# Is Equity Crowdfunding the Land of Promise for Female Entrepreneurship?

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## Abstract

Female entrepreneurship is lower than masculine one, with a high heterogeneity of the gender gap across industries and countries. Prior research (see Becker-Blease and Sohl, 2007; Bigelow *et al*., 2014; Eddleston *et al*., 2016) has found that female entrepreneurs are less likely to receive private equity funding, institutional capital, and bank financing. This difficult access to traditional credit sources may lead female entrepreneurs to actively seek funding from alternative channels, such as crowdfunding. By using a unique dataset of 626 equity crowdfunding campaigns, gathered from the Italian, Spanish, Finnish, and Swedish platforms over the period 2014–2019, we find that companies founded by women are more successful in receiving financial backing, both involving more investors and achieving their fundraising goal easier than male counterparts. We also examine whether the level of gender gap in the country influences this phenomenon, finding that the female advantage is stronger in countries where women are more disadvantaged and far from equal opportunities.

## 1. Introduction

In the existing literature, there is a substantial evidence that women are penalised with respect to men in many funding markets: private equity (Becker-Blease and Sohl, 2007), institutional capital (Bigelow *et al*., 2014), and bank financing (Buttner and Rosen, 1988; Fay and Williams, 1993; Muravyev *et al*., 2009; Hertz, 2011; Alesina *et al*., 2013; Ongena and Popov, 2015; Eddleston *et al*., 2016). This makes the weight of female entrepreneurship strictly minority in some fields: Canning *et al*. (2012) show that female-led firms receive only 1.3% of venture capital financing. A Bloomberg study, analysing 890 U.S. start-ups in 2016, reveals

that only 7% of the founders were women, receiving significantly less money than their male counterparts. According to data from PitchBook and All Raise, the organisations supporting women in venture capital and start-ups, Fortune[1] reports that U.S. female founders raised $2.88 billion in 2018, which is only 2.2% of the total $130 billion invested in venture capital over the year (the exact same percentage was reported for 2017).

Data from the European Commission confirms the U.S. evidence:[2] when women establish and run a business have to face several challenges: a difficult access to finance, information, business networks and training, other than objective troubles in reconciling business and family. To overcome this situation, the European Commission is working to encourage more women to start their own companies, promoting and supporting female entrepreneurship through the Small Business Act and the Entrepreneurship 2020 Action Plan.

Lacking access to traditional venture capital, female entrepreneurs have to find an answer elsewhere and seek funding from alternative channels, such as crowdfunding. There is some early evidence that women are not at a disadvantage compared to men in crowdfunding, and they even seem to perform better (see Mollick and Robb, 2016; Johnson *et al*., 2018; Zhao *et al*., 2020). Referring to the U.S. context, only Geiger and Oranburg (2018) find significant evidence that crowdfunding campaigns that have a female primary signatory receive less funding. The 2017 PwC report "Women Unbound: Unleashing female entrepreneurial potential" based on 2015 and 2016 seed crowdfunding data, shows that – even though men raise more finance than women – crowdfunding female-led campaigns significantly outperform those led by men in terms of probability of success. The analysis covers about 465,000 seed crowdfunding campaigns from nine of the largest global crowdfunding platforms showing that female-led campaigns were 32% more successful at reaching their funding target than male-led campaigns. Even in more 'male dominated' sectors, such as technology, where there are nine male-led campaigns to every one female-led campaign, female-led campaigns were more successful, 13% to 10% respectively. Also in the U.S. and in the U.K. – that is, the countries with the largest volumes of campaigns –, 20% of male-led campaigns reached their targets compared with 24% and 26% of female-led campaigns, respectively.

By using a unique dataset of 626 equity crowdfunding campaigns, gathered from the Italian, Spanish, Finnish, and Swedish platforms over the period 2014–2019, we aim to investigate the role of female entrepreneurs in the success of equity crowdfunding projects. To this end, following Ahlers *et al*. (2015), Colombo *et al*. (2015), Vismara (2016) and Barbi and Mattioli (2019), we run a standard OLS regression for the natural logarithm of the number of investors that funded the project (*ln_invest*) and for the amount raised at the end of the campaign, measured as a percentage of the set goal (*perc_amount*). Our paper aims to provide new empirical evidence on the relationship between female entrepreneurship and crowdfunding, focusing on how this relationship is influenced by the level of masculinity in the country. Our main original contribution to the existing literature is that we assess whether there is a relationship between female success in equity crowdfunding and the level of masculinity/femininity of a country. To our knowledge, there are no studies linking the performance of female entrepreneurs to cultural values.

[1] Available online at https://fortune.com/2019/01/28/funding-female-founders-2018/ (last accessed: February 8, 2021).

[2] Available online at https://ec.europa.eu/growth/smes/promoting-entrepreneurship/we-work-for/women_en (last accessed: February 8, 2021).

Our results show that women entrepreneurs perform well in the equity crowdfunding scenario; however, this advantage is strongly reduced in countries where there is a higher gender equality and a larger value of the Global Gender Gap Index (see Section 3), our proxy for a country's masculinity level.

The rest of the paper is structured as follows. Section 2 specifies our research hypotheses. Section 3 provides a description of the Global Gender Gap Index. In Section 4, we describe our sample, while Section 5 introduces the variables used in our empirical analysis. Section 6 reports our main results, while conclusions are drawn in Section 7.

## 2. Literature review and research hypotheses

Turning to the academic literature, the existence of a women advantage in informal funding markets seems confirmed, with different competing theories trying to explain it. Some researchers point to *activist homopholy* (Greenberg and Mollick, 2017), stating that female backers strongly support female-led projects over male-led ones. Since women are more represented as both project founders and funders with respect to what happens in traditional markets, women are considerably more likely to achieve their funding goals in informal markets. However, there are also papers showing that men still make up the majority of funders on most crowdfunding platforms (Marom *et al*., 2016), making unlikely that the female advantage in crowdfunding is due solely to that "demographic effect" and opening to alternative explanations.

The *warm glow theory* (Andreoni, 1990) suggests that investors commonly help others to feel good about themselves (Allison *et al*., 2015). In other words, considering the altruistic nature of crowd investors, they could act as charitable donations funders; it may be that they will feel their investment will do more for a female entrepreneur and, thus, feel better when funding a female-led project rather than a men-led project.

