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Greenhorns or old stagers: Is equity crowdfunding in Poland inclusive?

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ABSTRACT

Objective: The article aims to indicate whether equity crowdfunding (ECF) in Poland is inclusive and whether the attributes of inclusivity influence the campaign's success.

Research Design & Methods: The research covers all ECF campaigns in Poland from 2012-2022. The data collection includes details on equity offers, the companies' top management teams (TMT) structure, and crowdfunding campaign results. We implemented the ANOVA analysis to verify the hypotheses, and further, based on the data obtained, we built the regression models.

Findings: Most of the surveyed entities are characterized by a lack of inclusive attributes. The dominant part of entities founded by ECF are companies located in Warsaw or the capitals of voivodships, managed by men aged between 31-59.

Implications & Recommendations: The results show that there is no reason to believe that issuers who are gender inclusive will be more successful in ECF. Moreover, there is no evidence to reject the claim that the inclusiveness of the issuer measured by the age of the CEO can affect the success of the issue. However, the location of the issuer can affect the success of an ECF offer.

Contribution & Value Added: Previous research on inclusivity has been conducted mainly in countries with high ethnic diversity. This research identifies the attributes of inclusiveness appropriate for ethnically homogeneous countries. Moreover, we conducted a comprehensive analysis of companies active in the ECF market in Poland.

Article type:	research article
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INTRODUCTION

In the beginning, people saw crowdfunding as a funding form suitable mainly for charity projects, and its donation model gained significant interest. Equity crowdfunding (ECF) developed slower, mainly because of regulations, legal constraints, and the question of trust. However, after the financial crisis of 2008-2010, scientific research confirmed that its importance as a financial source appropriate for new ventures increased (Moritz & Block, 2014; Lukkarinen *et al*., 2016). Previous study showed ECF to be an adequate form of financing for entities with limited access to funds (Schwienbacher & Larralde, 2010; Ahlers *et al*., 2015; Brown *et al.*, 2018; Lukkarinen *et al.*, 2022) mainly because of the lack of credit history, size, and innovative sector. Thus, people saw ECF as a form for entrepreneurs who just started their business, and have no or little experience. The terms such as 'new venture,' 'newly born entrepreneurship,' or 'enterprise in early stages' characterize only the entity itself as a legal form. They characterise neither the entrepreneurs nor the founders. It is impossible to check and asses the entrepreneurship profile cannot only based on the entity's age. The key figure is the entrepreneur and their characteristics. Research on reward crowdfunding highlights the importance of personal attributes and strategic planning in shaping

growth aspirations in research on reward crowdfunding (Beier & Wagner 2017), similar to ECF studies – among others by Cumming *et al.* (2021), Vismara *et al.* (2017), and Butticè and Vismara (2022).

Despite the growing body of literature on ECF, several research gaps remain. These include the need for longitudinal studies to examine the long-term impact of ECF on firms and investors, as well as the integration of behavioural theories (*e.g.*, signalling theory, agency theory) to better understand investor and entrepreneur dynamics (Huynh, 2016; Chang, 2023). Moreover, people increasingly use ECF platforms to support sustainable technological initiatives, particularly those addressing social and environmental challenges. However, communicating the credibility of sustainability intentions remains a challenge for entrepreneurs seeking funding through ECF. Future research should explore how ECF platforms can better facilitate the co-creation of sustainable solutions and how investors perceive the value proposition of sustainable projects (Yanez-Valdes & Guerrero, 2023).

One of the most significant challenges in ECF is information asymmetry between entrepreneurs and investors. Entrepreneurs often possess more information about their ventures than investors, leading to adverse selection and moral hazard (Huynh, 2016; Mazzocchini & Lucarelli, 2022). Hence, the characteristics of the entrepreneur seem to be an important factor in investment decisions on ECF.

In this article, we focus on the entrepreneurs' characteristics concerning the ECF campaign in Poland. The importance of the Polish economy in the CEE Region is based, among others, on the size of the country and the inhabitants number. It is a market with significant purchasing power. Moreover, Poland has a well-developed capital market. The Warsaw Stock Exchange was ranked fifth based on capitalization in 2021 among 15 European stock markets and has a dominant position in the region (Kicia & Kordela, 2024). ECF has developed a lot recently in Poland. To the best of our knowledge, there is no complex research on entrepreneur profiles financed by ECF in Poland, we try to fill this research gap.

We aimed to indicate whether ECF in Poland is inclusive and whether the attributes of inclusivity influence the campaign's success. We treated the title metaphorically, so the old stager was a synonym for a middle-aged white man from the big cities. As opposed to greenhorns, which tend to be young, and not evident in business, considering experience, background, gender, and other personal characteristics. Another goal was to identify factors proving the inclusive nature of ECF (World level, Poland level) analysis of the relationship between the characteristics of enterprises and entrepreneurs and the funding.

In the next section, we will focus on literature underpinning, which was the basis for the hypotheses development. The third section will include the methodology. In the fourth section, we will present and discuss the results. We will conclude by emphasizing the most important results, indicating the limitations and future research directions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The topic of financial inclusion is gaining importance, the Web of Science Core Collection (WoS) shows more than 8 440 publications connected to this topic, of which over 1 604 are in the field of economics, 905 in the business finance area, more than 620 in business, and over 530 in management. The number of citations is also growing dynamically. The literature provides many definitions of financial inclusion. A few years ago, scholars typically defined financial inclusion as using formal financial services (Allen *et al.*, 2016), and associated it primarily with banking and access to traditional financial intermediaries. A broader definition suggests that financial inclusion means ensuring access to formal financial services and products, such as transactions, credit cards, payments, savings and insurance, that are provided in a sustainable manner (Singh & Singh Kondan, 2011). Another approach defines it as a process that ensures the ease of access, availability, and usage of the formal financial system for all economy members (Sarma & Pais, 2011). Increasingly, financial inclusion is understood as access to financial services, not necessarily to the services of the banking sector, and not necessarily to services provided by traditional financial intermediaries. It is an essential process, particularly in least-developed countries, where inequality in wealth distribution can lead to financial exclusion, and economic growth is crucial for increasing financial inclusion (Cicchiello *et al.*, 2021b).

