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Master Thesis in Finance

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On the Shoulders of Giants:

Quality signalling in Venture Capital and Equity Crowdfunding

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Abstract:

In the latest years Equity Crowdfunding has experienced exponential growth as a way of financing new ventures. This study explores whether equity crowdfunding investors, or “the crowd”, interpret signals of venture quality in a way similar to professional Venture Capitalists (“VCs”) and also if their investment decisions are subject to similar constraints and biases. For the purpose of this research the relevant literature streams related to Venture Capital investment decision-making processes were explored. Data for 288 successfully completed projects on Crowdcube, a UK platform for equity crowdfunding, was collected and OLS regressions were utilized. The findings were mixed and indicate that, to a certain extent, the crowd interpret signals regarding the quality of the investment proposition in a similar manner as VCs. These signals were related to the entrepreneurial and professional background of the founder and the management team, the third party endorsements they have received, their commitment and level of preparation as well as the overall attractiveness of the business idea. Additionally, Equity Crowdfunding was found to relax investment decision biases related to gender factors.

Key words

Venture Capital (VC), Crowdfunding, Equity Crowdfunding, Entrepreneurship

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Table of Contents

1. Introduction	1
2. Institutional Background	3
2.1 Crowdfunding	3
2.1.1 Definition and Business Model	3
2.1.2 Types of Crowdfunding	4
2.1.3 The Crowdfunding Market in Europe	6
2.1.4 Equity Crowdfunding	8
2.1.5 The Equity Crowdfunding market in Europe	9
2.1.6 Investors	10
2.1.7 Entrepreneurs	11
2.2 The Venture Capital Industry	12
2.2.1 Development of the Industry	12
2.2.2 The structure of the Venture Capital markets	13
3. Previous research and theoretical framework	14
4. Hypotheses Framework	19
5. Data & Methodology	28
5.1 Data	28
5.2 Dependent variables	29
5.3 Independent variables	30
5.4 Control variables	31
5.5 Research method	31
5.6 Descriptive statistics	32
5.7 Correlations	35
6. Results Analysis	37
6.1 Category 1: History of success	37
6.2 Category 2: CEO/Team characteristics	39
6.3 Category 3: External endorsements	41
6.4 Category 4: Preparedness	43
6.5 Category 5: Idea evaluation	45
6.6 Category 6: Biases	46
7. Discussion	49
7.1 Main Findings	49
7.2 Limitations	50
7.3 Suggestions for Further Research	51
7.4 Implications for scholars	52
8. Conclusion	53
9. Reference list	55
10. Appendix	61

List of Figures

1. Distribution of crowdfunding investment models globally, 2015	6
2. Global crowdfunding market by regions	8
3. Quarterly market value of equity crowdfunding in the alternative finance sector in the United Kingdom (UK) in 2014 and 2015	10
4. Fundraisers' reasons for choosing equity-based crowdfunding	12
5. Venture Capital financing model	14

List of Tables

1. Summary of Hypotheses	27
2. Summary of explanatory variables	30
3. Control variables	32
4. Descriptive statistics	33
5. Correlations	36
6. Models 1&4 Category 1	37
7. Models 1&4 Category 1 –Interactive terms	38
8. Models 1&4 Category 2	39
9. Models 1&4 Category 3	41
10. Models 1&4 Category 4	43
11. Models 1&4 Category 5	45
12. Models 1&4 Category 6	46
13. Summary of confirmed/rejected hypotheses	48

Appendix

1. Regression Results Category 1	64
2. Regression Results Category 2	64
3. Regression Results Category 3	65
4. Regression Results Category 4	65
5. Regression Results Category 5	66
6. Regression Results Category 6	66

1. Introduction

Equity crowdfunding is gaining popularity as an alternative funding source for young companies. The fact that some prominent ventures successfully raised funds on equity crowdfunding platforms helped spur their establishment as financing models of a new breed that are here to stay. Both entrepreneurs and investors alike are curious about the opportunities this new, constantly evolving venue, can offer them. Little is still known about the investing process on these platforms and the research on quality signals, investment decision-making and companies' characteristics is limited. This Master thesis strives to provide some additional effort towards filling that space.

Before crowdfunding was developed as a financing model, VCs were the only institutional forces to support entrepreneurship and new ventures. Alternative funding sources, like business angels, were only the first step before a start-up decided to pursue VC financing. In contrast to VC, equity crowdfunding financing is not conducted by professional investors with access to networks that allow them to identify and help promising start-ups develop. Equity crowdfunding relies on thousands of individuals with dubious financial knowledge and background that operate independently from any institutional investment framework. Additionally, while the term sheets delivered by VCs include extensive anti-dilution and control rights, the crowd's investments are not protected in a similar contractual way. Given these facts, it is not surprising that someone might think that project quality is not assessed in a proper way from equity crowdfunding investors compared to professionals like the VC firms.

The purpose of this research is to explore whether the amateur investors who acquire a stake in a new enterprise through the equity crowdfunding venue interpret signals of venture quality in the same manner as experienced VC professionals do. If equity crowdfunding investors interpret quality signals in the same way that sophisticated investors (in our case VC firms) do, then the credibility of these signals, and to a broader extent, the credibility of the investment selection processes of VC firms will be further strengthened. Moreover it will be implied that the "crowd" is capable of making rational and informed investment decisions and it is not as unsophisticated as many would assume. On the other hand, if the outcome indicates that is not the case, then this would imply that equity crowdfunding is not assessing project quality in an appropriate way, or that VC decision making processes are not considered relevant and useful within the equity crowdfunding universe. However, given the

experience and the overall effectiveness of VC firms to back promising start-ups (Kortum & Lerner, 2000; Lerner, 2002) it is expected that their selection processes would be replicated, at least to some extent, by equity crowdfunding investors as well.

In order to test the above mentioned expectations about the selection process utilized by the “crowd”, an Ordinary Least Squares (OLS) quantitative analysis is utilized over a sample of 288 projects that were successfully closed on Crowdcube (the biggest UK equity crowdfunding platform) in the period 2011-2015. Data was collected on several variables for each of the six broader categories that are expected to have an effect on the success of the crowdfunding round. Namely, these are: the history of success of the founder/CEO of the company seeking crowdfunding (1), the team and CEO characteristics (2), the availability of external endorsements for the project (3), the degree of preparedness demonstrated in the pitch (4), evaluation of the general idea (5) as well as known biases (6). For shaping our expectations and formulating our hypotheses we relied on established effects after careful examination of the existing literature on VC investment decision-making. For the purpose of this study three dependent variables that are considered to capture crowdfunding success in a proper way were used– the percentage oversubscription achieved by a company on its pitch, the total number of investors in the crowdfunding round and the adjusted average investment per investor (adjusting for the largest investment amount). Also controls for time, industry, and where reasonable, stage fixed effects, were introduced.

The results confirm that the “crowd” indeed values some of the established effects that have been shown to matter to VCs. A founder/CEO who has established a company in the past is positively valued by the “crowd” only if he also possesses industry experience applicable to the current venture seeking crowdfunding. A larger management team, an experienced CEO and mutual acquaintance among the team members result in greater crowdfunding success. The availability of patents matters when no previous investments have been made in the company seeking financing. When a company prepares a more detailed business plan it attracts higher number of investors. Previous investments in the company and the disclosure of financial statements also contribute to the crowdfunding success. On the other hand, equity crowdfunding relaxes the gender bias profoundly established in the literature on VC decision-making.

This master thesis is organized as follows. In Section 2 the Crowdfunding industry is discussed in more detail, including the different types of crowdfunding models, putting emphasis on Equity crowdfunding and also a brief overview of the Venture Capital industry covering its development and structure is provided. Section 3 presents an overview of the

relevant literature on VC investment decision-making and signals of quality. In Section 4 the hypotheses to be tested in this thesis are formulated and Section 5 describes the data sample, variables construction and research method in addition to descriptive statistics and correlations. Section 6 provides results and analysis of the findings and section 7 contributes a general discussion of the latter as well as limitations of this study and suggestions for further research. Section 8 concludes.

2. Institutional Background

2.1 Crowdfunding

2.1.1 Definition and Business Model

According to Mollick (2014) crowdfunding is a relatively new way of funding for entrepreneurs and start-ups developed from the previous concepts of crowdsourcing and micro finance. Schwienbacher & Larralde (2010) defined crowdfunding as ‘‘an open call, essentially through the Internet, for the provision of financial resources and/or voting rights in order to support initiatives for specific purposes’’.

Crowdfunding embraces a wide range of potential financing needs. In some occasions, crowdfunded projects seek to raise small amounts of capital (for example \$1000) in order to initiate a particular one-time project like a concert or a theatrical play. In those cases the funds are mainly provided by friends and family and crowdfunding is just a mechanism to facilitate the procedure. However, it becomes increasingly observed that crowdfunding is being used as a way to attract entrepreneurial seed capital (Schwienbacher & Larralde, 2010) allowing the founders to raise the money required to start their venture. As an example, of the fifty highest funded projects on Kickstarter, the biggest reward-based crowdfunding platform, 45 have become ongoing start-up firms.

It is important to mention that crowdfunding provides a financing model for start-up firms that significantly differs from the traditional Venture Capital funding model. To begin with, over two million people have funded projects on Kickstarter alone which makes the procedure highly ‘‘democratic’’ instead of ‘‘oligopolistic’’. Secondly, crowdfunding investors are not organized at all which contradicts the high coordination and organization of the VC community. Thirdly, in most cases the interaction between the entrepreneurs and their backers takes place mainly in open online communities and not in person. Finally, investors are, in general, unable to exert any kind of control over the company in which they have invested.

The process of crowdfunding is quite straightforward. The entrepreneurs that wish to raise funds for a project need to submit an application to one of the available online platforms. A crowdfunding platform is a website where potential investors can view the projects that are available for investment and select which ones to contribute to. In the project description section, the entrepreneurs outline their idea and what they wish to accomplish with the money as well as upload any material, like videos and pictures that will help support their case and convince the investors to contribute in order to meet their funding target. Also, there is substantial interaction between project backers and entrepreneurs in the form of Q&A and comments that take place both on the platform and through other communication channels like social media. During the funding period the entrepreneur is able to post updates on the pitch web page in order to keep investors informed regarding developments of the project or the campaign.

From its side, the platform typically runs some checks in order to make sure that the pitch is suitable for the platform, usually assessing the entrepreneurs' background in order to avoid illegal activities. The entrepreneur is also asked to specify their funding target as well as a deadline for the fundraising period. When the campaign reaches the pre-specified deadline the entrepreneur either receives the money that has been collected or, in most cases, if the target has not been reached the contributors receive their money back. This is something that depends on the policy of each platform. On the other hand, if the funding goal has been reached before the campaign deadline the entrepreneur may decide whether to continue the fundraising and, as a result, the pitch gets oversubscribed. The platforms usually receive some kind of fee that depends on the total amount raised if the project gets funded successfully or, in some cases, they get an equity stake in the company.

2.1.2 Types of Crowdfunding

There are four types of crowdfunding models up to date. According to their structural form they can be categorized as reward-, donation-, lending-, and equity-based crowdfunding.

Reward based

In order to attract investors, founders of start-ups that apply for this type of crowdfunding offer some kind of reward in exchange for an investor's contribution. The rewards are not financial but rather a tangible product that is promised to be delivered to the investors in the future. For instance, the reward can be some sort of product "pre-sell" that will allow the entrepreneur to finance the development phase and also develop an estimation of the size of

the product's addressable market. This is more common with technology start-ups that require high initial investment in R&D. In the occasion where the project concerns an event the reward can be an autograph, a T-shirt or a meeting with the founder or the artist. The average amount raised per project through this type of crowdfunding was €7,000 by the end of 2014 (European Commission, 2015).

Donation based

Donation based crowdfunding “places funders in the position of philanthropists, who expect no direct return for their donations” (Mollick, 2014). In this type of crowdfunding donors are not promised any sort of reward for their contribution and in most cases their motivation to pledge money is driven by intrinsic and social goals such as a belief to a higher cause. One of the most characteristic crowdfunding campaigns of that kind was Barack Obama's presidential campaign in 2008 (Dushnitsky and Marom, 2013). Donation based crowdfunding is the most commonly used type but the average amount raised per project is the smallest compared to the other types and by 2014 it stood at €4,000 in Europe (European Commission, 2015). Since no tangible benefits or control rights over the project pertain to the investors the only risk of this form of crowdfunding is the funds not being used for the expected purpose.

Lending based

Lending based, or debt based, crowdfunding gives the entrepreneur the opportunity to raise funds for a project through contract for a loan that needs to be repaid in the future. Some of these loans also carry a pre-specified interest rate while some others, which are mainly oriented to support projects with a social purpose, can be interest free (European Banking Authority, 2015). One of the reasons why an entrepreneur might engage into this type of crowdfunding, can be a limited access to bank loan financing or because this is a cheaper alternative compared to bank loans. Moreover, the funds that project owners usually raise through this crowdfunding venue are typically larger with an average amount of €11,000 by 2014 (European Commission, 2015) in Europe. The reason for that is the financial returns that are being promised to the investors (interest payments) as well as the opportunity that is being provided to them to diversify risk and gain some exposure to early stage lending. However, the main risk of this type of crowdfunding is a wrong estimation of the entrepreneur's creditworthiness from the platform that might lead to potential default situations.

Equity based

In this type of crowdfunding the entrepreneurs sell a stake of their business to the investors that pledge money. The procedure used in this case simulates, to some extent, the traditional methods of private equity, venture capital and business angel investing, since it actually "matches companies with would-be angels via an internet-based platform" (European Commission, 2015). The return that the investor receives when investing in equity crowdfunding campaigns highly depends on the performance of the start-up. In case the project fails then the investor loses his investment. The investor may use his own experience in order to assess the potential of a project with the amount of information that is available and decide whether and how much to invest. The average amount raised through equity crowdfunding platforms in Europe stands at around €260,000 (European Commission, 2015). Equity crowdfunding provides a venue for investors to invest into seed and early stage companies which was previously an investment option available only to Venture Capital firms as well as Business Angels.

In addition to the above mentioned types of crowdfunding, several hybrid platforms offer a combination of different crowdfunding types. In Europe, platforms with multiple funding types supported the fundraising of €52.3 million for projects in 2014, a more than doubling of this type of activity compared with 2013 (European Commission, 2015).

The following chart (Massolution) illustrates the Distribution of crowdfunding investment models for 2015 on a global scale.

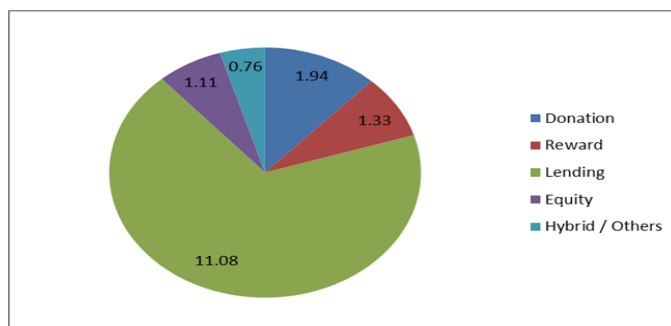


Figure 1. Distribution of crowdfunding investment models globally 2014, 2014 (in billion USD)

2.1.3 The Crowdfunding Market in Europe

In 2015 the European Commission conducted a research trying to map the characteristics of the Crowdfunding Market in Europe and also to provide key trends in the crowdfunding market in the European Union during 2013 and 2014 based on platform and project mapping

analyses (Crowdfunding: Mapping EU markets and events study, European Commission, 2015).

According to the research, 510 live platforms were identified as active in the EU on 31 December 2014. The total number of platforms on that date represents an increase of 23.2% compared to the 2013 level, with growth in identified platforms slowing down from a peak of 74.3% in 2010. The total number of new platform launches fell from 133 in 2013 to 96 in 2014. The UK had the greatest number of live platforms by the end of 2014, accounting for 28.0% of the EU total number of platforms. It was followed by France, Germany, the Netherlands and Italy, which cumulatively accounted for a further 47.5%.