The differential treatment between men and women could also be explained by turning to the social psychological literature on *stereotypes*, according to which a stereotype relates to the belief that an individual in a particular category or social group shares relevant characteristics and behaviours with others belonging to the same category (Powell *et al*., 2002). When there is limited access to information, individuals are more prone to rely on underlying stereotypes (Tosi and Einbender, 1985), and crowdfunding markets are undoubtedly representative of this type of situation. Crowdfunders lack reliable and credible information (Belleflamme *et al*., 2014; Moss *et al*., 2015), have no personal contact with the project founders (Courtney *et al*., 2017), and are unlikely to conduct due diligence of the entrepreneur (Ciuchta *et al*., 2016). These features make crowdfunding very different from other forms of venture finance, like venture capital, where entrepreneurs interact with highly trained professional investors for many months to broker an equity deal (Petty and Gruber, 2011), and make crowdfunders more prone to implicitly use stereotypes when making funding decisions. Furthermore, crowdfunding markets lack institutional mechanisms (Bigelow *et al*., 2014), formal due diligence processes (Huang and Pearce, 2015), and major legal repercussions for misrepresentation (Lin and Viswanathan, 2015). In this scenario, the stereotype literature focuses on the perceived trustworthiness (Eckes, 2002), which can be linked to gender as one of the most common perceived signals for stereotyping (Fiske and Taylor, 1991). Psychology shows that women tend to be viewed as more trustworthy than men because of typical social roles that society

associates to them, like domestic roles (e.g., mother) whose purpose is to put the goodwill of others first.

Since culture influences and shapes thoughts, feelings and reactions of people (McGrath *et al*., 1992), we can also link this literature to the model developed by Hofstede (1980, 1991, 2003). Although this model does not focus on the influence of culture on the level of entrepreneurship in a country, it explores the concept of culture through six dimensions, one of which is represented by masculinity/femininity. Cultures with a high value on the scale of masculinity tend to have more pronounced gender differences. Accordingly, countries with a masculine orientation should have higher rates of entrepreneurship, while those characterised by higher female values should show a greater tendency toward paid employment (McGrath *et al*., 1992; Shane, 1992, 1993). However, the correlation between gender distinction of people and their cultural beliefs is still a confusing issue and the empirical literature produced mixed results; it seems there is no general support for a specific relationship among masculine/feminine society, female participation to entrepreneurship and female success in entrepreneurship. Some studies find that in masculine contexts women feel distant from the prevailing values in society and therefore are less likely to create a company (Quevedo, Izar and Romo, 2010). Other researchers suggest the opposite, that is to say, that in masculine societies women are "imbued" of those values that make up their culture and decide to undertake entrepreneurial projects more easily than in countries with more feminine cultures (Cardozo, 2010).

Overall, the literature review suggests that scholars, policy makers, and practitioners are devoting much attention to the relationship between female entrepreneurship and crowdfunding. Some early evidence suggests a female advantage and several theories compete in explaining in. Furthermore, the evidence from past papers is not conclusive about the relationship between the level of masculinity of a country and the differences in entrepreneurial success of men and women.

Our paper aims to provide new empirical evidence on the relationship between female entrepreneurship and crowdfunding, focusing on how this relationship is influenced by the level of masculinity in the country. Our original contribution to the existing literature is twofold. First, we analyse a cross-country sample of crowdfunding campaigns over 2014–2019, providing further evidence on the relationship between female entrepreneurs and the success of equity crowdfunding projects. Our expectations are consistent with those of Alsos and Ljunggren (2017), who find that gender plays a relevant role in how entrepreneurs signal venture quality. Hence, our first hypothesis is the following:

$H_1$ *Female-led equity crowdfunding campaigns are more successful than male ones.*

Secondly, we exploit cross-country heterogeneity to assess whether there is a relationship between female success in equity crowdfunding and the level of masculinity/femininity of a country. To our knowledge, there are no studies linking the performance of female entrepreneurs to cultural values. However, we do believe that the orientation toward masculinity can play an important role. If we rely on the *warm glow theory* (Andreoni, 1990) to explain the female advantage in crowdfunding, it is likely that the behaviour of crowdfunders as charitable donors is more pronounced and evident in countries where women are more disadvantaged than men and where the gender gap in entrepreneurship is greater. In a similar vein, if we refer to the *stereotype* literature, it is reasonable to assume that the perceived trustworthiness of women may be higher in countries where women are still associated with domestic roles (e.g., a mother taking care of the house, children, and elderly) whose purpose

is to put the goodwill of others first. Using the same sample, we test our second research hypothesis:

$H_2$ *The advantage for female-led equity crowdfunding campaigns is stronger in countries where women are further from equal opportunity.*

Following previous studies (Barns and Preston, 2010; Pathak *et al*., 2013), in order to test this hypothesis, we use as proxy for a country's masculinity level, the Global Gender Gap Index (GGGI), published by the World Economic Forum, which is a comprehensive measure of a country's progress in the fight against gender inequality.

## 3. The Global Gender Gap Index

The World Economic Forum first introduced the Global Gender Gap Index in 2006 as a framework for capturing the magnitude of gender-based disparities and tracking their progress over time. The index is a comprehensive measure of a country's progress in the fight against gender inequality and expresses the percentage of the gap between men and women that countries have filled. For this reason, the Gender Gap index is between 0 and 1: if, for example, the index is equal to 0.5, then the gender gap has been filled by 50%; if it is equal to 1, the integration is complete.

The index is a synthesis of performance across four dimensions, namely: 1) Economic Participation and Opportunity, 2) Educational Attainment, 3) Health and Survival, and 4) Political Empowerment. Particularly useful for the purpose of our empirical analysis is the first sub-index, related to female economic participation and opportunity.

Figure 3.1 compares the trend of the global gender gap in Italy, Finland, Spain, and Sweden from 2014 to 2019, while Figure 3.2 shows the evolution of the global gender gap within each country analysed.