Microfinance has an crucial role in financial inclusion (Ghosh, 2013; Brown *et al.*, 2016; Macchiavello, 2017; Mushtaq & Bruneau, 2019; Milana & Ashta, 2020). In conditions of failure to meet the needs of enterprises by traditional financial intermediaries, bottom-up initiatives such as microfinance or crowdfunding may provide capital to the entities. Based on an analysis of research conducted in African countries, Lwesya and Mwakalobo (2023) concluded that small and medium enterprises face significant obstacles to fulfilling their potential to grow because of a lack of finance and inadequate access to sources of finance. Similar problems resulting from other reasons are also noticeable in Europe. Due to the low profitability of banks and relatively strict rules and regulations aimed at combating risk-taking after the financial and debt crises, access to capital at the early stage of enterprise development is insufficient (Blaseg *et al.*, 2021). Among research topics connected to microfinance, the cluster regarding constraints on microcredit for SMEs is the largest (Lwesya & Mwakalobo, 2023). ECF is a chance for SMEs to fill the financial gap (Kim & De Moor, 2017).

Crowdfunding is an initiative started by the grassroots movement, not by major financial institutions. Thus, we may perceive the crowdfunding development as increasing the availability of funds, as pro-inclusive activity. The literature refers to pro-inclusive changes in the capital market as a democratization process of capital markets. This is a situation where the capital markets can create an environment in which entrepreneurs and investors typically underrepresented in these markets can participate (Mollick & Robb, 2016). Hence, the financial markets' democratization means their openness, lower requirements, easier access to funds, higher involvement of small investors, and lower bureaucratic constraints, which make them more inclusive. These two terms are therefore closely related. Financial inclusion can lead to a reduction in the cost of capital, the improvement of financial management, and the protection of investors and borrowers from fraud. At last, an inclusive financial system ensures safe saving practices and generally facilitates a range of efficient financial services, leading to increased efficiency and prosperity (Sarma & Pais, 2011). Scholars see ECF as a promising way to promote financial inclusion (Kim & De Moor, 2017), and describe it as a fintech tool for sustainable financial inclusion in the financial system (Venturelli *et al.*, 2020). Moreover, Vismara (2019) states that crowdfunding has an essential contribution to the inclusivity and democratization of financial markets considering both the needs of entrepreneurs and the expectations of investors. The subject is worth exploring, there is still a little research on it. The WoS gives 48 records on crowdfunding and financial inclusion (date to March 2025). None show the situation in the CEE region, which differs from Western countries based on its economics and political past, and the homogeneous ethnic origin of the inhabitants. To contribute to that research area, we explored the relationship between ECF and the financial inclusion of entrepreneurs. In line with the work of Butticè and Vismara (2022), we focused on entrepreneurs' inclusivity understood as the inclusion of silver entrepreneurs (we also added the inclusion of young ones), the inclusion of entrepreneurs in rural or peripheral areas (outside the capital of Poland, and outside of voivodeship capitals), as well as the inclusivity of women entrepreneurs, which we added based on literature review. The qualities that characterise people in TMT positions are called inclusiveness attributes. Research focused on financial inclusion and crowdfunding analysis of various attributes of inclusion.

In ethnically diverse societies like the US, race is a very important factor of entrepreneurship inclusion another is gender, geographical location, firm age or founder age, and even education (Figueiredo & Bendelá, 2024).

Trying to find the answer to whether crowdfunding democratizes access to funding, Mollick & Robb (2016) considered two features, *i.e.*, geographic and gender bias. The literature does not provide explicit answers on the impact of gender on the success of an ECF campaign. For example, regarding gender bias, Mollick and Robb (2016) recall numerous studies proving that female entrepreneurs generally are active in low capital requirements sectors, and are less active in both angel investors and venture capital markets. Further, in the case of crowdfunding, Lwesya and Mwakalobo (2023) revealed just four publications related to gender and ECF. However, the number seems to be higher and is increasing, and scholars have conducted studies on gender and crowdfunding from different perspectives (Horvat & Papamarkou, 2017; Geiger & Oranburg, 2018; Venturelli *et al.,* 2020; Gafni *et al.*, 2021; Wesemann & Wincent, 2021; Zhao *et al.*, 2021; Figueroa-Armijos & Berns, 2022; Prokop & Wang, 2022; Wang *et al.*, 2023a; Davis *et al.,* 2023; Wang & Prokop, 2025).

To the best of our knowledge, Horvat and Papamarkou (2017) conducted one of the first studies on crowdfunding and the issue of gender involvement. In their research, they considered data from one of the leading UK-based ECF platforms. Research shows that women entrepreneurs benefit from higher fundraising success rates in ECF, the campaigns led by female entrepreneurs are slightly more successful than male-led campaigns (Horvat & Papamarkou, 2017). This is in line with the research by Zhao *et al.* (2021). They studied 259 projects from ECF platforms in China and found that female entrepreneurs are more likely to receive funding through ECF than their male counterparts. This, in turn, is consistent with Cicchiello *et al.* (2021a), who found that having at least one woman on the board of companies seeking equity financing increases campaign success rates. However, the conclusions of another study by Cumming *et al.* (2021), are not consistent with the results mentioned above. According to them, there is no evidence for a higher likelihood that women attract investors. Similar results come from research conducted in the USA, where it was proven that campaigns raise significantly less funding as the target amount increases when the leading signatory is female (Geiger & Oranburg, 2018). In comparison, Prokop and Wang (2022) found that female-led ventures have comparable results in raising capital to those without women. No advantageous effect for female entrepreneurs in crowdfunding indicates Wang *et al.* (2023b). These conclusions align with the results from the French ECF platform (Andrieu *et al.*, 2021). The research revealed that the presence of women in top management positions even reduces the likelihood of funding. Moreover, the representation of women as leaders of crowdfunding campaigns is much lower (only 9.73%) compared to French statistics about women entrepreneurship (which is 39%) (Andrieu *et al.*, 2021). There are many contradictions in the research results. The latest study based on data from a Chinese ECF platform shows no significant funding difference between entrepreneurship led by men and women. Moreover, mixed-gender teams outperform single-gender teams (Chuang *et al.*, 2025). Cross-sectional research conducted in 64 countries indicates that being a female entrepreneur (or a rural person) as a key characteristic of an individual increases the likelihood of financing a project fully (Figueroa-Armijos & Berns, 2022). Research on women's project financing is also inconclusive. Women as crowdinvestors are more likely to fund projects from female entrepreneurs (Bonvino *et al.*, 2025). While, previous research suggests otherwise, namely that female investors are more likely to invest in projects strongly supported by men (Mohammadi & Shafi, 2018). Since the findings are inconclusive, we wanted to contribute to this discussion. Perhaps due to cultural factors or the degree of development of the crowdfunding market in the studied countries, the results are not clear, hence there is a need to further explore the topic. The women in Poland are underrepresented in business, their share in the business is below the EU average, and to be more visible, and to succeed they need to be better prepared for competition. Thus, hypothesised:

