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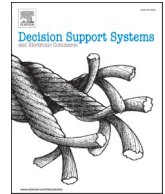
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# Growing pains and blessings: Manifestations and implications of equity crowdfunding industry maturation

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## ABSTRACT

The equity crowdfunding industry has grown significantly in the past decade. Industry life cycle theory suggests that growth dynamics and relations between stakeholders change as industries mature. The present study examines the characteristics and implications of maturation in the equity crowdfunding industry via the lens of industry life cycle theory. Specifically, we explore whether the industry is reverting to traditional entrepreneurial finance practice, or whether it retains its original distinguishing characteristics. Accordingly, we first assess changes with respect to users (investors) and products (campaigns and investment objects). Second, we assess the implications of these changes by comparing the determinants of fundraising campaign success in earlier and later industry stages. We use a longitudinal database and survey data sourced from a long-standing European equity crowdfunding platform. We show that equity crowdfunding seems to be converging towards traditional entrepreneurial finance practice, yet maintaining certain unique features stemming from digitality, platform nature, and investor diversity. Specifically, we show that (1) fundraising ventures and their campaigns have become larger and more professional, and (2) engaged investors became more knowledgeable and return-oriented. Accordingly, traditional investment criteria, such as team and commercial terms ratings, have become more important predictors of campaign success, and easily observable campaign characteristics, such as B2C business models, and minimum investment thresholds, less so. The findings support platform managers and entrepreneurs as they plan for campaigns seeking to attract investors in the industry's later stages.

## 1. Introduction

Equity crowdfunding (hereinafter 'ECF') is an innovative form of entrepreneurial fundraising growing in popularity and importance. At its core lie activities in which retail and institutional investors answer an open call by entrepreneurs offering to sell a specified amount of equity or bond-like shares via the internet to prospective investors [1]. Such exchanges are facilitated by platforms serving as two-sided markets that match entrepreneurs with prospective retail [2] and institutional investors [3].

Overall, the one-decade old ECF industry has grown dramatically, reaching a global volume of USD 1.5 billion within ten years since its inception [4], while democratizing entrepreneurial finance by providing access to funding to underrepresented groups of entrepreneurs [5]. Some researchers suggest ECF is likely to pose a real challenge to venture capital and angel investors [6], while others highlight the benefits of

their complementary involvement [7]. However, ECF industry growth has involved both growing pains and blessings.

In a recent thought piece, Schwienbacher [2] reflects on the industry's tumultuous growth, highlighting its success in terms of a first funded unicorn, first platform going public, a decade of healthy growth, and successful product diversifications. In parallel, he acknowledges that many ECF funded companies have gone bankrupt with many investors incurring losses, and suggests the industry still struggles to become mainstream [2]. Moreover, one may also consider victories in certain regulatory amendments and harmonization efforts, while, at the same time, acknowledge the pains of managing delicate relations with regulators during long periods of regulatory uncertainty [8].

Regardless of growth trajectories, there is agreement that the industry is on a path towards maturation [2], at least in a number of key markets such as the UK, USA, and Singapore [4]. Thus far, ECF has received substantial interest from researchers [9] and policymakers

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[10]. A recent literature review has identified 113 journal contributions and gray papers published on the subject between 2012 and 2017, capturing a variety of perspectives and themes [9]. However, this research largely refers to the early days of the industry.

Lifecycle theories suggest that the rules and dynamics characterizing any particular industry in its early days may no longer hold at later stages [11,12]. We do not currently know to what extent previous findings about equity crowdfunding are invariably inherent to the industry and to which extent they are rather unique expressions of early stage industry dynamics [13]. For instance, as the bulk of users shifts away from innovators and early adopters towards early majority adopters, new determinants of successful crowdfunding practice may become influential. Moreover, during this transition, previously influential determinants may either exert different or no effects [14].

More specifically, it is important to explore the implications and outcomes of the tension between idealism and pragmatism as the industry matures [15]. Such tension requires platform management to strike a balance between pressures towards hyper-professionalism and hyper-idealism [15].