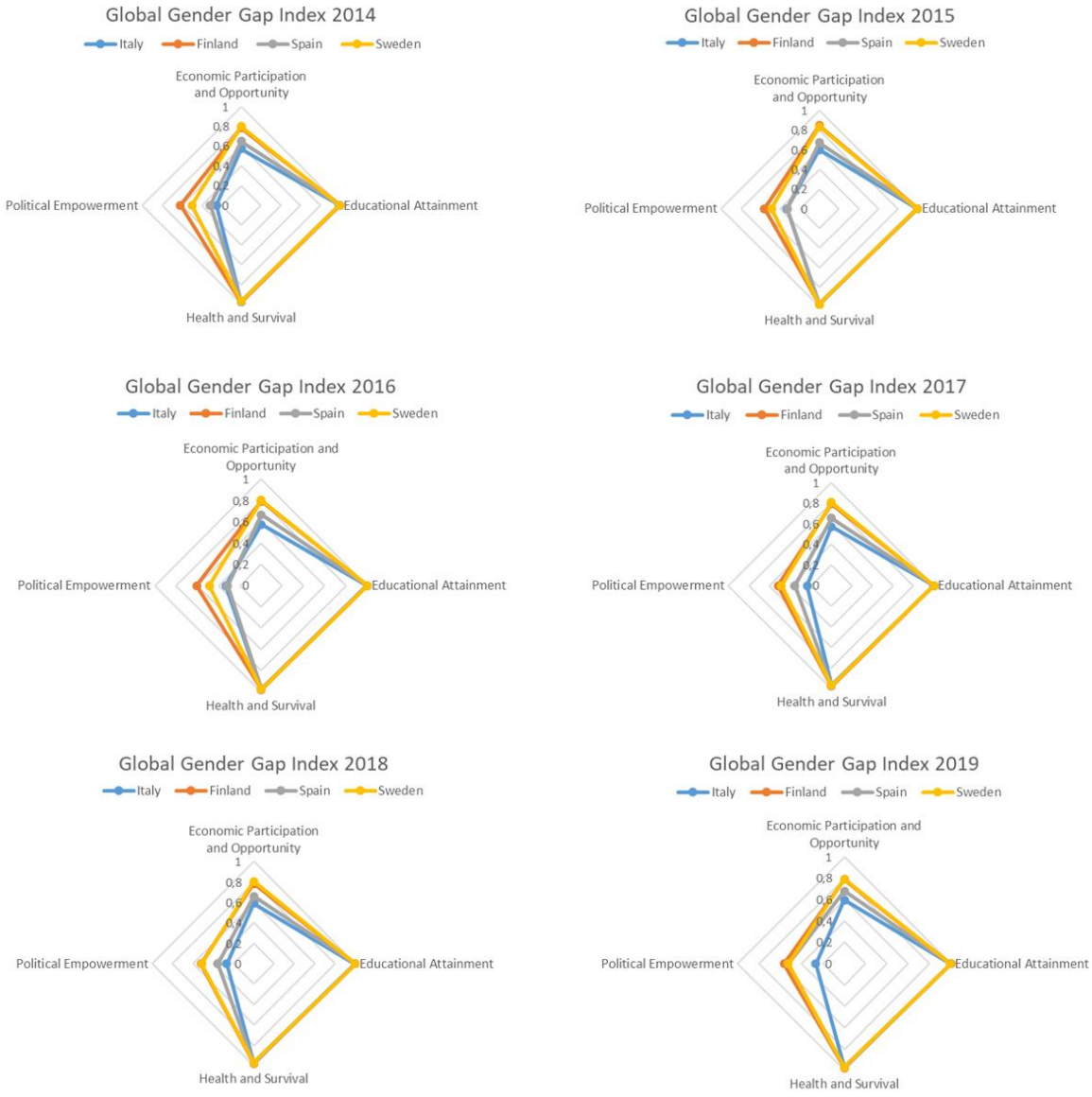


Figure 3.1. This figure compares the trend of the global gender gap in Finland, Italy, Spain and Sweden from 2014 to 2019.



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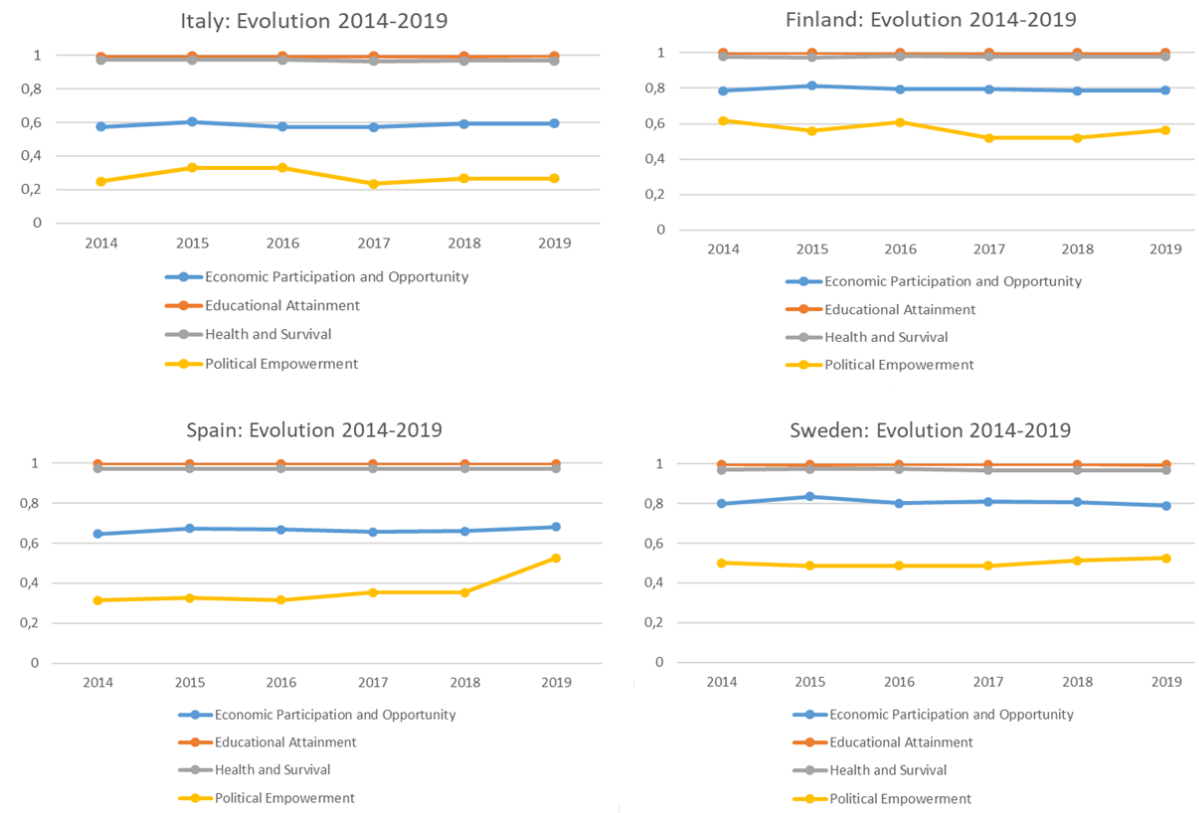


Figure 3.2. This figure shows the evolution of the global gender gap within Finland, Italy, Spain and Sweden from 2014 to 2019.