When the total EU market was analysed by platform funding type, rewards and equity platforms were the most common, together accounting for over half of all live platforms in 2014. Consistent with strong growth in the number of these platforms, their share of total platforms has steadily increased from 2009, while the share of donation-based platforms has decreased. The average amount raised across all funding types remained broadly constant at €10,000 to €12,000 during the scope period. The analysis indicates a cluster of projects equal to around €120,000 and €180,000, suggesting funding targets are often set at round-sum milestone amounts. However, the majority of projects are of smaller sizes (the average project size is €12,000).

Moreover, five UK-based platforms represented over 80% of successfully completed projects by value. Four of these five platforms were lending platforms, representing 95% of successfully completed loan projects by value. Equity crowdfunding overtook rewards crowdfunding in 2014 to be the third largest category, after loans and invoice trading, by amount raised. This growth was primarily driven by growth in the UK market. All funding types experienced an increase in activity between 2013 and 2014, both in terms of the number of projects and the amount funded. While the average amount raised across all funding types remained broadly consistent between 2013 and 2014, there were increases in the average project size for invoice trading and equity projects. The largest amount successfully raised for a single project in the scope period was €6.1 million (equity) followed by €5.0 million (loan). Finally, the five largest markets by total amounts raised by participating platforms in the scope period were the UK (€2.0 billion, or 89.5% of the total EU amount raised), France (€72.4 million), Germany (€53.2 million), the Netherlands (€23.9 million) and Spain (€21.6 million).

It is also worthy of mentioning that by the end of the 1st quarter of 2015 the European crowdfunding market represented a 31% of the global crowdfunding market with the US

market being first, holding a 43% stake, Asia being third with 10% and Oceania, Africa, and South America following with 7% , 6% and 2% respectively (Statista).

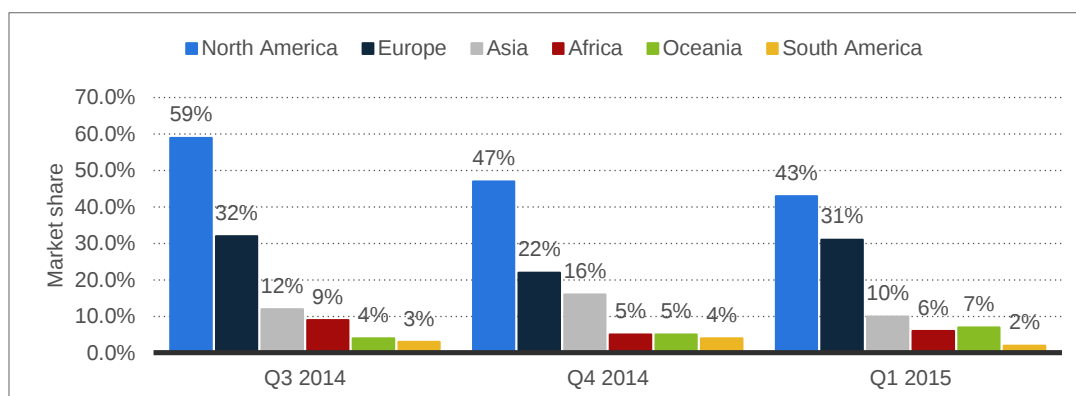


Figure 2. Global crowdfunding market by regions

2.1.4 Equity Crowdfunding

The main focus of this study is the extent to which equity crowdfunding investors follow the same criteria as sophisticated VC firms. Therefore, discussing separately and emphasizing more on issues surrounding the equity crowdfunding business model is beneficial for the purpose of this study.

Bradford (2012) describes equity crowdfunding as a financing model in which funders receive an interest in the form of an equity stake or an equity related arrangement in the start-up they invest in. Moreover, Belleflamme, Lambert and Schwienbacher (2012) explain that equity crowdfunding differentiates from other types because of its unique funding process. Entrepreneurs make an open request for funding and investors decide whether to back the project according to the info that is available to them. Also the crowdfunding platform plays an active role in the settlement of the transaction by providing a standardized contract and making sure that the payment procedure functions smoothly. Finally, Belleflamme, Lambert and Schwienbacher (2012) note that individual contributions in equity crowdfunding campaigns are much smaller than VC or business angel investments. Potentially the most inclusive definition of equity crowdfunding is provided by Ahlers et al (2012):

“Equity crowdfunding is a method of financing whereby an entrepreneur sells equity or equity-like shares in a company to a group of (small) investors through an open call for funding on Internet-based platforms”

As mentioned before, equity crowdfunding is the most appropriate model for the purpose of this study as the business model itself should encourage an investment decision process on behalf of the investors which could be similar to the decision making process VC firms are following.

When it comes to donation-based crowdfunding, the motivation of backers to invest might be different from collecting the financial returns of their investment. As mentioned before, donation-based crowdfunding projects might concern social or philanthropy campaigns and there might be other more important incentives for the backers than financial returns. In that context, overcoming information asymmetries regarding the real potential of the venture is a less important factor.

Similarly, when it comes to reward-based crowdfunding the motivation of investors to access the success potential of the start-up they invest in is weaker than in the equity crowdfunding context. This is because the investors receive a product as a reward for their investment and this makes them indifferent about the long term prospect of the venture they back.

Finally, someone might argue that lending based crowdfunding could be appropriate to investigate the investment criteria of funders as their returns depend on the ability of the start-up to pay back the debt. However as Ahlers et al (2012) and (Lin, Prabhala and Viswanathan, 2009) have argued, it is questionable whether the essential signal in lending crowdfunding is a company's credit information and reliable signals are not typically available from start-ups, because they may not have a credit history yet.

2.1.5 The Equity Crowdfunding market in Europe

For the purpose of this study data from Crowdcube, which is the biggest equity crowdfunding platform in Europe, was used. The reason the study is focused on Europe and not on the US is the legal restrictions imposed by US regulators. A person has to be an accredited investor in order to have the right to invest in equity crowdfunding campaigns (and observe the information about the investment opportunities). Therefore a brief description of the European equity crowdfunding market based on the 2015 European Commission research is presented (Crowdfunding: Mapping EU markets and events study, 2015).

By the end of 2014, the UK constituted the biggest European market for equity crowdfunding projects with €68.7 million raised by 237 projects. France and Germany follow with €13.8 million raised from 37 projects and €11.1 million raised from 34 projects in France and Germany respectively. Particularly in the UK the increase in equity crowdfunding investments had been almost exponential. The following graph provides a good illustration of

the growth that the equity crowdfunding market in the UK experienced in 2014 and 2015 (Statista).

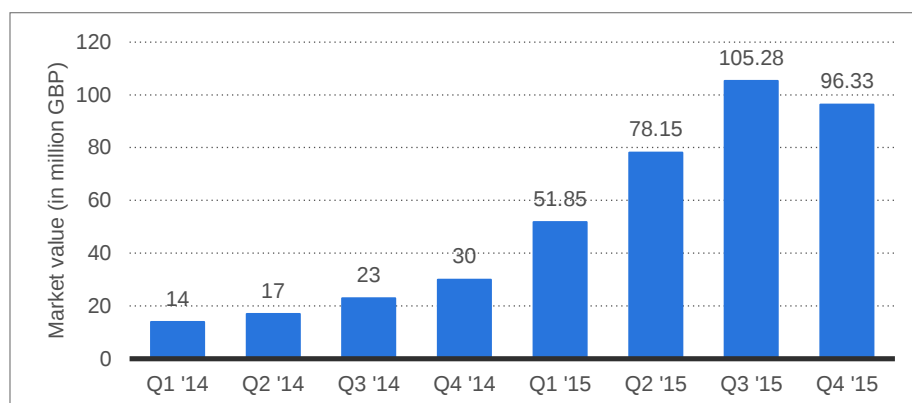


Figure 3. Quarterly market value of equity crowdfunding in the alternative finance sector in the United Kingdom (UK) in 2014 and 2015 (in million GBP)

Finally, the research from the EU commission indicates that there were no discernible groupings of individual projects at a particular Euro-amount raised. The majority of amounts raised were in the range of €0 to €500,000 with the average amount standing at €215,000 in 2013 and €260,000 in 2014.

2.1.6 Investors

The equity crowdfunding model makes it possible for investors to finance a start – up before VC firms do so, or, to put it another way, it digitises and scales the traditional angel or friends and family round. There are benefits and risks applicable to both investors and investee companies, and the merits of the model are subject to continuing analysis and debate (Foot Anstey, 2015). In this section the main benefits that make investors willing to invest through the equity crowdfunding venue are discussed together with the risks that they should take into consideration when doing so.

To begin with, when it comes to the benefits that investors expect when investing through equity crowdfunding, these mainly stem from the opportunity to invest in a wide variety of businesses at an early stage. The financial benefit of an equity crowdfunding investment entails risk diversification, as investors can diversify their portfolio and spread the risk, as well as lucrative returns in case the venture becomes successful in the future (Pierrakis & Collins, 2012). In case of a successful venture, returns on equity platforms can significantly exceed returns offered by lending crowdfunding platforms and also the returns offered by the

public equity capital markets (Foot Anstey, 2015). Finally, the due diligence effort that an investor must conduct can be significantly reduced or crowdsourced as every investor is part of a bigger crowd.

The risks that investors must consider when engaging into equity crowdfunding are multifaceted. Firstly, the investments are highly risky as the long term success potential of a start-up is highly challenging to determine and therefore investors might have to write down their investment or collect a return much lower than expected. Secondly, as with every other investment in early stage companies, the investment is highly illiquid and dividends are almost never paid out by start-ups. Also, no formal secondary market exists for these kind of shares and investors have almost no control rights and influence on the decision making process of the company (European Commission, 2013b). Thirdly, the exit timeline of an investment constitutes another risk factor, as many of these companies are “lifestyle” businesses that are unlikely to provide an exit for the investors within an acceptable time-line. Finally, it is not certain whether “the crowd” is capable of carrying out a proper due diligence before investing (a question that this thesis seeks to address) and therefore going with the flow does not guarantee that you invest in a company for which significant levels of due diligence have been achieved. According to Zhang et al (2014) 62% of the UK investors have no prior investment experience.

2.1.7 Entrepreneurs

Regarding the entrepreneurs, equity crowdfunding provides a way to bypass traditional financing channels, like VC firms, and provides an opportunity to gain access to the crowd and its capital. Additionally, the companies are able to set their own valuation and can generate attention around their venture by utilizing the platforms marketing tools or the power of social media (European Commission, 2013b). Moreover, family and friends can invest in the venture alongside well known investors and business angels. Another important benefit is the fact that start-ups do not have to meet the disclosure and regulation requirements that surround other equity deals and this is something that lowers the cost and increases the speed of the fundraising process (Pierrakis & Collins, 2012). Finally, the initial crowdfunding response in terms of oversubscription, number of investors etc. can potentially comprise an important feedback tool regarding the prospects of the start-up (De Buysere, Gajda, Kleverlaan, & Marom, 2012) and might help entrepreneurs determine the amount that they will seek in future rounds (Pierrakis & Collins, 2012). The following graph is an illustration of

the main reasons why fundraisers choose the equity crowdfunding venue to finance their ventures (Statista).

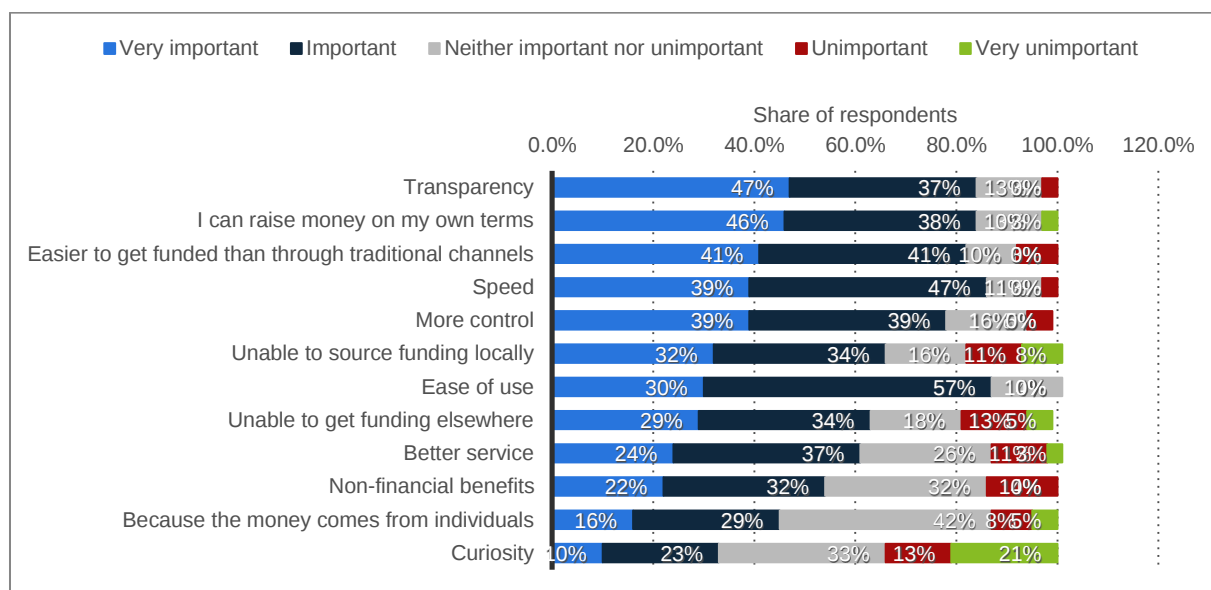


Figure 4. Fundraisers' reasons for choosing equity-based crowdfunding in the United Kingdom (UK) as of 2014

On the risks side, the most important drawback is the fact that crowdfunding investors are not ‘‘smart money’’, like VC firms, and therefore cannot offer the entrepreneurs access to a wider network of contacts nor can they help grow their company with their expertise (Foot Anstey, 2015). Moreover, founders should take into account that the regulatory framework is still somewhat unclear and might change in the near future and also that they will be required to reveal potentially sensitive information regarding their venture for the purpose of the crowdfunding campaign (Foot Anstey, 2015). Finally it is not clear whether investors sufficiently understand the risks and the terms of their investments. As a result, in the event of further financing rounds, the company might have to deal with diluted investors.

2.2 The Venture Capital Industry

2.2.1 Development of the Industry

The first Venture Capital firm was created in the US in 1946 by the president of MIT, a Harvard Business School Professor and local business leaders (Gompers & Lerner, 2001). Since then, and especially the last 30 years, the Venture Capital industry has experienced tremendous growth. More specifically, in 1980 the amount of VC investments in

the US was \$610 million (PricewaterhouseCoopers Moneytree) while a decade afterwards, in 1990, the total amount of Venture Capital investment stood at \$2.3 billion. During the so called “dot-com bubble”, overall investment reached a peak level of \$ 100 billion with the majority of the capital being committed to the IT sector (around 60%) as well as life sciences and medical companies (10%).

However after the burst of the dot-com bubble in 2000, the overall VC investment experienced a substantial decline and firms became less attracted to the IT sector (Green, 2004). Following the crash, VC firms entered an era of negative returns and investment write-offs which lasted for approximately three years. The following years (2004-2007) the situation improved and the VC industry experienced increased fundraisings and a general recovery (SVB Capital, 2011). In 2015 VC investment in the US stood at a level of \$58.8 billion, according to the money tree report, with 50% of this amount being raised by the consumer service industry, 16% by the IT industry and 17% as well as 16% being invested in financial and healthcare companies respectively (Dow Jones Venture Capital Report 2015).

In Europe, the industry began to develop initially during the early 1990s. During the first half of the decade, and mainly due to the recession that took place, the funds invested by European firms were trivial compared to the funds invested by their American counterparts. However, later VC activity in Europe increased thanks to the lucrative returns of the dot-com bubble in the late 1990s – early 2000s, with investment amounting to almost a quarter of the US level during the same time period (Hege et al., 2008 and Boquist and Dawson, 2004). Additionally, the legislation and regulatory framework shifted during the 1990s in favour of the VC industry and this fact constituted another stimulating factor for the development of the industry (EVCA, 2010). However, as in the US, the burst of the dot-com bubble was a major blow for the VC industry in Europe that has since continued to lag behind its American counterpart despite the significant efforts that have been made by European governments to support its development (Hege et al., 2008).

