *FUNDED* was coded with 0 when the venture failed to receive their targeted funding, and 1 when target funding is successfully reached of passed. The average is reported as 0.73, implying that 73% or 68 ventures in the sample received at least their targeted funding (in some cases, ventures often received funds well-above their target), while 27% or about 25 ventures failed to reach their targeted funds. The second dependent variable *RAISED*% is measured by percentage funds received relative to the target funding. On average, ventures in the sample showed to have received 121.9% or about 20% higher than the initial funding target. The lowest venture received only 1% of its target, while the highest was 375% or over 3 times higher than initially targeted.

With regards to independent variables, the first variable *PATENT* is measured as 0 for those ventures that did not indicate ownerships of any patents, and 1 otherwise. The 0.07 average point reported indicates that only 7% or 6 of the total samples owned a patent. The disappropriately low result of ventures that owned at least a patent could be related to the types of industry these ventures operate. Followings are variables for Human Capital. Firstly MNG\_EDU reported an average of 31.5% of top management team who holds at least a master degree. The minimum value of 0% implied that none of the top management team in the venture holds a master degree or higher, on contrast to 100% reported for the maximum value. Next, CEO\_EXP was measured in terms of absolute number of experiences of the CEO. On average, sample ventures showed to have preference for CEO that has more experience with 14 years reported. CEO with the most experience is reported as 35 regardless whether the past experience was directly related to the current ventures or not, while the lowest one is 0 year. Next is the size of the top management team, on average ventures have about 4 persons representing key management teams. Venture with the least number of team reported as only 1 person that also acts as its CEO, while the most with 12 persons in the team. Unexpectedly, the number of board member is disappropriately low, with only 1 of board member per venture on average. Although a large number of ventures do not have a single board member, the most board members in a venture is 7 persons. The last variable of human capital is *PROF INV* or involvement of professional investors during the funding campaign, which is measured as 0 if professional investors involvement was not directly presented and 1 otherwise. Table 3 reported a mean of 0.73, which implies almost two-third of the ventures disclosed the information regarding the involvement of professional investors.

With regards to social networks, the table did not present the absolute number of friends, likes, followers, or connections for Facebook, Twitter, and LinkedIn profiles of CEO and the ventures. Instead, natural logarithm is used (see table 1). First, the connections of LinkedIn profile of the

CEO (CEO\_LIN) have a minimum value of 0 to a maximum value of 7.528, while its means is recorded as 6.020. Next the natural logarithm of the CEO's Twitter's followers (CEO\_TW) was averaged on 3.069 with the lowest point of 0 and the highest point of 9.845. In regards to ventures' social networking profiles, venture's Twitter (VEN\_TW) recorded a mean of 6.068, with minimum value of 0 and maximum value of 11.760. Lastly, venture's Facebook page (VEN\_FB) recorded to have a mean of 6.356 with minimum value of 0 and a maximum value of 12.069.

The next independent variables are financial information. *FNC\_FOR* was measured in code with 0 and 1 indicating a non-disclosure of financial forecast and a disclosure of financial forecast respectively. The reports only accounts whether financial forecast in disclosed in th campaign page, disregarding the level of sophistication of the reports. On average, a large majority (94% or 89 ventures) did present their financial forecast, while 6% or 8 ventures did not directly present the document. Pre-money valuation (PRE\_VALUE) of the ventures showed a more varied result. Venture with the least value reported was  $\in$  360,000, while the most valuable venture prior the financing round was  $\in$  75,500,000. On average, the value of all 94 ventures was  $\notin$  6,045,824 each.

Variables of independent variable category *other non-financial information*, are coded the same manner as 0 and 1. The disclosure of business plan (BUS\_PLAN) has an average value of 0.49, representing half of the samples. The mean of media coverage (MED\_COV) showed a rather high number of 0.65, indicating the 65% of all samples have previously been featured in at least one mainstream media (online- and offline magazines, newspaper, etc.) which is typically presented in their websites. Next the availability of market analysis report (MAR\_AN) showed a mean of 0.47 similar to that of variable business plan.

Table 3 further reports variable equity offerings by the ventures (OFFERINGS) have a low value of 2.39% and high value of 27.01% with an average of 10.62%. Size of the company is measured in absolute number of total employees, and as reported has a mean of 12.63 employees per venture. The minimum value is 2 employees, which typically consisted of only the founders, to as high as 111 total employees. The last variable is age of the venture (AGE\_MONTHS) that was measured in term of months of its existence. The youngest venture showed the number of only 1 month, with the oldest venture in the sample to be 132 months old. The mean age is shown to be 36.47 months. The next sub-chapter presents the correlation matrix table between each variable using Pearson Correlation.

# Table 4: Pearson's Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FUNDED (1)	1																			
RAISED% (2)	.686**	1																		
PATENT (3)	0.171	0.096	1																	
MNG_EDU (4)	0.194	.345**	.317**	1																
CEO_EXP (5)	-0.02	-0.014	.225*	0.087	1															
BBOARD_SIZE (6)	0.077	0.015	-0.085	-0.044	-0.034	1														
MNG_SIZE (7)	0.171	0.132	0.041	0.003	0.173	0.06	1													
PROF_INV (8)	.673**	.498**	0.079	0.126	0.029	0.036	0.14	1												
CEO_LIN (9)	.322**	.342**	0.129	0.089	0.139	-0.001	0.025	.252*	1											
CEO_TW (10)	.256*	.226*	-0.012	0.11	-0.147	-0.025	0.011	0.191	.341**	1										
VEN_TW (11)	0.071	0.121	219*	0.008	-0.167	0.018	0.126	0.135	.290**	.498**	1									
<b>VEN_FB</b> (12)	.259*	.271**	344**	0.116	-0.152	-0.093	0.201	.232*	0.077	.230*	.546**	1								
FNC_FORE (13)	.237*	.243*	0.074	0.022	-0.021	0.04	0.124	.237*	0.163	0.144	0.043	0.033	1							
PRE-VALUE (14)	0.113	0.18	-0.021	0.062	0.129	0.011	.394**	0.175	0.131	0.034	0.199	.332**	0.106	1						
BUS_PLAN (15)	0.011	-0.09	0.047	0.148	-0.062	-0.023	0.116	0.059	-0.117	0.038	0.044	0.134	.256*	0.092	1					
MED_COV (16)	.516**	.253*	.209*	0.201	-0.006	0.044	0.165	.364**	.252*	.257*	.257*	.406**	.264*	.277**	.230*	1				
MAR_AN (17)	0.034	0.042	-0.022	0.109	-0.065	0.016	0.164	0.082	-0.062	0.079	0.116	0.181	.245*	0.198	.873**	.243*	1			
OFFERINGS (18)	-0.115	-0.163	-0.122	214*	-0.021	0.019	306**	0.13	-0.005	-0.086	0.063	-0.186	-0.103	318**	-0.134	-0.156	-0.096	1		
SIZE (19)	0.153	.220*	-0.028	0.071	0.121	0.064	.319**	.208*	0.133	0.183	.317**	.303**	0.118	.730**	0.075	.256*	.242*	-0.175	1	
AGE_MONTHS (20)	0.119	0.066	0.023	0.075	0.187	.282**	.204*	0.05	0.114	0.156	0.173	.230*	0.071	.219*	0.026	.274**	0.026	-0.195	.376**	1
** Correlation is signifi	cant at the	0.01 level	(2-tailed). *	<sup>c</sup> Correlatio	on is signifi	cant at the (	).05 level (2	2-tailed). F	or definitio	n of the va	riables, see	table 1.								