Accordingly, we wish to examine whether the ECF industry is evolving towards traditional equity investment practices as employed by venture capitalists and business angels, or whether it retains its distinct practices driven by grassroots ideals. The latter is embedded in notions of financial democratization and reducing social inequalities thanks to allowing more people to invest, and more ventures to raise money [15–17]. We address this in two steps. First, we assess whether ECF has undergone a change from the industry emergence stage to its growth stage. We do this through the lens of industry lifecycle theory by examining two salient dimensions of industry change, namely users (investors) and products (campaigns and investment objects, that is, fundraising companies). Specifically, we examine changes in investor sophistication (which we define as investors' willingness and ability to select profitable investment targets, gained through education and experience), campaign information quality (quality of the textual, verbal, and visual information provided about the target company on the campaign page), and investment object quality (quality of the fundraising company as a financial investment). Second, after substantiating the existence of such changes, we assess their implications by comparing the determinants of successful campaigning in two time periods that reflect earlier and later industry stages. For this purpose, we use longitudinal data sourced from a long-standing Northern European ECF platform (Invesdor), supplemented by survey data collected from its users in 2015 and 2018, respectively, representing three and six years after the platform's establishment.

We find that, overall, while the industry enjoys the blessings of growing professionalism, it also suffers the pains of replacing idealism with pragmatism. ECF practice is converging towards traditional venture capital and business angel practices, yet maintaining certain unique features. Specifically, some of the factors often considered to underlie ventures' fundraising success (as captured in earlier research), such as significant early funding from entrepreneurs' private networks [18,19], the minimum allowed investment [1,20], and the business model [21], may have represented early-stage industry dynamics and the involvement of early user groups. Indeed, these factors have become less influential in determining success in later campaigns, while giving way to factors typically considered by more sophisticated investors. Maturation is reflected in campaigns and investment objects, on the one hand, and investors, on the other hand. Among investors maturation is due to both new investors joining and some of the old investors starting to think and behave in new ways. Nevertheless, equity crowdfunding does retain certain unique features pertaining to digitality, platform characteristics, and investor diversity, which continue to differentiate it from other forms of traditional entrepreneurial finance.

Our findings contribute to ECF literature in several ways. Firstly, we present a pioneering effort in capturing the characteristics and implications of maturation in the equity crowdfunding industry based on one

of very few longitudinal studies on ECF. Secondly, we show a shift in the relative importance of various determinants of ECF campaign success in early and later stage campaigns. Specifically, we provide evidence for increased (1) quality of investment objects and the information provided about them; (2) investor sophistication; and (3) reliance on traditional investment criteria (that is, the attributes of the offering and the fundraising company based on which the investor makes their investment decision) in investment decision making, as the ECF industry matures. The latter implying greater focus on team quality, commercial terms and financial returns, and less on simpler campaign indicators, such as minimum investment sums and distinction between B2C and B2B firms. As such, we answer recent calls for longitudinal research into aspects of ECF practice and investor decision making [9,14,22]. The findings help platform managers and entrepreneurs plan for campaigns that will attract investors in the industry's later stages.

In the remainder of the paper, we first review lifecycle theories at the industry and product levels, highlighting key mechanisms underlying maturation in each. Next, we apply these insights into the context of ECF, while suggesting hypotheses capturing expected changes in terms of users, products, and the determinants of ECF campaign success between early and later lifecycle stages. This is followed by an outline of our methodological choices, analytical procedures, and results. Later, our findings are critically discussed, while we conclude by highlighting the key contributions, limitations, and implications.

## 2. Industry and product lifecycle theory

*Industry lifecycle theory* (hereafter 'ILC') aims to capture regularities in the patterns in which industries age, as well as explain the changes in technological development and industry structure over such period [12]. This approach is often traced to Abernathy and Utterback's [23] investigation of industrial innovation patterns in the American car manufacturing industry. This was followed by Klepper's [11] approach suggesting regularities in how entry, exit, market structure, and innovation vary from birth to maturity of technologically advanced industries.