H1: Companies with women in top management team (TMT) members are more successful in ECF offerings.

Cumming *et al.* (2021) have not only studied the relationship between gender and ECF. Moreover, they also checked the relationship between age and crowdfunding campaign success. They noticed that studies on ECF had neglected age issues. They cite the examples of Bill Gates (founder of Microsoft) and Mark Zuckerberg (co-founded Facebook), who founded companies at the age of nineteen as examples of the importance of young entrepreneurship. When examining the propensity to the entrepreneurship of novices, they noticed that it has a U-shaped age trend, falling around the age of 60, they also distinguished the age of 30 as the limit for propensity to work full-time (Zhang & Acs, 2018). The research indicates ECF seems to be an adequate form for innovative entrepreneurship, to fund projects with financing handicaps on the traditional financial market, and to build financing opportunities for young entrepreneurs and silver entrepreneurs. On the one side, there is little publication on age and ECF. On the other, some assumptions are pointed out about the adjustment of crowdfunding for young entrepreneurs. Conducting the analysis, we tried to fill this gap.

Hence, our following hypothesis considers age as an attribute of inclusivity.

H2: Companies with age-inclusivity top management team (TMT) members (under 30 or over 60) are more successful in equity crowdfunding offerings.

There is relatively little research on the influence of geographic location on the success of a crowdfunding campaign. A study on the reward model of crowdfunding demonstrates that since it is based on innovative IT solutions, it makes the expectation to constrain the geographical bias. At the same time, it emphasizes the role of intermediaries and the importance of addressing gender equality (Kromidha *et al.,* 2023). However, in the case of reward-based crowdfunding, there are studies indicating its uneven development across the US (Gallemore *et al.*, 2019), or a negative relationship between the geographic distance of funders and the success of crowdfunding projects (the farther a funder is located from the project, the lower the probability of the project's success) (Omrani *et al.,* 2022). There is still a gap regarding the geographical distance and ECF (Butticè & Vismara, 2022). The results of the studies on musical projects show crowdfunding thanks to the involvement of the internet relaxes a geographic constraint (Agrawal *et al.*, 2010). However, it concerns the geographic distribution of funders, not the projects themselves. Scholars studied the locations of campaigns founder for example in global cities (like Berlin, Bangalore, San Francisco, or Shanghai). Conclusions indicate the influence of location on campaign success, campaigns from global cities are more successful and have more foreign funders (Chakravarty & Ahsan, 2023). The site counts in a supply of crowdfunds, in more populated and prosperous regions the sources of funds are higher (Rostamkalaei & Freel, 2023).

The subject of our study was entrepreneurs' inclusivity. In this field, Roma *et al.* (2017) found the geographic location of the venture may influence ECF performance. Moreover, the geographic location has also served as a variable in a few other ECF research (Zhao *et al.,* 2021). The most recent research proves that spatial distance limits financial activity. Moreover, the number of ECF investments decreases with geographic distance (Cai *et al.*, 2024). In Poland, similar to many other countries, the capital is the business centre. Therefore, we wanted to check the campaign outcomes of firms in and outside the capital. In general, it seems that the Internet reduces the importance of location, as a consequence, crowdfunding would make it easier for entities outside the capital to raise funds. Agrawal *et al.* (2015) indicate ECF will increase financing opportunities by reducing distance-related costs. The relationship between success in ECF and geographical location differs among the countries.

In Brazil, entrepreneurs located in metropolitan areas are less likely to succeed. There are the following explanations. Firstly, in the rural areas, there is less competition, and as a consequence, it is easier to attract the interest of investors. Secondly, metropolitan companies have handicaps like greater competition making it more challenging to attract and impress potential investors (Figueiredo & Bendelá, 2024). In turn, on German market support is focused rather on projects that are closer to residence place (Wang & Prokop, 2025). The national capital tends to be an area with a higher average disposable income compared to other cities and a higher capital concentration. Therefore, we tested whether the location of a company's headquarters in Warsaw could be important for the success of crowdfunding offers in Poland. As crowdfunding is perceived as a complement to 3F financing, and the local community often actively participates in financing the crowdfunding campaign, we formulated a hypothesis:

H3: Companies outside voivodeships' capital cities are more successful in equity crowdfunding offerings.

Considering all the above, in our research we pointed out the following attributes of inclusivity: the board of management with female member(s), the supervisory board female member(s), the age of the CEO (under 30 or over 60), the location of headquarters outside voivodeship's capital cities. Poland is an ethnically homogeneous country. In the study, we found the share of foreigners in TMT to be non-statistically significant.