Table 4 presents the correlation coefficients of all variables using Pearson's Correlation matrix. In general variabe MED\_COV (media coverage) was reported to have high correlation with some others varibales in the data set. However the highest correlations among variables are reported between variables business plan (15) and market analysis (17) with 0.873 points and pre-money valuation (14) and venture size (19) with 0.73 points. High correlations are also reported between variables venutre's Facebook and venture's Twitter, and between venture's Twitter.

Independent Variables	Tolerance	VIF	All Variables	Tolerance	VIF
Intellectual Capital			Intellectual Capit	al	
PATENT	0.599	1.669	PATENT	0.591	1.693
Human Capital			Human Capital		
MNG_EDU	0.809	1.236	MNG_EDU	0.788	1.269
CEO_EXP	0.838	1.194	CEO_EXP	0.786	1.272
BOARD_SIZE	0.929	1.077	BOARD_SIZE	0.823	1.214
MNG_SIZE	0.785	1.274	MNG_SIZE	0.733	1.364
PROF_INV	0.796	1.257	PROF_INV	0.695	1.44
Social Networks			Social Networks		
CEO_LIN	0.723	1.383	CEO_LIN	0.714	1.401
CEO_TW	0.659	1.518	CEO_TW	0.618	1.619
VEN_TW	0.510	1.961	VEN_TW	0.452	2.21
VEN_FB	0.430	2.328	VEN_FB	0.396	2.527
Financial			Financial Inform	ation	
Information			1 /////////////////////////////////////	unon	
FNC_FORE	0.825	1.212	FNC_FORE	0.818	1.222
PRE_VALUE	0.715	1.399	PRE_VALUE	0.370	2.706
Other non-Financial I	nformation		Other non-Finan	cial Informati	on
BUS_PLAN	0.216	4.635	BUS_PLAN	0.198	5.061
MED_COV	0.574	1.744	MED_COV	0.561	1.782
MAR_AN	0.216	4.631	MAR_AN	0.192	5.199
			Additional Varial	bles	
			OFFERINGS	0.647	1.546
			SIZE	0.343	2.917
			AGE_MONTHS	0.648	1.544

# **Table 5. Collinearity Statistics**

*VIF*: Variance of inflation factor. Tests showed if data met the assumption of colinearity, indicating that multicolinearity was not a concern (Tolerance >.1 and VIF <10). For definitions of the variables, refer to table 1.

Variables	Model 1	l	Mod	Mod	lel 3	M	odel 4	Mo	del 5	
v ar lables	Ex(B)	sig	Ex(B)	sig	Ex(B)	sig	Ex(B)	sig	Ex(B)	sig
Intelectual Capital										
Patent	0.000	0.999								
Human Capital										
MNG_EDU	1.012	0.546	1.017	0.350	1.024	0.143	1.013	0.457	1.001	0.959
CEO_EXP	0.937	0.378	0.938	0.398	0.985	0.789	0.947	0.442	0.874	0.398
BOARD_SIZE	1.515	0.172	1.477	0.199	1.278	0.373	1.487	0.184	2.007	0.196
MNG_SIZE	1.316	0.382	1.304	0.361	1.326	0.280	1.280	0.420	1.294	0.671
PROF_INV	0.009	0***	0.008***	0***	0.016	0.000	0.010	0***	0.000	0.052*
Social Networks										
CEO_LIN	3.336	0.061*	3.646	0.042**	1.765	0.142	3.704	0.031**	65.067	0.085*
CEO_TW	1.264	0.196	1.265	0.199	1.030	0.823	1.255	0.195	1.133	0.737
VEN_TW	0.471	0.041**	0.452	0.03**			0.462	0.029**	0.193	0.1*
VEN_FB	1.387	0.155	1.322	0.195	1.015	0.208	1.337	0.185	2.166	0.1*
Financial Information										
FNC_FORE	0.886	0.954	0.813	0.919	0.360	0.470	0.982	0.993	0.061	0.498
PRE_VALUE	1.000	0.098*	1.000	0.078*	1.000	0.062	1.000	0.145	1.000	0.068*
Other non-Financial Information										
BUS_PLAN	9.521	0.274	9.362	0.262	6.601	0.292			244.777	0.318
MED_COV	0.054	0.033**	0.036	0.011**	0.043	0.005	0.049	0.013**	0.000	0.041**
MAR_AN	0.461	0.709	0.544	0.749	0.866	0.932	3.773	0.246	0.136	0.701
Additional Variables										
OFFERINGS									0.486	0.111
SIZE									1.057	0.675
AGE_MONTHS									0.930	0.061*
Constant	10731721.840	0.999	0.119	0.557	0.216	0.605	0.077	0.469	17.734	0.700
Nagelkerke R Square		0.782		0.777		0.722		0.769		0.865

