CENTRE FOR FINANCIAL REGULATION AND INNOVATION

Literature Review

Equity Crowdfunding

Ziyad Abuo Habla[1]* | Daniel Broby[1]*

[1]Strathclyde Business School, Glasgow, Scotland

Correspondence
Daniel Broby,
Strathclyde Business School, Stenhouse Wing, 199 Catherderal Street, Glasgow G4 0QU
Email: daniel.broby@strath.ac.uk

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The University of Strathclyde is a leading international technological university that has made *Fintech* one of its strategic clusters.

This paper reviews the literature on equity crowdfunding. Crowdfunding is a new financing internet-based tool where a crowd of investors pools together capital in order to support a specific purpose. We addresses how equity crowdfunding is covered in the literature, which fields of equity crowdfunding are dominant and what the future research avenues are. This is important because equity crowdfunding is gaining increasing attention as it is a substitute financing instrument. We take a critical approach, dividing the literature into those papers related to *Capital Markets*, *Campaign Success Factors*, *Signals from Investment Decisions* and *Post Investment Development*. Our contribution is in documenting the early literature in this nascent field of enquiry.

KEYWORDS
Equity, Crowdfunding, Fintech, Capital Markets, Literature review.

1 | INTRODUCTION

Crowdfunding is a new financing tool for venture funding (Kuppuswamy and Bayus 2017, Mollick 2014). It is where a crowd pools together a amounts of money for supporting specific goal via an internet platform (Ahlers et al. 2015, Guenther, Johan and Schweizer 2018). The money is often invested as equity. Funding through crowdfunding is faster and more efficient than the traditional funding resources such as banks (Ahlers et al. 2015). Moreover, it minimizes the financing gap and enhances innovations (Herve and Schwienbacher 2018). Crowdfunding attracts both professional investors such as business angels (BAs) and venture capitals (VCs) and non-professionals such as public crowds (Belleflamme et al. 2014).

Abbreviations: VC - Venture Capitalist Investors; BA - Bankers Acceptance Investors; IPO - Initial Public Offering; US - United States

[1]* Researcher, Centre for Financial Regulation and Innovation
[2]* Director, Centre for Financial Regulation and Innovation

Crowdfunding is not a new concept, and its earliest occurrence can be dated in the 1990s (Hoegen, Steininger and Veit 2018). It is the broader conception of crowdsourcing that uses people to collect views, comments, and resolutions to business activities (Belleflamme et al. 2014, Herve and Schwienbacher 2018). Crowdfunding has three components: the entrepreneur who has the innovation, the crowd who provides the funding, and the platform that provides the connection between entrepreneurs and investors (Stevenson, Kuratko and Eutsler 2019b). This structure eliminates the middle-man financial intermediary (Strausz 2017).

Many academic papers have witnessed an increasing use in crowdfunding in recent years (Belleflamme et al. 2014). This may be explained by the fact that crowdfunding has relatively low entry barriers (Hoegen et al. 2018). During the past three years, crowdfunding had over 1000 percent growth (Hoegen et al. 2018) and threatened the traditional financing institutions and players such as BAs, banks, and VCs (Khavul, Chavez and Bruton 2013).

Entrepreneurial ventures are essential tools for economic development and growth (Estrin et al. 2018). In the past few years, crowdfunding has become a mainstream tool and an alternative financing tool to entrepreneurs for financing ventures (Brown et al. 2018b, Vismara 2016, Hornuf and Schwienbacher 2018), and it is also a popular tool within startups (Ralcheva and Roosenboom 2019, Mahmood, Luffarelli and Mukesh 2019, Walthoff-Borm, Schwienbacher and Vanacker 2018a, Vulkan et al. 2016). Investment-based crowdfunding, crowd-investing, securities-based crowdfunding are all subgroups of equity-based crowdfunding (Hornuf and Schwienbacher 2018).

Block et al. (2018b) explained the factors that stand behind the emergence of crowdfunding. From the supply side, there is the economic and financial crisis; the subprime crisis of 2008 led to authorities tightening the regulations on the banking system by increasing the minimum capital requirement through Basel regulations. There is also the matter of regulation, where the high regulation leads to the emergence of entrepreneurial finance. Moreover, there are also government policies such as the JOB act on the U.S. that facilitates the IPO, and the technology development enables the emergence of new entrepreneurial finance. On the demand side, there is the product market; globalization and the internet development create "winner-take-all markets" as Facebook and Google, both of which operate in a quasi-monopolistic situation that developed the social networks which provide startups the access to non-financial resources. Lastly, there is the notion of disintermediation where borrowers and fund investors deal directly without the middle-man that reduces the agent problem.

The literature distinguishes four crowdfunding categories, namely donations, reward, lending, and equity crowdfunding (Vulkan et al. 2016, Block et al. 2018b, Cox and Nguyen 2018, Stanko and Henard 2017). Few studies have mentioned the pre-ordering as a fifth category (Belleflamme et al. 2014). Reward crowdfunding provides people with physical inducements relative to their support worth (Cox and Nguyen 2018). Donation refers to instances where non-government institutions or private parties donate for charity purposes (Block et al. 2018b). Lending can be explained using the famous model of peer-to-peer lending, which is based on funders receiving an interest rate as a return to their loans to founders (Lin, Prabhala and Viswanathan 2013). Pre-ordering gives the entrepreneur price discrimination between consumers before production and those ordering a final product (Belleflamme et al. 2014). In short, equity crowdfunding is seen as "a method of financing, whereby an entrepreneur sells a specified amount of equity or bond, like shares in a company to a group of (small) investors through an open call for funding on the internet-based platforms" (Walthoff-Borm et al. 2018a, 1).