Despite its potential to democratize access to capital, ECF has not fully addressed the funding disparities faced by underrepresented entrepreneurs, such as women and ethnic minorities. While ECF has reduced structural barriers for some groups, gender and racial biases persist among investors, limiting its inclusivity. Further research is needed to identify strategies to enhance diversity and inclusion in ECF markets (Chang, 2023; Paul & Rena, 2024). That research gap, related directly to inclusiveness and indirectly to understanding investor behaviour in ECF inspired us. The above-presented research pointed out the investor's and entrepreneurs' behaviour regarding inclusivity attributes. We follow the

way. However, first of all, we comprehensively examined all three attributes to get the whole picture. Secondly, we studied the Polish market, which was not the subject of previous papers.

We formulated the following research question: Are there differences between entities with inclusive attributes and other entities in the effects of crowdfunding campaigns (size of the goal, amounts raised, degree of goal achievement, number of investors)? Our hypothesis investigated the relations between chosen attributes of inclusivity and the success of the ECF campaign.

RESEARCH METHODOLOGY

Sample and Data Collection

The study subject was the campaigns of companies that raised capital on crowdfunding platforms in Poland in the period 2012-2022. Data on all ECF campaigns that took place during this period was collected in a public database by Trzebinski[1] and provided the authors with a starting point for analysis. We removed all records involving suspended or cancelled campaigns and entities whose data were unavailable in the National Court Register. In the following step, we collected additional data on TMT size, gender structure, age, and headquarters location at the period of offering. We retrieved data manually for each venture from a public database of the National Court Register. Again, records with missing data on TMT members or headquarters were removed from the database. For the final analysis, we accepted data on 259 ECF campaigns carried out by 220 companies out of 280 equity campaigns included in the initial sample.

Based on the obtained data, we aimed to identify the characteristics of enterprises using ECF, and thus further diagnose whether ECF in Poland supports financial inclusion. We considered an entity to be inclusive if at least one of the following conditions was met: there was a woman on the management or supervisory board, the entity was managed by a person under the age of 30 or over 60, a foreigner sat on the management board or supervisory board, the entity was located outside the voivodeship capital[2] (Figure 1).

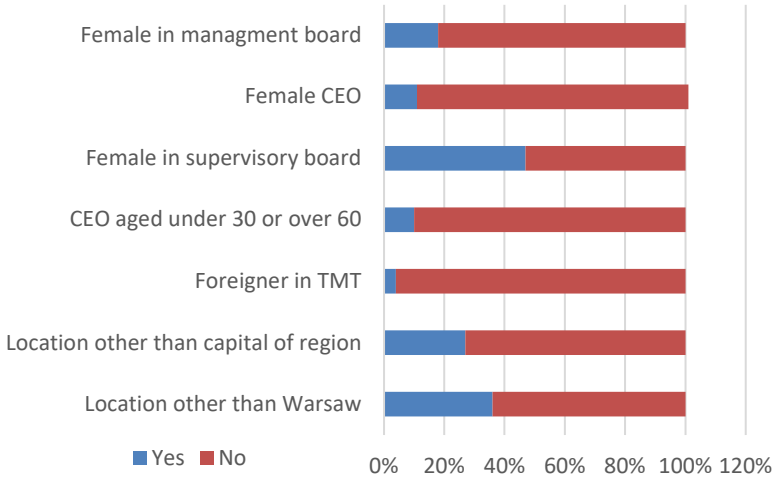

Figure 1. Main traits of the entities included in the sample
Source: own elaboration.

The collected data indicated that entities with inclusive attributes build the minority in the sample. Our research showed that women were on the boards of 18% of companies that use ECF. This is a slightly better result compared to the whole of Poland. Research shows that women are in about 17% of management boards of public companies, while in the European Union, it is about 30%. The vast

[1] https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroun-Color=green
[2] The term 'top management team' (TMT) is used in business and academia to refer to the relatively small group of the most influential people in a company. The structure of companies, and companies' bodies differ between countries, legal forms, and economic systems. We used this term to refer to members of the management board and the supervisory board.

majority of companies included in the sample (90%) were managed by people aged 31 to 59. Just 27% of entities active on ECF platforms were located outside the voivodeship capital, furthermore, 64% of companies were located in Warsaw (the capital of the country).

Table 1 presents the main descriptive statistics of the campaigns included in the sample. The average and median values of the set goal of the campaigns were higher than the average and median values of the results. Thus, considering the whole sample the companies received less funds than planned. However, we also analysed campaigns that were suspended or withdrawn before the end of the deadline, partly due to low interest in the offer.

Table 1. The main descriptive statistics of the campaigns included in the sample, all are valued in PLN

Variable	Mean	Median	Lower quartile	Upper quartile	Minimum	Maximum
Goal in PLN	2 031 224	1 923 135	982 309	2 962 494	50 000	5 000 000
Result in PLN	1 142 968	747 315	226 917	1 577 250	4 726	4 550 000

Source: own study based on a database by Trzebiński, Wrocław University of Economics, Poland, https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroundColor=green (DOA 10 May 2023).

Model and Variables

We divided the collected data into two groups. The first group of variables included measures of the effectiveness of equity-based crowdfunding offers. The second group included measures that could determine this effectiveness as indicated in the literature review, specifically those related to the inclusiveness of crowdfunding.