2.2.2 The structure of the Venture Capital markets

In general, a VC firm is usually comprised by around a dozen venture investors which are called the general partners (GPs). In order to make investments in start-ups VC firms raise money from institutional investors or wealthy individuals through vehicles called funds. These investors that commit their capital to the firm are called the Limited Partners (LPs). The partnership between the GPs and the LPs entails that the GPs will proactively manage those funds therefore assuming unlimited liability and from their side the LPs will retain unlimited

liability by not interfering with the fund's operations. The typical lifetime of a fund is around a decade and during that time GPs select in which start-ups to invest, they monitor, mentor and provide value added services to these companies. When the GPs deem that the time is right they exit from a company, usually by selling their stake or taking the company public, and thus they generate returns which they distribute to their LPs. Compensation for the GPs comes in the form of a management fee and also in the form of a performance – based payment called carried interest or just “carry”. The following graph provides an illustration of the way the VC business model works.

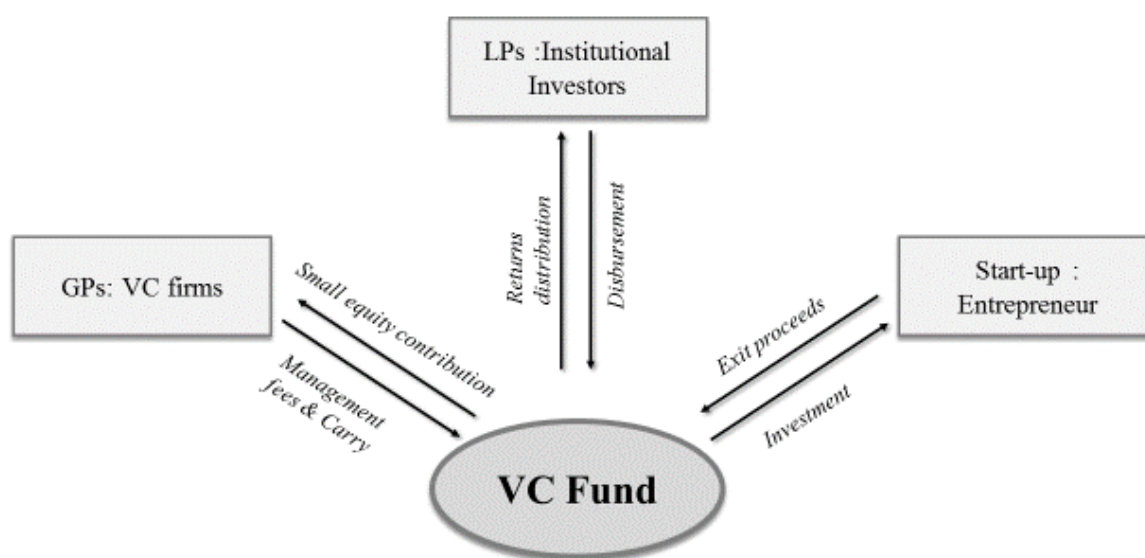


Figure 5. Venture Capital financing model

3. Previous research and theoretical framework

In this section an overview of the literature addressing the Venture capital selection of entrepreneurs and companies is provided. Additionally, the most widely-acknowledged aspects of the VC investment decision-making process in relation to the literature streams relevant to them are discussed.

One of the most important elements of the VC firms' activity is the screening and selection of appropriate investment targets. Because of the effectiveness that VC firms have demonstrated

in backing promising start-ups, especially in the technology sector (Kortum & Lerner, 2000; Lerner, 2002), their decision making process has been thoroughly investigated and analysed by several scholars (MacMillan, 1986; Kaplan & Strömberg, 2004; Elitzur & Gavious, 2003; Zacharakis et al, 2007). A unique characteristic of the VC investment decisions is the limited information conditions under which they are taken. Early stage companies have very limited, if any, history to examine and therefore their true quality is difficult to determine *a priori* thus creating significant informational asymmetries that VCs need to overcome.

According to Stiglitz (2002) informational asymmetries exist when “different people know different things” or, in other words, informational asymmetries occur between those who possess private information and those who would make better decisions if they had it. Stiglitz (2002) also describes two types of information in which asymmetries can play an important role: information about quality and information about intent. In the first occasion, one party is not aware of the true characteristics and the quality level of the other while in the second case the party that possesses private information can engage into opportunistic behaviour (Elitzur & Gavious, 2003). Michael Spence in 1973 proposed his “Signalling Theory” according to which in a situation with information asymmetry, it is possible for people to signal their type, thus believably transferring information to the other party and resolving the asymmetry problem (Spence, 1973). The profundity of his theory, therefore, lies in ascribing costs to information acquisition processes that resolve information asymmetries in a wide range of economic and social phenomena (Connely & Certo, 2011).

As mentioned previously, the market in which VCs operate is highly inefficient as a result of the limited information regarding the track record and the history of start-up companies. Therefore, and in line with Spence’s (1973) “Signalling Theory”, VC firms try to use their expertise and experience in order to identify signals that indicate the quality of the venture they consider investing in. Given the fact the selection process that VC firms are following is highly personal in nature (Mollick, 2014), these signals are identified through one-to-one meetings, business plan pitches as well as common network connections (Shane & Cable 2002; Baum & Silverman 2004; Kaplan & Strömberg, 2004). According to the existing literature, the signs that VC firms are looking for might concern several aspects of the venture like, for example, the quality of the management team, the track record of the CEO and the overall attractiveness of the business idea (MacMillan, 1986; Kaplan & Strömberg, 2004; Busenitz & Fiet, 2004). In the following paragraphs the signals that VCs are looking for in order to determine if a young enterprise may be capable of achieving its goals will be

discussed in more detail and also some biases that are proven to distort VC assessments will be outlined (Cumming & Dai, 2010; Chen et al, 2009; Harrison & Mason, 2007).

Of the critical signals identified by expert VC investors, scholars have found that venture capitalists seem to be particularly attentive to the “history” of the entrepreneur and the team. Kaplan and Strömberg (2004) report in their study that more than 60 percent of the VCs in their sample point to CEO / management team experience as a positive factor when considering whether to invest in a venture. A young and relatively inexperienced team was pointed out as a weakness by VCs in the same study. Hsu (2007) confirms that entrepreneurial teams with more venture founding experience have a higher likelihood of raising VC investment. These findings are in line with the human capital accumulation theory. Gompers et al. (2010) show that entrepreneurs who have been successful in the past are more likely to be successful in their present endeavor than first time entrepreneurs or entrepreneurs that have previously failed. Also, experienced entrepreneurs who have failed in the past learn valuable lessons that prepare them for their future ventures (Cope, 2011).

In addition to the history of success of the management team and the founder / CEO, VCs pay particular attention to other characteristics of the key team members as well (Franke et al, 2008, Silva, 2004, Tyebjee & Bruno, 1984, MacMillan et al, 1984). Shane et al (2002) find that social relationships between the investors and the entrepreneurs positively influence the decision of investors to fund the venture. MacMillan et al (1984) show that VCs value to a great extent an entrepreneur’s familiarity with the market of the venture, track record relevant to the venture as well as demonstrated leadership in the past. Other studies have also shown that investors value relevant experience – see Kaplan and Strömberg (2004) and Franke (2008). Hsu (2007) explores the effect of MBA and PhD degrees of any of the venture’s team members on the probability of obtaining funding. Maidique (1986) demonstrates that VCs perceive founders with advanced education as a positive signal for the venture success. The above findings are also supported in Colombo & Grilli (2005) who find that founders’ years of university education predominantly in managerial and economic fields affect the growth of new technology-based firms. Franke (2008) shows that a team with mixed education fields comprised of both managerial and technical skills, is preferred to either a solely managerial one or a solely technical one. The same paper also shows the importance to VCs of the mutual acquaintance within the team in a professional setting. Baum & Silverman (2004) show that larger management teams obtain more VC financing, perhaps signalling a greater accumulation of human and social capital.

It is also widely acknowledged by several scholars that VC firms might receive signals regarding the quality of a start-up from third parties, in the form of endorsements (Stuart et al, 1999; Baum et al 2000; Shane & Cable, 2002; Higgins et al, 2011). Social networks and alliances might help reduce informational asymmetries between entrepreneurs and VCs and thereby assist start-ups in gaining access to resources. Baum & Silverman (2004) indicate that start-ups with a lot of downstream and horizontal alliances (for example marketing, distribution and manufacturing related alliances) attract significantly more VC financing as this implies higher commercial viability of their service or product. Also they find that start-ups with more and recent patents are more likely to be backed by VC firms. The importance of patents is also emphasized by Hsu & Ziedonis (2007) who proved that the existence of patents is a signal that eliminates informational asymmetries around start-up quality during their first financing round. Interestingly, they suggest that the effect is no longer apparent in subsequent rounds as more information regarding the success potential of the start-up becomes available to investors and thus they rely less on patents as signals of quality. Additionally, the importance of external endorsements is emphasized by Shane & Cable (2002) who argue that the network ties and the reputation of an entrepreneur influence the selection of ventures to fund through a process of information transfer. Finally, another interesting research conducted by Higgins et al (2011) proved that IPOs of new technology firms are more successful when the company is affiliated with a Nobel laureate.

Another factor that is being taken into account by VCs during their decision making process is the extent to which entrepreneurs are ready to exploit the opportunity that is being given to them by demonstrating preparedness and passion during the pitches and the face to face meetings (Chen et al, 2009; Delmar & Shane, 2003; Kirsh et al 2009; Cardon et al, 2009). In general, venture capitalists look for preparation as a signal that entrepreneurs understand the risks and pitfalls of a new business and have an approach to address some of these concerns (Mollick, 2014). More specifically, Chen et al (2009) researched the effect of preparedness in business plan presentations through the employment of laboratory experiments and surveys and concluded that increased levels of preparedness are positively correlated with the decision to fund the project. Also, Cardon et al (2009) found that passion is an important factor that drives VC funding. More specifically they indicate that angels and VCs do use displayed passion as a factor in their investment decisions and specifically focus on the enthusiasm, preparedness and commitment entrepreneurs demonstrate. On the other hand, the findings of Kirsh et al (2009) contradict the previously mentioned research on preparedness as they find

that the presence of planning documents and some information contained therein are weakly associated with VC funding decisions.

Apart from the characteristics of the team and the CEO, external endorsements and the demonstrated preparedness of the entrepreneurs, VCs also consider the overall attractiveness and risk of the business idea (MacMillan, 1986; Kaplan & Strömberg, 2004; Prasad et al, 2000; Elitzur & Gaviious, 2003; Zacharakis et al, 2007; Kaplan et al, 2007). One of the first research papers regarding VC investment decisions was provided by MacMillan (1986) who suggested that VCs consider as very important the market and product considerations when deciding which venture to back up. Moreover, one of the most detailed descriptions of what kind of attributes VCs are looking for when examining a business idea is provided by Kaplan & Strömberg (2004) who analysed investments in 67 portfolio companies by 11 venture capital partnerships between 1987-1999. According to that research, the most important factors for VCs are the size and growth rate of the company's addressable market, the technology, the competition and the customer adoption rate. Finally, Kaplan et al (2007) suggest that it would be beneficial for VC firms to place more weight on a strong business rather than on a strong management team.

As mentioned previously, VC firms primarily try to accumulate information and signals regarding the quality of a start-up through personal interaction, face to face meetings and social networks. This fact introduces some biases in the decision making processes and the way VCs gather signals in a way that cannot be justified by a start-ups success potential or performance. These biases are mainly related to geographical and gender factors and they have been extensively investigated by scholars.

The first widely acknowledged bias is geographic. VC firms tend to invest in start-ups located in specific areas which are close to where the VC firm is located (Gupta & Sapienza, 1992; Sorrenson & Stuart, 2001; Aizenman & Kendall, 2008; Chen et al, 2009; Cumming & Dai, 2010; Agrawal et al, 2011). According to Chen et al (2009) an explanation for this phenomenon might be that VC investments are in industries where geographically localized knowledge spillovers are likely to be important. Accordingly, venture capital firms locate to maximize benefits from these spillovers. A virtuous cycle of co-location is maintained as entrepreneurs choose to locate their businesses closer to funding sources, pools of talented employees, and academic researchers. The higher success rate for companies based in the venture capital centres suggests that these may be optimal geographies for founding new venture-backed businesses. Sorenson & Stuart (2001) indicate that reduced informational asymmetries are the reason for geographic concentration, as information about potential

investment opportunities generally circulates within geographic and industry spaces. They also find that the average distance between a VC and their investment is 70 miles.

Another set of biases is related to the gender of the entrepreneur, with female founders being less likely to be selected by Venture Capitalists (Greene et al, 2001; Ruef, Aldrich, & Carter, 2003; Greene & Hart, 2003; Alsos & Ljunggren, 2016; Harrison & Mason, 2007; Miller, C. 2010). An explanation of this bias that has been put forward is homophily (Ruef et al, 2003). Only 14% of the Venture Capitalists in the US are women (Miller, 2010) and Ruef et al (2003) argue that male entrepreneurs are more likely to be financed both because of shared networks and because of homophilic tendencies on the side of the Venture Capitalists. However, Harrison & Mason (2007) point out that the cause of gender bias should be attributed to social capital and networking and not to homophily as female venture capitalist behave in a similar manner as male venture capitalists. Finally, Greene et al (2001) further highlighted the social network barriers that make it more difficult for female entrepreneurs to acquire financing.

VC firms are quite effective in picking appropriate investment targets (Kortum & Lerner, 2000; Lerner, 2002) which implies that their selection criteria are sound and the signals that they use - indicative of a new venture's success potential. On the other hand, the methods they use to identify these signals lead to gender and geographic biases. For the entrepreneurs, the knowledge of VC selection processes, through academic research or other learning channels, has led them to create male dominated teams with the appropriate background, invest time and effort in developing network ties and demonstrate preparation during the interaction with the VCs (Mollick, 2014). However, a new financing model has become available to entrepreneurs the recent years in the shape of equity crowdfunding and it is gaining traction as an alternative financing source.

4. Hypotheses Framework

This section introduces the hypotheses that will be used in order to test whether equity crowdfunding investors collect and interpret signal of quality in a same manner as VCs do. The basis for the hypotheses formulation lies in the extensive literature around VC selection of entrepreneurs and start-ups, as described in the previous section.

As mentioned previously, the differences between the Venture Capital and the Equity Crowdfunding financing models are substantial (Mollick, 2014). One of the major differences is that the entrepreneurs that seek financing through equity crowdfunding attract funds from a big pool of amateur investors rather than a single or limited number of VC firms, thus making the procedure more “democratic” and not so “oligopolistic”. Moreover, decisions to invest are being made on an individual level by every investor as there is no coordination among them, and also there is no price setting mechanism or a procedure that aggregates crowd preferences. Although the success or failure of a venture might be affected by the amount of money that has already been pledged in the project (Kuppuswamy & Bayus, 2013), investment decisions are not collective and investors can be viewed as a crowd of independent amateurs (Mollick, 2014).

The purpose of this research is to explore whether the amateur investors who acquire a stake in a new enterprise through the equity crowdfunding venue interpret signals of venture quality in the same manner as experienced VC professionals do. If equity crowdfunding investors interpret quality signals in the same way that sophisticated investors (in our case VC firms) do then the credibility of these signals, and to a broader extent, the credibility of the investment selection processes of VC firms will be further strengthened. Moreover it will be implied that the “crowd” is capable of making rational and informed investment decisions and it is not as unsophisticated as many would assume. On the other hand, if the outcome of the analysis indicates that this is not the case, then this would imply that equity crowdfunding is not assessing project quality in an appropriate way or that VC decision making processes are not considered relevant and useful within the equity crowdfunding universe. However, given the experience and the overall effectiveness of VC firms to back up promising start-ups (Kortum & Lerner, 2000; Lerner, 2002) it is expected that their selection processes would be replicated, at least to some extent, by equity crowdfunding investors as well.

Previous research has shown that VC investors put weight on the history of the founder and the team. In particular, previous venture founding experience leads to increased likelihood of venture capital investment (Hsu, 2007). As a consequence of these findings it is interesting to explore whether these results would be confirmed in the equity crowdfunding environment as well. Another interesting aspect worth investigation is whether the crowd differentiates between previous venture *founding* experience and previous venture *non-founding* experience. This leads us to the first 2 hypotheses:

H1: Previous venture founding experience will lead to a greater equity crowdfunding success.