Finland (83.2%) and Sweden (82.0%) are among the main countries with the highest gender equality in the world, respectively, in the 3rd and 4th positions, while Spain (79.5%) is 8th overall, and Italy is 76th. In terms of the Economic Participation and Opportunity sub-index, Finland and Sweden are 18th and 16th positions respectively, while Italy with a score of 59.6% is 117th, and Spain with 68.1% is 72nd.

## 4. Sample

We conduct a cross-platform analysis by investigating equity crowdfunding local platforms operating in four different countries. We build up a hand-collected dataset of 626 equity crowdfunding campaigns pitched on equity crowdfunding platforms active in Italy, Spain, Sweden, and Finland at the date of data collection (December 2019). We choose these four countries in order to reach a twofold objective: 1) having micro data on equity crowdfunding which are disclosed to public in a comparable format, and 2) considering countries with a strong different ranking in terms of gender gap. After considering missing information for some variables included in our model, the final sample counts 626 observations.

Our sample is built by using different sources: the equity crowdfunding platforms in Italy and Spain are found on national registries, whereas there is not a national registry for equity crowdfunding platforms in Sweden and Finland.

The list of Italian authorised equity crowdfunding platforms is from the CONSOB registry. All the authorised equity crowdfunding platforms, according to the Italian regulation, are

registered on this list. In December 2019, there were 18 platforms with active campaigns: Action Crowd, Back To Work 24, Cofyp, CrowdFundMe, Crowd Invest Italia, Ecomill, Fundera, Idea Crowdfunding, Investi-RE, Leonardo equity, Lita.co, Mamacrowd, Muum Lab, Next Equity, OpStart, Stars Up, 200Crowd, We are starting.

The list of Spanish platforms is from the Comision Nacional del Mercato de Valores (CNMV), in which all the licensed crowdfunding platforms are listed. At the time of data collection, there were 10 platforms with active campaigns: Adventureros, Bizkaia, Capital Cell, Einicia, Fellow Funders, Fundeen, La Bolsa Social, SociosInversores, StartupXplore, The Crowd Angel.

The list of Finnish and Swedish platforms is found on the report of the European Crowdfunding Network "Country Crowdfunding Factsheet – Finland – June 2018", from which we select only the equity crowdfunding ones: Invesdor and Vauraus in Finland and FundedByMe in Sweden.

The list of platforms is reported in Table 4.1, which shows the country, the city in which the platform is located, and the foundation year (we only report platforms included in our empirical analysis).

| Platform | Country | City | Foundation year |
|---|---|---|---|
| Action Crowd | Italy | Milan | 2012 |
| BackToWork 24 (ex Equinvest) | Italy | Milan | 2014 |
| CrowdFundMe | Italy | Milan | 2013 |
| CrowdInvest Italia | Italy | Prato | 2018 |
| Fundera | Italy | Milan | 2014 |
| Investi-RE | Italy | Milan | 2015 |
| Mamacrowd | Italy | Milan | 2014 |
| Next Equity | Italy | Macerata | 2014 |
| OpStart | Italy | Bergamo | 2015 |
| StarsUp | Italy | Livorno | 2013 |
| The Best Equity | Italy | Milan | 2018 |
| Two-Hundred – 200 Crowd | Italy | Brescia | 2014 |
| We Are Starting | Italy | Bergamo | 2014 |
| Bizkaia | Spain | Bilbao | 2018 |
| Capital Cell | Spain | Barcelona | 2014 |
| Einicia | Spain | Madrid | 2015 |
| Fellow Funders | Spain | Madrid | 2016 |
| La Bolsa Social | Spain | Madrid | 2015 |
| Invesdor | Finland | Helsinki | 2012 |
| FundedByMe | Sweden | Stockholm | 2011 |

Table 4.1. Equity crowdfunding platforms.

We analyse a 6-year time span (i.e., from 2014 to 2019), since this is the only period for which information is available for all the investigated countries.

## 5. Variables and data sources

We gather information on equity crowdfunding campaigns from the platform's website and from the original offering documents, where they are recorded and publicly available.

To ensure that investors are fully aware of the risks associated with their investment, the online portal has to provide them with specific and detailed information on the start-up and public offer (i.e., information on the project; business plan and internal organisation of the start-up; banks and investment companies taking care of the payments relating to each subscription; any costs borne by investors; professional investors already subscribed to a part of the shares; any public offer already launched by the same start-up on other online portals, etc.). Moreover, this information has to be continuously updated.

Only the start-up will be responsible for its completeness and truthfulness. Once the campaign is ended, invested amounts are transferred from the escrow accounts to the founders' accounts. After that, investors become shareholders in the company, and they acquire all the established rights. Conversely, when the funding goal is not reached, the platforms will refund the invested amount to investors. All the successful campaigns are displayed on platforms websites following a similar structure, ensuring homogeneity and comparability for the collected information.

We collected information about the features of the offers (i.e., the fundraising goal, the amount raised, the equity offered and the minimum investment allowed for each campaign) and of the founders, including their total number and their gender, as reported on the "Team" page of each campaign. The public data available have some limitations. Some information referring to the identity of the investors, founders, and CEOs' start-up are incomplete or unavailable. Moreover, many platforms allow investors to invest in a crowdfunding campaign using the 'Anonymous' identity. Considering missing data, our final sample includes 626 observations.

Since our aim is to investigate the role of female entrepreneurs on the success of equity crowdfunding projects, our dependent variable is a proxy for the campaign success. Following prior studies on the topic (Ahlers *et al*., 2015; Colombo *et al*., 2015; Vismara, 2016) we measure success in two different ways: 1) the (natural log of) number of investors (*ln_invest*), and 2) the percentage of the amount raised at the end of each campaign (*perc_amount*).

To test our hypotheses, we include a comprehensive list of explanatory variables, which are in line with the crowdfunding literature.

Our main interest variables are related to female entrepreneurship as a driver of campaign success (Mohammadi and Shafi, 2017): *woman* is a dummy variable taking the value of 1 if at least one founder is female or the CEO is female, and 0 otherwise. We also consider separately these two roles, with a dummy identifying the presence of a female founder (*femf*) or a woman CEO (*ceo_gender*).