2 | BACKGROUND

Equity crowdfunding is a new tool for innovative and early-stage ventures and is explained by a variety of authors (Kleinert, Volkmann and Grünhagen 2018, Vulkan et al. 2016, Agrawal, Catalini and Goldfarb 2016). By using an online platform, early-stage entrepreneurs can raise funds in exchange for some of their venture ownership with investors (Estrin et al. 2018, Ahlers et al. 2015). This is similar to the traditional funding models of VCs and BAs (Belleflamme et al. 2014). Earning returns is often an incentive for investors in investment (Block et al. 2018b). Investment in early stage ventures is a high risk with a high return (Wang et al. 2019). This platform and business model helps in minimizing the funding gap, especially with the firms that are not desired by the traditional financing institutions (Wang et al. 2019).

Equity crowdfunding has an increased global use. For example, the annual transaction value of equity-based crowdfunding in Europe (excluding the UK) has increased from 18.4 million euro in 2012 to 211 million euro in 2017. In the UK, the annual volume of equity transaction has increased from 30 million in 2011 to 333 million in 2017. The UK is the leading crowdfunding market in Europe, with 68percent of the crowdfunding market based in the UK (Statista 2017).

According to the World Bank Global Findex Database, the estimated number of unbanked adults is at 1.7 billion (Demirguc-Kunt 2018). Crowdfunding has gained increasing attention from the World Bank; particular attention is given to the equity crowdfunding platform as an innovation for financial inclusion (CGAP 2017, 25):

"...Crowdfunding may facilitate digitization of traditional forms of finance... Crowdfunding platforms can follow the same trend driving the use of basic financial products and services and/or adopting new technologies to substitute or complement traditional financial institutions."

Based on the focus areas of the papers collected, we categorize our literature review into four parts: (a) capital market, (b) campaign success factors, (c) signals in investment decision, and (d) post-investment development.

3 | APPROACH

To collect the relevant literature we conducted a literature review on equity crowdfunding. To do so, we used the most comprehensive and relevant databases that are relevant to our topic. These databases are the Business Source Complete (EBSCO), Science Direct, Web of Science, and ABI Inform Collection (ProQuest). All these databases provide inclusive literature on topics in management, finance, entrepreneurship and economics. The search was performed between May 25 and June 10, 2019; for the search we used the expressions "equity-based crowdfunding", "equity crowdfunding", "equity crowdsourcing", and "equity crowd-funding" in the different literature titles, abstracts, and keywords.

After collecting different literature reviews, we found 110 articles that answer the critical expression criteria. A comprehensive tool was used in order to restrict the literature to peer-review academic journals that were published in English. By using the Journal Citation Reports on the Web of Science website, we focused on the top first quartile articles with the highest impact factor scores. To have an inclusive high peer-reviewed journal, we included all the journals from management, finance, economics, business, and social issues; a total of 207 papers were found.

During our literature review, we used an exclusion criterion where we excluded (a) all papers that are not published in English, (b) working papers, and (c) all other papers that are not a peer-reviewed academic paper. After focusing our research key expressions within the top quartile peer-reviewed journals, we succeeded in minimizing the 110 papers to 29 relevant papers as listed in descending order, as seen in Table 1.

From Table 1 and Figure 1, we see that the 11 articles which comprise 38 percent of the total articles are published in the Small Business Economics Journal; the top three journals of Small Business Economics, Journal of Business Venturing, and Journal of Corporate Finance contain 62 percent of the publications on this topic.

Our literature review reveals that equity crowdfunding is a new topic for research literature. The literature only began focusing on this topic starting from 2014; there are no publications on this topic before this year, and significant

TABLE 1 Journal type

Full Journal Title	Journal Impact Factor	Publications	Total (%)
Small Business Economics	2.857	11	38%
Journal of Business Venturing	6.000	4	14%
Journal of Corporate Finance	2.215	3	10%
Corporate Governance- International Review	2.705	2	7%
Entrepreneurship Theory and Practice	5.321	2	7%
Research Policy	4.661	2	7%
California Management Review	3.302	1	3%
Electronic Markets	3.818	1	3%
Industrial Marketing Management	3.678	1	3%
International Small Business Journal	3.900	1	3%
MIS Quarterly	5.430	1	3%
Total		29	100%

TABLE 2 Article focus

Research area	Publication number	Publication number (%)
Capital market	5	17.2%
Signals	14	48.3%
Success factors	7	24.1%
Post-funding	3	10.3%

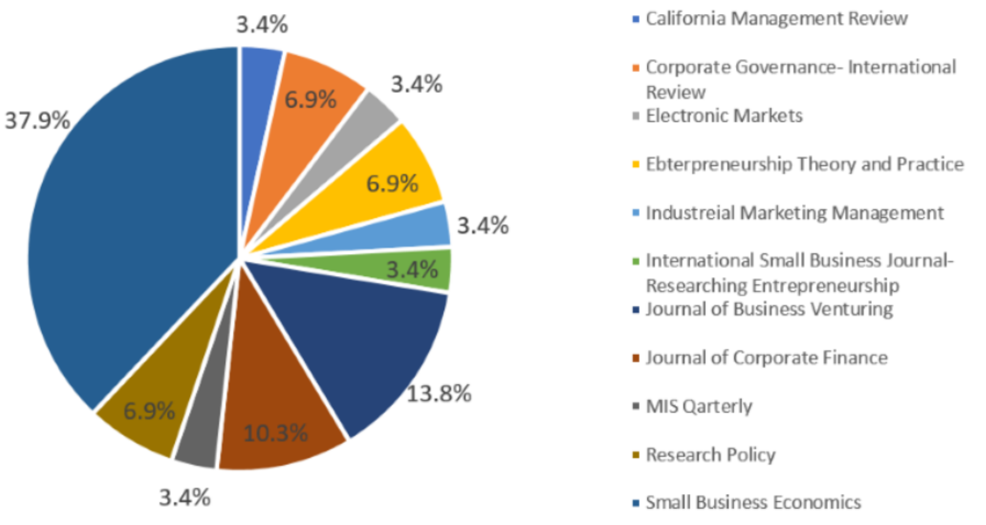
publications started from the year 2017. The year 2018 is the significant year where 18 papers of the 29 are published during this year. Figure 2 shows that equity crowdfunding had increased attention over the last few years when the aggregated publications increased from seven publications in the year 2017 to 29 publications until our review work in May 2019.