# Table 6: Binary Logistic result with Funded/Not Funded as dependent variable

Panel A:Binary Logistic with FUNDED as the Dependent Variable

# Table 7: OLS regression

X7 • 11	Model	1: all IVs	Model 2:		Model 3:	NO VN TW	Model	4: NO BP	Model 5:	
v ariables	В	Т	В	Т	В	Т	В	Т	В	Т
(Constant)	48.754	0.518	43.411	0.464	32.844	0.349	12.06	0.122	187.84	1.585
Intelectual Capital										
PATENT	20.343	0.739							16.378	0.599
Human Capital										
MNG_EDU	0.67	3.382***	0.716	3.818***	0.744	3.95***	0.641	3.24***	0.628	3.175***
CEO_EXP	-0.451	-0.554	-0.41	-0.507	-0.329	-0.404	-0.423	-0.492	-0.131	-0.159
BBOARD_SIZE	1.624	0.488	1.177	0.361	0.689	0.21	1.915	0.553	2.278	0.655
MNG_SIZE	2.785	0.977	2.91	1.026	2.616	0.916	3.114	1.033	1.805	0.63
PROF_INV	54.229	3.826***	54.627	3.868***	56.441	3.974***	56.002	3.733***	61.56	4.111***
Social Networks										
CEO_LIN	12.059	2.088**	12.304	2.14**	10.394	1.834*	14.786	2.44**	11.49	2.005**
CEO_TW	1.534	0.712	1.517	0.705	0.165	0.083	1.648	0.721	0.85	0.39
VEN_TW	-4.565	-1.541	-4.603	-1.558			-4.181	-1.333	-3.255	-1.046
VEN_FB	6.147	2.33**	5.258	2.245**	3.486	1.688*	5.4	2.17**	5.328	1.987*
Financial Information										
FNC_FORE	49.902	1.98*	49.284	1.962*	51.141	2.02**	39.597	1.493	47.295	1.892**
PRE_VALUE	-7.677	-1.103	-7.187	-1.04	-6.784	-0.974	-6.039	-0.824	-15.725	-1.888**
Other non-Financial Informatio	п									
BUS_PLAN	-80.953	-3.411***	-79.364	-3.368***	-77.807	-3.275***			-80.415	-3.24***
MED_COV	-11.847	-0.764	-8.092	-0.554	-7.259	-0.493	-12.081	-0.78	-10.18	-0.658
MAR_AN	63.824	2.68***	61.834	2.62**	59.507	2.505**	-6.151	-0.474	64.024	2.542**
Additional Variables										
OFFERINGS									-2.173	-2.022**
SIZE									0.361	0.769
AGE_MONTHS									-0.057	-0.205
Adjusted R <sup>2</sup>		0.414		0.418		0.49		0.342		0.426

Panel B: OLS with Total Funds Raised as the Dependent Variable

#### **5.2 Regression Results**

Table 6 and table 7 present the multivariate regression results between dependent variables of funding success and independent variables of intellectual intelligence, human capital, social networks, financial, and other non-financial information using binary logistics and OLS regression accordingly.

#### Discussion

Hypothesis 1 expects intellectual capital, Patent, to be positively related to funding success in equity crowdfunding, as patent was concluded to be a credible signal for small ventures in other financing methods (e.g. Audretsch et al., 2012; Baum and Silverman, 2004). However, I did not find enough evidence to support the first hypothesis. In model 1 of panel A, and model 1 and 5 of panel B where variable PATENT was included, coefficients were reported to be positive, but statistically insignificant for both funding success variables. Albeit, this result is in line with previous study on equity crowdfunding by Ahler et al. (2015) where no evidence was found between patent grants and funding success. One possible major reason is a large number of ventures in the data sample did not own a single patent. If we refer back to table 3 of descriptive statistics, the average ventures owning a patent was a mere 0.07; indicating only 7% of 94 samples owned at least a single patent.

The proceeding hypotheses expect positive relationship between all variables of human capital with funding success. Management education (MNG\_EDU, table 6 and 7) presented positive coefficients in all 10 models. However I found mixed results regarding the statistical strengths between panel A with dependent variable FUND and panel B with dependent variable FUNDSRAISED. All models in panel B presented significant relationship between management education and funding success, while in all models of panel A showed positive but insigfineant coefficients. Models 1 - 5 of panel B constantly presented significant and positive coefficients for management education even when some other variables are removed. Thus these results only partially supported hypothesis 2a if I used funding success measurement of total funds raised. Similar mixed results were also found in Ahler et al. (2015) with different measurement of funding success. One particularly interesting point for management education as a signal to investors in crowdfunding platforms is how it was presented. On the platforms, I found many ventures did not show their top management's team educational backgrounds on the platform page, rather they presented small description of their entrepreneurial experiences, which was displayed on the page. Formal education information however was extensively presented in their LinkedIn page (which I found in most platform page to be visibly linked). Referring back to the correlation matrix, there is a strong correlation between management education and LinkedIn connection.

Hypothesis 2b predicts positive relationship between experience of the CEO and funding success. However, the result was inconclusive. In models 1 - 5 of panel A coefficients are positive, but in models 1 - 5 of panel b showed negative coefficients. Thus this finding could not support hypothesis 2b, which is particularly interesting as previous literatures such as Giullati and Higgins (2003) and Hsu (2007) gave evidence of high importance of experiences as credible a credible signal to venture capitalists. One possible reason could be the lack of experience in the respective field of the ventures. On my sample even though the average experiences of the CEO stood at 14 years (table 3), I found in many case a considerably large amount of CEO experiences did not directly relate to the industry type in which their ventures operate.

In regards to variables *board size* and *management size*, the results are insignificant but, in line with the hypotheses, have positive coefficients in all 10 models of panels A and B. For comparison, Ahler et al. (2015) found strong relation between number of board members and funding success in equity crowdfunding. When referring back to descriptive statistics (table 3), a large number of ventures do not have board members. All in all, although all signs showed to be positive, the results are statistically insignificant to conclusively support hypothesis 2c (board size) and hypothesis 2d (management size).

Hypothesis 2e expects information disclosure of the involvements of professional investors to be positive related to funding success. Regression results showed postive and highly significant coefficients in all models to both measurements of funding success. It follows from this that removing other varibles in model 2, 3, and 4 of panels A and B did not change the effect of information disclosure of professional investors' involvement effects. I interpret this result to mean there is signaling value when ventures decide to disclose the information when there professional or accredited investors are involved as a large number of investors in equity crowdfunding tend to be less experienced investors (Bellefleme et al., 2014). Again, the lack of comparative studies restraining my result to be firmly analyzed to others. However, in relation to VC financing and public equity financing, I have argued that involvement of reputable investors would increase the likelihood of a young venture to be attractive to others (Certo, 2003; Stuart et al., 2004; Ndofor and Levitas, 2004).