H2: Previous venture non-founding experience will lead to a greater equity crowdfunding success.

Some authors argue that there is a difference between *serial* and *portfolio* entrepreneurs. For example Gottschalk et al (2014) argue that portfolio entrepreneurs possess better “content domain experience” than serial entrepreneurs do. Serial entrepreneurs are those who have a history of founding venture after venture without being involved in any two ventures at the same time. Portfolio entrepreneurs, on the other hand, are those who are simultaneously involved in more than one of their ventures. Therefore this study will explore whether investors in the equity crowdfunding domain make such a differentiation and attribute a bigger weight on portfolio entrepreneurs:

H3: Portfolio entrepreneurs will achieve a greater equity crowdfunding success.

A second set of signals that VCs take into consideration when deciding which ventures to back up include various characteristics of the CEO/founder and the team. Connectedness between VC investors and the entrepreneur under the form of direct and indirect ties has been shown to positively affect the decision of VCs to commit financing (Shane et al, 2002). LinkedIn has an excellent tool providing easy to understand connections between people who use the platform, including mutual acquaintances. The count of LinkedIn followers for the founder/CEO of the pitch is utilized in order to see whether a bigger network affects the success of the project to raise capital on the equity crowdfunding platform. A bigger network increases the chances of investors to be indirectly linked to the founder and thereby their ability to obtain information about him/her.

H4: A larger count of LinkedIn followers for the CEO/founder of the venture will lead to a greater equity crowdfunding success.

Kaplan and Strömberg (2004) show in their study that VCs explicitly state experienced CEO as a reason to invest in a company. The study will explore whether crowdfunding investors value experienced founders/CEOs in a similar manner:

H5: A more experienced founder/CEO will lead to a greater equity crowdfunding success.

Numerous studies show that industry experience is among the most important CEO/team characteristics that VCs are looking for when considering their investment opportunities (Kaplan and Strömberg, 2004; MacMillan et al, 1984; Franke et al, 2008). Based on the findings in these papers, the following hypothesis will be tested:

H6: A founder/CEO with previous experience in the industry of the venture will lead to a greater equity crowdfunding success.

Colombo & Grilli (2005) report that founders' years of university education in managerial, and to a lesser extent – scientific and technical - fields positively affects the growth of new technology-based firms. Roberts (1991) however reports that individuals with a PhD degree, having obtained more research experience as contrasted to commercial experience, are associated with lower new venture performance. Hsu (2007) finds a significant negative relationship between a PhD-degree holder and VC funding. The author also reports a zero effect for an MBA-degree holder. Following human capital theory and the findings in the papers mentioned above, the following hypotheses related to the academic level of founders/CEOs in the equity crowdfunding environment are formed:

H7: A founder/CEO with an MBA degree will lead to a greater equity crowdfunding success.

H8: A founder/CEO with a PhD degree will lead to a lesser equity crowdfunding success.

Franke et al (2008) finds out that VCs consider mutual acquaintance among the venture team members (especially on a professional base) as a characteristic attributable to preferred teams. It is expected that equity crowdfunding investors value this attribute in a similar manner, which leads to the next hypothesis:

H9: Acquaintance among the team on a professional level will lead to a greater equity crowdfunding success.

As Baum & Silverman (2004) report, ventures with larger top management teams attract more VC financing. The authors suggest larger teams may possess bigger human, as well as social, capital. Equity crowdfunding investors are tested on these views through the next hypothesis:

H10: Larger management teams will lead to a greater equity crowdfunding success.

According to previous research, a third set of signals that VC firms take into account when assessing the quality of a start-up takes the shape of third-party, or external, endorsements (Stuart et al, 1999; Baum et al 2000; Shane & Cable, 2002; Higgins et al, 2011). However, in the equity crowdfunding dimension endorsements do not occur through shared physical social networks as it is highly unlikely that amateur investors and founders will have common acquaintances. However, an equity crowdfunding pitch might receive endorsements through other channels like for example through the press, through affiliation with a prominent figure, such as an artist or a scientist, or even through the conferment of an award or a prize related to entrepreneurship. Therefore it is expected that endorsements even of this form would be considered as a signal of quality from the crowd and thus the following hypothesis is examined:

H11: A high number of external endorsements that a pitch has attracted in the form of media references, and/or awards, and/or affiliations with prominent figures, will lead to a greater equity crowdfunding success.

Moreover, it has been highlighted by multiple scholars that patents comprise another significant form of endorsement that helps VCs overcome informational asymmetries (Hsu & Ziedonis 2007; Conti et al 2011; Higgins et al, 2011; Hoenen et al, 2012). Especially when the enterprise is in a very early stage, the outcome of the first financing round is highly affected by the existence of patents, which is not the case for subsequent financing rounds, during which more information about the company is available to investors (Hsu & Ziedonis, 2007; Hoenen et al, 2012). Consequently, hypotheses are constructed in order to test the dynamics between the existence of patents and crowdfunding success:

H12: The existence of patents will lead to a greater equity crowdfunding success.

H13: The existence of patents will lead to a greater equity crowdfunding success, if no previous financing round has occurred in the past.

As discussed in the previous section of this thesis, another set of signals that VCs are seeking to detect before deciding to invest are those that indicate preparedness and passion from the side of the entrepreneurs (Delmar & Shane, 2003; Chen et al, 2009; Kirsh et al 2009; Cardon et al, 2009). Although VCs make their judgements regarding the preparedness level of an entrepreneur through face to face meetings, which is something that hardly ever happens during an equity crowdfunding campaign, we consider that preparedness and passion in equity crowdfunding can be demonstrated in other ways. It can be presumed that appropriate proxies, or signals, that can capture the preparation level of an entrepreneur and the team are the length of the pitch video, the number of pictures that have been uploaded and also the extent to which the business plan is presented in a detailed way. When it comes to the video as a proxy for preparedness, several other scholars have attempted to interpret whether the existence of a video leads to greater crowdfunding success (Kuppuswamy & Bayus, 2013; Mollick, 2013; Crosetto & Regner, 2014; Huili and Yaodong, 2014). However their efforts were focused on reward – based crowdfunding, which constitutes a totally different financing model, and also they didn't account for the length of the video but only for its existence. Therefore the first hypothesis, related to preparedness, that this study will explore is the following:

H14: The longer the length of the pitch-video, the greater the equity crowdfunding success of the campaign.

Following the same logic, and also in line with previous research on reward – based crowdfunding (Mollick, 2013; Crosetto & Regner, 2014; Joenssen et al, 2014), the number of pictures available on the campaign's webpage will be used as a proxy for preparedness.

H15: A high number of pictures on the campaign's webpage will lead to greater equity crowdfunding success.

Finally, it is expected that a detailed analysis of the entrepreneurs' business plan on the campaign's webpage should work as a signal of preparedness. The importance of a sound business plan for the success of a new venture has been emphasized by several scholars (Honing & Karlsson, 2004; Chen et al, 2009) and Crosetto & Regner (2014) have explored

the relationship between the business plan's word count and the crowdfunding success of a campaign in the reward-based crowdfunding dimension. In a similar manner the following hypothesis is constructed:

H16: The higher the word count of a business plan, the greater the equity crowdfunding success.

Another stream of literature focuses on the characteristics of entrepreneurial business ideas that are appreciated by VC firms when they make their investment decisions (MacMillan, 1986; Kaplan & Strömberg, 2000; Prasad et al, 2000; Elitzur & Gavious, 2003; Zacharakis et al, 2007; Kaplan et al, 2007). Factors like the market size, the customer adoption rate and the technology involved are taken into account by VC professionals when trying to assess the attractiveness and the riskiness of an idea (MacMillan, 1986; Kaplan & Strömberg, 2004). In equity crowdfunding pitches a direct way to assess the success potential of a venture idea is to analyse the financial statements of a start-up and gain an overview of its profitability and financial situation in general. This provides a more precise overview of the risks, and it can help lessen asymmetric information because investors will have a better basis on which to form earnings expectations (Epstein and Schneider, 2008). Therefore our study arrives to the following hypothesis:

H17: The disclosure of financial statements leads to a greater equity crowdfunding success.

Additionally, several scholars have highlighted that VCs seek for signals that will indicate the true quality of the business proposal (Prasad et al, 2000; Elitzur & Gavious, 2003; Busenitz et al, 2005; Conti et al 2011). Specifically, Conti et al (2011) suggest that the amount of founder, friend and family money that has been pledged to the venture is perceived as a positive signal from VCs as they perceive a wealth contribution from the entrepreneur and his close social circle as an indication of commitment to the venture and acts as a risk mitigating factor. Following the same logic, Prasad et al (2000) found that the proportion of the entrepreneur's net worth invested in a new venture constitutes a credible investment decision signal. Finally, Elitzur & Gavious (2003) suggest that a past investment from a business angel is a positive signal regarding the venture's quality, as it signals that the entrepreneur has chosen to exert a positive level of effort by accepting the cost of dealing with the angel in terms of equity concession. In the equity crowdfunding context, someone would expect that previous

successful financing rounds imply that some kind of due diligence has already been made on the start-up from the investors that pledged their money earlier and it is likely that unsophisticated investors, with limited resources and ability to perform proper due diligence and post-investment support, will see a successfully completed financing round as a quality stamp for the project (Pierrakis & Collins, 2012). In order to examine the effect of previous investments in equity crowdfunding campaigns the following hypothesis is created:

H18: Previous crowdfunding rounds or investments by professional and/or angel investors lead to greater equity crowdfunding success.

Several scholars have also explored the phenomenon of VC investments' geographic concentration (Gupta & Sapienza, 1992; Sorrenson & Stuart, 2001; Aizenman & Kendall, 2008; Chen et al, 2009; Cumming & Dai, 2010; Agrawal et al, 2011). Because of the need to evaluate the venture through personal interaction and shared social networks VC activity is constrained in specific locations where both the VC firms and the start – ups are located. However, it can be reasonably expected that this geographic constraint will not be present in equity crowdfunding as investors are geographically dispersed and do not base their evaluation on personal meetings with the founders or common acquaintances. Additionally, Agrawal et al (2010) have proved through their research in the music crowdfunding industry that the presence of an online platform helps overcome the geographic bias to a significant extent. One purpose of this study is to examine what is the role of geography in equity crowdfunding investing and therefore the following hypothesis will be examined:

H19: The location of the project will not significantly affect the equity crowdfunding success of the campaign.

The final hypothesis of this paper is related to another type of acknowledged bias in the VC decision making process, namely the gender bias (Greene et al, 2001; Ruef, Aldrich, & Carter, 2003; Greene & Hart, 2003; Alsos & Ljunggren, 2016; Harrison & Mason, 2007; Miller, C. 2010). Some of the scholars suggest that the reason lies in homophily (Ruef et al, 2003) while others propose that the reason is social network barriers (Greene et al, 2001). However it would be expected that gender bias will not be relevant for equity crowdfunding as there is almost no face-to-face interaction and investment decisions are not based on signals from shared social networks. Consequently, this study arrives to its final hypothesis:

H20: The gender of the entrepreneur will not significantly affect the equity crowdfunding success of the campaign.

A summary of the hypotheses and the category to which they correspond is presented below.

Table 1. Summary of hypotheses

Category	Hypotheses
Category 1: History of Success	<i>H1: Previous venture founding experience will lead to a greater equity crowdfunding success.</i> <i>H2: Previous venture non-founding experience will lead to a greater equity crowdfunding success.</i> <i>H3: Portfolio entrepreneurs will achieve a greater equity crowdfunding success.</i>
Category 2: CEO/Team characteristics	<i>H4: A larger count of LinkedIn followers for the CEO/founder of the venture will lead to a greater equity crowdfunding success.</i> <i>H5: A more experienced founder/CEO will lead to a greater equity crowdfunding success.</i> <i>H6: A founder/CEO with previous experience in the industry of the venture will lead to a greater equity crowdfunding success.</i> <i>H7: A founder/CEO with an MBA degree will lead to a greater equity crowdfunding success.</i> <i>H8: A founder/CEO with a PhD degree will lead to a lesser equity crowdfunding success.</i> <i>H9: Acquaintance among the team on a professional base will lead to a greater equity crowdfunding success.</i> <i>H10: Larger management teams will lead to a greater equity crowdfunding success.</i>
Category 3: External endorsements	<i>H11: A high number of external endorsements that a pitch has attracted in the form of media references, and/or awards, and/or affiliations with prominent figures, will lead to greater equity crowdfunding success.</i>

	<i>H12: The existence of patents will lead to a greater equity crowdfunding success.</i> <i>H13: The existence of patents will lead to a greater equity crowdfunding success, if no previous financing round has occurred in the past.</i>
Category 4: Preparedness	<i>H14: The longer the length of the pitch-video, the bigger the equity crowdfunding success of the campaign.</i> <i>H15: A high number of pictures on the campaign's webpage will lead to greater equity crowdfunding success.</i> <i>H16: The higher the word count of a business plan the greater the equity crowdfunding success.</i>
Category 5: Idea Evaluation	<i>H17: The disclosure of financial statements leads to a greater equity crowdfunding success.</i> <i>H18: Previous crowdfunding rounds or investments by professional and/or angel investors will lead to greater equity crowdfunding success.</i>
Category 6: Biases	<i>H19: The location of the project will not significantly affect the equity crowdfunding success of the campaign</i> <i>H20: The gender of the entrepreneur will not significantly affect the equity crowdfunding success of the campaign</i>

Therefore this paper will attempt to examine two sets of hypotheses. Categories 1-5 are related to VC selection criteria and the hypotheses that correspond to these categories will allow for a better view on the extent to which equity crowdfunding investors are affected by the same signals of quality as professional VCs. Category 6, and the corresponding hypotheses, examine whether specific biases are relaxed through the equity crowdfunding financing model.

5. Data & Methodology

5.1 Data

For the purposes of this thesis primary sources of data were predominantly utilized. Secondary sources of data were used only when information was not directly available from the primary source. When secondary data sources (regarding, for example, CEO/founder age)

were utilized, any conscious effort was made in order to guarantee the credibility of the data obtained, either through more than one data source or through objective discussion among the writers. Primary data sources were the equity crowdfunding platform that was used for the purposes of this work as well as LinkedIn – the professional networking platform. Secondary sources varied and were obtained through the Internet.

Data was collected from the UK-based crowdfunding platform Crowdcube. Crowdcube offers investors the possibility to invest in equity and bonds. In the period from January 2016 to April 2016 we collected data for 301 projects seeking equity funding. The number of funded equity projects keeps growing as a function of time and at the moment of the writing of this master thesis the count has reached 312. This includes all successfully funded projects on Crowdcube from the moment of its inception in 2011. After initial inspection of the collected data 13 projects from the sample were excluded due to lack of reliable information even from secondary data sources. Therefore, the final data sample consists of 288 observations.

Crowdcube provides exhaustive information for each project seeking funding and as a result it was possible to collect a large quantity of data from the equity crowdfunding platform itself. Moreover, the information for each project follows a structured nature which allows for an objective and comparable data collection process.

5. 2 Dependent variables

For the purposes of this thesis three dependent variables that adequately capture the extent to which the equity crowdfunding campaign of the company has been successful were used. The first two, *oversubscription* and *total number of investors* are directly obtainable from each project's pitch on Crowdcube. *Oversubscription* represents the percentage amount of money raised above the initial target announced by the project seeking equity funding. This figure is scaled to represent a percentage of the total target amount so, for example, an oversubscription of 20% means that a project has received 20% more money than the amount it stated as its target initially. The *total number of investors* is self-explanatory and represents the number of people who have invested in a project. The third dependent variable we used, *adjusted average investment*, was not directly obtainable from the project's pitch and we constructed it ourselves. The following formula illustrates how this dependent variable was arrived at:

$$\text{adjusted average investment} = \frac{(\text{total amount raised} - \text{largest investment})}{(\text{total number of investors} - 1)}$$

The total amount raised and the largest investment amount were directly observable for each project as was also the total number of investors. By adjusting for the largest money amount invested by a single investor in the numerator and excluding this single investor in the denominator a clearer picture of how the majority of the investors in a project (“the crowd”) have supported it emerges. The above adjustment was carried out because the largest investment amount can potentially be susceptible to manipulation, as for example would be the case when a relative to a team member invests a large amount of money into the project in point. Clearly, such action does not represent a manipulation per se. However, it may also be the case that such action has nothing to do with rational investment decision-making in the equity crowdfunding context, which is what this thesis attempts to measure. On the contrary, it may be a product of irrational affection and it is optimal to diminish the chances of such events crawling in the data.