In terms of publications content, we find that the publications focus on four primary areas. As seen from Figure 2, the research areas are the capital market, signals, success factors, and post-funding development. Around 48 percent of the publications are in the signal area, specifically in trying to understand the venture attributes and signals. Around 24 percent of the publications focus on critical factors that cause the campaigns to achieve success; 17 percent of the publications deal with the capital market, and the remaining 10 percent focus on the venture post-investment development.

In terms of the geographic research area, the literature shows that most research focuses on Europe with a specific concentration in the UK. As Table 3 shows, around 48 percent of the publications on crowdfunding are based in the UK, and 18 percent are in Germany. Later, we demonstrate that this focus is a product of the advanced UK equity crowdfunding market in relation to other markets. Most of the studies focus on a single geographic area as a case study.

The literature shows that most of the research methods are quantitative. As Table 4 shows, out of the 29 papers

FIGURE 1 Distribution among journals



included in our review, one paper that is 1 percent of the entire collection is a conceptual paper, and the other 28 papers contain empirical research. Of these 28 papers, the 23 papers that are 78 percent of the entire collection are quantitatively based on one online equity crowdfunding platform as a case study with a manual, collected data and which uses the regression method as an analysis technique. The remaining five papers that are 17 percent of the entire collection are qualitative with a few cross-border research papers.

4 | SCOPE

Our literature review has a number of limitations. First, there were a number of different terminology used in equity crowdfunding that could have overlapped. We used different possible terminologies like "equity-based crowdfunding", "equity crowdfunding", "equity crowdsourcing", and "equity crowd-funding". We did not find significant differences in the outcomes, but in some cases, small differences exist between the outcomes of the different terminologies used. An in-depth and comprehensive use of the terminologies should be useful. Second, our research is only based on four databases, namely the Business Source Complete (EBSCO), Science Direct, Web of Science, and ABI Inform Collection (ProQuest). These databases we include all the journals from management, finance, economics, business and social issues. However, due to the extensive use of crowdfunding in different areas such as donation, real estate, etc., more databases engine should be useful. Lastly, the existing database is limited in performing in-depth research that includes the abstract and keywords. Performing research that includes the entire document may reveal more comprehensive and relevant studies. Expanding the literature to include other parts of the paper rather than the abstract and keywords should reveal a more relevant literature review.

We limited our review to peer-reviewed journals and in English, and we excluded working papers. We focused on the top first quartile articles with the highest impact factor scores using the Journal Citation Reports on the Web of Science website; this was done in order to have an inclusive high peer-reviewed journal. However, we think expanding

FIGURE 2 Accumulated number of papers

TABLE 3 Geographic origin

Geographic focus	Publication number	Geographic coverage
UK	13	44.83%
Germany	5	17.24%
Cross-countries	4	13.79%
Australia	2	6.90%
USA	2	6.90%
Italy	1	3.45%
Netherlands	1	3.45%
Sweden	1	3.45%

the article to the top first and second quartile can be useful that can include other publications but with less ranking.

5 | CAPITAL MARKETS

In this group, we identify six different papers that focus on the equity crowdfunding market. Here is a detailed summary of these studies that explain the research topic, research methodology, geographic research area, and the data set.

Author(s) and Journal Research issue Research design Region Data

1. Brown, R., S. Mawson, A. Rowe and C. Mason (2018b) International Small Business Journal The paper discusses the impact of equity crowdfunding on the startups receiving the investment. Qualitative: Based on Gioia methodology UK Phone and email interviews were conducted with 42 UK nascent entrepreneurial ventures with completed funding campaigns between 2011 and 2015; they raised their campaign on Crowdcube, Seedrs, and SyndicateRoom

TABLE 4 Research mthod employed

Research Method	Publication number	Distribution
Quantitative	23	79%
Qualitative	5	17%
Conceptual	1	1%

2. Walthoff-Borm, X., A. Schwienbacher and T. Vanacker (2018) Journal of Business Venturing. The paper discusses the reasons behind the firm's decision in fundraising through equity crowdfunding. Quantitative: Descriptive statistics and multivariate analysis: UK A sample of 277 firms that applied for funding (both successful and not-successful) through Crowdcube from 2012 to 2015.
3. Brown, R., S. Mawson and A. Rowe (2018a). Industrial Marketing Management. The paper discusses the impact of startup entrepreneurs' network on the crowdfunding process. Qualitative: Research survey: UK Based on 63 firms, telephone interviews were conducted that raised investment during 12 months of 2015 through three UK crowd equity platforms: Crowdcube, Seedrs, and Syndicate Room.
4. Guenther, C., S. Johan and D. Schweizer (2018) Small Business Economics: The paper examines the relationship between the geographic distance of home country investors and ventures. Quantitative research: Logistic regression Australia Data collected from 104 crowdfunding projects performed on the ASSOB platform during the years 2006 and 2012.
5. Burtch, G., A. Ghose and S. Wattal (2014) MIS Quarterly This paper examines the impact of culture and geographic distance on choosing the online peer-to-peer transaction partner. Quantitative: Econometric modelling Different unspecified regions Based Kiva.org peer-to-peer lending platform, descriptive and correlation analysis on 3,350,393 lending performed during the year 2005 and 2010.
6. Hornuf, L. and A. Schwienbacher (2017) Small Business Economics This paper analyses the potential impact of equity crowdfunding regulation. Qualitative: Legislation review and comparison: Austria, Belgium, France, Germany, Italy, UK and USA An explanatory of the regulatory framework.

Equity crowdfunding is a new source and an alternative to the existing traditional financing tools such as BAs and VCs (Estrin et al. 2018). Walthoff-Borm et al. (2018a) developed a method to identify which ventures are more likely to use equity crowdfunding. They stated that entrepreneurs use firstly internal financing findings, followed by external debt funding, and lastly if the firm capacity does not allow more borrowings, firms are likely to use the equity crowdfunding as the "last resort" to issue securities for financing.