#### Social Networks

The effect of social context of individuals and collective individuals within an organization has been broadly studied in many fields (Belliveau et al., 1996; Ghosal and Nahapiet, 1998). I examined the effect of social networks using social networking sites of both CEO and the

ventures. Social networks are particularly interesting in this case as it is one of the few main differences between traditional venture financing (e.g. VC financing or IPO). Previous literatures also argue that social networks are important in peer-to-peer financing, as it could motivate (potential) investors and thus subsequently facilitate investment decisions (Brussee, 2013; Lin et al., 2013; Moritz and Block, 2015). However, its role in equity crowdfunding is little known so far. In line with hypothesis 3a, connectivity of LinkedIn profile of the CEO showed positive and highly significant relation to funding success in all models of both panels A and B with the exception of model 4 of panel A when variable venture's Twitter was removed. There is no previous study to see the influence of LinkedIn to funding success in equity crowdfunding for comparison. Although not within equity crowdfunding context, this result is consistent with Giudici et al. (2013) who studied social capital and crowdfunding in Italy in general, and Mollick (2014) who studied crowdfunding and social networking. The positive significant coefficient LinkedIn in most models suggests that LinkedIn was more aggressively used by potential investors compare to the other two social networking sites. One reason could be the contents within LinkedIn profile. As was mentioned in earlier chapters, Kietzmann et al. (2011) identified functionalities of each social networking site. With LinkedIn's most important functionalities include Identity, Relationship, and *Reputation*. In my data sample I found LinkedIn profile to be a highly informative source, especially in regards to professional information. Due to limited information available in the crowdfunding platform page.

Next hypothesis 3b predicts positive influence of CEO's Twitter to funding success. The results are insignificant in all 10 models although coefficients are still positive as was predicted. Thus the results were inconclusive. Hypothesis 3c expects same relationship between venture's Twitter and funding success. Similar to hypothesis 2a of management education, the results were only partially supportive to one of the funding success measurements. Its coefficients are statistically significant and positive in Panel A of dependent variable FUNDED, but negative and insignificant in all models of Panel B in which it was included. One possible reason could be the strike contrast of few ventures that extensively use Twitter and many of those who do not use it at all. Venture's Facebook produces a more conclusive result compare to that of Twitter. All coefficients are positive in models 1 - 5 of panels A and B. However models 1 - 4 of panel A did not show significant coefficient, although its strength increased to be significant in model 5 when all variables are added. On the other hand, all models of panel B with dependent variable total funds raised Facebook produced highly significant coefficients. Thus I concluded the result supports my hypothesis. In unreported data from my venture samples, I found Facebook to be more popular than Twitter.

I now turn to disclosure of financial information. I used two variables for financial information, *financial forecast* and *pre-money valuation*. Hypothesis 4a expects the availability of financial forecast to be positively influencing. As argues in previous chapters, voluntary financial forecast disclosed by management team serves as a positive signal to outside investors (Healy and Palepu, 2001; Pownall and Waymire, 1984). All models produced positive coefficients. However, similar to management education, the results were only partially supportive to one of the funding success measurements. Models 1 - 5 of panel a failed to produce statistically significant evident, while it showed positive and significant coefficients in panel A with the exception of model 4 when variable business plan was removed. Referring back to correlation matrix (table 4), business plan and financial information were significantly correlated to each other at 5% level. One possible reason for a weaker strength of financial forecast when business plan was removed, in some cases ventures only provided financial forecast within their business plan when it was presented in crowdfunding platform.

Hypothesis 4b expects pre-money valuation of the ventures to have same influences as financial forecast. Similarly to previous result, it is only partially supportive to one of the funding success measurement. In line with the preceded hypothesis, pre-money valuation has positive and significant coefficient to FUNDED. However its coefficient is negative but not significant in panel B with dependent variable total funds raised. One explanation could be that data limitation, which again restraining me to have conclusive results. For example the measurement I used is simply the availability of financial forecast, which can be considered as 'crude' measurements as I ignored the level of complexity and accuracy of each financial forecast provided. Note that during my data collection, I found some platforms obligated the ventures to provide financial forecast for investors, while some do not require any. Nonetheless, referring to the table 3 of descriptive statistics, I found the majority of ventures do provide some kind of financial forecast regardless of each complexity Furthermore, compare to companies in public equity financing where financial information sometime excessively and constantly reviewed and updated, ventures in equity crowdfunding platforms typically only provide one small document that they used for the entire funding period. Another reason could be that young ventures tend to be highly 'optimistic' in projecting the future financial state (Healy and Palepu, 2001), subsequently when investors taking this into their consideration, they might not value financial forecast provided as much as other signals. Similar o financial forecast, for hypothesis 4b, possible reason could be that regardless the size of the ventures do not quite matter in equity crowdfunding, as I found in data collection that both larger valued and lower valued ventures receive almost equally same results of funding success in terms of funded/not funded and % of total funds raised.

With regards to variable business plan, Hypothesis 5a predicts positive influence of the availability of business plan. However regressions results were inconclusive, with insignificant positive coefficient for variable funded/not funded in all models it was tested (models 1, 2, 3, and 5; table 6). However, in regards to variable total amount raised (panel B, table 7), regression results presented business plan with negative and statistically significant coefficients in all models, which it was included (models 6, 7, 8, 10; table 7). These results are opposed to the hypothesis and prior literatures by Karlsoon and Honig (2009) and Poon (1996). On the other hands, supported Delmar and Shane (2004) who implied negative correlations. Concluding from all regression results, it failed to prove hypothesis 5a.

Hypothesis 5b expects media coverage to be positively influential. Regression results were rather mixed. Variable MED\_COV was included in all models and have positive with statistically significant coefficients in models 1 - 5 of panel A, but negative and insignificant in models 1 - 5 of panel B. While in other models showed negative coefficients with insignificant results. I did not differentiate the extent to which ventures were exposed to media, rather only differentiating ventures that have been featured in at least one main stream media. As regression results in model 1 - 5 showed to be highly significant, I concluded that it is again only partially supported hypothesis 5b. This is in line with Deephouse (2000), and McCombs and Shaw 1972).