To analyse the impact of gender inequality on the success of women entrepreneurs, we build two interaction terms: the first is the product between the dummy *woman* and the value of the gender gap index (*woman_ggg_index*), while the second focuses on the subindex measuring

women's labour force Economic Participation and Opportunity (*woman_epo_subindex*). We do not include the value of the gender gap index (or the EPO subindex) standing alone, since its effect would be not distinguishable from other factors that are country-specific and time-variant. In order to consider all (unobservable) time-variant country-specific variables, we include in all our models country*year fixed effects (other than platform fixed effects).

Finally, we also include a set of additional control variables to account for other factors that, following previous studies, might be a relevant driver of success for equity-based crowdfunding campaigns. First, we consider the "size" of the campaign, proxied by its fundraising goal variable (*target_a*), measured as the natural logarithm of the amount that founders seek to raise using crowdfunding, in millions of euros (Mollick, 2014; Block *et al*., 2018).

Second, we include some variables to consider the perceived riskiness of the proposal. As outlined by Ahlers *et al*. (2015) and Vismara (2016), a relevant signal for investors is the amount of equity retained after an offering (*min_equity_off*), which is attentively set by entrepreneurs to signal the unobservable characteristics of their start-up. Entrepreneurs have also the opportunity to include in the offering document a more precise and detailed overview of the risks, in order to reduce the problem of asymmetric information, so that investors will have a better basis to formulate their expectations (Epstein and Schneider, 2008). Including a disclaimer will help to increase the total amount of funding; on the contrary, not offering any disclaimer and no financial forecast increases the risk of ambiguous information. For this reason, we include a variable (*financ_info*) equal to 1 if financial information about the company is available on the platform and 0 otherwise.

All campaigns posted on the platform feature rich content, including the possibility to upload a video in order to make the purpose of the project better known to investors. Since many empirical studies show the importance of a product video and the quality of the images in increasing the probability of success (Kunz *et al*., 2016; Angerer *et al*., 2017; Vismara *et al*., 2017; Block *et al*., 2018), we also include the natural logarithm of the number of visualisations of the video uploaded on the project page (*ln_vis*).

Lastly, as almost one-half of the companies in our sample belongs to the services industry, we include an industry dummy variable (*service*), which takes the value of 1 if the company belongs to the services industry, and 0 otherwise. Table 5.1 provides an overview of the variables and their description. Table 5.2 reports the descriptive statistics of the variables used in our regression analysis for each country.

| **Variable name** | | **Description** |
|---|---|---|
| | *Dependent variables* | |
| Number of investors (Ln) | *ln_invest* | Number of investors that funded the project at the end of the campaign |
| Amount raised (%) | *perc_amount* | The percentage of the amount raised at the end of the campaign. |
| | *Explanatory variables* | |
| Woman | *Woman* | Dummy variable equals to 1, if at least one entrepreneur (founder or CEO) is a woman, and 0 otherwise. |

| Variable name | | Description |
|---|---|---|
| Ceo gender | *ceo_gender* | Dummy variable equal to 1, if the Ceo is a woman, and 0 otherwise. |
| Female founders | *Femf* | Dummy variable equals to 1, if the founder is a woman, and 0 otherwise. |
| Global gender gap index | *ggg_index* | Percentage of the gap between men and women. The index is equal to 1 for complete integration; and 0 for inequality. |
| Economic opportunity gender gap subindex | *epo_subindex* | Percentage of the gap between men and women for the economic opportunities. The subindex is between 0 and 1. It is equal to 1 if parity is achieved; and 0 for inequality. |
| | *Control variables* | |
| Service | *Service* | Service is an industry dummy variable which takes the value of 1 if the company belongs to the "service" sector |
| Target capital (€) | *target_a* | Amount of target capital to be raised |
| Ln video | *ln_vis* | Number of visualisations of the video uploaded on the project page. |
| Financial info | *finance_info* | Dummy variable equal to 1 if financial information on the company is available on the platform, and 0 otherwise. |
| Equity offered (%) | *min_equity_off* | Percentage of equity offered. |

Table 5.1. Variable definitions. This table shows the variables used in this paper, distinguishing by dependent, explanatory and control variables.

| ITALY | | | | | |
|---|---|---|---|---|---|
| | Observation | Mean | Std. Dev. | Min. | Max. |
| | | *Dependent variables* | | | |
| Number of investors | 274 | 3.6311 | 1.4296 | 0 | 7.6406 |
| Amount raised | 274 | 2.0663 | 1.8862 | 0 | 9.4991 |
| | | *Explanatory variables* | | | |
| Woman | 274 | .2774 | .4485 | 0 | 1 |
| Ceo gender | 272 | .0993 | .2996 | 0 | 1 |
| Female founders | 274 | .2518 | .4349 | 0 | 1 |
| | | *Control variables* | | | |

| | | | | | |
|---|---|---|---|---|---|
| Global gender gap index | 274 | .7055 | .0088 | .6920 | .7260 |
| Economic opportunity gender gap subindex | 274 | .5864 | .0104 | .5710 | .6030 |
| Target capital | 274 | 11.5984 | .9099 | 5.1985 | 14.6040 |
| Ln vis | 274 | 6.6378 | 1.2538 | 0 | 12.5520 |
| Financial info | 274 | .5511 | .4983 | 0 | 1 |
| Equity offered | 274 | 7.9751 | 6.9137 | .020 | 40 |

**FINLAND**

| | Observation | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| *Dependent variables* | | | | | |
| Number of investors | 112 | 4.8759 | 1.2155 | .6931 | 7.4639 |
| Amount raised | 112 | 1.7919 | 1.2598 | .1912 | 9.4991 |
| *Explanatory variables* | | | | | |
| Woman | 112 | .2411 | .4297 | 0 | 1 |
| Ceo gender | 112 | .1250 | .3322 | 0 | 1 |
| Female founders | 112 | .2232 | .4183 | 0 | 1 |
| *Control variables* | | | | | |
| Global gender gap index | 112 | .8346 | .0119 | .8210 | .8500 |
| Economic opportunity gender gap subindex | 112 | .7944 | .0102 | .7859 | .8150 |
| Target capital | 112 | 12.2322 | 1.0138 | 10.1267 | 14.2210 |
| Ln vis | 112 | 5.7877 | 3.0473 | 0 | 9.6623 |
| Financial info | 112 | .9911 | .0945 | 0 | 1 |
| Equity offered | 112 | 8.6366 | 10.1415 | .0432 | 73.51 |