Parallel to these developments, a separate stream of research anchored in marketing literature has emerged, labelled as the *product lifecycle theory* (hereafter 'PLC'), focusing on the evolution of products and strategies for introducing them into markets. This theory aimed to produce a framework that could explain products' relative success or failure, and suggest when it is best to change marketing strategies (regarding, e.g., pricing, promotion, or product development). The framework could also explain when to discontinue production altogether [24]. Here, while various early works are identified as the sources of theory origination, most refer to Levitt's [25] framework of product life cycle stages as an important point of departure.

Both ILC and PLC assume a gradual change, where the introduction of innovation triggers reactions from market stakeholders, which, in turn, influence strategic decision making. While ILC often considers a dichotomous distinction between early and mature industry stages [12], PLC suggests that products go through four stages from introduction to growth, maturity, and eventually a decline [24]. Table 1 summarizes the key assumptions of both frameworks.

When examining the evolutionary stages presented by each framework, one can argue that ILC's industry emergence stage parallels PLC's product introduction and growth stages, while ILC's industry maturity stage parallels PLC's product maturity and decline stages. Hence, on the one hand, it is possible to view PLC as a more detailed version of ILC, acknowledging more stages along an innovative product's lifecycle. On the other hand, one may also consider the ILC as complementary to the PLC, where the former provides an industrial evolutionary context for a specific product's evolution process.

With growing popularity came critique that can be aimed at both frameworks. Although we frame the criticism in terms of the PLC, similar arguments typically apply also to ILC. Some suggested improving

**Table 1**  
Core assumptions.

Theory	Lifecycle Stages	Lifecycle stage characteristics
Industry lifecycle (ILC)	Birth or emergence	<ul style="list-style-type: none"> <li>• Technological innovation challenges existing solutions</li> <li>• High growth in firm numbers / market entry rates</li> <li>• Population-level learning and building legitimacy</li> <li>• Shift from product to process R&amp;D</li> <li>• Emergence of dominant design</li> <li>• High growth in firm market exists</li> <li>• Inter-industry effects take place (downstream and upstream integration, cross-firm competence acquisitions)</li> <li>• Slow growth marked by setbacks</li> <li>• Extent of uptake is unknown and uncertain</li> </ul>
	Maturity	<ul style="list-style-type: none"> <li>• Speed of uptake depends on product complexity, newness, fit with consumer needs, and availability of substitutes</li> <li>• Challenge in getting consumers to try product</li> <li>• Fast sales growth</li> <li>• Entry of multiple competitors</li> <li>• Product and brand differentiation</li> <li>• Challenge to become consumers' brand of choice</li> </ul>
	Market development or introduction	<ul style="list-style-type: none"> <li>• Opening new distribution channels and retail outlets</li> <li>• Market saturation – most customers already own the product</li> <li>• Price competition intensifies</li> <li>• Challenge in maintaining distribution channels</li> <li>• Product differentiation becomes marginal</li> <li>• Greater investment in marketing promotions</li> <li>• Demand declines</li> <li>• Intensifying market exits, or mergers and acquisitions</li> </ul>
Product lifecycle (PLC)	Growth	<ul style="list-style-type: none"> <li>• Challenge to survive in face of depressed margins</li> <li>• Few firms survive serving an ever-shrinking market</li> <li>• Consumer indifference and boredom</li> </ul>
	Maturity	
	Decline	

Note: Based on authors' summary of key assumptions presented in discussions of the theories in Abernathy and Utterback [23], Cao and Folan [24], Klepper [11], Levitt [25], and Peltoniemi [12].

the PLC model by adding a fifth pioneering stage preceding all others, in which firms engage in product development and market testing, while juggling strained cash flows and flexible market development possibilities [e.g., 26]. Others outlined a more fundamental critique of the core assumptions underlying the PLC [e.g., 27]. First, the deterministic nature of the model ignores realities where regression or renewal of previous lifecycle stages can occur, as when products receive a chance at a second life following a successful revival. Second, causality goes both ways, as marketing strategies create new market conditions, and market conditions then influence strategic marketing choices. Third, the boundaries between the stages are fuzzy, and time horizons of each are product-sensitive, which make empirical validation of the model challenging and open to a wide scope of interpretations.