The last hypothesis (5c) expects the presence of market analysis report in the same manner as business plan. Variable market analysis was included in all models. The results were in line with the corresponding hypothesis which it expected positive relationships between the availability of market analysis report and funding success in equity crowdfunding.

Lastly, the addition of variables equity offerings, size, and age of the ventures in models 5 and 10 did not alter any results if compare it with models 2 and 6 respectively when all independent are included, with the exception of venture's Facebook.

# **Chapter 6: Conclusion, Limitations, and Research Direction**

#### **6.1** Conclusion

This study investigates possible signals that could potentially influence investors' decision to invest in ventures that raised capitals through equity-based crowdfunding. I used samples from live-projects from several European-based equity crowdfunding platforms, which was taken for the duration 4 months. The initial objective of the paper is to supplement the very limited available academic studies regarding investors-entrepreneurs relation in EC platforms, as the relevance of this evolving and expanding topic is growing in both academic and practice. A research question was formulated in the beginning of the study as '*what ventures*' *signals in equity crowdfunding platforms influence investors' decision to invest*?'. To answer the research question, I categorized several types of signals that could potentially be influential into 5 categories; namely intellectual capital, human capital, social networks, financial information, and other non-financial information. Subsequently, to provide empirical results, I used several different proxies for each of the signal categories.

For intellectual capital, patent is used as a proxy. The empirical result is rather inconclusive. One major reason is the data limitation. As the sample used is rather small, I found substantial majority of ventures from 5 equity-platforms did not own a single patent (94%). Although the results showed positive relationship of patent ownership and funding success, it is not statistically significant enough to conclude patent as an influencing signal. Furthermore, the low percentage of ventures with patent ownership is related to the types of industry in which each venture operate (refer to figure 4).

For human capital, the empirical test showed a more varied result. Of all five proxies used, management education and involvement of professional investors presented robust relationship with funding success especially to total funds raised. While information about involvement of professional investors is presented in the platform page during the financing campaign, not all information about management education was presented. However, many of ventures provided external link to LinkedIn of each of the management team in the main page of their crowdfunding platform. Additionally, I found no strong empirical evidence to prove the effect of experience, board size, and management size even though all of these proxies are presented in the same manner.

Social networks showed to stimulate funding success in all models. Compare to previous two signaling categories, social networks provided a more conclusive result. For both funding success proxies fully funded/not fully funded and amount of funding received, I found strong empirical evidence especially for LinkedIn and Facebook. Both LinkedIn of the CEO and

number of likes of the venture's Facebook page showed to enhance funding success. As for Twitter, number of followers on venture's Twitter empirically showed to influence whether or not the ventures is funded, but the strength decreased in regards to second proxy total funds raised but none for CEO's Twitter. One possible reason is that significantly less CEO used Twitter compare as opposed to LinkedIn for professional reason.

Regarding financial information, both disclosure of financial forecast and pre-money valuation of the ventures did not provide enough evidence and presented mixed results. One possible reason could be that regardless the size of the ventures do not quite matter in equity crowdfunding, as I found in data collection that both larger valued and lower valued ventures receive almost equally same results of funding success. Furthermore, almost all crowdfunding platforms require ventures to show financial forecast, although the level of sophistication of the forecast is not standardized. Subsequently, investors might tend to under-look this information. Similar to human capital, I found mix empirical results for proxies of other nonfinancial information; availability of business plan, media coverage, and market analysis. Results show moderate level of influence of all three proxies when looking at its effect on both funding success proxies. However when looking at each funding success proxy, the statistical strength of business plan and market analysis report is greater for proxy total fund raised, while media coverage is greater in funded/not funded proxy but showed low impact on the other. Among other additional variables, I found no strong empirical evidence of ventures age, size, and equity offering to objectively justify their relationship with funding success. The possible reasons could be the wide variety data and the limited amount of samples. For example the age of ventures have a lower limit of 1 month, while the upper limit is 132 months (table 3).

Concluding this study, social networks connections of LinkedIn and Facebook, involvement of professional investors, and management educational backgrounds are most influential sources of signals that empirically shown to have the highest influence of funding success in equity crowdfunding platforms. As was explained in theoretical background, information availability is very limited for investors prior investment compare to other types of financing such as venture capital and public equity financing. With the main source of communication for both investors and entrepreneurs is the online crowdfunding platform; entrepreneurs must carefully select information that would attract investors. Social network is a particularly interesting case, as it is traditionally not considered as a type of signal that would influence funding in venture capital financing and public equity financing. However in online financing like equity crowdfunding, it is regarded as an important criterion for investors. This founding of social networks is in line with several other papers that studied online financing in other forms than equity crowdfunding such as Lin et al. (2013) and Giudici et al. (2013).

## 6.2 Academic and Practical Implications

The study provides some insights for current literatures specifically addressing equity-based crowdfunding. A relatively new topic, much of the currently available literatures address the process, regulations, and potentials (Moritz and Block, 2016). Not much know which types of information that could be provided through crowdfunding platforms would facilitate investors' decision to invest or how information asymmetry between investors and entrepreneurs could be reduced. It is expected due to limitation of information provided, investors participating in equity crowdfunding platforms would posses higher investment risk compare to investors in other private equity financing such as VC financing. As the traditional risk-reduction strategies in other private equity financing like strict evaluation and screening process or contract negotiations are not typically available in equity crowdfunding. Thus identifying relevant information that are considered quality signals could provide important contribution in both academic research and future practical state of online financing. Additionally, this paper elucidate the potentially crucial effects of online attributes of social networking sites in addition to other alternative signals that are identified in private equity financing (e.g. patents, educations, etc.). As the availability of various social networking sites has provided us with unprecedented amount of data.