The work by Brown et al. (2018b) stated that young entrepreneurs who almost are "discourage borrowers" expressed there is a strong demand to equity crowdfunding, which is due to the failed funding gap that they suffer from. Equity crowdfunding has another benefit than the funding itself. It provides investors with the skills and knowledge through the network, which can allow for better decisions making (Estrin et al. 2018). It shows that the benefits given to these entrepreneurs are more significant than the money itself; these benefits are gained from the model by which they receive money with a small size of equity reduction in terms of firm value, product value, the social network, and skills (Brown et al. 2018b).

With respect to the geographic distance between funders and entrepreneurs, contradictory findings exist in the literature. On one side, equity crowdfunding platform can mitigate the geographic distance. Vulkan et al. (2016) argued that most of the investors who support Seedrs's—which is the biggest UK equity crowdfunding platform—are from the

London area, but there also are a significant number of backers from across the country. On the other side, investment through equity crowdfunding platform provides the investors' information on different ventures with zero costs, but these platforms do not solve the distance constraint (Guenther et al. 2018). Investors from each country are sensitive to the geographic place of the venture and there is a negative relationship between investment and distance from the venture. However, the negative impact decreases in overseas investors with long geographic distance between investors and ventures(Guenther et al. 2018)

Third-party trust system can mitigate the geographic and culture risk (Burtch, Ghose and Wattal 2014). The same finding is in Giannetti and Yafeh (2012) who stated that the higher the distance between borrowers and banks, the higher the interest rate and the lower the loan amount is, and the more the banks may ask for the third party as a guarantee. Great distance has information cost; around 53 percent of backers invest in projects located in their geographic area (Ahlers et al. 2015).

One paper covers the legal situation of the equity crowdfunding. Strong regulation that focuses on investor protection will have a negative impact on crowdfunding ventures, and tailored regulation is needed in this case (Hornuf and Schwienbacher 2017).

5.1 | Critique

The major part of the literature in this section are equally qualitative and quantitative. Some of the papers discuss the important equity-based crowdfunding rule in the early stage financing. However, no paper provides an empirical analysis to show how equity crowdfunding can play an essential rule in minimizing the financing gap. This research avenue has support from Block et al. (2018b).

- How can equity crowdfunding fail the financing gap? Some literature has stated that equity crowdfunding can play a complementary financing tool to the existing ones such as VCs, Bas, and banks. However, these studies do not show how equity crowdfunding can play such a role. Thus, further research can focus on exploring an empirical analysis to answer the following questions:
- How does equity crowdfunding play a complementary financing tool with the traditional ones?
- How does equity crowdfunding affect traditional finance? Most of the equity crowdfunding cases are concentrated in Europe. No analysis explains why there is a variation between the countries in using equity crowdfunding. A question arises as to whether there is any culture impact involved. Thus, a research path can focus on the impact of culture on equity crowdfunding.
- Is equity crowdfunding usage affected by culture? No paper has discussed the secondary market for trading equity. Further research discusses how the implication of the secondary market on the equity crowdfunding market can have contribution to the literature.
- To which extent can a secondary crowdfunding market enhance the equity crowdfunding market itself?
- Are there are differences between the platforms in secondary equity crowdfunding? There are contradictory findings related to the geographical distance between the funders and the ventures. However, the third party can mitigate the distance; there are no studies yet that have mentioned how this occurs.
- How can the third party can mitigate geographic constraint?
- Do cultural differences impact the cross-border use of the equity crowdfunding platform? There are no significant studies that discuss the regulation implication on equity crowdfunding. Different literature mentions different regulations in this field, such as the JOB act in the U.S. There are no peer-reviewed papers that discuss the regulation implication on equity crowdfunding. Comparison research that focuses on the different regulations in equity

crowdfunding in different countries is needed.

- Do different countries have a different regulation approach on equity crowdfunding?
- Is there any relationships between regulation and the equity crowdfunding development market?
- How can different regulations limit the development of equity crowdfunding market? Equity crowdfunding is described as an alternative financing tool. No studies have discussed the implementation of this tool in the developing countries.
- How can equity crowdfunding enhance financial inclusion in the undeveloped countries?
- Do developing countries can have access to equity crowdfunding platforms?
- Are there differences in the use of equity crowdfunding platforms in developed and undeveloped countries?

6 | CAMPAIGN SUCCESS FACTORS

In this group, we identify six different papers that focus on the equity crowdfunding campaign success factors. Here is a detailed summary of these studies that explains the research topic, research methodology, geographic research area, and the data set.

1. Vulkan, N., T. Åstebro and M. F. Sierra (2016). Journal of Business Venturing Insights This paper examines the success factors of the equity crowdfunding campaign.Quantitative: Descriptive statistics UK Based on 636 equity crowdfunding campaigns that include 17188 investors, 64831 investments between the years 2012 and 2015 through Seedrs, the largest equity crowdfunding platform in the UK.
2. Cumming, D., M. Meoli and S. Vismara (2019). Research Policy. Research Policy This paper discusses the equity crowdfunding ownership structure. Quantitative: Descriptive statistics analysis UK Based on 491 equity crowdfunding offering on the UK Crowdcube between the years 2011 and 2015
3. Hornuf, L. and M. Neuenkirch (2017). Small Business Economics This paper examines the banker's' variables that affect their motivation to price the venture shares Quantitative: Regression and descriptive analysis Germany Q sample of 499 backers in 44 German equity crowdfunding campaigns during 2011 and 2016
4. Hornuf (2018). Journal of Corporate Finance. This paper discusses the impact of shares allocations mechanism, First-come-first-served, and auction mechanism, all in relation to investors' investment decision. Quantitative analysis: Regression Germany Based on four German platforms: Companisto, United Equity, Seedmatch, and Investment. Data collected for 81 successful funding firms between the years 2011 and 2014
5. Hornuf, L. and A. Schwienbacher (2018). Journal of Corporate Finance This paper discusses market mechanisms and funding dynamics in equity crowdfunding. Quantitative analysis Germany Data collected from 89 funding campaigns during June 2011 to April 2014 from four German crowdfunding portals
6. Ralcheva, A. and P. Roosenboom (2019). Small Business Economics This paper presents forecasting success factors in equity crowdfunding Quantitative analysis: Regression UK Data collected from a sample of 2171 equity crowdfunding campaigns from Crowdcube and Seedrs between the years 2012 and 2017
   Raising funding through the equity crowdfunding platform is performed through the campaign with limited time (Ralcheva and Roosenboom 2019). Campaigns that fail to raise the target amount would return all the raised money to funders. However, successful campaigns generate the target amount minus the fees of 10–12 percent (Cox and Nguyen 2018). Campaign success has a moderate concern in the literature. Equity crowdfunding campaigns are either to succeed or to fail; on some equity crowdfunding platforms, a significant number of campaigns are overfunded (Vulkan et al. 2016).