5.3 Independent Variables

The hypotheses developed in Section 5 correspond to specific independent variables that will allow for testing them and thereby creating an understanding on the investment decisions of equity crowdfunding investors. Data for the construction of these variables was obtained through primary (campaigns webpage, LinkedIn) or secondary sources (other Internet websites). Below a table is provided with the variables used according to the literature categorization framework that was introduced in the previous section. Explanation regarding the nature and the construction of each variable is provided in the Appendix.

Table 2. Summary of explanatory variables

<i>Category</i>	<i>Independent Variables</i>
Category 1: History of success	• Previous Startup Ventures • Previous Start – up work experience (non-founder) • Portfolio Entrepreneur

Category 2: CEO/Team Characteristics	• LinkedIn followers • CEO years of work experience • Industry experience • CEO education MBA • CEO education PHD • Acquaintance among the team • Management team size
Category 3: External endorsements	• Press references ,awards, affiliations with prominent figures • Patents & Trademarks
Category 4: Preparedness	• Video length • Number of pictures • Business plan presentation word count
Category 5: Idea evaluation	• Financial statements • Previous Investments
Category 6: Biases	• City • CEO gender

5.4 Control variables

Several control variables were introduced in the analysis in order to strengthen its findings. Namely, these are controls for time (at which year was the project funded), industry of the project and stage of the project (as described on the equity crowdfunding platform). Time fixed effects controls are considered appropriate as the size of the crowd changes with respect to time and the equity crowdfunding platform's characteristics evolve. Also controls for stage were used when deemed appropriate.

5.5 Research method

For the purposed of this research an Ordinary Least Squares (OLS) regression method was utilized. Bivariate linear regressions as well as multivariate linear regressions were used, including controls for the effects described in Section 5.4. Five models with different sets of control variables as described in Table 3 were constructed. Even though the sample size includes more than 92% of all projects that received equity crowdfunding on Crowdcube as of the writing of this master thesis, in order to make the results more robust and improve the estimations, a bootstrapping procedure for the standard errors in our models was employed. Then the p-values are reported as obtained from the above procedure at a 1%, 5% and 10% confidence levels.

Table 3. Control variables

Model	Control variables included
Model 1	No control variables
Model 2	Time control variables
Model 3	Industry control variable
Model 4	Time and Industry control variables
Model 5	Time, Industry and Stage control variables

5.6 Descriptive statistics

The total number of observations is 288. The number is lower for the variable “Acquaintance among the team” because several projects consist solely of their founder and the effect attempted to be measured with this variable is lost in these projects. The projects were divided in five industries. Their distribution is as follows: There are 85 projects in the Technology, Media and Telecommunications (“TMT”) industry, 35 in the Consumer products industry, 41 in the Professional & Business services industry, 82 in the Food & Drink industry and 45 other projects were categorized under “Other” to include all other industries.

On average projects were 36 percent oversubscribed. The minimum oversubscription (maximum undersubscription) is -10 percent. On the other end of the spectrum, the maximum oversubscription is 251 percent. The average number of investors per project is just over 200. One project has only 8 investors, whereas another one has 2,702. The adjusted average investment has a mean of GBP 1,615.9 with a minimum of just GBP 193 and a maximum of GBP 13,119.

In 49 percent of the pitches, the founder/CEO has previous experience in a start-up in a founding role. In 28 percent of the cases, the previous start-up experience of the founder/CEO was in a non-founder role. However, for some projects the founder/CEO had both kind of previous experience. Just over 20 percent of the founders/CEOs are portfolio entrepreneurs, meaning they were actively involved in another venture at the time of fund raising.

Table 4. Descriptive statistics

	No. of obs.	Min	Average	Median	Max	St. deviation
Dependent variables						
Oversubscription	288	-10%	36%	23%	251%	44%
Total number of investors	288	8	200.2	124.0	2 702.0	300.2
Adjusted average investment	288	193.0	1 615.9	1 216.0	13 119.0	1 395.5
Independent variables						
1. History of success						
Previous start-up founding experience	288	0	0.5	0.0	1	0.5
Previous start-up nonfounding experience	288	0	0.3	0.0	1	0.5
Portfolio entrepreneur	288	0	0.2	0.0	1	0.4
2. Founder/CEO & Team characteristics						
Linkedin followers	288	0	1 148.2	671.5	12 904.0	1 626.1
CEO years of work experience	288	0	17	15	45	9.5
Industry experience	288	0	0.6	1.0	1	0.5
CEO MBA degree	288	0	0.1	0.0	1	0.3
CEO PhD degree	288	0	0.0	0.0	1	0.2
Acquaintance among the team	273	0	0.3	0.0	1	0.5
Management team size	288	1	3.3	3.0	9	1.7
3. External endorsements						
Patents & Trademarks	288	0	0.2	0.0	1	0.4
Idea backed by media/prominent figures	288	0	2.8	0.0	160	10.2
4. Preparedness						
Video length	288	0	2.8	3.1	14.4	2.0
Nr. of pictures available	288	0	9.0	7.5	85	8.3
Idea word count	288	161.0	776.8	702.0	4 276.0	423.2
5. Idea Evaluation						
Financial statements	288	0	0.7	1.0	1	0.5
Previous investment	288	0	0.3	0.0	1	0.5
6. Biases						
City	288	0	0.6	1.0	1	0.5
CEO gender	288	0	0.8	1.0	1	0.4
7. Interactive terms						
Industry experience x Previous start-up founding experience	288	0	0.4	0.0	1	0.5
Industry experience x Portfolio entrepreneur	288	0	0.2	0.0	1	0.4
Previous investment x Patents	288	0	0.3	0.0	1	0.4
Control variables						
Time	288	0	0.9	1.0	3	1.0
Stage	288	1	2.0	2.0	3	0.7
Industry classification	288	1	2.9	3.0	5	1.5
-TMT	85					
-Consumer products	35					
-Professional & Business services	41					
-Food & Drink	82					
-Other	45					

On average, founders/CEOs had 1,148 LinkedIn followers with the maximum amount of followers in our sample being 12,904. The minimum amount of followers (which includes the amount of connections, but is also influenced by the publishing activity of the person on LinkedIn) we captured in our sample was 0. This is the case for undeveloped LinkedIn profiles. The average years of work experience of the founder/CEO in our sample was 17. The sample contains extremely unexperienced founders/CEOs with virtually no work experience as well as very experienced founders/CEOs with 45 years of work experience under their belt. With regards to previous industry experience, 64 percent of the founders/CEOs in the sample possessed such experience. With regards to their education level, just under 10 percent of founders/CEOs had an MBA degree, with even less – just over 3 percent – a PhD degree.

Around 32 percent of the teams contained two or more members that have previously worked together, be it in large established companies, or at start-ups.

The average team size in our sample was just above 3 people. The minimum is 1 in case only the sole founder is involved with the venture at the time of the pitch. The largest team in the sample consisted of 9 people.

Just under 24 percent of the investment pitches in the sample had patents and/or trademarks granted at the time of the investment proposal. On average, a project was mentioned / backed by 2.8 articles / prominent figures in the public space. This figure ranges from 0 to 160, although the standard deviation is 10.2.

The average length of a project's video pitch was 2 minutes and 8 seconds. The longest video had a duration of 14 minutes and 41 seconds. On the other end of the spectrum were the projects that did not provide a video and consequently were given a value of 0. On average, projects had provided 9 pictures in their pitches. There were some projects with no pictures provided and the largest count of pictures provided was 85. 776.8 words long is the description of a project idea, on average. This figure ranges from just 161 words (more characteristic for the earliest projects that pitched on Crowdcube) to 4,276 words.

About 62 percent of the start-ups were based in a big city and for a little over of 83 percent the founder/CEO is male.

Almost 70 percent of the projects in the sample had provided financial statements at the time of their pitches. About one-third of the projects in the sample had received previous investment from professional investors, angels or the crowd itself in a previous equity crowdfunding round.

5.7 Correlations

Table 4 on the next page contains the correlation coefficients between the various variables. Overall the correlation coefficients between the variables are low with values well below 0.3 in the majority of the cases. Apart from the higher correlation coefficients between the interactive terms and their component variables, which could be expected, there are only two other higher coefficients. The first is between the variables portfolio entrepreneur and previous venture founding experience. However, with its value of 0.46 it cannot be argued the two variables are highly correlated. The other is between the variables number of pictures available and idea backed by media/prominent figures. Its value is 0.4.

Table 5. Correlations

	Oversubscription (%)	Total number of investors	Adjusted average investment	Previous venture founding experience	Previous venture non-founding experience	portfolio entrepreneur	Linkedin followers	CEO years of work experience	Industry experience	Education Level of the CEO(MBA)	Education Level of the CEO(PHD)	Acquaintance among the team	Management team size	Patents & Trademarks	Idea mentioned in articles / Backed by prominent figures	Financial statements	Video length	Number of Pictures available	Idea presentation word count	City	CEO/ Founder gender	Previous investment	prev venture founding experience x industry experience	industry experience x portfolio entrepreneur	previous investment x patents
Oversubscription (%)	1																								
Total number of investors	0.46	1.00																							
Adjusted average investment	-0.02	-0.05	1.00																						
Previous venture founding experience	0.08	0.08	0.00	1.00																					
Previous venture non-founding experience	0.00	0.00	-0.04	0.22	1.00																				
portfolio entrepreneur	0.06	-0.04	0.03	0.46	0.09	1.00																			
Linkedin followers	0.02	0.04	-0.03	0.12	0.07	0.15	1.00																		
CEO years of work experience	-0.02	-0.09	0.12	0.10	0.08	-0.04	0.07	1.00																	
Industry experience	0.08	0.03	0.12	0.16	0.01	0.12	0.05	0.14	1.00																
Education Level of the CEO(MBA)	0.03	-0.04	0.05	0.03	0.00	0.10	0.04	0.01	0.02	1.00															
Education Level of the CEO(PHD)	0.13	-0.02	-0.04	-0.07	0.01	0.05	0.05	0.07	0.10	-0.06	1.00														
Acquaintance among the team	0.03	0.07	0.18	0.16	0.11	0.03	-0.07	0.04	0.09	0.02	0.09	1.00													
Management team size	0.16	0.32	0.14	0.08	0.03	-0.01	-0.01	0.11	0.09	0.06	-0.03	0.17	1.00												
Patents & Trademarks	0.09	0.05	0.04	0.01	-0.11	-0.01	-0.05	0.09	0.07	-0.07	0.16	0.00	0.02	1.00											
Idea mentioned in articles / Backed by prominent figures	0.03	0.11	0.05	-0.08	0.08	-0.07	0.03	-0.02	-0.04	0.00	-0.04	0.10	0.18	-0.05	1.00										
Financial statements	0.14	0.18	-0.03	0.12	-0.08	0.04	0.00	-0.07	-0.04	0.07	-0.04	0.04	0.13	0.19	0.09	1.00									
Video length	0.09	0.19	0.04	-0.04	0.07	-0.08	-0.01	0.15	0.12	0.01	-0.07	-0.01	0.15	-0.06	-0.02	-0.03	1.00								
Number of Pictures available	0.10	0.13	-0.06	-0.05	-0.01	-0.04	0.02	-0.03	-0.06	0.08	-0.06	0.04	0.17	0.02	0.40	0.22	0.04	1.00							
Idea presentation word count	0.10	0.24	0.05	0.08	0.06	0.03	0.07	0.03	0.02	0.07	-0.05	0.07	0.24	0.10	0.12	0.09	0.05	0.14	1.00						
City	0.07	0.14	0.08	0.01	-0.04	0.07	0.00	-0.22	-0.02	0.14	-0.16	0.12	0.10	-0.09	0.08	0.17	-0.06	0.08	0.04	1.00					
CEO/ Founder gender	-0.04	0.00	0.10	0.19	0.10	0.13	0.03	0.09	0.11	0.08	0.08	0.12	0.01	0.04	-0.13	-0.02	0.07	-0.13	0.03	-0.08	1.00				
Previous investment	0.08	0.21	0.10	0.03	0.06	0.03	0.01	-0.05	0.07	0.06	-0.05	0.02	0.26	-0.06	0.15	0.10	0.07	0.11	0.19	0.11	0.06	1.00			
prev venture founding experience x industry experience	0.12	0.14	0.01	0.76	0.08	0.41	0.14	0.09	0.55	0.03	-0.02	0.09	0.14	0.01	-0.06	0.11	0.04	-0.03	0.10	0.02	0.15	0.06	1.00		
industry experience x portfolio entrepreneur	0.12	-0.01	-0.01	0.42	0.05	0.85	0.19	-0.02	0.32	0.06	0.08	0.04	-0.04	0.02	-0.06	0.03	-0.04	-0.08	-0.01	0.06	0.09	0.04	0.56	1.00	
previous investment x patents	0.01	0.10	0.11	0.03	0.10	0.03	0.03	-0.05	0.03	0.06	-0.07	0.04	0.23	-0.33	0.15	0.04	0.05	0.00	0.08	0.13	0.06	0.86	0.04	0.02	1.00

6. Results Analysis

In this section results and explanations of the quantitative analysis are provided. Five models in total for each of our three dependent variables are employed. Analysis and an in-depth discussion of the findings is provided, by taking into consideration two models for each of the hypotheses – one without control variables (Model 1) and the one model featuring control variables that gives the highest R^2 . This allows exploring for any significant effects of the independent variables while achieving the highest explanatory power among the models.

6.1 Category 1: History of success

In order to test hypotheses under Category 1, OLS regressions with Models 1 through 4 were utilized. The results are presented in table 5.

Table 6. Category 1: History of success

Dependent variable	Oversubscription		Number of investors		Adjusted average investment	
	(1)	(4)	(1)	(4)	(1)	(4)
Previous venture founding experience	0.0735	0.0501	45.5035	30.9850	9.8120	-10.1599
<i>R-squared</i>	0.0070	0.0857	0.0000	0.1205	0.0000	0.0185
Previous venture non-founding experience	0.0001	-0.0190	1.1968	-26.6251	-95.5587	-68.5462
<i>R-squared</i>	0.0000	0.0829	0.0000	0.1194	0.0010	0.0189
Portfolio entrepreneur	0.0640	0.0698	-30.4078	-16.0405	90.2684	35.5423
<i>R-squared</i>	0.0034	0.0865	0.0017	0.1183	0.0007	0.0185
Fixed effects:						
<i>Time</i>	No	Yes	No	Yes	No	Yes
<i>Industry</i>	No	Yes	No	Yes	No	Yes
<i>Stage</i>	No	No	No	No	No	No
Observations	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

As can be observed from the table the coefficients for the explanatory variables are not significant in any model. Although including control variables in the regressions increases the explanatory power of the model, the coefficient of the independent variables is still insignificant even at the 10% confidence level. Therefore, based on these results, hypotheses 1 – 3 are rejected. It seems that previous venture experience (both *founding* and *non-founding*), as well as being a portfolio entrepreneur does not lead to greater equity crowdfunding success. One explanation regarding the results of the portfolio entrepreneur variable may be that crowd investors see involvement in another venture as a bad sign. This could be because they think that the founder/CEO will not invest his entire energy, time and focus in the venture the crowd is investing in. An explanation for the results of the previous

experience variables can be sought after in experience curve theory. As Kehler et al (2013) explain in their study, entrepreneurs may not be able to apply their knowledge from past experience due to “barriers to learning”. It could be that the context-domain similarity between previous ventures and the current venture is weak, and crowd investors are skeptical about the ability of the founder/CEO to apply his knowledge to the new situation. An interactive term between *Previous venture founding experience* and *Industry experience* is created in order to increase this context-domain similarity. Another interactive term between *Portfolio entrepreneur* and *Industry experience* is utilized in order to test whether context-domain similarity combined with content-domain similarity (“general experience in starting ventures” as per Kehler et al, 2013) lead to a significant effect. Then the same models on this new independent variables are used. The results are presented in table 7.