**SWEDEN**

| | Observation | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| *Dependent variables* | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Number of investors | 191 | 4.3502 | .9987 | 1.7918 | 8.5264 |
| Amount raised | 191 | 1.6002 | 1.2967 | .0182 | 9.4991 |
| *Explanatory variables* | | | | | |
| Woman | 191 | .3089 | .4633 | 0 | 1 |
| Ceo gender | 189 | .2011 | .4019 | 0 | 1 |
| Female founders | 191 | .2932 | .4564 | 0 | 1 |
| *Control variables* | | | | | |
| Global gender gap index | 191 | .8185 | .0030 | .8150 | .8230 |
| Economic opportunity gender gap subindex | 191 | .8060 | .0125 | .7900 | .8360 |
| Target capital | 191 | 11.7202 | 1.0305 | 9.1597 | 15.7198 |
| Ln vis | 191 | 5.5548 | 3.3676 | 0 | 12.9976 |
| Financial info | 191 | .8115 | .3921 | 0 | 1 |
| Equity offered | 191 | 9.7131 | 10.2847 | .020 | 74.93 |

**SPAIN**

| | Observation | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| *Dependent variables* | | | | | |
| Number of investors | 49 | 4.2890 | .8234 | 1.6094 | 6.6733 |
| Amount raised | 49 | 1.1694 | .2583 | .9168 | 2.7356 |
| *Explanatory variables* | | | | | |
| Woman | 49 | .3265 | .4738 | 0 | 1 |
| Ceo gender | 49 | .2041 | .4072 | 0 | 1 |
| Female founders | 49 | .2449 | .4345 | 0 | 1 |
| *Control variables* | | | | | |
| Global gender gap index | 49 | .7610 | .0241 | .7325 | .7950 |
| Economic opportunity gender gap subindex | 49 | .6665 | .0109 | .6470 | .6810 |

| | | | | | |
|---|---|---|---|---|---|
| Target capital | 49 | 12.4456 | .8096 | 10.8198 | 14.2855 |
| Ln vis | 49 | 6.2527 | .8777 | 4.1109 | 8.6846 |
| Financial info | 49 | .3878 | .4923 | 0 | 1 |
| Equity offered | 49 | 12.6196 | 6.2416 | 1.64 | 30.30 |

Table 5.2. Descriptive statistics. These tables show the descriptive statistics of the sample of crowdfunding campaigns launched on the Italian, Finnish, Swedish and Spanish platforms between 2014 and the end of December 2019.

Looking at the summary statistics for our dependent variables, we can observe that the average (natural log of) number of investors ranges from 3.6311 in Italy to 4.8759 in Finland (since they are in natural log, this corresponds to a range from about 38 persons in Italy to 131 in Finland). The average percentage of amount founded with respect to the goal is quite high and ranges from about 117% in Spain to about 207% in Finland, with a very large variability. In terms of female presence, we can see that the dummy *woman*, on average, ranges from about 24% in Finland to about 33% in Spain, showing that women are still a minority in crowdfunding campaigns, but their quote is not so small as in other venture finance contexts.

## 6. Empirical analysis and main results

As previously argued in Section 3, we use two different variables measuring the success of the equity-crowdfunding campaign: following Ahlers *et al*. (2015) and Barbi and Mattioli (2019), we run a standard OLS regression for the natural logarithm of the number of investors that funded the project (*ln_invest*). Then, following Ahlers *et al*. (2015), Colombo *et al*. (2015) and Vismara (2016), we also study the amount raised at the end of the campaign, as a percentage of the set goal (*perc_amount*).

Since this variable present some very large outliers, we winsorize values at the 99$^{th}$ percentile (for a similar approach, see Ahlers *et al*., 2015; Vismara, 2016; Vulkan *et al*., 2016; Piva and Rossi-Lamastra, 2017).

We also include platform fixed effects, in order to account for unobserved time invariant heterogeneity across several platforms. Finally, our models incorporate country*year fixed effects, capturing unobservable factors which are country-specific and time-variant and may have an effect on crowdfunding campaigns (i.e., the degree of crowdfunding legitimacy over time, economic cycle, etc.).

Table 6.1 shows the results of our main model, in which we jointly consider the presence of a woman among founders or as a CEO.

| **VARIABLES** | **(Model 1)**<br>**ln_invest** | **(Model 2)**<br>**perc_amount** |
|---|---|---|
| Woman | 2.795* | 7.158*** |

| VARIABLES | (Model 1) ln_invest | (Model 2) perc_amount |
|---|---|---|
| | (1.473) | (2.188) |
| woman_ggg_index | -3.497* | -8.961*** |
| | (1.887) | (2.790) |
| Service | -0.066 | -0.144 |
| | (0.102) | (0.131) |
| target_a | 0.274*** | -0.487*** |
| | (0.076) | (0.117) |
| ln_vis | 0.084*** | 0.048* |
| | (0.018) | (0.027) |
| financ_info | -0.053 | -0.147 |
| | (0.150) | (0.204) |
| min_equity_offered | 0.006 | 0.009 |
| | (0.005) | (0.006) |
| Constant | -2.784** | 6.215*** |
| | (1.238) | (1.490) |
| Observations | 626 | 626 |
| R-squared | 0.433 | 0.241 |
| Platform Fixed Effects | Yes | Yes |
| Country*Year Effects | Yes | Yes |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6.1. The table details the coefficients of our empirical analysis. Model 1 shows the coefficient of a standard OLS regression (using robust standard errors) of the number of individual investors that made pledges in the campaign (*ln_invest*), on the chosen explanatory variables. Model 2 shows the coefficients of a standard OLS regression (using robust standard errors) of the percentage of the amount raised at the end of the campaign (*perc_amount*), on the chosen explanatory variables. Since this variable present some very large outliers, we winsorize values at the 99$^{th}$ percentile In each analysis we include independent variables referring to woman entrepreneurs (*woman*), the global gender gap index between men and women (*woman_ggg_index*), the sector of industry (*service*), the information related to the amount that founders seek to raise using crowdfunding (*target_a*), the number of the visualisations of the video upload on the project page (*ln_vis*), the financial information (*financ_info*), the equity offered (*min_equity_off*). All the specifications include country*year and platform fixed effects. Robust standard errors are in brackets. ***, ** or * denote significance at the 1%, 5% and 10% levels, respectively.