The venture shares type issued to investors has an impact on campaign success. The separation between ownership and control affects campaign success negatively. However, this risk can be mitigated in crowdfunding with experienced founders (Cumming, Meoli and Vismara 2019). Ralcheva and Roosenboom (2019) developed a prediction model for a successful campaign. They stated that a company that has retained equity, previous external financing, previous experience in accelerators is more likely to succeed in the equity crowdfunding campaign.

Shares allocations have an impact on campaign success. The first-come-first-served (FCFS) mechanism has an "L" shape, where most shares are allocated in the early days; however, in the auction mechanism, the "U" shape is seen, where most of the share's allocation is at the end of the campaign (Hornuf and Schwienbacher 2018). In a similar vein, campaigns that reach the funding goal earlier affect the investors' valuation of the venture share price (Hornuf and Neuenkirch 2017).

There has been a lack of empirical studies that investigate the investors' size. Successful campaigns are often seen with a significant number of investors with at least one backer with strong commitment (Vulkan et al. 2016).

6.1 | Critique

The literature focuses on ventures that are selected by the equity platform for fundraising. No analysis explains the criteria of how a specific venture can be accepted and listed for funding. Research that explains the reasons and the differences in accepting and refusing ventures from being listed on the equity crowdfunding platform is needed.

- What are the selection criteria in accepting ventures on the platform? Are these selection criteria different between platforms and countries? The literature focuses on campaign success factors. However, there is no emphasis on campaign failure factors. Research that focuses on the equity crowdfunding campaign failures can contribute to the literature.
- What are the factors that cause campaign failure?
- Is campaign failure different between countries? There are three types of funding, namely those that failed to receive the required amount, those that are successful in receiving the required amount, and those who have an overfunding. There is no explanation in the literature why some campaigns have overfunding and why others do not.
- What are the reasons for an overfunded campaign? Vulkan et al. 2016 divided the shares allocation mechanism into two groups, namely U mechanism and L mechanism. However, they do not mention which type investors use. Further research can help to identify which types of investors use the two mechanisms; this can have a contribution to the literature.
- What type of investors use the "U" mechanism, and what type use the "L" one?
- What type of investors use the equity crowdfunding? Is there any difference between investors across different platforms? Cumming, Meoli, and Vismara 2019 stated that experience impacts the investor's decision. However, their research does not mention which experience are entailed and whether there are differences or ratings between the different experiences. Further research that focuses on rating the different type of previous entrepreneur experiences can have a positive impact on the literature.
- What type of entrepreneur professional experience has the most significant impact on investors investment decision? Investors put a heavy weight on signals in different areas to assess their investment. However, no paper discusses the entrepreneur activity type. The activity venture activity area is one of the essential lending criteria in traditional financing such as banks. Some activities are ranked with a high risk by the traditional and are venture and are banned from receiving traditional funding. Research that focuses on the impact of the venture activity type on investors investment decision will likely have a positive contribution.

- Does the venture activity type affects the investor's investment decision?
- Do investors use credit scoring in evaluating their investment?
- Do investors rely on the third party to evaluate their investment?

7 | SIGNALS FROM THE INVESTMENT DECISION

In this group, we identify 13 different papers that focus on the equity crowdfunding signals. Here is a detailed summary of these studies that explains the research topic, research methodology, geographic research area, and the data set.

a. Estrin, S., D. Gozman and S. Khavul (2018). Small Business Economics. The paper examines the UK equity-based crowdfunding market as a new source and an alternative to the existing traditional one such as BAs and VCs. Qualitative and inductive analysis UK Multiple case method

b. Kleinert, S., C. Volkmann and M. Grünhagen (2018). Small Business Economics The paper studies third-party signals in equity crowdfunding; it examines how prior financing can be an alternative to the information asymmetry and provide a signal about the quality of the investment. Quantitative: Regression analysis UK Data from 221 startups business plans that run equity crowdfunding on Crowdcube during 2017 and 2018

c. Wang, W., A. Mahmood, C. Sismeiro and N. Vulkan (2019). Research Policy. The paper discusses how the behaviour of Bas can play a decisive role in minimizing the information asymmetries in equity crowdfunding. Quantitative: Lognormal model UK Based on 50,999 distinctive investors and 1151 unique campaign through the UK equity crowdfunding platform between the years 2012 and 2017

d. Dorfleitner, G., L. Hornuf and M. Weber (2018). Electronic Markets This research shows the level of interaction between startups and investors during the financing campaign. Quantitative: Regression statistics Germany Based on a sample 751 campaigns from leading German equity crowdfunding platforms, namely Seedmatch and Copansito.

e. Block, J., L. Hornuf and A. Moritz (2018). Small Business Economics. The paper discusses the impact of information update on equity crowdfunding camping. Quantitative: Descriptive statistics Germany Based on 71 campaigns on two German crowdfunding platforms, with 39,399 investments on Seedmatch and Companisto, which are German platforms between the years 2012 and 2015

f. Mahmood, A., J. Luffarelli and M. Mukesh (2019). Journal of Business Venturing The paper discuss the impact of visual signals such as startup logo design complexity on the backer's investment decision. Quantitative: Regression analysis USA Based on 10,611 investments across 62 crowdfunding that were made between 2015 and 2016.