Table 7. Category 1: Interactive terms

Dependent variable	Oversubscription		Number of investors		Adjusted average investment	
	(1)	(4)	(1)	(4)	(1)	(4)
Previous venture founding experience x Industry experience (interacted)	0.1126**	0.1002*	85.3122**	93.4901**	38.1848	-24.5652
<i>R-squared</i>	0.0151	0.0938	0.0185	0.1388	0.0002	0.0185
Portfolio entrepreneur x Industry experience (interacted)	0.1430*	0.1650**	-8.1803	22.9265	-58.9162	-155.5889
<i>R-squared</i>	0.0138	0.1002	0.0001	0.1186	0.0002	0.0200
Fixed effects:						
<i>Time</i>	No	Yes	No	Yes	No	Yes
<i>Industry</i>	No	Yes	No	Yes	No	Yes
<i>Stage</i>	No	No	No	No	No	No
Observations	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

With regards to the first interactive term the coefficients for both *Oversubscription* and *Number of Investors* are significant at the 5 percent level and positive. Including controls increases the explanatory power of the model and preserves the signs of the coefficients and their significance (although for *Oversubscription* the significance level decreases from 5 percent to the 10 percent). It seems that the crowd believes previous venture founding experience to be useful for founders/CEOs with experience in the same industry as the venture seeking funding on the equity crowdfunding platform. An intuitive explanation for that is the ability of the founder/CEO to apply his knowledge to the current venture because of context-domain similarity provided by the industry.

When the second interactive term is concerned, significant effect is found for *Oversubscription*. In addition to the usual control variables, control for stage was also introduced, because as the venture develops and enters in more mature stages it may require

larger commitment from its founder and he may decide to concentrate his resources on just one venture. Positive effect was found at the 5 percent level for the more complex model with control variables and significant effect at the 10 percent level for the simpler, no control variables model. It seems that content-domain similarity combined with context-domain similarity have a positive effect on oversubscription. In other words, equity crowdfunding campaigns fare well when founders/CEOs who have gained knowledge from the same industry can apply it efficiently due to repeated actions in the entrepreneurial context.

6.2 Category 2. CEO/Team characteristics

Following the same approach as before, hypotheses under Category 2 CEO / Team characteristics are tested. The results of the regressions are presented in table 8.

Table 8. Category 2: CEO/Team characteristics

Dependent variable	Oversubscription			Number of investors			Adjusted average investment		
	(1)	(4)	(5)	(1)	(4)	(5)	(1)	(4)	(5)
Linkedin followers	0.0000	0.0000	-	0.0072	0.0102	-	9.8120	-10.1599	-
<i>R-squared</i>	0.0003	0.0842	-	0.0015	0.1209	-	0.0000	0.0185	-
CEO years of work experience	-0.0011	-0.0005	-	-2.7548*	-1.5298	-	16.5518**	15.6264*	-
<i>R-squared</i>	0.0005	0.0826	-	0.0076	0.1202	-	0.0128	0.0294	-
Industry experience	0.0640	0.0698	-	-30.4078	-16.0405	-	90.2684	35.5423	-
<i>R-squared</i>	0.0034	0.0865	-	0.0017	0.1183	-	0.0007	0.0185	-
CEO MBA degree	0.0420	0.0351	-	-44.4286	-63.2604*	-	203.9382	247.5053	-
<i>R-squared</i>	0.0008	0.0831	-	0.0019	0.1218	-	0.0019	0.0212	-
CEO PhD degree	0.3104	0.3004	-	-26.8115	-55.8630	-	-313.8704	-315.1624	-
<i>R-squared</i>	0.0169	0.0980	-	0.0003	0.1190	-	0.0017	0.0201	-
Acquaintance among the team*	0.0310	-0.0159	-	45.7117	13.0383	-	575.1198**	681.4480***	-
<i>R-squared</i>	0.0011	0.0747	-	0.0048	0.1108	-	0.0356	0.0659	-
Management team size	0.0453**	0.0290	0.0272	56.0818***	47.4309***	41.6603**	125.6238***	149.7776***	126.5143**
<i>R-squared</i>	0.0313	0.0939	0.0995	0.1024	0.1828	0.1989	0.0238	0.0484	0.0656
Fixed effects:									
Time	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Stage	No	No	Yes	No	No	Yes	No	No	Yes
Observations	288	288	288	288	288	288	288	288	288

*Nr. of observations for acquaintance among the team is different.

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

No significant effect for the count of *LinkedIn followers* was found. This could be due to the variable itself. The count of LinkedIn followers may not be a good enough proxy for the founder/CEO connectedness and the quality of his network, because the number of followers was obtained at the time of writing this thesis. If access was possible to data back in time when the venture was raising funds on the equity crowdfunding platform, different numbers which potentially could have revealed any significant effects would have been collected.

For the *CEO years of work experience* the effects are mixed. On one hand, the number of investors is significant at the 10 percent level and the relationship between the number of investors and the CEO's years of work experience is negative. However, once control

variables are introduced to our regression the effect is no more significant. On the other hand, significance is found at the 5 percent level for the *Adjusted average investment's* model 1. The relationship here is positive. Introducing control variables decreases the significance to the 10 percent level, but still preserves it. The explanatory power of the models that contain control variables is higher than for the models that do not have control variables in them for both dependent variables for which any significant effect was detected. As models that include control variables are more robust, we argue that hypothesis 5 is not rejected, even though the effect is only significant at the 10 percent level. The findings are in line with VCs preferences towards experienced CEOs as found in Kaplan & Strömberg (2004).

No effects were found for CEOs that possess industry experience. Therefore, hypothesis 6 is rejected. However, referring back to the interactive term *Previous venture founding experience* x *Industry experience*, one would argue that industry experience matters to the extent the founder/CEO has founded a company in that industry in the past. This experience would have allowed him/her to gain knowledge as argued before and based on experience curve theory and context-domain similarity. Probably the crowd has trust in the entrepreneurs' ability to apply their knowledge from past ventures to new ventures in the same industry, but not in ventures in other industries.

With respect to the education of the CEO, a significant effect for an MBA-degree holding CEOs was found on the *Number of investors* in the venture. The effect is significant on the 10 percent level, however it does not support hypothesis 7 which predicted greater crowdfunding success for CEOs who are MBA-degree holders. Interestingly enough, this effect in the sample is negative and introducing control variables to the model makes it significant as opposed to no effect for the simpler model with no control variables. Further research into this effect may prove useful to reveal fundamental reasons for these findings. One explanation may be that the crowd considers the time invested in work experience more valuable than the time invested in an MBA-degree and therefore punishes this "waste" of resources. We find no effect for PhD-educated CEOs and therefore reject hypothesis 8. It should once again be noted, however, that the sample contains just about 3 percent of CEOs that are PhD-degree holders.

Hypothesis 9, which predicts that acquaintance among the team on a professional level will lead to a greater crowdfunding success, is not rejected. A significant effect for the mutual acquaintance variable is found for the *Adjusted average investment* simple model. Introducing control variables makes the effect only stronger increasing its significance to the 1 percent

level from 5 percent for the simpler model. As it seems, mutual acquaintance among the team members leads to a GBP 681 in increased *Adjusted average investment*.

With regards to the *Management team size*, yet another control variable is introduced, namely the stage of the venture. Naturally as time goes by and ventures mature, they attract more people to their workforce and management. Significant and positive effect of the *Management team size* was found on the *Number of investors* as well as on the *Adjusted average investment*. Although significant effect is also found for *Oversubscription* it disappears once control variables are introduced. Hypothesis 10 cannot be rejected on the basis of these findings. Crowd investors value larger management teams, probably recognizing the higher amount of social and human capital concentration in them.

6.3 Category 3: External endorsements

For the purpose of exploring the hypotheses that are related to this category (H11- H13) OLS regressions that correspond to Models 1 to 4 (5 for the interactive model) were used. Apart from the regressions with one explanatory variable and the control dummies, a regression with interactive terms in order to examine hypothesis H13 was utilized. The explanatory variable for this regression was constructed through a multiplication of the binary variables that correspond to the existence of patents and investment of business angels and professionals in the past. This way it is attempted to capture the effect of a patent when no previous investment has previously taken place, which is the basis of the H13 hypothesis formulation. The interactive term takes the value of 1 if patents exist and there was no previous investment and 0 otherwise.

Table 9. Category 3: External endorsements

Dependent variable	Oversubscription			Number of investors			Adjusted average investment		
	(1)	(4)	(5)	(1)	(4)	(5)	(1)	(4)	(5)
Patents & Trademarks	0.0910	0.0395	-	37.4399	40.8836	-	129.2875	86.9699	-
<i>R-squared</i>	0.0077	0.0838	-	0.0028	0.1209	-	0.0015	0.0191	-
Idea backed by media/prominent figures	0.0012	0.0008	-	3.1766	2.3348	-	6.8208	9.3651	-
<i>R-squared</i>	0.0007	0.0829	-	0.0116	0.1240	-	0.0025	0.0230	-
Patents & Trademarks x Previous investment (interacted)	0.0099	-0.0143	-0.0242	69.9590	27.8712	11.9242	340.6805*	383.9848*	323.0457*
<i>R-squared</i>	0.0001	0.0827	0.0908	0.0108	0.1195	0.1527	0.0118	0.0326	0.0556
Fixed effects:									
Time	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Stage	No	No	Yes	No	No	Yes	No	No	Yes
Observations	288	288	288	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

As can be observed from the results table, the regressions that correspond to hypotheses H11 and H12 do not provide statistically significant results regardless of the model that is being used (Appendix table 3). On the other hand, the interactive regression which is being used in order to test Hypothesis 13 provides a statistically significant positive coefficient for a 10% significance level both for Model 1 and Model 5. Moreover, as can be expected, the introduction of the control variables increases the R-squared of the regression.

The implication of these findings is that hypotheses H11 and H12 are rejected while hypothesis H13 is not. Therefore, and in contrast to what was expected, it becomes apparent that equity crowdfunding investors do not consider as credible quality signals endorsements that come in the form of press references, awards or affiliations with prominent figures, and also it seems that the existence of patents only matters when no previous financing round has taken place.

Regarding hypothesis H11, it seems that endorsements through third parties do not play an important role in the equity crowdfunding dimension. As discussed before, VCs value endorsements of the entrepreneur's quality that derive through common social ties and professional networks and also they appreciate alliances that increase the commercial viability of a start-up's offering (Stuart et al, 1999; Baum et al 2000; Shane & Cable, 2002; Higgins et al, 2011). Whether external endorsements, constitute a similarly important signal of quality in equity crowdfunding was less clear since they do not occur through common networks or acquaintances but rather take the shape of a quote from a journalist, or an award, or the affiliation with a prominent figure such as an artist, a politician, etc. As has been shown by the analysis it is concluded that endorsements of that diminished state fail to increase the legitimacy of an entrepreneur or a venture and do not lead to a greater crowdfunding success. Therefore hypothesis H11 is rejected.

Hypotheses H12 and H13 are related and it is appropriate to discuss the implications of the analysis by taking into account the outcome of both. As proved by many scholars, and discussed in Section 5.1, patents constitute another form of endorsement that helps VCs overcome informational asymmetries regarding the true quality of the venture (Hsu & Ziedonis 2007; Conti et al 2011; Higgins et al, 2011; Hoenen et al, 2012). As a result of this literature stream hypothesis H12 was created in order to test whether the existence of patents plays an important role in equity crowdfunding. Since no statistically significant result was retrieved this hypothesis has to be rejected. On the other hand, it is important to take into account a separate stream of literature that suggests that patents only matter for VCs during the first financing round of a young enterprise (Hsu & Ziedonis, 2007; Hoenen et al, 2012).

For that purpose hypothesis H13 was constructed and the corresponding interactive regression that test the above-mentioned scenario. Interestingly ,and in line with the above mentioned literature stream, a statistically significant positive coefficient was retrieved, which implies that the existence of patents during the first financing round of a venture leads to a higher amount of *Adjusted average investment* and thus to a greater equity crowdfunding success. Consequently, although hypothesis H12 is rejected hypothesis H13 is confirmed.

6.4 Category 4: Preparedness

This category is related to hypotheses H14-H16 and Models 1-4 have been utilized. Below the regression results table containing Model 1(No controls) and Model 4 (the best fit according to R-squared value) is presented.

Table 10. Category 4: Preparedness

Dependent variable	Oversubscription		Number of investors		Adjusted average investment	
	(1)	(4)	(1)	(4)	(1)	(4)
Video length	0.0490***	0.028*	18.3104**	3.3549	47.1933	81.6888
<i>R-squared</i>	0.0421	0.0934	0.0125	0.1182	0.0038	0.0274
Nr. of picture available	0.0053**	0.0026	4.8035	2.1204	-9.4399	-4.3595
<i>R-squared</i>	0.0101	0.0847	0.0177	0.1210	0.0032	0.0190
Idea word count	0.0001	0.0000	0.1671**	0.1275*	0.1868	0.2290
<i>R-squared</i>	0.0100	0.0832	0.0555	0.1474	0.0032	0.0228
Fixed effects:						
<i>Time</i>	No	Yes	No	Yes	No	Yes
<i>Industry</i>	No	Yes	No	Yes	No	Yes
<i>Stage</i>	No	No	No	No	No	No
Observations	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

Overall, it can be observed that the regressions give statistically significant results for at least 1 of the 3 dependent variables, both for the *Video length* and the *Business plan presentation word count*. On the other hand, no statistically significant coefficients are found after the introduction of controls for the *Number of Pictures* available. Specifically, *Video length* positively affects the *Oversubscription* amount as well as the *Number of investors* when no fixed effects controls are included in the regression (Model 1). However after introducing time and industry controls (Model 4) it is observed that a positive and significant coefficient is retrieved only for *Oversubscription*. Additionally, it is observed that the *Idea word count* significantly affects the *Number of investors* both before and after the time and industry controls are introduced. Finally, the *Number of pictures* variable does not provide statistically significant results for any of the dependent variables after controls are introduced.

An immediate implication of these results is that hypotheses 14 and 16 are confirmed while hypothesis 15 is rejected. The confirmation of hypotheses 14 and 16 supports the view that the preparation level that is demonstrated by the entrepreneur is positively perceived by the crowd. According to the relevant literature stream, sophisticated VCs seek to track signals of preparation and passion during their interaction and their face to face meetings with the entrepreneurs, which indicate that the founders are ready to exploit the opportunity that is being given to them (Delmar & Shane, 2003; Chen et al, 2009; Kirsh et al 2009; Cardon et al, 2009). In an equity crowdfunding campaign, one way that passion and preparedness can be conveyed to investors is through the pitch video. Through the video an entrepreneur can actually “talk” to prospective investors and persuade them to invest by expressing his passion and enthusiasm about his idea. The effort of creating a decent and attractive video pitch is not negligible and therefore hypothesis H14 was constructed based on the assumption that equity crowdfunding investors would consider the length of a video as a positive indication of preparedness and passion. Eventually, this hypothesis is not rejected and proves that the *Length of the video* is a factor that positively affects the *oversubscription* of a pitch thus leading to greater crowdfunding success.

In a same manner, the length of the business plan provided by the entrepreneur was used as a signal that he understand the risks and pitfalls of a new business, and he has an approach to address some of these concerns. The importance of business plans in VC pitches has been established by scholars (Honing & Karlsson, 2004; Chen et al, 2009) and our findings support their arguments. It is found that the *Idea word count* significantly affects the *number of investors* and leads to greater crowdfunding success, thus confirming hypothesis H16.

On the other hand, the *Number of pictures* that the entrepreneur uploads on the campaign’s website seem not to have any effect in the success of the pitch after time and industry controls are introduced to the model. Therefore, hypothesis H15 is rejected. A potential explanation for that might be that the *Number of pictures* uploaded on the pitch do not constitute a strong quality signal as they serve the same purpose as the video, in terms of capturing the product or the team of the venture, but at the same time they are weaker attention grabbers compared to the video which displays lively objects thus providing a better understanding of the product and the team. Therefore, it is highly likely that investors do not make their investment decisions according to the pictures they see on the webpage.