#### 6.3 Limitations and Suggestions for Further Research

During the course of the study, I uncover some limitations that could be address in the future research. As was mentioned in earlier chapters, this study is only one of the very few papers that specifically studied signaling in equity-crowdfunding topic. To my knowledge there are only 2 published papers specifically addressed signaling in equity-based crowdfunding. Following is the summary of limitations of the study:

- 1. Data limitation during the course of the study. As equity crowdfunding is the least common type of crowdfunding, there are only a handful of active platforms even when Europe-wide cross-border was conducted. Other than UK's two most active equity crowdfunding platforms, I found the average live projects on other platforms across Europe only to be 4-6 at a time.
- 2. I believe to have more conclusive results of the effects of social media; future research should collect their data in a timely manner with longer data collection time. When addressing social media influence as proxies to funding success, it could be irrelevant if social media proxies are taken after funding campaign period is over, as

it is likely that social media proxies have grown since. Thus I would suggest following a strict longer collection period.

- 3. In addition to venture qualities that were observed as signals in this study, it is also reasonable to assume that investors would seek other 'unobserved' signals that entrepreneurs fail to show in the platforms. Thus I would suggest later study to investigate signals from investors' point of views.
- 4. There are some other measurements within social alignment that can be used as 'signals, for example Hoffman and Fodor (2010) explained different measurements on social networking sites based on the goals of the company such as number of response to 'friends', frequency in posting, number of repost, etc., however as the scope of this research is not only weighted on social media, these measurements are ignored. Future research is recommended to do a sole focus on connection social media content as signals to investors as. As CF, depending on its types is sometimes also considered as social media.
- 5. The number of unsophisticated or amateur investors involved in CF projects is large enough that some of these signals might be overvalued or undervalued. Further research is suggested to differentiate the number of accredited investors and amateur investors to investigate which signals are valued more for each type of investors to produce more robust result.
- 6. Sequential financing of new venture by VCs, in some papers, relate to lowering quality signals on signal such as patents. However there is no research has been done regarding this issue to examine to what extent sequential financing can be applied to EC. Entrepreneurs can have multiple financing rounds in CFP just like conventional equity-financing method, however it is highly likely that data about same investors investing in the same venture in different financing round going to be difficult to obtain.

# References

- 1. Akerlof, G. (1970). The market for lemons: qualitative uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84.
- 2. Alvarez, S. A., & Busenitz, L. W. (2001). The entrepreneurship of resource-based theory. *Journal of management*, 27(6), 755-775.
- Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of accounting and economics*, 22(1), 3-30.
- 4. Agrawal, A. K., Catalini, C., & Goldfarb, A. (2011). *The geography of crowdfunding* (No. w16820). National bureau of economic research.
- 5. Ahlers, G. K., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, 39(4), 955-980.
- Arrow, K. J. (1972). Gifts and exchanges. Philosophy and Public Affairs, 1(4), 343– 362.
- Audretsch, D. B., Bönte, W., & Mahagaonkar, P. (2012). Financial signaling by innovative nascent ventures: The relevance of patents and prototypes.*Research Policy*, 41(8), 1407-1421.
- 8. Balboa, M., & Martí, J. (2007). Factors that determine the reputation of private equity managers in developing markets. *Journal of Business Venturing*, 22(4), 453-480.
- 9. Barclay, M. J., & Smith, C. W. (1995). The maturity structure of corporate debt. *the Journal of Finance*, *50*(2), 609-631.
- Baum, J. A., & Silverman, B. S. (2004). Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *Journal of business venturing*, 19(3), 411-436.
- 11. Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, 29(5), 585-609.
- 12. Belleflamme, P., Omrani, N., & Peitz, M. (2015). The economics of crowdfunding platforms. *Information Economics and Policy*, *33*, 11-28.
- Belliveau, M. A., O'Reilly, C. A., & Wade, J. B. (1996). Social capital at the top: Effects of social similarity and status on CEO compensation. Academy of management Journal, 39(6), 1568-1593.
- Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of banking & finance*, 22(6), 613-673.

- 15. Bertomeu, J., & Magee, R. P. (2015). Political pressures and the evolution of disclosure regulation. *Review of Accounting Studies*, 20(2), 775-802.
- 16. Bhide, A. V. (2003). *The origin and evolution of new businesses*. Oxford University Press.
- 17. Bielefeld, W. (2009). Issues in social enterprise and social entrepreneurship. *Journal* of Public Affairs Education, 69-86.
- Blind, K., Edler, J., Frietsch, R., & Schmoch, U. (2006). Motives to patent: Empirical evidence from Germany. *Research Policy*, 35(5), 655-672.
- Bloom, N., & Van Reenen, J. (2002). Patents, real options and firm performance. *The Economic Journal*, *112*(478), C97-C116.
- Brealey, R., Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *The journal of Finance*, 32(2), 371-387.
- 21. Burkett, E. (2011). Crowdfunding Exemption-Online Investment Crowdfunding and US Secruties Regulation, A. *Transactions: Tenn. J. Bus. L.*, *13*, 63.
- Burton, M. D., Sorensen, J. B., & Beckman, C. M. (2002). Coming from good stock: Career histories and new venture formation. *Research in the Sociology of Organizations*, 19(1), 229-262.
- 23. Busenitz, L. W., Fiet, J. O., & Moesel, D. D. (2005). Signaling in Venture Capitalist—New Venture Team Funding Decisions: Does It Indicate Long-Term Venture Outcomes?. *Entrepreneurship Theory and Practice*, 29(1), 1-12.
- 24. Butler, M., Kraft, A., Weiss, I.S., 2007. The effect of reporting frequency on the timeliness of earnings: the cases of voluntary and mandatory interim reports. Journal of Accounting and Economics 43, 181–217.
- 25. de Buysere, K. & Hooghiemstra, S. N., (2016). The Perfect Regulation of Crowdfunding: What Should the European Regulator Do?. In *Crowdfunding in Europe* (pp. 135-165). Springer International Publishing.
- 26. Bygrave, W. D., & Timmons, J. A. (1992). Venture capital at the crossroads. Harvard Business Press.
- 27. Cassar, G., Ittner, C. D., & Cavalluzzo, K. S. (2015). Alternative information sources and information asymmetry reduction: Evidence from small business debt. *Journal of Accounting and Economics*, 59(2), 242-263.
- 28. Certo, S. T. (2003). Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of management review*, *28*(3), 432-446.
- 29. Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management*,45(7), 458-465.