In Model 1, campaign success is measured by using the (natural log of) total number of investors at the end of the campaign, while in Model 2 our dependent variable is the percentage of the amount raised (with respect to the goal).

Our results show that women entrepreneurs perform well in the equity crowdfunding scenario, since the dummy *woman* has a positive effect on both the number of investors (Model

1, coefficient = 2.795, significant at 10%) and the amount raised at the end of the campaign with respect to the goal (Model 2, coefficient = 7.158, significant at 1%). In both cases, the effect of having a woman as one of the founders or as CEO is positive and statistically significant, at the 10% confidence level or less. These results provide support to our first hypothesis ($H_1$ *Female-led equity crowdfunding campaigns are more successful than male ones*)

Our findings are consistent with Horvat and Papamarko (2017) that, analysing four years' worth of data from one of the leading UK equity crowdfunding platforms, show that women entrepreneurs benefit of higher success rates in fund raising. We also confirm the evidence found by Malaga *et al*. (2018), Bapna and Gianco (2019) and McGuire (2020) in the United States context.

Next, we observe the coefficient for our interaction variable, in order to examine the role of the global gender gap index (*woman_ggg_index*). Both in Model 1 and Model 2, the coefficient is negative and statistically significant at the 10% confidence level or less: more in details, in Model 1 the coefficient is -3.497, significant at 10%, and in Model 2 it is coefficient=-8.961, significant at 1%. These coefficients are both negative and very large: considering the possible values of the global gender gap index (i.e., a minimum of 0.6920 in Italy and a maximum of 0.85 in Finland), this interaction effect is able to cancel out a large part the effect of the dummy *woman*. In fact, if we run the model including only the dummy *woman* and not considering the interaction with the gender gap index, we only find a small positive effect of having a female founder or CEO. This may explain why some studies (Vismara, 2016; Piva and Rossi-Lamastra, 2017) show that female entrepreneurs do not differ from their male counterparties in terms of ability to attract investors.

We can conclude that considering either the number of investor or the percentage amount founded, it seems that the positive effect of having a woman as one of the founders or as CEO is higher in countries with a larger gender gap and lower in countries where there is more gender equality. This is consistent with our second hypothesis ($H_2$ *The advantage for female-led equity crowdfunding campaigns is stronger in countries where women are further from equal opportunity*).

Referring to our control variables, we find quite intuitive results with respect to the size of the project (*target_a*): a larger size has a positive correlation with the number of investors involved and makes it more difficult to raise the target amount of funds.

Moreover, we find that the number of visualisations of the video (*ln_vis*) uploaded on the project page has a positive impact on the equity crowdfunding campaigns. In details, in Model 1, the visualisations are significant at 1%, while in Model 2 at 10%. These findings are consistent with previous studies focusing on the relationship among the presence of a video, the images quality, the number and the updates of comments and the campaigns success probability (Kunz *et al*., 2016; Angerer *et al*., 2017; Vismara *et al*. 2017; Block *et al*., 2018). Following previous studies (Hervé *et al*., 2016), the relevance of communication may be another source of advantage for women, taking that they show stronger social networks compared to men (Idemudia *et al*., 2017). Moreover, Gorbatai and Nelson (2015) argue that:

> […] women are generally more empathetic to others' needs, being able to position their idea as desirable from the perspective of its ideational characteristics […] women are better at telling a story that resonates with potential crowdfunding investors, and are less likely to use money- or finance-related language than men.

Women promoting a crowdfunding campaign tend to use a more emotional and inclusive language in videos and pitches than men. This language is more appealing to female and male investors, and it is positively correlated to the fundraising success. Therefore, a greater presence of women in entrepreneurship would bring both positive qualitative and quantitative effects, as women have strong skills and abilities, particularly in interpersonal and communicative relationships (Gorbatai and Nelson, 2015).

In Table 6.2, we run another OLS regression, in which our key independent variable is built using the Equal Participation and Opportunity sub-index, rather than the overall gender gap index, focusing our attention on the component more interesting to our aims (*woman_epo_subindex*).

| **VARIABLES** | **(Model 1)** **ln_invest** | **(Model 2)** **perc_amount** |
|---|---|---|
| Woman | 1.560** | 3.671*** |
| | (0.732) | (1.099) |
| woman_epo_subindex | -2.078** | -4.866*** |
| | (1.009) | (1.511) |
| Service | -0.066 | -0.143 |
| | (0.102) | (0.132) |
| target_a | 0.272*** | -0.490*** |
| | (0.076) | (0.118) |
| ln_vis | 0.084*** | 0.049* |
| | (0.018) | (0.027) |
| financ_info | -0.047 | -0.138 |
| | (0.150) | (0.205) |
| min_equity_off | 0.585 | 0.892 |
| | (0.535) | (0.633) |
| Constant | -2.772** | 6.218*** |
| | (1.238) | (1.502) |
| Observations | 626 | 626 |
| R-squared | 0.434 | 0.241 |
| Platform Fixed Effects | Yes | Yes |
| Country*Year Effects | Yes | Yes |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6.2. The table details the coefficients of our empirical analysis. Model 1 shows the coefficient of a standard OLS regression (using robust standard errors) of the number of individual investors that

made pledges in the campaign (*ln_invest*), on the chosen explanatory variables. Model 2 shows the coefficients of a standard OLS regression (using robust standard errors) of the percentage of the amount raised at the end of the campaign (*perc_amount*), on the chosen explanatory variables. Since this variable present some very large outliers, we winsorize values at the 99th percentile In each analysis we include independent variables referring to woman entrepreneurs (*woman*), the economic and opportunity participation subindex between men and women (*woman_epo_index*), the sector of industry (*service*), the information related to the amount that founders seek to raise using crowdfunding (*target_a*), the number of the visualisations of the video upload on the project page (*ln_vis*), the financial information (*financ_info*), the equity offered (*min_equity_off*). All the specifications include country*year and platform fixed effects. Robust standard errors are in brackets. ***, ** or * denote significance at the 1%, 5% and 10% levels, respectively.

We use this sub-index because it is based on the following three features: the participation gap, the remuneration gap, and the advancement gap. The participation gap is captured by using the difference between women and men in labor force participation rates; the remuneration gap is proxied by the ratio between the estimated female-to-male earned income and a qualitative indicator measuring the wage equality for similar work; while the advancement gap is proxied by the ratio of women to men among legislators, senior officials, and managers, and the ratio of women to men among technical and professional workers. Our findings are consistent with the main model and support our second hypothesis: in countries where the female labor force participation is lower than that of men and in which there is a greater gender inequality, women are more likely to be successful in equity crowdfunding campaigns, both in terms of the number of investors and the amount collected at the end of the campaign.