6.5 Category 5: Idea evaluation

Hypotheses H14 and H15 were created in order to capture the signalling effect of factors related to the attractiveness and the riskiness of an entrepreneur's business idea. For the purpose of testing these hypotheses we utilized Models 1-5 and the regression results table is presented below, including Model 1 and Model 5 which constitutes the best – fit model in terms of R-squared values. The introduction of stage fixed effects controls is appropriate because the stage of the company is related to the likelihood that previous investments have taken place and also with the ability to provide financial statements.

Table 11. Category 5: Idea evaluation

Dependent variable	Oversubscription		Number of investors		Adjusted average investment	
	(1)	(5)	(1)	(5)	(1)	(5)
Previous Investment	0.0719	0.0245	131.0353***	71.0750*	291.4817*	268.5998
<i>R-squared</i>	0.0060	0.0908	0.0427	0.1638	0.0097	0.0533
Financial statements	0.1314***	0.0358	117.1947***	94.6954***	-99.1755	-87.4711
<i>R-squared</i>	0.0193	0.0912	0.0327	0.1681	0.0011	0.0464
Fixed effects:						
<i>Time</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
<i>Industry</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
<i>Stage</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
Observations	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

From the table above, it can be inferred that both *Financial Forecasts* and *Previous Investments* are statistically significant, before and after the introduction of controls, for at least one of the three dependent variable we used in order to measure crowdfunding success. More specifically, the existence of *financial statements* has a positive impact on *Oversubscription* and also on the *Number of investors* when Model 1 is utilized. However, after the introduction of Model 5, and the corresponding set of controls, this variable only affects the *Number of Investors* in a statistically significant way. Regarding *previous investments*, although positive and significant coefficients are retrieved when Model 1 is implemented for *Number of Investors* and for *Adjusted Average Investment*, the effect of this variable remains only significant for *Number of investors* when time, industry and stage controls are introduced (Model 5).

The implication of the regressions' results is that both hypotheses, H14 and H15, are confirmed. These hypotheses were created as a result of a literature stream that highlights the fact that VCs, apart from the quality and characteristics of the CEO and the team, also emphasize on the viability and success potential of the entrepreneurial idea (MacMillan, 1986;

Kaplan & Strömberg, 2004; Prasad et al, 2000; Elitzur & Gavious, 2003; Zacharakis et al, 2007; Kaplan et al, 2007). As expected, the disclosure of financial statements was positively perceived by the crowd as it was enabled to create a better view on the financial situation and profitability of the start – up thus mitigating the uncertainty around the venture’s true quality. Therefore, hypothesis H14 was confirmed. Moreover, hypothesis H15 was created as a result of the research of some scholars who argued that VCs seek for signals that will indicate the true quality of the business proposal (Prasad et al, 2000; Elitzur & Gavious, 2003; Busenitz et al, 2005; Conti et al 2011). Therefore, the existence of past investments from professionals and/or business angels is perceived as a positive signal from equity crowdfunding investors as it indicates that some kind of due diligence has already been made on the venture. This confirms hypothesis H15.

6.6 Category 6: Biases

The next category of hypotheses was created in order to explore whether geography and the entrepreneur’s gender are factors that affect the success potential of the campaign. Models 1 - 4 were used and below the regression results table is presented in the same way as before.

Table 12. Category 6: Biases

Dependent variable	Oversubscription		Number of investors		Adjusted average investment	
	(1)	(4)	(1)	(4)	(1)	(4)
City	0.0644	0.0394	85.544***	37.4933	222.2623	306.394*
R-squared	0.0051	0.0843	0.0192	0.1213	0.0060	0.0290
Gender	-0.0432	-0.0294	-2.9583	34.6989	307.8198*	237.4603
R-squared	0.0014	0.0831	0.0000	0.1196	0.0068	0.0222
Fixed effects:						
Time	No	Yes	No	Yes	No	Yes
Industry	No	Yes	No	Yes	No	Yes
Stage	No	No	No	No	No	No
Observations	288	288	288	288	288	288

Significance at the 1%, 5% and 10% confidence level is signified with ***, ** and * respectively. The values in brackets indicate the R^2 of the respective regression.

From the table above it can be concluded that only *City* is the variable that produces a statistically significant coefficient after introducing Model 4 and the corresponding controls. More specifically, although *City* seems to be significantly affecting the *Number of Investors* when Model 1 is used this ceases to be the case when time and industry fixed effect controls (Model 4) are introduced. On the other hand, *City* seems to have a statistically significant positive impact on *Adjusted average investment* after the introduction of the controls. When it comes to *CEO’s gender*, although initially a significant effect on *Adjusted average investment* is observed, this effect is no longer apparent when controls are introduced.

Given the results we obtained from our regression analysis it is concluded that hypothesis H16 is rejected while hypothesis H17 is confirmed.

Hypothesis H16 was created as a result of the extensive literature that argued about the existence of strong geographical bias in VC investment decisions (Gupta & Sapienza, 1992; Sorrenson & Stuart, 2001; Aizenman & Kendall, 2008; Chen et al, 2009; Cumming & Dai, 2010; Agrawal et al, 2011). This hypothesis was based on the assumption that this geographic constraint will not be present in equity crowdfunding as investors are geographically dispersed and do not base their evaluation on personal meetings with the founders or on endorsements from common acquaintances. However, this seems not to be the case as it is observed that the location of the venture significantly affects its success potential. A possible explanation for this phenomenon might be the fact that founders of promising ventures decide to locate themselves in financial and entrepreneurial hubs in order to benefit from networking events, access to greater social networks and also to be close to the VC firms from which they might expect to seek financing. Therefore hypothesis H16 is rejected.

The purpose of hypothesis H17 is to test whether equity crowdfunding investors favor male entrepreneurs in the same way as VCs do (Greene et al, 2001; Ruef, Aldrich, & Carter, 2003; Greene & Hart, 2003; Alsos & Ljunggren, 2016; Harrison & Mason, 2007; Miller, C. 2010). From the analysis it is concluded that this is not the case as after introducing controls no significant coefficient is retrieved from the regressions. As expected, equity crowdfunding relaxes this particular type of bias as issues like homophily and network barriers are not relevant for equity crowdfunding. First of all, it is highly likely the case that female backers in equity crowdfunding are more than female VCs and therefore they can screen, identify and support projects which are led by female entrepreneurs. Also, in equity crowdfunding there's hardly any face to face interaction and investment decisions are not based in shared acquaintances and social networks making the gender issue irrelevant. Consequently, hypothesis H17 is confirmed and it can be concluded that gender is not a factor that drives the investment decisions of the crowd.

A summary of the hypotheses and their respective outcome (confirmed/rejected) is provided below.

Table 13. Summary of confirmed/rejected hypotheses

Category 1: History of success		
H1	Previous venture founding experience will lead to a greater equity crowdfunding success	Rejected
H2	Previous venture non-founding experience will lead to a greater equity crowdfunding success	Rejected
H3	Portfolio entrepreneurs will achieve a greater equity crowdfunding success	Rejected
Category 2: CEO/Team characteristics		
H4	A larger count of LinkedIn followers for the CEO/founder of the venture will lead to a greater equity crowdfunding success.	Rejected
H5	A more experienced founder/CEO will lead to a greater equity crowdfunding success	Confirmed
H6	A founder/CEO with previous experience in the industry of the venture will lead to a greater equity crowdfunding success	Rejected
H7	A founder/CEO with an MBA degree will lead to a greater equity crowdfunding success	Rejected
H8	A founder/CEO with a PhD degree will lead to a lesser equity crowdfunding success	Rejected
H9	Acquaintance among the team on a professional base will lead to a greater equity crowdfunding success	Confirmed
H10	Larger management teams will lead to a greater equity crowdfunding success	Confirmed
Category 3: External Endorsements		
H11	A high number of external endorsements that a pitch has attracted in the form of media references, and/or awards, and/or affiliations with prominent figures, will lead to greater equity crowdfunding success	Rejected
H12	The existence of patents will lead to a greater equity crowdfunding success.	Rejected
H13	The existence of patents will lead to a greater equity crowdfunding success, if no previous financing round has occurred in the past	Confirmed
Category 4: Preparedness		
H14	The longer the length of the pitch-video, the bigger the equity crowdfunding success of the campaign	Confirmed
H15	A high number of pictures on the campaign's webpage will lead to greater equity crowdfunding success	Rejected
H16	The higher the word count of a business plan the greater the equity crowdfunding success	Confirmed
Category 5: Idea Evaluation		
H17	The disclosure of financial statements leads to a greater equity crowdfunding success	Confirmed
H18	Previous crowdfunding rounds or investments by professional and/or angel investors will lead to greater equity crowdfunding success	Confirmed
Category 6: Biases		
H19	The location of the project will not significantly affect the equity crowdfunding success of the campaign	Rejected
H20	The gender of the entrepreneur will not significantly affect the equity crowdfunding success of the campaign	Confirmed

7. Discussion

7.1 Main Findings

All three hypotheses under the first category “History of success” were rejected. It seemed that crowd investors did not consider previous venture founding/non-founding experience as a factor to take into their evaluation of the viability of the investment proposal. They also did not appreciate if a founder/CEO is a portfolio entrepreneur. Not convinced by these findings, interactive terms were created that showed significant effect when a founder had both a previous venture founding experience and experience in the same industry as the venture seeking funds on the crowdfunding platform. Significant effect was also obtained for the combination of a portfolio entrepreneur with an industry experience. These results are satisfactory when considered in the light of content- and context-domain expertise and applicability of skills obtained in the past to the present.

Out of the 7 hypotheses under the second category “Founder/CEO and team characteristics” significant results were obtained for 4 of them. The count of LinkedIn followers seemed not to matter to crowd investors, however a more appropriate proxy for the strength and depth of a founder/CEO’s social network may potentially provide different interpretation. On the other hand, an experienced founder/CEO indeed affects positively the success of the equity crowdfunding campaign of the company. Industry experience per se was not found to have significant effect on the success of the crowdfunding campaign, however when used in the interactive terms introduced under category 1, it contributed to the performance of the funding campaign. Even though it was expected that a founder/CEO with an MBA degree will result in a greater funding success, it actually had a negative effect on the number of investors after controlling for time and industry fixed effects. Previous studies have provided inconclusive results for this variable and more research could prove useful in understanding the fundamental reasons behind this. In contrast, no significant effects were established for a founder/CEO who is a PhD-degree holder. As expected, mutual acquaintance among the team and the management team size have significant and positive effects on the success of the equity crowdfunding campaign.

Two of the three hypotheses under the third category “External endorsements” were rejected. No significant effect was established for the number of press references, awards and/or affiliations with prominent figures on the success of the funding campaign. The majority of the external endorsements a company has obtained were mentioned in its pitch on the crowdfunding platform, however no links to the original article/source were provided on

many instances, which deprived investors from the opportunity to “experience” the endorsement directly from the source. Even though patents were not found to matter by themselves, this changed once the lack of previous investments by professional/angel investors in the venture was taken into consideration. When no previous investments were made in the venture, patents indeed have a positive and significant effect on the success of the crowdfunding campaign.

Significant results were obtained for two out of the three variables under the fourth category we explore – “Preparedness”. The length of the video uploaded on the page of a project’s pitch positively affects the campaign’s success although only at the 10 percent confidence level. Even though the number of pictures had a positive and strongly significant effect, it disappeared once we controlled for time and industry. Nonetheless, investors were positively affected by the thorough description of the startup idea in the business plan, even after controlling for industry fixed effects.

Both hypotheses under the fifth category “Idea evaluation” were confirmed. The disclosure of financial statements and the presence of a previous investment in the startup by a professional/angel investor were perceived as positive signals and strengthened the support of the crowd.

The sixth category in this study, “Biases”, is devoted to some well-known biases in the VC investment decision-making. No support was found for the expectation that the location of the project will not matter for the crowdfunding success. In fact, investors put more money on average in companies located in cities that have larger markets, bigger populations, are financial and entrepreneurial hubs. The gender of the founder/CEO was found not to influence the startup’s success on the crowdfunding platform. This is in line with the expectation that equity crowdfunding would relax this bias.

7.2 Limitations

There are several important issues that have to be kept in mind regarding our sample data and its results. First of all, Crowdcube does not provide data on failed projects. Although our sample does contain underfunded projects, we were unable to obtain data for projects that were significantly underperforming their announced targets. This may weaken any relationships we found in our study because it removes certain valuable observations from our sample data which could have revealed valuable investor preferences and cues about the investment decision-making process of the crowd. Secondly, Crowdcube was founded in 2011. Even though equity crowdfunding is gathering traction with the mainstream media

nowadays and is hotly debated, it is still in its infancy. A lot of factors are evolving with time, among which are the number of investors operating on equity crowdfunding platforms (“the crowd” gets bigger), the entry of professional investors in the equity crowdfunding space (“the crowd” gets more diverse) as well as the equity pitches prepared by teams who learn from past mistakes or are better able to judge which are the most important characteristics that would increase their chances of success on the crowdfunding platform. Within a short time horizon of just several years, the findings of our master thesis may not be relevant tomorrow. Thirdly, our sample consists of data from just one equity crowdfunding platform that is UK-based. This may give rise to a strong regional focus and our findings may not be applicable in other geographical settings. However, we truly believe that the “crowd” is global in nature, in a sense that its reach to investment opportunities is predominantly determined by Internet availability at least when equity crowdfunding is concerned. As a pioneer and the biggest player in the industry, Crowdcube has set an example that many other equity crowdfunding platforms follow.

7.3 Suggestions for Further Research

Due to the traction that crowdfunding is currently gaining and also the limitations of our research, we believe that there is a lot of potential for future research on the subject. Given the impressive growth of equity crowdfunding and the increasing number of platforms globally, an interesting research perspective would involve the collection of data from multiple platforms, potentially located in different countries, while using this study as a basis for a hypotheses framework. This would allow to capture differences in the investment decisions of the crowd between platforms and countries. Moreover, a comparison of the crowd’s investment behavior between equity crowdfunding and lending based crowdfunding would be interesting given the fact that in both models investors need to make their investment decisions in an environment of limited information regarding the company’s history. Therefore, someone would expect that in lending based crowdfunding investors would seek for signals of creditworthiness and quality potentially similar to the ones examined by equity investors thus further strengthening the validity of these signals. Additionally, future research can explore the performance of successfully crowdfunded start-ups and draw a comparison between the performances of VC or angel backed firms and equity crowdfunded start – ups. What is more, exploring which platform specific characteristics are crucial for the success of a crowdfunding campaign might lead to useful implications for entrepreneurs and new enterprises. Also, incorporating regulatory parameters in the study, like tax advantages, might

shed plenty of light on the impact of legislation in equity crowdfunding and entrepreneurship in general. Another promising research venue would be the profile of the equity crowdfunding investor and his investment strategy, provided there is one. Currently, equity crowdfunding platforms do not provide extensive information about the individual investors but that may change in the future. If that change appears indeed, researchers may be interested in portfolio construction, diversification, biasedness and other characteristics currently confined to the established financial markets.

7.4 Implications for scholars

We believe that our findings have broader implications related to the entrepreneurship research field. The fact that entrepreneurial selection follows a relatively similar path, when it comes to assessing quality, both in the Equity Crowdfunding and the in Venture Capital dimension, while relaxing at least one acknowledged VC investment bias, means that a new research context for examining new ventures and ideas is available to scholars.

As it is widely known, apart from injecting capital into start-ups, VCs perform several other roles that might help the venture they financed to develop and become successful in the future. This might involve the leveraging of their professional network in order to provide expertise and several other non-monetary resources to the start-up. Consequently, an investment rejection from a VC does not only mean that the start-up is only excluded from a financing source but it also has deeper consequences on its viability prospects. Therefore, it can be argued that several promising innovations and ideas never materialized because they didn't get access to VC funding and networks. Therefore, Venture Capital is a critical part of the entrepreneurship ecosystem and plays an important role in determining which innovations and firms will "live" and "die". Also, a complementary issue that was raised by Granovetter and Ferrary (2009) is that the institutionalized selection process of ventures is biased in a way that prevents some subset of valuable technologies and promising firms from achieving success. In the case of VC, these distortions, or biases, might concern location and gender, among others.