We used the following variables to describe the effectiveness of crowdfunding campaigns:

- *SuccessRate* – continuous variable, the ratio of the capital collected in the equity-based crowdfunding offer (*Funded*) to the target value of the offer (*Goal*); values equal to or greater than 1 represent the success of the offer, otherwise, failure to meet the goal;
- *Investors* – discrete variable, number of investors who responded to the offer and invested capital in stocks or shares; while it is difficult to arbitrarily indicate any minimum level of committed investors that can be considered satisfactory, a higher number of investors can be considered an indicator of success, depicting a grander scale of response to the offering and mobilization of capital;
- *Funded* – continuous variable, the value of capital collected in the equity-based crowdfunding offer in Polish zloty; the higher amount of capital collected indicates a positive reception of the investment proposal;
- *FundedToEquity* – continuous variable, the ratio of the capital collected to the value of the equity offering;
- *IsSuccess100* – binary variable, equal to 1 if the financial goal of the offer has been achieved or exceeded, or 0, otherwise;
- *IsSuccess80* – binary variable, equal to 1 if at least 80% of the financial goal of the offer has been achieved or 0, otherwise; the variable assumes a less restrictive approach to recognizing the offer as successful;
- *IsSuccess60* – binary variable, equal to 1 if at least 60% of the financial goal of the offer has been achieved or 0, otherwise; the variable takes an even more liberal approach to deeming an issuance successful, and was introduced to check if loosening the requirements to meet the financial target would reveal a different set of factors; the median *SuccessRate* of all observations is 0.66 indicating that a level of over 60% of the financial goal of the equity-based crowdfunding offer can be also considered as a success.

Table 2 provides descriptive statistics of the variables.

Table 2. Descriptive statistics of success measures of equity crowdfunding campaigns in Poland in 2012-2022

Variable	N	Minimum	Maximum	Average	Lower quartile	Median	Upper quartile
SuccessRate	259	0.0000	3.3333	0.6427	0.2100	0.6600	1.0000
Investors	235	0	9 125	941	51	115	322
Funded, PLN	258	4 726	4 550 000	1 205 163	278 763	881 364	1 678 179
FundedToEquity	195	0.42	50.00	12.87	8.00	11.00	17.34
IsSuccess100	258	0	1	0.37	–	–	–
IsSuccess80	258	0	1	0.42	–	–	–
IsSuccess60	258	0	1	0.51	–	–	–

Source: own study based on a database by Trzebiński, Wrocław University of Economics, Poland, https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroundColor=green (DOA 10 May 2023).

The second group of variables describes offers and the issuers. We considered these variables as potential factors for the offer's success:

- *IsFemBoard* – dummy variable equal to 1 if there was at least one woman as a member of the management board member at the time of the offer, or 0 otherwise;
- *IsFemCEO* – dummy variable equal to 1 if a woman was CEO at the time of the offer, or 0 otherwise;
- *IsFemSupBoard* – dummy variable equal to 1 if there was at least one woman as a member of the supervisory board at the time of the offer, or 0 otherwise;
- *IsCEOun30* – dummy variable equal to 1 if the CEO was under the age of 30 at the start of the offering or 0 otherwise;
- *IsCEOov60* – dummy variable equal to 1 if the CEO was older than 60 at the time the offering began, or 0 otherwise;
- *IsOutProvCap* – dummy variable equal to 1 if the company's headquarters was located outside the regional capital or 0 otherwise; a variable entered into the model similar to the research (Zhao *et al.,* 2021);
- *IsInWarsaw* – dummy variable equal to 1 if the company's headquarters was located in Warsaw or 0 otherwise; a variable introduced into the model to check the importance of Warsaw as the capital of Poland and the attractiveness of the place, which may, in the opinion of investors, offer a potentially more significant chance of business success for the idea being financed;
- *Goal* – continuous variable, the amount expressed in Polish zloty, the value of the issue goal as communicated by the issuer with the launch of the offering;
- *Year* – the year of the issue;
- *LegalForm* – discrete variable, describing the form of business: 1 – simple joint-stock company, 2 – joint-stock company, 3 – limited joint-stock partnership, 4 – limited liability company, 5 – limited liability limited partnership; from the point of view of investors, joint-stock companies may be seen as more attractive, given the ease of capital entry and exit;
- *IssuePrice* – continuous variable describing the proposed issue price per share or share in an ECF offering;
- *BoardMembers* – discrete variable, the number of board members who were serving in the company at the time of the launch of the issue;
- *YearCEOBorn* – the year of birth of the CEO; the variable extends the dimension of inclusivity of the company contained in the discrete variables *IsCEOun30* and *IsCEOov60;*

We used the variables *IsFemBoard*, *IsFemCEO,* and *IsFemSupBoard* to verify hypothesis H1. The variables *IsCEOun30*, *IsCEOov60,* and *YearCEOBorn* served to verify hypothesis H2. The variables *IsOutProvCap* and *IsInWarsaw* served to verify hypothesis H3. We used all the variables indicated above to identify the success factors of ECF offers. Table 3 provides descriptive statistics of the variables defining the various dimensions of the success of the implemented ECF campaigns.

Table 3. Descriptive statistics of inclusiveness factors and potential success of equity crowdfunding campaigns in Poland in 2012-2022

Variable	N	Minimum	Maximum	Average	Lower quartile	Median	Upper quartile
IsFemBoard	259	0	1	0.18 (0.39)	–	–	–
IsFemCEO	259	0	1	0.11 (0.31)	–	–	–
IsFemSupBoard	259	0	1	0.47 (0.50)	–	–	–
IsCEOun30	247	0	1	0.06 (0.24)	–	–	–
IsCEOov60	247	0	1	0.04 (0.20)	–	–	–
YearCEOBorn	247	1952	1997	1979.81 (9.29)	–	–	–
IsOutProvCap	259	0	1	0.23 (0.42)	–	–	–
IsInWarsaw	259	0	1	0.36 (0.48)	–	–	–
Goal (PLN)	259	50 000.00	5 000 000.00	2 045 405.68 (1 386 981.74)	999 996.00	1 999 964.50	3 000 034.25
Year	259	2012	2022	2 020.01 (1.74)	2020	2021	2021
LegalForm	258	1	5	2.39 (0.89)	2	2	2
IssuePrice (PLN)	203	0.23	75 000.00	1 017.44 (5 747.24)	6.04	28.80	102.50
BoardMembers	259	0	5	1.53 (0.76)	1	1	2

Source: own study based on a database by Trzebiński, Wrocław University of Economics, Poland, https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroundColor=green (DOA 10 May 2023).