To make our results more robust, in Table 6.3 and Table 6.4 we separately consider the role of female CEOs and female founders, respectively. This distinction is important to consider that being in the team of founders may have a different impact on the design and management of the proposed project than being in a pivotal role as a CEO. As it can be easily deducted from summary statistics presented in Table 5.2, these figures often overlap (the correlation is positive and equal to about 53%). As a consequence, we cannot run a model considering both roles together. Running separate models, results are less statistically robust, but our main conclusions remain the same.

| **VARIABLES** | **(Model 1)**<br>**ln_invest** | **(Model 2)**<br>**perc_amount** |
|---|---|---|
| ceo_gender | 2.043 | 10.750*** |
| | (1.962) | (3.533) |
| ceo_ggg_index | -2.766 | -13.553*** |
| | (2.475) | (4.391) |
| service | -0.073 | -0.149 |
| | (0.105) | (0.134) |
| target_a | 0.267*** | -0.497*** |
| | (0.080) | (0.126) |

| VARIABLES | (Model 1) ln_invest | (Model 2) perc_amount |
|---|---|---|
| ln_vis | 0.085*** | 0.055** |
| | (0.018) | (0.027) |
| financ_info | -0.070 | -0.196 |
| | (0.153) | (0.211) |
| min_equity_off | 0.641 | 1.078* |
| | (0.542) | (0.646) |
| Constant | -2.030** | 7.743*** |
| | (1.007) | (1.621) |
| Observations | 622 | 622 |
| R-squared | 0.430 | 0.241 |
| Platform Fixed Effects | Yes | Yes |
| Country*Year Effects | Yes | Yes |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6.3. The table details the coefficients of our empirical analysis. Model 1 shows the coefficient of a standard OLS regression (using robust standard errors) of the number of individual investors that made pledges in the campaign (*ln_invest*), on the chosen explanatory variables. Model 2 shows the coefficients of a standard OLS regression (using robust standard errors) of the percentage of the amount raised at the end of the campaign (*perc_amount*), on the chosen explanatory variables. Since this variable present some very large outliers, we winsorize values at the 99$^{th}$ percentile In each analysis we include independent variables referring to ceo gender (*ceo_gender*), the global gender gap index between ceo men and women (*ceo_ggg_index*), the sector of industry (*service*), the information related to the amount that founders seek to raise using crowdfunding (*target_a*), the number of the visualisations of the video upload on the project page (*ln_vis*), the financial information (*financ_info*), the equity offered (*min_equity_off*). All the specifications include country*year and platform fixed effects. Robust standard errors are in brackets. ***, ** or * denote significance at the 1%, 5% and 10% levels, respectively.

| VARIABLES | (Model 1) ln_invest | (Model 2) perc_amount |
|---|---|---|
| femf | 2.520 | 5.771** |
| | (1.532) | (2.258) |
| femf_ggg_index | -3.187 | -7.296** |
| | (1.961) | (2.884) |
| service | -0.066 | -0.164 |
| | (0.104) | (0.137) |
| target_a | 0.274*** | -0.495*** |
| | (0.077) | (0.121) |

| VARIABLES | (Model 1) ln_invest | (Model 2) perc_amount |
|---|---|---|
| ln_vis | 0.083*** | 0.051* |
| | (0.018) | (0.028) |
| financ_info | -0.055 | -0.181 |
| | (0.151) | (0.207) |
| min_equity_off | 0.577 | 0.843 |
| | (0.538) | (0.644) |
| Constant | -2.059** | 7.495*** |
| | (0.994) | (1.546) |
| Observations | 622 | 622 |
| R-squared | 0.431 | 0.230 |
| Platform Fixed Effects | Yes | Yes |
| Country*Year Effects | Yes | Yes |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6.4. The table details the coefficients of our empirical analysis. Model 1 shows the coefficient of a standard OLS regression (using robust standard errors) of the number of individual investors that made pledges in the campaign (*ln_invest*), on the chosen explanatory variables. Model 2 shows the coefficients of a standard OLS regression (using robust standard errors) of the percentage of the amount raised at the end of the campaign (*perc_amount*), on the chosen explanatory variables. Since this variable present some very large outliers, we winsorize values at the 99$^{th}$ percentile In each analysis we include independent variables referring to the number of female company's founders (*femf*), the global gender gap index between founders men and women (*femf_ggg_index*), the sector of industry (*service*), the information related to the amount that founders seek to raise using crowdfunding (*target_a*), the number of the visualisations of the video upload on the project page (*ln_vis*), the financial information (*financ_info*), the equity offered (*min_equity_off*). All the specifications include country*year and platform fixed effects. Robust standard errors are in brackets. ***, ** or * denote significance at the 1%, 5% and 10% levels, respectively.

## 7. Conclusions

While women are generally found at a disadvantage with respect to male counterparts in traditional credit markets, this seems not to be the case for alternative funding channels like crowdfunding. In this paper, we run a cross-country empirical analysis over 2014–2019 in order to provide new evidence on female presence in equity-crowdfunding campaigns. Using 626 observations across Finland, Italy, Spain, and Sweden we find that woman have an advantage with respect to men, considering both the number of investors involved and the ability to reach the target amount of funds. However, this advantage is strongly reduced in countries where there is a higher gender equality and a larger value of the Global Gender Gap Index.

Our focus on the moderating role of gender equality has required a cross-country setting, which naturally reduces the depth of data at disposal. Further studies adopting a micro perspective may provide in the future more evidence on the drivers of female advantage. Our main findings are consistent with both the *warm glow* and the *stereotype* theory, suggesting that investors are more likely to prefer women in contexts where females are more disadvantaged with respect to men, and are more likely to be ideally linked to figures (such as mothers) caring about others. This result suggests that perceptions and stereotypes maybe a relevant driver of crowdfunding success, calling for more research on the impact of culture in alternative finance.

This result has relevant practical implications, suggesting that equity crowdfunding maybe an effective funding channel for female entrepreneurship, especially in countries where this is still less developed than male one, giving a significant contribution to the path towards gender equality. It also has important policy implications, providing regulators with further evidence in favour of facilitating the development of alternative finance and creating a level playing field across European countries.

**Keywords:**

entrepreneurial finance; equity crowdfunding; female entrepreneurship

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