g. Piva, E. and C. Rossi-Lamastra (2018). Small Business Economics. The paper present human capital signals and entrepreneurs' success in equity crowdfunding. It argues the impact of human capital on equity crowdfunding campaign success. Quantitative: Robust Probit estimates Italy Based on 460 entrepreneurs with 160 successful campaigns through the Italian platform SiamoSoci

h. Vismara, S. (2016). Small Business Economics The paper discusses the impact of equity retention on the investment decision. Quantitative: Descriptive statistics UK Based on 271 projects listed on Crowdcube and Seedrs, for period between 2011 and 2014

i. Agrawal, A., C. Catalini and A. Goldfarb (2016). California Management Review The paper discusses the Syndicates platform as a solution for information asymmetry in equity crowdfunding. Theoretical framework. Conceptual

j. Ahlers, G. K. C., D. Cumming, C. Guenther and D. Schweizer (2015).

k. Entrepreneurship Theory and Practice The paper examines signalling in equity crowdfunding. Quantitative: Multivariate regression Australia Based on 104 campaigns offering on ASSOB, the most significant Australian crowdfunding was performed between 2006 and 2011.

l. Vismara (2018). Entrepreneurship Theory and Practice The paper examines the shared information between investors in equity crowdfunding. Quantitative: Multivariate regression UK Study based on 132 equity offering on Crowdcube between January and December 2014.

m. Polzin, F., H. Toxopeus and E. Stam (2018).Small Business Economics The paper covers the impact of interpersonal relationships on information used in crowdfunding. Quantitative: Regression analysis Netherlands Based on a survey of 1278 participants in crowdfunding from 2013 collected by the National Crowdfunding Research in the Netherlands.

Stevenson, R. M., M. P. Ciuchta, C. Letwin, J. M. Dinger and J. B. Vancouver (2019) Journal of Business Venturing The paper examines the impact of investors' own belief on their ability to succeed in a specific task (self-efficacy) on the decision making. Qualitative: Two case studies USA Experimental study

n. Mohammadi, A. and K. Shafi (2018). Small Business Economics The paper discusses the impact of entrepreneur's gender on the investor's investment decisions. Quantitative: Descriptive statistics analysis Sweden A sample of 31 campaigns campaigns from 2012 to 2015; investors are from FundedByMe.

7.1 | Critique

The major part of the papers reviewed regarding equity crowdfunding focuses on the information asymmetries. Due to the high cost of information asymmetries, entrepreneurs prioritize the finance resources use as suggested by the pecking order theory (Myers 1984). Information asymmetry happens when "different people know different things" (Stiglitz 2002). The literature discusses two critical types of information, namely information on quality and information on intent. On the first type, the information asymmetries occur when one side does not have complete information about its counterpart; the second type occurs when one side is not aware of the features of its counterpart (Stiglitz 2002, Elitzur and Gavious 2003).

The signalling theory was formulated in the labour market and becomes prevalent reducing uncertainty in decision making. The employer has difficulties in evaluating productive staff and determining his salary before hiring. The model suggests that the candidate education is an excellent individual attribute that gives a signal about the individual quality (Spence 1973). The model suggests a Pareto equilibrium optimization solution that serves both parties for the signaller and the receiver. The equilibrium occurs when both the signallers and receivers evaluate the cost benefit from the signal and make the optimization decision based on all available signals. There is a reverse relationship between the cost of a credible signal and the quality of the sender. The lower in quality of the sender, the higher the cost the sender needs for investing in signals (Bergh et al. 2014).

Since the creation of the signalling theory in 1973, there has been increased use of this theory, especially in investment. It is a useful tool for overcoming the information asymmetry when one of the two parties have different information (Connelly et al. 2011). It helps to minimize the information gap that exists between investors and stockholders (Miller and Del Carmen Triana 2009).

Most of the literature on crowdfunding focus on the specific factor that affects investor decision making based on the signalling theory. Hoegen at al. (2018) in "How do investors decide? An interdisciplinary review of decision making in crowdfunding" summarized different literature review on crowdfunding, and they mentioned the decision criteria that investors use in investing in crowdfunding (Hoegen et al. 2018). Six decision criteria groups are recognized:

a. Benefit and quality refer to the promised benefit from the investment. In equity crowdfunding, the benefit is the promised return or profit from investment exit. Quality is based on product description and on the campaign process that measured is by the information quality and content.

b. Financial risk and campaign statistics refer to the available information on mitigating risk factors such as high credit grades, business plan, debt to income ratio. This also includes the actual campaign statistics, such as the size campaign amount and duration.

c. Founder perception and attributes involve the team skills, characteristics, physical contact with founders, founder's education, disclosures, founder demographic, and physical attributes, such as gender, age, colour skin.

d. Social relationship and endorsement refer to the focus on founders' social capital such as several connections on the social network, marital status, and endorsement on social media.

e. Context refers to the crowdfunding platform features such as visuality and accessibility by mobile phone.

f. Investor characteristics refers to the investor's reaction attitude to texts and visual images.

The large body of the literature focuses on the entrepreneurs generated signals on investor behaviour. Estrin et al. (2018) stated that investment through equity crowdfunding is involved in high risks as well as the possibility of adverse selection due to lack of information asymmetry that brings inexperienced investors to the market. Investors are deeply involved in risk evaluations, and it is important for them to have a clear understanding before making any investment through the crowdfunding and investments that are return promising with minimum transaction costs (Estrin et al. 2018). There is a relationship between previous successful campaigns and the likelihood of future investment. Prior crowdfunding success is essential when the investment social capital quality is low. Previous high reputable investors can provide a good signal regarding startup quality. In the case there is uncertainty about startup quality, human and social capital can provide a good signal about the investment quality (Kleinert et al. 2018).

The equity-based crowdfunding platform has a favourable position in minimizing the information asymmetries. Wang et al. (2019) stated that equity crowdfunding platform facilitates the communication between substantial and diversified investors, and these helps to minimize the information asymmetries. Investors decision is highly based on the behaviour of BAs. BA investment decision signals the venture quality, and it allows information exchange from experienced investors to the crowd. Angels play a success factor in big campaigns with volume above £100,000. Crowd investors complement BAs in funding small campaigns that are not of the interest of BAs. Platforms that have information about the amount of equity proposed, financial estimates, and human capital have a substantial impact on investors' decision (Ahlers et al. 2015).