We first subjected variables describing the success of the equity-based crowdfunding offer and success factors to a simple analysis to identify potential intra-group and inter-group correlation relationships. In the first group of variables, a relatively strong correlation between the various measures of success, showing a fairly consistent picture of the categories included in this set. Non-significant correlations were most common for the *FundedToEquity* and *Investors* index. The first observation indicated that an offer's success, understood as collecting expected capital, does not depend on the issuer's size. In contrast, the second indicates that this success is also not determined by many investors responding to the offer. Regarding success factors, the analysis revealed weak and mostly statistically insignificant relationships between factors. With these results variables describing issuers can be considered as independent.

An ANOVA analysis used selected variables describing success factors as grouping variables to verify the hypotheses. Although the analysed campaign database consisted of all data-covered 259 cases from 2012-2022 and could be considered a large sample (>30 observations), it did not yet allow for deeper subgroup analyses. However, comparisons of ECF campaign results for groups differing in inclusivity parameters were possible with ANOVA and t-tests. The distributions of the factors analysed were independent, the sample was large and the distributions of the means did not deviate far from a normal distribution, regardless of the shape of the population distribution (Central Limit Theorem). With this assumption, the results of statistical tests, such as ANOVA or t-test, become robust to deviations from normality. Moreover, we tested the assumption of homogeneity of variance with Levene's test. We then estimated Linear and logistic regression models to explain the joint impact of variables.

For discrete variables, we compared measures of success between groups of observations with and without attributes suspected to be a factor of success. For continuous variables, we compared measures of success between groups with factors observed below and above the median value. For the *LegalForm* variable, we compared the two main forms in which entities pursued issuance: joint-stock company (N=201) and limited liability company (N=41) representing 93.4% of observations. We performed the analysis using IBM SPSS software.

RESULTS AND DISCUSSION

An analysis of correlational interdependencies between measures of success of ECF offers and potential factors of success tentatively identified several key parameters that were relatively weak but statistically significantly related to measures of the success of the offer. These included the goals of the offer (*Goal*, negative relationship prevails), legal form of the issuer (*LegalForm*, positive relationship prevails), year of organization of the issue (*Year*, negative relationship prevails), and issue price (*IssuePrice*, positive relationship prevails). There may be potential relationships between issue success and location. However, we did not find any correlations in the area of inclusivity in terms of gender and age of TMT. We also discovered the negative relationship between measures of success and the presence of the shareholders' family on the issuer's management board.

For all ECF cases analysed, the average goal of the offer (*Goal*) was PLN 2 045 406 and allowed collecting an average of PLN 1 150 632 in a single offer (*Funded*), which resulted in a success rate (*SuccessRate*) of 64.26%. The collected capital allowed the average issuer to increase its equity more than a dozen times (the average *FundedToEquity* ratio was 12.87) and attracted 368 investors on average (*Investors*). If collecting at least the target capital was considered successful, 37% of cases can be considered successful (*IsSuccess100*). Moreover, 42% of issuers collected at least 80% of the goal, while 60% of the goal was collected in just over half of cases.

Gender

The presence of women either on the management board, serving as a CEO, or participating in the issuer's supervisory bodies was associated with setting a lower financial goal for the offer. The difference was statistically significant for issuers with a woman as a chairman (difference PLN 456 245; p-value = 0.05). A lower financial target was followed by a lower value of funds raised in an issue, the difference was statistically significant when a woman was present on the company's board (difference: PLN 331 587; p-value = 0.015) and when a woman served as a CEO (difference: PLN 349,831; p-value = 0.015). These results were consistent with the findings of Geiger and Oranburg (2018), Andrieu *et al.* (2021), and Cumming *et al.* (2021).

The difference in goals disappeared when we considered only the supervisory board. For other measures of ECF success, we found no statistical differences from the perspective of the presence of women in management or supervisory bodies. However, there was a significant positive effect of a female CEO on the success rate of an offer. Although the differences were not statistically significant, they were associated with a higher success rate, a higher ratio of issue proceeds to equity, and a higher chance of meeting the target at the 100%, 80%, and 60% threshold of the issue target. This result relates to the findings of Figueroa-Armijos, Berns (2022), and Zhao *et al.* (2021).

The presence of women on management boards (non-statistically) was associated with the opposite situation and hurt the effectiveness of the equity-based crowdfunding offer. In every case, the number of investors interested in an offer was lower when a woman served on the management board. Thus, apart from the cases indicated, there was no reason to believe that issuers who were gender inclusive would be more successful in ECF. In this case, the conclusion differs from the one presented in research by Cicchiello *et al.* (2021a).

Age

An analysis of the parameters of ECF offerings grouped by CEO age showed no deviation for younger (under 30, *IsCEOun30*) or older (over 60, *IsCEOov60*) executives. Although the success rate rose to 83.73%

for the youngest CEOs, while it dropped to 59.10% for the oldest, the differences compared to the other age groups were not statistically significant (p-value 0.071 and 0.356, respectively). A similar situation applies to other success measures. Thus, we did not confirm hypothesis H2: there is no evidence to reject the claim that the issuer's inclusiveness measured by the age of the CEO can affect the issue's success. Thus, the results for Poland did not support the relationship suggested by Cumming *et al.* (2021).