Nevertheless, the same critics also acknowledged that a lifecycle approach does provide a useful framework for thinking about the growth and development of a new product, company, or an industry [24,27]. Accordingly, in the current study, we seek to examine evidence of maturation in the ECF industry by building on assumptions outlined in ILC and PLC.

### 3. Equity crowdfunding from a lifecycle perspective

Empirical evidence regarding the development of the ECF industry suggests it has grown fast, despite otherwise sluggish economy and various regulatory bottlenecks that have characterized most markets in the same period. To exhibit this growth, we use the database underlying the Cambridge Centre for Alternative Finance's annual Alternative Finance Industry Reports [4,28]. Here, 134 platforms from around the world reported offering ECF services, in total overseeing global transaction volume of USD 1.51 billion in 2018, up by 9.4% from 2017, and 129% from USD 0.6 billion in 2014. When excluding China, where the industry has been contracting following the tightening of regulation and oversight in recent years, 2018 global volumes represent a growth of 34% from 2017, and 152% from 2014. Similar developments have taken place in other equity-like alternative finance models, such as real-estate crowdfunding, revenue sharing, and community shares valued at 2.9 billion, 0.4 billion, and 0.1 billion respectively in 2018.

Such growth levels are substantial especially as most have occurred under uncertain regulatory conditions in most markets and different regimes that inhibited scaling across-borders [28]. This has been addressed in Europe by introducing a pan-European Crowdfunding Service Provider regime in 2019 [8].

Hence, as the ECF industry celebrated its tenth anniversary in 2019 [2], its current state seems to suggest that while it is no longer at its birth stage, it remains far from full-fledged maturity. Strong industry growth is expected to continue and ECF platforms are expected to become increasingly prominent [29]. In this respect, the current industry state represents later stages of what is referred to by the ILC as the emergence stage, while better corresponding with what the PLC refers to as the growth stage. Such development has implications for all key stakeholders, including ventures, investors, platforms, and regulators. Accordingly, we aim to investigate these implications and identify the changes occurring as the ECF industry shifts from the market introduction to the growth stage on its path towards maturity. More specifically, we investigate two salient manifestations of industry evolution – the maturing of products (campaigns and investment objects) and the maturing of users (investors) of the ECF platforms.

Both product and user maturation occur in parallel and in a mutually reinforcing manner [25]. Progression along the cycle stages is shaped by changes to demand patterns. Demand patterns follow the innovation adoption trajectory [30], while first catering to the needs of innovators and early adopters. They are then followed by early and late majority adopters, finally reaching customers classified as laggards [31]. First, in terms of products, theory suggests that at early stages, products represent early versions, recently often referred to as 'minimum viable products', which are continuously improved based on early users' feedback and usage patterns. Second, in terms of users, theory suggests that at early stages, customers are more likely to represent early adopters and innovators who find value in experimentation with novel products and solutions [32]. With time, products are further polished and reach new segments of early majority users who find value in product quality. In even later stages competition intensifies, product quality and features are stabilized and fit market needs, and differentiation shifts towards process innovation, competitive pricing, and scale economies [30].

#### 3.1. Maturation of products (campaigns and investment objects)

In ECF, the core products being offered to users are the investment opportunities presented on the platform. From a lifecycle perspective, during the growth stage, supply increases as multiple actors enter the market [25]. This leads to increases in demand through improved products and users' increased awareness of the product and its quality, which in turn translate into increased sales [33]. In the context of ECF, product quality is reflected both in the quality of the information provided in fundraising campaigns and in the quality of the investment

objects (e.g., the firm, the entrepreneur, the entrepreneurial team) [9].