Information update impacts investors behaviour. Investors react to information disclosures during the campaign; however, the internet platform has much information that limits the investors' attention. (Hornuf and Schwienbacher 2018). Ventures strategically increase the posting of information about the business development and the group identity during and after the funding campaign, as a result of competition with other campaigns in another crowdfunding (Dorfleitner, Hornuf and Weber 2018). There is a positive impact of the startup information updates during the crowdfunding campaign and the campaign improvement. Positive signals are reflected in the number of participants in the campaign as well as the amount invested. A more straightforward language has a positive impact too with the focuses on the latest startup development (Block, Hornuf and Moritz 2018a).

Investors can rely on the ownership structure as a signal of firm profitability. There is a relationship between the equity crowdfunding shareholders structure and firm performance. Equity crowdfunding firms that are financed by "nominee" shareholder structure generate less profitable than equity crowdfunding with "direct shareholders structure" (Walthoff-Borm, Vanacker and Collewaert 2018b).

Another type of signal that the literature discusses is the visual one. Mahmood et al. (2019) stated that the logo complexity of the ventures affects the crowd perception on the venture's innovation level and the investment decision. To a certain level, the higher the complexity of the venture logo is, the higher level of innovation is perceived by funders about the specific venture, and the higher the probability of investment decision is.

In line with the different signals that investors rely on in their funding decision, experience and education are two signals on human capital that indicate the startup quality (Piva and Rossi-Lamastra 2018). Equity retention indicates the startup quality. Entrepreneurs who sell a big part of their shares are more likely to attract fewer investors. Entrepreneurs social involvement increases the likelihood of campaign success (Vismara 2016, Ralcheva and Roosenboom 2019). Other findings suggest that investors with early-investment and with public profiles attract later investors. Investors delay their investments to see early investors' identity and behaviour, and once they receive the information, they assess their investment based on the early investors' decisions (Vismara 2018). The gender of entrepreneurs is also used as a signal by investors.

Female entrepreneurs are less likely to raise money in comparison to male entrepreneurs (Vismara 2016). There is a low probability that female investors invest in early-stage startups, high tech startups, and firms that provide a high share of the equity. However, females are likely to invest in projects where the share of male investment are high (Mohammadi and Shafi 2018)

Information asymmetry has an impact on the investors' investment choice that leads to market failure. Equity crowdfunding syndicates is the solution for information asymmetry. Syndicate is a feature of the equity crowdfunding platform that increases the investment size as well as minimizes market failure (Agrawal et al. 2016). In such a case, equity crowdfunding platforms helps to minimize information asymmetries (Wang et al. 2019). At the same line, self-efficacy has a negative impact on decision making; however, it was minimized when funders performed searching activities and increase their knowledge. Funders with a high level of self-efficacy have fewer chances to invest in projects with high quality in comparison to funders with a high knowledge level (Stevenson et al. 2019a)

The relationship between funders and entrepreneurship plays a role in signalling. Investors who have a relationship with the founders—these investors are known as "in-crowd investors"—have a higher chance to use the information than the "out-crowd" investors who have no relationship with the entrepreneurs. In-crowd investors examine the importance of entrepreneurs and previous projects more than out-crowd investors.

In crowdfunding campaigns that focus on financial return, out-crowd investors use financial planning and risk assessment more than in-crowd investors (Polzin, Toxopeus and Stam 2018). Along the same line, (Brown, Mawson, and Rowe 2018a) stated that the relationship that investors have with the entrepreneurs can have three levels. There is the pre-funding stage, where there is a weak business connection with the crowdfunding platform. However, there is a secure family connection stage, which is a factor of the campaign success. During the campaign, there is a deep connection between the startup and investors in evaluating the investment. In the post-investment stage, startups become the "network orchestration" that has positive and negative impacts.

Estrin et al. (2018) stated that investment through equity crowdfunding is involved in high risks and the possibility of adverse selection. No papers have discussed the selection process that the platform can perform before accepting any startup to be listed on the platform. Further research that discusses the procedures that the platform performs to minimize the risk and the adverse selection will likely contribute to the literature.

- What are the selection procedures that platforms perform to minimize the adverse selection? Are there are differences between platforms? Wang et al. (2019) stated that equity crowdfunding platform facilitates the communication between investors, but they did not mention how. The research is based on "the free riders' theory" in which the investment decisions of BAs signal the venture quality. Further research that examines the platform role in identifying the investors can have a contribution to the literature. This research path avenue has support from Hoegen at al. (2018, 358), who suggested a research focus on the “influence of platform features, functionality, and design on investment decisions”.

- Do platforms distinguish between BAs and VCs from the different investors, and which data are needed so that platform can play a significant player in minimizing the information asymmetries?
- Do platforms perform due diligence on ventures before making decisions? To which extent do they ensure adverse selection?
- Are there differences between the equity crowdfunding platforms that cause different decisions by investors? Scholars such as Hornuf and Schwienbacher (2018), Dorfleitner, Hornuf, and Weber (2018) and Block, Hornuf and Moritz (2018a) have discussed the impact of information disclosure updates during the campaign on the investors’ decisions. However, they did not mention any specific information. Further research that focuses on the type of information update can have a positive impact on the literature.
- Are there differences in the type of information updated during the campaign on the investor investment decision?
- Which information update can have a positive impact, and which can have a negative impact?
- Are all investors affected on the same level by the same information updates? Is there is a difference between investors? Different papers such as Piva and Rossi-Lamastra (2018), Vismara (2016), Ralcheva and Roosenboom (2019), and Vismara (2018) have discussed the relationship between investors and entrepreneurs, as well as how investors can rely on this relationship to make an investment decision. However, this kind of relationship does not provide any information about the entrepreneur’s industry experience as well as the education type of the entrepreneur. Further research can have a positive impact on the literature:
- How can venture sector activity have different signals?
- Can the entrepreneur industry type experience affect the signals to investors?
- Can the entrepreneur education type have impact signals to investors? A contradictory finding exists in our literature that is related to intellectual property. While Ralcheva and Roosenboom (2019) stated the importance of intellectual property right, Ahlers et al. (2015) stated that there is no impact of property right on investors decisions. The contradictory results can be due to different factors such as sample size, different regulatory environments, and different research methodologies. Further research on this topic can have a positive impact and support, where findings of the two studies are the most accurate. Some studies focus on information updates during the campaign. However, there is no supervision on the information posted on the equity crowdfunding platform. Research on the value of this information by investors can have a positive impact on the literature.
- To which extent can the investors rely on the information updated?
- How can supervision on the platform content affect the investor’s decision? enditemize