Location

It would seem that the fintech development reduces the importance of location in financial inclusion, and crowdfunding would ease access to funds for ventures outside the economic centre. However, our results regarding location were not entirely consistent with previous ones from the Brazilian market (Figueiredo & Bendelá, 2024) or Germany (Wang & Prokop, 2025). Poland's economic and business centre is its capital, and indeed, the vast majority of projects were placed by ventures with headquarters in Warsaw (64%). However, the provincial ventures were more successful. Indeed, we found significant statistical differences in the financial goal of the offer (*Goal*), the funds collected (*Funded*), the ratio of the funds collected to equity (*FundedToEquity*), and the number of interested investors (*Investors)*. Issuers whose headquarters were located outside regional capitals rather than in capitals set the highest financial goals (higher by PLN 755 274; p-value < 0.001), while issuers based in Warsaw set the lowest (lower than those outside Warsaw by PLN 509 123; p-value = 0.002). Since the success rates were similar, ranging between 64.01% and 64.75% depending on the location, the lower targets yielded a similar effect for the amounts collected in an offer. For entities located outside regional capitals, the average amount collected from equity-based crowdfunding was PLN 1 568 985 (p-value = 0.006), and for those located in Warsaw, it was the lowest, averaging PLN 865 512 (p-value < 0.001). Offers by issuers from outside of Warsaw also attracted a greater number of investors (an average of 450 versus 210 for Warsaw-based entities; p-value = 0.009), while entities outside of regional capitals attracted larger capital amounts in relation to their equity (16.32 times versus 11.77 times for the others; p-value = 0.001). Other measures of success were not statistically different between groups of entities by location. Given the indicated differences, we can assume that the location of the issuer can affect the success of ECF offers, and there is no evidence for rejecting hypothesis H3. Thus, the studied ECF offers bore the characteristics of inclusiveness due to the headquarters location and successful financing of entities from smaller centres. The results are related to the observations of Roma *et al.* (2017) and Zhao *et al.* (2021). Rostamkalaei and Freel (2023) focused on the geography of ECF supply but did not provide specific comparisons of campaign success based on issuer location in any country. They emphasize spatial influences on crowdfunding investment without confirming or contradicting our findings. Giudici *et al.* (2018) explain in their paper that geography influences crowdfunding success, showing that local altruism enhances project success, particularly in areas with strong social relations. However, it does not explicitly address ECF or compare results across different countries. In our study, we did not analyse the investor side. We may explore this theme in subsequent research involving investors who participate in ECF campaigns and declare to what extent sentiment towards local entities may influence their involvement in a project.

Regression Models

In the next step, we estimated linear regression models for continuous variables describing issue success (*Funded*, *SuccessRate,* and *FundedToEquity*) and logistic regression models for the dichotomous variable *IsSuccess100*. For each dependent variable, we estimated models based on all factors identified as potential success factors (Model 1A, 2A, 3A, and 4A respectively) as well as selected factors in a significant relationship with the success rate (Models 1S, 2S, 3S, and 4S respectively). We used logarithms of the offer financial goal (*Goal*) and collected financing (*Funded*) due to their range of variability compared to other variables in the model.

All linear regression models were statistically significant. Models of the collected capital confirmed a statistically significant negative impact on women's membership in the management board however a positive impact of a woman serving as CEO. By this, gender factors of the inclusiveness of equity-based crowdfunding proved to be significant. While these results may seem contradictory, they are also evi-

dence of the positive effect of inclusivity. The mere participation of women on the board, especially when they are not acting as CEO, must have a strong negative effect on the effectiveness of the offer, since it is neutralized by the positive effect of the female CEO. From this perspective, if gender inclusivity in a business project were to be used in ECF, the best solution is to have a woman acting as CEO, rather than just providing seats for women on a company's board managed by a male CEO.

Moreover, higher financial crowdfunding targets allow for a statistically higher nominal amount of capital collected. Furthermore, when the number of variables is reduced in the model, the positive effect of the legal form of the issuer, organized as a limited liability company, remains evident. In the models explaining the *SuccessRate* variable, setting a higher financial target (which is more difficult to achieve) had a negative effect. However, offering new shares by the limited liability company (preferred by investors as cost-effective to the joint-stock company) had a positive effect. In both models of the *FundedToEquity* variable, the inclusiveness parameter, related to the location of the issuer's headquarters outside the regional capital, turned out to be statistically significant. It had a positive effect on the studied variable (Table 4).

Table 4. Regression models: Factors of success in equity-based crowdfunding offers

Variables	Model 1A	Model 1S	Model 2A	Model 2S	Model 3A	Model 3S
	All	Selected	All	Selected	All	Selected
Dependent	Log(Funded)	Log(Funded)	SuccessRate	SuccessRate	FundedToEquity	FundedToEquity
Const	0.855 (.0.654)	0.677 (0.644)	2.399 *** (0.519)	2.291 *** (0.504)	-6.615 (9.591)	-14.729 (8.311)
IsFemBoard	-0.428 ** (0.152)	-0.327 * (0.143)	-0.209 (0.121)	–	-1.914 (2.000)	–
IsFemCEO	0.543 ** (0.188)	0.422 * (0.179)	0.245 (0.149)	–	4.951 * (2.470)	3.679 * (1.625)
IsOutProvCap	0.059 (0.098)	–	0.087 (0.078)	–	4.636 *** (1.367)	3.870 ** (1.266)
IsInWarsaw	-0.065 (0.086)	–	-0.041 (0.068)	–	1.311 (1.208)	–
Log(Goal)	0.731 *** (0.100)	0.799 *** (0.097)	-0.340 *** (0.079)	-0.313 *** (0.076)	2.967 * (1.475)	3.982 ** (1.370)
LegalForm	0.100 * (0.044)	0.106 * (0.044)	0.121 *** (0.035)	0.117 *** (0.035)	-1.246 (1.475)	–
Board4mbers	0.096 (0.053)	–	0.037 (0.042)	–	1.523 * (0.760)	1.038 (0.700)
F-test	10.535 ***	17.085 ***	6.607 ***	20.468 ***	5.208 ***	7.692 ***
Observations	249	252	250	255	186	190
R-squared	0.228	0.213	0.156	0.138	0.164	0.139
Adj. R-squared	0.207	0.201	0.132	0.132	0.132	0.121

Notes: Robust standard errors in parentheses. ***, ** and * indicates statistical significance at the 0.1%, 1%, and 5%, respectively.

Source: own study based on a database by Trzebiński, Wrocław University of Economics, Poland, https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroundColor=green (DOA 10 May 2023).