Previous research suggests that the higher the quality of information provided in ECF campaigns, the higher the likelihood of campaign success. Both textual and visual elements have been shown to play important roles. For instance, ECF campaign descriptions, which include information on exit plans are positively associated with successful fundraising [34]. Both provision of updates during the campaign [35,36] and information exchanges between prospective investors and entrepreneurs on public discussion boards [37] have been positively associated with ECF campaign success. Some have found the inclusion of multiple visual images in the campaign description to enhance ECF campaign success [38]. Others have shown company logo complexity to be positively associated with investors' funding decisions [39].

Similarly, research generally shows a positive association between quality of investment objects and ECF success. The human capital indicators of business education and entrepreneurial experience were found to significantly contribute to entrepreneurs' success with ECF in Italy [40]. Studies using UK data showed that ECF campaigns by firms that received prior financing from business angels, venture capitalists, crowdfunding, or grants were more likely to succeed [34]. Moreover, entrepreneurs' education level and relevant professional experience were all associated with greater success [41]. Similarly, the number of board members and their MBA education were positively associated with ECF campaign success in Australia [1].

At the same time, a different study in Finland showed that expert assessments of campaigns' and investment objects' different quality aspects were not significantly associated with campaign success [21]. Furthermore, some found evidence that German firms opting for ECF are of lower quality, characterized by lower profitability and greater indebtedness than other firms and hence opt for ECF as a last resort [42], after being pushed towards it by distressed banks [43].

We suggest that some of these discrepancies may be related to the industry stage reflected in each study's empirical setting. As the industry matures, and platforms compete to become the solution provider of choice, we suggest they will both seek to attract higher quality investment objects and press those to provide higher-quality information in their campaigns. Such efforts aim to maintain and increase investors' interest in ECF investment opportunities. And, furthermore, such efforts will be more successful in later industry stages, thanks to a growing record of previous successes and the reputational benefits thereof. Thus, we hypothesize a change in campaign information quality, which is reflected in the number of different information elements, including campaign updates [35], number of words on the campaign main page [44], and discussion forum posts [45]:

**H1a.** *Information quality will be higher in campaigns launched at the growth stage than in campaigns launched at the early introduction stage.*

Similarly, we hypothesize a change in the quality of investment objects, as reflected by company age, whether the company is already generating revenue, and the presence of professional investors in the team [1,46]. This corresponds to product life cycle theory predicting that product quality will be enhanced from introduction to growth stage [30]. Accordingly, longer firm experience, evidence of sales, and presence of professionals in the team all serve as quality indicators for investment products, implying lower risk of investment:

**H1b.** *Investment object quality will be higher in campaigns launched at the growth stage than in campaigns launched at the early introduction stage.*

### 3.2. Maturation of users (investors)

Reviews of the earlier days of the ECF industry tend to refer to investors as largely unsophisticated [41], who are less able to select investments efficiently and are more likely to behave in an irrational manner [47]. In the early days, investors did not usually conduct lengthy target evaluation processes or intensive personal communications with

fundraisers, and instead considered easily observable campaign features [13,21]. Such campaign features do not require carefully reading through the fundraising documentation or getting to know the target company, but can instead be quickly inferred from the campaign page or social media. However, as the industry matures, it is likely that the investor base becomes more sophisticated. This could happen either through strategic targeting of more sophisticated investors by platforms, or via experiential and vicarious learning by crowd investors. This dynamic may further be enhanced by greater regulatory clarity and stability, thanks to amendments such as those in the JOBS Act [48] in the U. S. or the European Crowdfunding Service Provider regime [8]. Greater regulatory clarity and stability may make professional investors more open to ECF, knowing that their interests are protected.

In this context, one of the dilemmas highlighted by Shneor et al. [15] relates to tensions between idealism and professionalism, as the crowdfunding industry matures. Early investors in alternative finance models, such as equity crowdfunding, are likely to be innovators triggered by idealistic notions of spreading financial democracy and challenging traditional financial institutions rather than by sole profit seeking. Similarly, sophisticated investors are more likely to follow marketing trends and invest in the scalability of winning concepts when their investment is protected by relevant laws, rather than by idealism and experimentation with high risk.