- Cohen, B. D., & Dean, T. J. (2005). Information asymmetry and investor valuation of IPOs: Top management team legitimacy as a capital market signal. *Strategic Management Journal*, 26(7), 683-690.
- 31. Coleman, J. S. (1990). Foundations of social capital theory. *Cambridge*, *Mass: Belknap*.
- 32. Colombo, M.G., Grilli, L., 2005. Founders' human capital and the growth of new technology-based firms: a competence-based view. Research Policy 34, 795–816.
- 33. Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39-67.
- Dainelli, F., Bini, L., & Giunta, F. (2013). Signaling strategies in annual reports: evidence from the disclosure of performance indicators. *Advances in Accounting*, 29(2), 267-277.
- 35. Danmayr, F. (2013). Archetypes of Crowdfunding Platforms: A Multidimensional Comparison. Springer Science & Business Media.
- 36. Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of business venturing*, *18*(3), 301-331.
- Deephouse, D. L. (2000). Media reputation as a strategic resource: An integration of mass communication and resource-based theories. *Journal of management*, 26(6), 1091-1112.
- Delmar, F., & Shane, S. (2004). Planning for the market: business planning before marketing and the continuation of organizing efforts. *Journal of Business Venturing*, 19(6), 767-785.
- Elitzur, R., & Gavious, A. (2003). Contracting, signaling, and moral hazard: a model of entrepreneurs, angels, and venture capitalists. *Journal of Business Venturing*, 18(6), 709-725.
- 40. European Commission. (2016). Crowdfunding in the EU Capital Market Union. Retrieved from European Commission website: http://ec.europa.eu/finance/generalpolicy/docs/crowdfunding/160428-crowdfunding-study\_en.pdf
- 41. Fang, L., & Peress, J. (2009). Media coverage and the cross-section of stock returns. *The Journal of Finance*, 64(5), 2023-2052.
- 42. Ferrera, M., Hemerijck, A., & Rhodes, M. (2011). *The future of European welfare states: Recasting welfare for a new century*. Oxford University Press.
- 43. Fischer, E., & Reuber, R. (2007). The good, the bad, and the unfamiliar: The challenges of reputation formation facing new firms. *Entrepreneurship Theory and Practice*, *31*(1), 53-75.

- 44. Folta, T. B., & Janney, J. J. (2006). Moderating effects of investor experience on the signaling value of private equity placements. *Journal of Business Venturing*, 21(1), 27-44.
- 45. Fombrun, C., & Shanley, M. 1990. What's in a name? Reputation building and corporate strategy. *Academy of Management Journal*, 33: 233–258.
- 46. Ford, M. W., Matthews, C. H., & Baucus, M. S. (2003). To Plan or Not to Plan: Is that really the question. In *Babson Conference*.
- 47. Freeman, J. (1986). Entrepreneurs as Organizational Products: Semiconductor Firms and Venture Capital Firms. Advances in the Study of Entrepreneurship, Innovation, and Economic Growth, 1, 33–52.
- 48. Gao, H., Darroch, J., Mather, D., & MacGregor, A. (2008). Signaling corporate strategy in IPO communication A study of biotechnology IPOs on the NASDAQ. *Journal of Business Communication*, 45(1), 3-30.
- 49. Gerber, E. M., Hui, J. S., & Kuo, P. Y. (2012, February). Crowdfunding: Why people are motivated to post and fund projects on crowdfunding platforms. In *Proceedings of the International Workshop on Design, Influence, and Social Technologies: Techniques, Impacts and Ethics.*
- 50. Ghoshal, S., & Nahapiet, J. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 23(2), 242-266.
- 51. Gierczak, M. M., Bretschneider, U., Haas, P., Blohm, I., & Leimeister, J. M. (2016). Crowdfunding: Outlining the New Era of Fundraising. In *Crowdfunding in Europe* (pp. 7-23). Springer International Publishing.
- 52. Gimeno, J., Folta, T., Cooper, A., Woo, C., 1997. Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. Administrative Science Quarterly 42, 750–783.
- 53. Giudici, G., Guerini, M., & Rossi Lamastra, C. (2013). Why crowdfunding projects can succeed: the role of proponents' individual and territorial social capital. *Available at SSRN 2255944*.
- 54. Gulati, R., & Higgins, M. C. (2003). Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. *Strategic Management Journal*, 24(2), 127-144.
- 55. Hall, B. H., Jaffe, A., & Trajtenberg, M. (2005). Market value and patent citations. *RAND Journal of economics*, 16-38.
- 56. Hagedorn, A., & Pinkwart, A. (2016). The financing process of equity-based crowdfunding: An empirical analysis. In *Crowdfunding in Europe* (pp. 71-85). Springer International Publishing.

- 57. Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of accounting and economics*, *31*(1), 405-440.
- 58. Hsu, D. H. (2007). Experienced entrepreneurial founders, organizational capital, and venture capital funding. *Research Policy*, *36*(5), 722-741.
- 59. Hoenen, S., Kolympiris, C., Schoenmakers, W., & Kalaitzandonakes, N. (2014). The diminishing signaling value of patents between early rounds of venture capital financing. *Research Policy*, *43*(6), 956-989.
- 60. Hoffman, D. L., & Fodor, M. (2010). Can you measure the ROI of your social media marketing?. *MIT Sloan Management Review*, 52(1), 41.
- 61. Kale, J. R., Kini, O., & Payne, J. D. (2012). The dividend initiation decision of newly public firms: Some evidence on signaling with dividends. *Journal of Financial and Quantitative Analysis*, 47(02), 365-396.
- 62. Karlsson, T., & Honig, B. (2009). Judging a business by its cover: An institutional perspective on new ventures and the business plan. *Journal of Business Venturing*, 24(1), 27-45.
- 63. Keasey, K., & Short, H. (1997). Equity retention and initial public offerings: the influence of signalling and entrenchment effects. *Applied Financial Economics*, 7(1), 75-85.
- 64. Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business horizons*, 54(3), 241-251.
- 65. Kirmani, A., & Rao, A. R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable product quality. *Journal of marketing*,64(2), 66-79.
- 66. Kreps, D. M. (1990). A Course in Mi croeconomic Thneory.
- 67. Kuppuswamy, V., & Bayus, B. L. (2015). Crowdfunding creative ideas: The dynamics of project backers in Kickstarter. UNC Kenan-Flagler Research Paper, (2013-15).
- 68. Lehner, O. M. (2011). The phenomenon of social enterprise in Austria: A triangulated descriptive study. *Journal of Social Entrepreneurship*, 2(1), 53-78.
- 69. Lehner, O. M. (2013). Crowdfunding social ventures: a model and research agenda. *Venture Capital*, *15*(4), 289-311.
- 70. Levy, H., & Lazarovich-Porat, E. (1995). Signaling theory and risk perception: An experimental study. *Journal of Economics and Business*, *47*(1), 39-56.
- 71. Lewellen, J. (2004). Predicting returns with financial ratios. *Journal of Financial Economics*, 74(2), 209-235.