8 | POST-INVESTMENT DEVELOPMENT

In this group, we identify three different papers that focus on the equity crowdfunding post-investment development. Here is a detailed summary of these studies that explain the research topic, research methodology, geographic research area, and the data set.

a. Walthoff-Borm, X., T. Vanacker and V. Collewaert (2018). Corporate Governance-an International Review The paper examines equity-based crowdfunding, shareholder structures, and firm performance. Quantitative: Descriptive statistics analysis UK Sample of 277 firms that successfully raised funding from Crowdcube from 2012 to 2015.

b. Signori, A. and S. Vismara (2018). Journal of Corporate Finance. The paper discusses the impact of campaign success on venture activity development. Quantitative: Descriptive statistics analysis UK Data of 212 successful campaigns from UK Crowdcube, Crunchbase, and Companies house between the years 2011 and 2015.

c. Hornuf, L., M. Schmitt and E. Stenzhorn (2018). Corporate Governance-an International Review This paper discusses ventures failure after successful crowdfunding. Quantitative: Multivariate regression UK and Germany Based on data from 413 firms that were successful in at least one fundraising from 13 crowdfunding in the UK and Germany between the years 2011 and 2016.

8.1 | critique

Few studies have examined the venture development in the post-funding stage. Signori and Vismara (2018) stated that during the two years after the successful campaigns, 18 percent of the firms are failed, 9.4 percent have seasoned equity offers, 35 percent succeed in raising additional funding, of which 26 percent succeed in raising additional public funding, 9.4 percent through BAs, and the remaining 1.4 percent through MA. The level of investors involved in the first offering explains the post-offering scenario. Investors with a high involvement in the first offering are more likely to have success in the post-offering. The initial offering made by a significant number of investors is less likely to perform M and A and seasoned offering later. Firms that succeeded quickly in raising funding through the first offering are more likely to make another post-offering. In terms of failure, the paper stated that there was not any failure within the experienced investors in the first offering (Signori and Vismara 2018).

Differences between German and UK firms exist in receiving post-funding. The German firms have more post-funding from BAs and VCs than the UK firms; however, they have more probability of failure. The number of senior managers and the number of VCs affect the post-campaign funding success (Hornuf, Schmitt and Stenzhorn 2018).

There is very few research on moral hazard. Reward-based crowdfunding that pays the funding in deferred instalments gives assurance and restriction of moral hazard (Strausz 2017). Investors suffer from information asymmetries. This issue causes investors to rely on different signals to assess their investment. However, there is no guarantee that the venture will use the funding to go with the venture declaration and the entrepreneur's obligations towards investors. This situation can lead to moral hazards, which is defined as the following by Casu (2015, p.11):

"..*Moral hazards is the risk that the borrower might engage in activities that are undesirable from the lender's point of view because they make it less likely that the loan will be repaid and thus harm the interest of the lender..*"

In the absence of regulations that can prevent moral hazards occurrence, research can have a positive contribution to the literature:

- Which regulations are needed to prevent startups from moral hazards? There is no research focus found on the failure of ventures after the funding stage. Ventures can be bankrupted from different reasons, such as management and wrong decisions. A further decision that focuses on the post-investment bankruptcy is needed.
- How investors can identify ventures bankruptcy?
- How successful campaign can affect post-investment venture development?
- Funding through equity crowdfunding has value added such as networking, and skills rather than the funding itself. No research has examined the impact of the value added in venture development.

- What is the value added from equity crowdfunding investment?
- How does the value added from the equity crowdfunding investment affect business development?
- How can government policy and legislation prevent morals hazards?
- How can government policy and legislation prevent venture bankruptcy?

9 | CONCLUSION

This paper reviewed the literature on equity-based crowdfunding, a new topic that has been receiving research attention since 2014. The past two years in 2018 and 2019 are the most productive years in terms of peer-reviewed published papers. Equity-based crowdfunding is one of the four crowdfunding groups. The purpose of our research is to map the different research papers in equity-based crowdfunding.

Based on the top quartile journals in the Web of Science citation website, we found that 29 papers deal with four subject areas, namely capital market, campaign success factors, signals, and post-investment development. Most of the publications, specifically 13 of them, are in the signals group. In terms of the academic peer-reviewed journal, we found that 38percent of the papers are published in the Small Business Economics journal, and 52 percent of the papers appear in Small Business Economics and Journal of Business Venturing.

Our findings show that the research on equity crowdfunding is receiving more attention, but 64 percent of the publication focuses on Europe with a concentration on the UK, which has 45 percent of the entire group. More research that focuses on different geographic areas and more comparison research cross-countries are needed. We highlighted different future research avenues through our research.

Our research suggestions include the possible research questions, but the list does not include the entire future research path avenues. We highlighted the importance of post-investment venture development and due diligence in the pre-investment stage. In the due diligence intervals, few studies are published in this area, even though it is an essential stage in which entrepreneurs are selected. More research is needed to help the platforms perform professional due diligence. In the post-investment stage, there are also few studies that are published. This is a crucial stage where investment failure and investment bankruptcy can have negative consequences on the market. More research is needed in venture failures and in moral hazards. We conclude that further research on the platform and its ability to enhance the equity crowdfunding is needed.

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