Platforms have several reasons for targeting more knowledgeable or professional investors. First, resource constrained young platforms need to engage in more efficient marketing efforts, aiming to attract investors that can potentially invest higher sums as basis for generating their income [15]. Second, by attracting lead investors, campaign legitimacy may be enhanced, and opportunities to tap into such investors' network of colleagues and followers may also be enhanced. Here, research shows that information cascades among individual investors play a crucial role in ECF campaigns [49], and that the involvement of lead investors enhances campaign success [44,50]. Indeed, some platforms provide early access to lead investors during a hidden phase, before opening the campaign to the general public [21]. Moreover, a recent study showed that angels play an important role in funding larger ventures, which is supplemented by crowd investors filling remaining funding gaps, the latter playing a more pivotal role in the funding of smaller ventures [7].

Research also provides evidence of learning by and from investors. Investors use their communication with peers and entrepreneurs via the ECF platform as a learning tool [45]. There is also evidence of information flows between angel investors, as well as from angel investors to crowd investors [7]. Accordingly, we hypothesize:

**H2.** *ECF investors in campaigns launched at the growth stage will be more sophisticated than investors in campaigns launched in the early introduction stage.*

In accordance with the above, as the industry matures, more sophisticated investors engage in ECF, and hence it is also likely that the determinants of ECF campaign success will change to better reflect the requirements of such investors. Since sophisticated investors are likely to be concerned with a different set of criteria for their investment decisions than crowd investors [21,51,52], the relative importance of such considerations is likely to increase as more of them engage in ECF. Accordingly, one can expect that investment decision criteria traditionally used by venture capitalists (VCs) or business angels will become more important in determining campaign success, while other more easily observable criteria will become less important. Thus, we hypothesize:

**H3a.** *Investment criteria traditionally used by VC and angel investors become more important in determining ECF campaign success at the growth stage than at the early introduction stage.*

**H3b.** *Easily observable campaign characteristics become less important in determining ECF campaign success at the growth stage than at the early introduction stage.*



## 4. Empirical study

### 4.1. Context

We address the hypotheses in the empirical context of Finland, which is the second largest ECF market in Europe after the UK, with its 2018 volumes of USD 67.9 million accounting for 24% of mainland Europe's volumes [28]. This represents a growth of 18% from its 2017 volume (USD 57.3 million), and 113% from its 2016 volume (USD 31.9 million) [53]. Early ECF activities in Finland emerged in 2012. In 2018, there were four platforms offering ECF services in the country. Considering the relative size of its population and economy, Finland having four platforms, or 5% of all ECF platforms globally, suggests that the market is more advanced than in many other countries. Furthermore, Finland was one of the first in Europe to approve bespoke regulation overseeing equity crowdfunding practice already in 2016 [54]. Therefore, we think that Finland represents a relevant market for capturing evolutionary conditions of the ECF industry.

We use a unique longitudinal data set sourced continuously over the period of several years from the longest-standing ECF platform in Finland, Invesdor. The data cover eight years of the platform's activity, since its inception in spring 2012 through to the end of 2019.