Given the fact that VCs are an integral and irreducible part of the start-up universe and entrepreneurship, it is inevitable that all the relevant research on that field is saturated with the distorting effect and the biases of the VC industry. For instance, when it comes to technology entrepreneurship, the majority of the databases used for research purposes draw mostly from populations of VC-backed firms, implicitly codifying the role of VC selection as a precondition of entrepreneurial success (Busenitz, Fiet, & Moesel, 2004).

We believe that Equity Crowdfunding creates an alternative research context through which to examine entrepreneurship and issues of venture success. Given the fact that the business model of equity crowdfunding is fundamentally different from the one VCs follow, we proved that gender bias is not affecting the crowd's investment decisions. For the same reason, we expect that Equity Crowdfunding could be potentially free from several other biases and distortions that our study failed to capture. Therefore, it allows the financing of ventures that might not have been able to acquire financing from VCs, thus increasing their viability and success potential. This fact leads to the creation of a universe of ventures that have not been through the constrained filtering and selection process of VCs and creates a new context that a researcher could use in order to analyze new ideas and innovations. In other words, a scholar that is conducting a research on entrepreneurship can analyze a sample of companies that would not exist if Equity Crowdfunding had not been developed or if it was operating under the same biases and constraints as VCs. However, Equity Crowdfunding is gaining traction the latest years and also, as proved in this paper, it is highly likely to be free of the distortions that characterize VCs investments (at least to some extent).

8. Conclusion

The purpose of this master thesis has been to explore the extent to which the “crowd” is influenced in its investment decisions through the equity crowdfunding financing model by signals that professional VC investors deem of quality enough to influence their own decisions whether to back up a company seeking financing. By exploring the literature on VC investment decision-making we shaped hypotheses that we tested on the equity crowdfunding sample obtained. We based the expectations of the outcome on established in the VC literature effects, as venture capital investors have been shown to make the right bets in the past. Through the rational decision making paradigm that was adopted in this study, we expected unsophisticated and disorganized investors in the face of the “crowd” to react to presumable signals of quality in the same manner as VCs do. The results obtained are mixed. Out of the 20 explicit hypotheses that were formulated, 10 were confirmed and 10 were rejected. This suggests that the “crowd” is influenced by some of the same signals pointed by VCs while at the same time relaxes the effect of gender bias in entrepreneurial selection.

We believe that our work makes three significant contributions to the existing literature around entrepreneurship and crowdfunding. First of all, it sheds some light on the differences between professional and amateur views on new ventures and their quality. Up to a specific

extent, it was found that the crowd and the Venture Capital firms interpret signals of quality in the same way while gender bias does not constrain investment decisions within the equity crowdfunding context. Secondly, our research strengthens the credibility of the signals that are appreciated both by VCs and amateur investors as these signals are used to capture venture quality in multiple contexts. Finally, to our knowledge, this paper is one of the few existing research efforts to analyze equity crowdfunding and to place it within a context that is connected with the existing literature around entrepreneurship and the Venture Capital industry.

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10. Appendix

Independent Variables Construction

Category 1: History of success

Previous Startup Ventures (H1): This variable is binary and indicates whether the CEO of the project has founded other start-ups in the past.

Previous Start-up work experience – non founder (H2): This variable is binary and indicates whether the CEO has been occupied in the past with a start – up company, without being its founder.

Portfolio Entrepreneur (H3): This variable is binary and indicates whether the CEO of the campaign is in charge of another start –up at the same time.

Category 2: CEO/Team characteristics

LinkedIn followers (H4): This variable is numerical and indicates the number of the venture's CEO professional connections in LinkedIn as well as the people who follow his public updates and long-form posts.

CEO's years of work experience (H5): This variable is numerical and was constructed by adding all the years of work experience of the CEO as they were presented in his LinkedIn profile or the campaign's website.

CEO's industry experience (H6): This variable is binary and indicates whether the CEO possesses previous work experience related to the industry that the venture belongs to.

CEO education MBA (H7): This variable is binary and indicates whether the founder/CEO is a holder of an MBA degree. Information was obtained either from the campaign's section where the team was presented or from the education section of the CEO's LinkedIn profile.

CEO education PHD (H8): Following the same logic as the above mentioned variable, this binary variable indicates whether the founder/CEO is a holder of a PhD degree.

Acquaintance among the team (H9): This is a binary variable that indicates whether at least 2 of the management team members have worked together in the past. Information was obtained by comparing the LinkedIn work experience entries of the team members.

Management team size (H10): This is a numerical variable that reflects the number of executive board members, as presented on the campaign's webpage that comprise the management team of the start –up.

Category 3: External endorsements

Press references, awards, affiliations with prominent figures (H11): This is a numerical variable for the construction of which we counted the number of press references and awards that were being mentioned in the campaign's webpage. Moreover if prominent figures (artists, scientists, politicians etc.) were affiliated with the start – up we were also increasing the count in order to reflect this fact.

Patents & Trademarks (H12): This is a binary variable that indicates the number of patents and trademarks that the start – up has established.

Category 4: Preparedness

Video length (H13): This variable is numerical and indicates the length of the video that is uploaded in the campaign's webpage. When there was no video available we were setting the value to zero.

Number of pictures (H14): This is a numerical variable that captures the number of pictures that have been uploaded on the campaigns webpage by the entrepreneur

Business plan presentation word count (H15): This is a numerical variable that indicates the word count of the business plan as presented in the campaign's webpage.

Category 5: Idea evaluation

Financial statements (H16): This is a binary variable that indicates whether financial statements of the start – up have been uploaded on the campaign's webpage.

Previous investments (H17): This variable is binary and indicates whether the start-up has received financing in the past from business angels, VCs or whether it has successfully completed another crowdfunding round.

Category 6: Biases

City (H18): This variable is binary and indicates whether the start - up is located in a major entrepreneurial and financial hub. In our database the relevant hubs we identified are London and Stockholm. The location of the venture was obtained directly from the campaigns webpage.

Gender (H19): This is a binary variable that indicates the gender of the entrepreneur. If there were more than one founders with different gender, we were taking into account the gender of the CEO.

Regression specifications

Table 1. Category 1: History of success

Dependent variable	Oversubscription				Number of investors				Adjusted average investment			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Previous venture founding experience	0.0735	0.0549	0.0653	0.0501	45.5035	28.7116	46.1648	30.9850	9.8120	26.5783	-24.9139	-10.1599
<i>R-squared</i>	0.0070	0.0768	0.0237	0.0857	0.0000	0.1035	0.0342	0.1205	0.0000	0.0076	0.0115	0.0185
Previous venture non-founding experience	0.0001	-0.0262	0.0084	-0.0190	1.1968	-40.1800	16.7146	-26.6251	-95.5587	-44.7204	-121.5534	-68.5462
<i>R-squared</i>	0.0000	0.0736	0.0183	0.0829	0.0000	0.1047	0.0290	0.1194	0.0010	0.0077	0.0130	0.0189
Portfolio entrepreneur	0.0640	0.0707	0.0653	0.0698	-30.4078	-22.7420	-20.8010	-16.0405	90.2684	84.4190	37.9962	35.5423
<i>R-squared</i>	0.0034	0.0771	0.0218	0.0865	0.0017	0.1021	0.0292	0.1183	0.0007	0.0081	0.0116	0.0185
Previous venture founding experience x Industry experience	0.1126**	0.1036*	0.1071*	0.1002*	85.3122**	84.1092**	94.834**	93.4901**	38.1848	39.4751	-26.5228	-24.5652
<i>R-squared</i>	0.0151	0.0856	0.0312	0.0938	0.0185	0.1190	0.0500	0.1388	0.0002	0.0077	0.0115	0.0185
Portfolio entrepreneur x Industry experience	0.1430*	0.1621**	0.1512*	0.1650**	-8.18032787	13.4889	6.0587	22.9265	-58.9162	-84.5739	-133.9780	-155.5889
<i>R-squared</i>	0.0138	0.0905	0.0332	0.1002	0.0001	0.1014	0.0285	0.1186	0.0002	0.0080	0.0126	0.0200
Fixed effects:												
Time	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Industry	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Stage	No	No	No	No	No	No	No	No	No	No	No	No
Observations	288	288	288	288	288	288	288	288	288	288	288	288

Table 2. Category 2: CEO/Team characteristics

Dependent variable	Oversubscription					Number of investors					Adjusted average investment				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Linkedin followers	0.0000	0.0000	0.0000	0.0000	-	0.0072	0.0091	0.0088	0.0102	-	9.8120	26.5783	-24.9139	-10.1599	-
<i>R-squared</i>	0.0003	0.0747	0.0186	0.0842	-	0.0015	0.1036	0.0307	0.1209	-	0.0000	0.0076	0.0115	0.0185	-
CEO years of work experience	-0.0011	-0.0005	-0.0009	-0.0005	-	-2.7548*	-1.8401	-2.2836	-1.5298	-	16.5518**	15.6671**	16.2923*	15.6264*	-
<i>R-squared</i>	0.0005	0.0730	0.0187	0.0826	-	0.0076	0.1046	0.0335	0.1202	-	0.0128	0.0188	0.0235	0.0294	-
Industry experience	0.0640	0.0707	0.0653	0.0698	-	-30.4078	-22.7420	-20.8010	-16.0405	-	90.2684	84.4190	37.9962	35.5423	-
<i>R-squared</i>	0.0034	0.0771	0.0218	0.0865	-	0.0017	0.1021	0.0292	0.1183	-	0.0007	0.0081	0.0116	0.0185	-
CEO MBA degree	0.0420	0.0387	0.0352	0.0351	-	-44.4286	-54.6789*	-55.9483*	-63.2604*	-	203.9382	228.4783	223.8908	247.5053	-
<i>R-squared</i>	0.0008	0.0736	0.0188	0.0831	-	0.0019	0.1041	0.0315	0.1218	-	0.0019	0.0098	0.0137	0.0212	-
CEO PhD degree	0.3104	0.3049	0.2933	0.3004	-	-26.8115	-58.1736	-31.8563	-55.8630	-	-313.8704	-270.2629	-349.7397	-315.1624	-
<i>R-squared</i>	0.0169	0.0891	0.0330	0.0980	-	0.0003	0.1024	0.0288	0.1190	-	0.0017	0.0088	0.0135	0.0201	-
Acquaintance among the team*	0.0310	-0.0221	0.0326	-0.0159	-	45.7117	0.3098	56.1263	13.0383	-	575.1198**	678.7187***	574.0781**	681.4480***	-
<i>R-squared</i>	0.0011	0.0650	0.0191	0.0747	-	0.0048	0.0931	0.0367	0.1108	-	0.0356	0.0581	0.0443	0.0659	-
Management team size	0.0453**	0.0302	0.0428**	0.0290	0.0272	56.0818***	46.0490***	56.6045***	47.4309***	41.6603**	125.6238***	154.7687***	120.6073***	149.7776***	126.5143**
<i>R-squared</i>	0.0313	0.0855	0.0457	0.0939	0.0995	0.1024	0.1638	0.1306	0.1828	0.1989	0.0238	0.0402	0.0329	0.0484	0.0656
Fixed effects:															
Time	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
Industry	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Stage	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
Observations	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288

*The number of observations for the variable “Acquaintance among the team” is 273.

Table 3. Category 3: External endorsements

Dependent variable	Oversubscription					Number of investors					Adjusted average investment				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Patents & Trademarks	0.0910	0.0569	0.0647	0.0395	-	37.4399	53.7757	17.5153	40.8836	-	129.2875	104.7168	118.5975	86.9699	-
<i>R-squared</i>	0.0077	0.0757	0.0220	0.0838	-	0.0028	0.1066	0.0290	0.1209	-	0.0015	0.0084	0.0127	0.0191	-
Idea backed by media/prominent figures	0.0012	0.0006	0.0014	0.0008	-	3.1766	2.2417	3.2868	2.3348	-	6.8208	8.0665	8.0343	9.3651	-
<i>R-squared</i>	0.0007	0.0731	0.0194	0.0829	-	0.0116	0.1069	0.0407	0.1240	-	0.0025	0.0109	0.0148	0.0230	-
Patents & Trademarks x Previous investment (interacted)	0.0099	-0.0091	0.0046	-0.0143	-0.0242	69.9590	28.7609	68.2439	27.8712	11.9242	340.6805*	413.0556**	314.4137*	383.9848*	323.0457*
<i>R-squared</i>	0.0001	0.0730	0.0183	0.0827	0.0908	0.0108	0.1029	0.0385	0.1195	0.1527	0.0118	0.0241	0.0214	0.0326	0.0556
Fixed effects:															
<i>Time</i>	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
<i>Industry</i>	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
<i>Stage</i>	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
Observations	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288

Table 4. Category 4: Preparedness

Dependent variable	Oversubscription				Number of investors				Adjusted average investment			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Video length	0.0490***	0.0274	0.0477***	0.028*	18.3104**	2.3671	17.4739*	3.3549	47.1933	77.9017	51.6822	81.6888
<i>R-squared</i>	0.0421	0.0832	0.0570	0.0934	0.0125	0.1014	0.0395	0.1182	0.0038	0.0157	0.0159	0.0274
Nr. of picture available	0.0053**	0.0024	0.0053*	0.0026	4.8035	2.5835	4.1147	2.1204	-9.4399	-7.4164	-6.5135	-4.3595
<i>R-squared</i>	0.0101	0.0748	0.0279	0.0847	0.0177	0.1059	0.0408	0.1210	0.0032	0.0093	0.0129	0.0190
Idea word count	0.0001	0.0000	0.0001	0.0000	0.1671**	0.1250*	0.1666**	0.1275*	0.1868	0.2465	0.1718	0.2290
<i>R-squared</i>	0.0100	0.0739	0.0261	0.0832	0.0555	0.1300	0.0826	0.1474	0.0032	0.0127	0.0141	0.0228
Fixed effects:												
<i>Time</i>	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
<i>Industry</i>	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
<i>Stage</i>	No	No	No	No	No	No	No	No	No	No	No	No
Observations	288	288	288	288	288	288	288	288	288	288	288	288

Table 5. Category 5: Idea evaluation

Dependent variable	Oversubscription					Number of investors					Adjusted average investment				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Previous Investment	0.0719	0.0434	0.0593	0.0347	0.0245	131.0353***	89.9158**	125.4915***	87.3288**	71.0750*	291.4817*	365.8373**	267.8595	336.2279*	268.5998
<i>R-squared</i>	0.0060	0.0750	0.0223	0.0838	0.0908	0.0427	0.1202	0.0669	0.1356	0.1638	0.0097	0.0220	0.0195	0.0305	0.0533
Financial statements	0.1314***	0.0541	0.1132**	0.0430	0.0358	117.1947***	85.1899***	103.3536***	75.7910***	94.6954***	-99.1755	-67.6615	-109.4067	-80.6068	-87.4711
<i>R-squared</i>	0.0193	0.0756	0.0321	0.0842	0.0912	0.0327	0.1154	0.0530	0.1290	0.1681	0.0011	0.0079	0.0127	0.0190	0.0464
Fixed effects:															
<i>Time</i>	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
<i>Industry</i>	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
<i>Stage</i>	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
Observations	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288

Table 6. Category 6: Biases

Dependent variable	Oversubscription				Number of investors				Adjusted average investment			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
City	0.0644	0.0404	0.0590	0.0394	85.544***	42.304*	76.672***	37.4933	222.2623	296.434*	239.0998	306.394*
<i>R-squared</i>	0.0051	0.0748	0.0225	0.0843	0.0192	0.1056	0.0435	0.1213	0.0060	0.0176	0.0182	0.0290
Gender	-0.0432	-0.0199	-0.0520	-0.0294	-2.9583	26.2659	8.4757	34.6989	307.8198*	291.2433*	249.6992	237.4603
<i>R-squared</i>	0.0014	0.0732	0.0201	0.0831	0.0000	0.1022	0.0285	0.1196	0.0068	0.0134	0.0157	0.0222
Fixed effects:												
<i>Time</i>	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
<i>Industry</i>	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
<i>Stage</i>	No	No	No	No	No	No	No	No	No	No	No	No
Observations	288	288	288	288	288	288	288	288	288	288	288	288