Logistic regression models explained 11.9-14.2% of the variance of the dependent variable. In both models, the inclusivity factors of an issuer were statistically insignificant. The value of the equity offer and the legal form of the issuer explained the odds of crowdfunding success. Both models similarly showed that a 10-fold increase in the offer value reduced the odds of the offer success by over 63%. In contrast, operating as a limited liability company increased the odds of success by 1.5-1.6 times compared to a joint-stock company (Table 5). Therefore, the results were consistent with those presented earlier for linear regression models.

The literature analysis and previous research on ECF success and gender-related obstacles and benefits did not give unequivocal results. The previous study collected from the population of US ECF campaigns showed that campaigns receive significantly less funding when the primary signatory was

female. Moreover, campaigns raised significantly less funding, as the target amount increased, when the primary signatory was female (Geiger & Oranburg, 2018), or in other cases, there were no significant gender effects (Wang *et al.*, 2023b; Chuang *et al.*, 2025). Thus, studies on ECF in the USA (Geiger & Oranburg, 2018), France (Andrieu *et al.*, 2021) or the UK (Cumming *et al.,* 2021) suggest that crowdfunding does not ease the handicap of women in raising funds to create startups. Our research was consistent with the results of these scientific works. Unlike studies of Figueroa-Armijos and Berns (2022), Zhao *et al.* (2021), and Cicchiello *et al.* (2021a), which support the thesis that women do not set lower funding goals than men, and they have higher rates of success than men, which in turn is in line with our results regarding the success rate of crowdfunding campaigns.

Table 5. Logistic regression models: chances of success in equity-based crowdfunding offers

Variables	Model 4A			Model 4S		
	All			Selected		
Dependent	IsSuccess100			IsSuccess100		
	B	Wald	Exp(B)	B	Wald	Exp(B)
Const	5.042 * (2.451)	4.234	154.854	4.439 (2.312)	3.686	84.728
IsFemBoard	-0.717 (0.604)	1.407	.488	–	–	–
IsFemCEO	0.935 (0.727)	1.653	2.548	–	–	–
IsOutProvCap	0.447 (0.359)	1.555	1.546	–	–	–
IsInWarsaw	-0.164 (0.321)	0.261	0.849	–	–	–
Log(Goal)	-1.079 * (0.380)	8.059	0.340	-0.981 ** (0.356)	7.583	0.375
LegalForm	0.492 ** (0.159)	9.636	1.636	0.445 ** (0.154)	8.338	1.561
BoardMembers	-0.085 (0.191)	0.197	0.919	–	–	–
-2 Log-Likelihood	–	312.172	–	–	316.958	–
Observations	–	242	–	–	242	–
Correctly classified	–	70.9%	–	–	71.3%	–
Nagelkerke R-squared	–	0.142	–	–	0.119	–

Notes: Robust standard errors in parentheses. ***, ** and * indicates statistical significance at the 0.1%, 1% and 5%, respectively.

Source: own study based on a database by Trzebiński, Wrocław University of Economics, Poland, https://airtable.com/shrXxy1MnmVD3hFuo/tblCtdOZ7FNdfdCI9/viwIMdWZAeI7ZdHPW?backgroundColor=green (DOA 10 May 2023).

There are quite a few studies regarding the TMT age. In our study, age did not have a meaningful impact. The sample may be too small to show the relation. Alternatively, Polish people over 60 years old were not very involved in economic activity or unfamiliar with modern financial sources. The technological progress, the fintech development, on the one hand, supports the financial inclusion of people (especially those living in the province or poorer), but on the other makes it somewhat difficult for older people unfamiliar with modern applications.

Financial and economic centres, which are mostly the capitals of the countries, have the highest intellectual and social capital. Therefore, it is not surprising that most of the studied campaigns were started by companies in Warsaw. However, the success factors are higher for companies located outside the capital. On the one hand, the online platform seems to eliminate most distance-related hurdles, on the other hand, it does not eliminate social-related frictions (Agrawal *et al.*, 2010). We may associate this, for example, with the greater integrity of local communities and creates interesting study fields. The impact of local communities and social capital may explain the results. Outside big

cities, there is less anonymity. This makes it easier to reach family and friends with information about the project. It is also easier to gain their favour due to the low competition from other local projects.

CONCLUSIONS

To our knowledge, the presented research is the first to empirically assess the potential of ECF in the financial inclusion of underrepresented categories of entrepreneurs in Poland. Our sample included all ECF campaigns, so the result shows the entire market perspective. Companies with inclusive attributes on ECF platforms are in the minority in Poland. Nevertheless, we would be inclined to say consistent with Mollick and Robb (2016) that crowdfunding to some extent 'can help take the democratization of innovation, entrepreneurship(…) By giving a voice to people who would otherwise never even have a chance to seek funding, let alone provide it, crowdfunding creates opportunities for new businesses and innovations, as well as a new wave of investors.'

Most of the surveyed entities were characterized by a lack of inclusive attributes. The dominant part of entities founded by ECF are companies located in Warsaw or the capitals of voivodships, managed by men between the ages of 31-59. These results may contribute to the literature on ECF and female entrepreneurship, young, and silver entrepreneurship, and the link between ECF and financial inclusion.

Our research is not free from limitations. First of all, this study relies on data collected in Poland, an ethnically homogeneous country, so we excluded nationality or ethnical background from the inclusivity attributes. Therefore, we focused on other features of entrepreneurs. However, we may apply this approach in other countries, at least from the Central and East Europe regions, which are generally ethnically homogeneous. The other factors are universal. Secondly, it would be valuable to study only the age, as it was the least studied. Due to the sample size, we did not do that. Thirdly, even if it covers the whole sample of ECF issues available for the study period, the sample itself is not large enough to compare all interesting subgroups *e.g.*, sectoral differentiation, which may build a good direction in further research. Furthermore, the interesting differences in the effects of crowdfunding campaigns depending on the issuer's location could not be explained by the data we used. However, other cited studies indicate that investor sentiment towards local actors and products may explain these differences. Extending the study to analyse the motivations and behaviour of the demand side (investors) would show the process from a broader perspective and could explain the effects we discovered.

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Use of Artificial Intelligence

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