### 4.2. Sample and variables

Our dataset consists of campaign- and investor-level data from multiple sources, which considerably reduces the risk of common method bias. The campaign-level sample includes two sub-samples: all campaigns conducted via Invesdor in the industry's early years representing the platform's first three years of operation (2012–2014) and all campaigns conducted in later years (2017–2019). The same measures were largely used for both sub-samples. In order to rule out the possible effects of internationalization and platform diversification, we only include campaigns conducted by companies based in Finland. In addition to platform-sourced data, we engaged an external expert evaluator to develop ratings of each investment target along the business angel evaluation framework utilized by the Finnish Business Angels Network (FiBAN). The rating variables reflect the expert's evaluations and they are defined similarly as in Lukkarinen et al. [21 p.33] for comparability. In fact, to ensure consistency we used the same expert who rated the campaigns for Lukkarinen, et al. [21]. To conduct the evaluations, the expert was given all the information available on each campaign page, except for data reflecting the campaign outcome (total raised, number of investments, % of funding target raised). The campaign outcome data were censored to ensure that knowledge of the actual outcome would not create bias. The expert first carefully went through the information for one campaign, then assigned ratings for that campaign, and then moved on to the next one. The ratings were not done in campaign-chronological order, reducing the risk that the baseline rating level would gradually change as campaign quality (potentially) changes over time. As an experienced business developer and business leader with a long professional track record of evaluating, rating, and coaching startups, but with no previous connections to the sampled companies, the expert was optimally positioned to assign the ratings. Consistency of rating principles across campaigns was ensured by strictly adhering to the rating framework and variable definitions (Table 2c), and only rating campaigns available in the Finnish language.

The investor-level data was sourced from the Invesdor platform's database and covered all investors and their investments during the same two time periods, as well as the investors' responses to two surveys that were conducted in cooperation with the platform. Invitations with unique survey links were sent to persons who had made at least one investment via the Invesdor platform. The first survey was conducted in September 2015 and the second in November–December 2018. The first survey received responses from 943 investors, of which 911 passed a multi-step reliability assessment and were retained for analysis. The

second survey received 1408 responses, of which 1343 were deemed reliable and retained for analysis. Response rates were 19% and 8%, respectively.

All variables are described in Tables 2a through 2c. Table 2a presents the variables used to measure product maturation through campaign information quality (H1a) and investment object quality (H1b). They were sourced from the platform's database and Orbis, which is a global database, maintained by Bureau van Dijk, of private and public companies that has been extensively used for equity crowdfunding and other company-level research ([42,43]).

Table 2b presents the variables that measure user maturation at investor level through investor sophistication (H2). They were sourced from the two investor surveys.

Table 2c presents the variables that measure user maturation at campaign level. We measure campaign success with the number of investors and with the total amount of money raised in the campaign, both often used for this purpose [9]. Campaign success factors include traditional investment criteria (H3a) and easily observable campaign characteristics (H3b). They were sourced from the expert ratings, the platform database, campaign pages, SharedCount, and Facebook for developers.

### 4.3. Descriptive statistics

Table 3 presents summary statistics for the early campaigns that ended in 2012–2014 and later campaigns that ended in 2017–2019. The number of investors grew nearly by a multiple of eight and the amount raised became over tenfold. The average amount invested per investor thus also grew. Entrepreneur-set funding targets grew considerably. While less than half of companies were revenue generating at the time of the campaign in the early days, over 80% were revenue generating in the later sample. There are no notable differences in minimum investment size, the share of funds from private networks, or the business model. Note that the absolute rating values between the two samples should not be compared because the “bar was set higher” in the second sample. However, the team received the highest rating across rating dimensions in both samples.

Table 4 presents correlations between all campaign-level variables. While the number of investors and the total amount raised are highly correlated, this does not create multicollinearity issues because they are used as dependent variables in separate regression models. Similarly, average rating is not used in the same regressions as the sub-ratings used for its calculation. Hence, overall, none of the independent variables are excessively correlated with each other and are well within the 0.7 level or lower. Furthermore, all VIF values are below 4 (highest 3.2), implying our data adheres to some of the strictest thresholds for ensuring there is

**Table 2a**  
Variables measuring product maturation (H1).

Variable	Description
<b>Variables measuring product maturation through campaign information quality (H1a)</b>	
Campaign updates	Number of times the campaign was updated while it was ongoing. Only relevant pieces of additional information, such as topical business developments, qualify as updates. Small changes to, e.g., campaign text, do not qualify
Number of words	Number of words on the campaign main page
Forum posts	Number of discussion forum posts on the campaign discussion forum page. Includes posts by (prospective) investors, entrepreneurs, and platform staff
<b>Variables measuring product maturation through investment object quality (H1b)</b>	
Company age	Company age (in years) at campaign start
Revenue generating	Indicator valued 1 if the company had positive revenues in the year preceding the campaign, and 0 otherwise.
Professional investor	Indicator valued 1 if the company had, according to the campaign page, secured business angel or venture capital funding before or during the campaign, and 0 otherwise