- 72. Lin, M., Prabhala, N. R., & Viswanathan, S. (2013). Judging borrowers by the company they keep: Friendship networks and information asymmetry in online peer-to-peer lending. *Management Science*, *59*(1), 17-35.
- 73. Massolution, C. L. (2015). Crowdfunding Industry Report.
- 74. McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public opinion quarterly*, *36*(2), 176-187.
- 75. Meyer, G. D., & Zacharakis, A. L. (2000). The potential of actuarial decision models: can they improve the venture capital investment decision?. *Journal of Business Venturing*, 15(4), 323-346.
- 76. Mollick, E. R. (2013). Swept away by the crowd? Crowdfunding, venture capital, and the selection of entrepreneurs. *Venture Capital, and the Selection of Entrepreneurs* (*March 25, 2013*).
- 77. Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of business venturing*, 29(1), 1-16.
- 78. Moritz, A., & Block, J. H. (2016). Crowdfunding: A literature review and research directions. In *Crowdfunding in Europe* (pp. 25-53). Springer International Publishing.
- 79. Morduch, J. (1999). The microfinance promise. *Journal of economic literature*, *37*(4), 1569-1614.
- Nasrabadi, A. G. (2016). Equity crowdfunding: Beyond financial innovation. In Crowdfunding in Europe (pp. 201-208). Springer International Publishing.
- Ndofor, H. A., & Levitas, E. (2004). Signaling the strategic value of knowledge. Journal of Management, 30(5), 685-702.
- 82. Ordanini, A., Miceli, L., Pizzetti, M., & Parasuraman, A. (2011). Crowdfunding: transforming customers into investors through innovative service platforms. *Journal of service management*, 22(4), 443-470.
- 83. Penman, S. H. (1980). An empirical investigation of the voluntary disclosure of corporate earnings forecasts. *Journal of accounting research*, 132-160.
- Poetz, M. K., & Schreier, M. (2012). The value of crowdsourcing: can users really compete with professionals in generating new product ideas?. *Journal of Product Innovation Management*, 29(2), 245-256.
- 85. Poon, J. T. F. (1996). Writing a business plan that communicates. *Entrepreneurs, Entrepreneurship, and Enterprising Culture, Singapore, Superskill Graphics.*
- Pownall, G., & Waymire, G. (1989). Voluntary disclosure credibility and securities prices: Evidence from management earnings forecasts, 1969-73. *Journal of Accounting Research*, 227-245.

- Putnam, R. D. (1995). Bowling alone: America's declining social capital *Journal of democracy*, 6(1), 65-78.
- 88. Ross, S. A. (1977). The determination of financial structure: the incentive-signalling approach. *The bell journal of economics*, 23-40.
- 89. Rubin, S. (2012). The Case for Crowdfunding. Inc. April, 17, 2012.
- 90. Schwienbacher, A., & Larralde, B. (2010). Crowdfunding of small entrepreneurial ventures. *Handbook of entrepreneurial finance, Oxford University Press, Forthcoming*.
- 91. Schultz, T. W. (1962). Reflections on investment in man. *The Journal of Political Economy*, 1-8.
- 92. Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), 217-226.
- 93. Shoemaker, P. J. 1996. Hardwired for news: Using biological and cultural evolution to explain the surveillance function. Journal of Communication, 46: 32–47.
- 94. Sorenson, O., & Stuart, T. E. (2001). Syndication networks and the spatial distribution of venture capital investments1. *American journal of sociology*,106(6), 1546-1588.
- 95. Spence, M. (1973). Job market signaling. *The quarterly journal of Economics*, 355-374.
- 96. Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. *World development*, 28(6), 1075-1086.
- Stuart, T. E., Hoang, H., & Hybels, R. C. (1999). Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative science quarterly*, 44(2), 315-349.
- 98. Turan, Semen S. (2015)a. Stakeholders in equity-based crowdfunding: Respective risks over the equity crowdfunding lifecycle. *Journal of Financial Innovation*, 1(2).
- 99. Turan, Semen S. (2015)b. Financial Innovation Crowdfunding: Friend or Foe? *Procedia - Social and Behavioral Sciences*, 195, 353-362.
- 100. Useem, M., & Karabel, J. (1986). Pathways to top corporate management. *American Sociological Review*, 184-200.
- 101. Valančienė, L., & Jegelevičiūtė, S. (2014). Crowdfunding for creating value: Stakeholder approach. *Procedia-Social and Behavioral Sciences*, *156*, 599-604.
- 102. Verstein, A. (2011). The misregulation of person-to-person lending. UC Davis Law Review, 45(2).
- 103. Vismara, S. (2016). Equity retention and social network theory in equity crowdfunding. *Small Business Economics*, *46*(4), 579-590.

- 104. Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. *American behavioral scientist*,45(3), 436-455.
- 105. Wickham, P. A. (2006). *Strategic entrepreneurship*. Pearson Education.
- 106. Wilson, K. E. (2011). Financing high-growth firms: The role of angel investors. *Available at SSRN 1983115*.

# Appendix

Appendix 1: Example of a campaign page in an equity crowdfunding platform

		Total f	unds raised	Days o	f financing ro	unds left	
	Equity	IS (pending) 👩			13 days left	£	Invest now
Logo	41%	<b>E31,390</b> Raised	79 Investors		<b>£75,000</b> Target	9.09 Equi	% £750,000 ty Pre-money valuation
1 1 7	Small desc	cription of the ve	nture	parent- d over e and	:	Venture's	snapshots
9 🄰 🔿	f 🎕	Companies House	External links		<ul> <li>£20k was sellers</li> </ul>	raised in April 20	15 to attract customers and
O / http		Terms and a	agreements		ister	your interest in a	ttending here:
Idea	Team	Financials	Discuss	Equity			
						Vi	deo presentation
dea							1
Introduction offers	of the vent	ure's products an	d uring products				