**Table 2b**  
Variables measuring user maturation at investor level (H2).

Variable	Description
<b>Variables measuring user maturation through investor sophistication (H2)</b>	
Investing experience	Investors' answers to the question: "Which of the following investment types do you own or have you owned? Please select all that apply." Included investment types: publicly listed shares, mutual funds, flat or house (rented out). Valued 1 for each owned investment type, 0 otherwise
Investor's background: education	Investors' answers to the question: "What is the highest level of education you have completed?" Education types range from below high school (1) to PhD (8)
Investor's background: entrepreneur	Valued 1 if investor selected the option "Own company (I am/was an entrepreneur)", 0 otherwise
Alternative uses for the money invested in ECF	Investors' answers to the question: "If the investment opportunity/opportunities had not been available, what would have been your most likely alternative use(s) for the money? Please select all that apply." Included options: publicly listed shares, mutual funds, savings account, debt reduction (e.g., mortgage down payments), consumption (e.g., products, services, travelling). Valued 1 for each selected use, 0 otherwise
Investment decision criteria	Investors' answers to the question: "How important were the following criteria when you were making your investment decision [in ECF]?" (2015); "How important are the following criteria when you make investment decisions on equity crowdfunding platforms?" (2018). Included criteria: product uniqueness, justification of the use of funds, company valuation, amount already invested in the campaign, number of investors or investments, equity share offered, historical financials, forecast financials. Five-point Likert scale ranging from not at all important (1) to very important (5)
Motivations: financial and non-financial	Investors' answers to the question: "Now, please assess the reasons that motivated you to make the investment [in ECF]." (2015); "Please assess the reasons that have motivated you to invest in equity crowdfunding." (2018). Included financial motivations: moderate return upon selling, high return upon selling, dividends. Included non-financial motivations: privileges as an owner-customer, being part of a phenomenon, helping the entrepreneur, revealing something about oneself. Five-point Likert scale ranging from strongly disagree (1) to strongly agree (5)

no concern with multicollinearity in the data [55].

## 5. Results

### 5.1. Results on product maturation

#### 5.1.1. Changes in campaign information quality

Table 5a presents a comparison of campaign information quality between early and later campaigns. The Mann-Whitney *U* test (or Wilcoxon rank-sum) statistic can be used for testing whether the early and later samples are from populations with the same distribution. Later campaigns had significantly higher information quality than early campaigns, when measured by the number of words ( $p < 0.001$ ) and by the number of forum posts ( $p < 0.001$ ). However, the number of campaign updates does not differ significantly between the two time periods. The results support H1a.

#### 5.1.2. Changes in investment object quality

To assess the difference in venture quality between ventures from the early and later samples, we compare three characteristics that convey venture quality: company age at campaign start; whether the company was already generating revenues in the year before the campaign; and whether the firm secured angel or venture capital investments before or

**Table 2c**  
Variables measuring user maturation at campaign level (H3).

Variable	Description
<b>Dependent variables measuring campaign success</b>	
Number of investors	Number of persons or entities that invested in the campaign via the platform
Total raised	Amount of money (in euros) invested in the campaign. Includes both via-platform investments and external investments from the entrepreneur's private networks
<b>Independent variables measuring traditional investment criteria (H3a)</b>	
Team rating	Expert assessment of the team's industry expertise, track record, educational background, experience, balance between team members' skill sets, as well as perceived motivation, drive, passion, commitment, and honesty. Five-point Likert scale (5 best)
Markets rating	Expert assessment of the attainable market that determines the company's growth potential. Five-point Likert scale (5 best)
Concept rating	Expert assessment of how well the product fits the target market, relevance of the end customer's problem, how well the company addresses the problem compared to other alternatives, and value of the solution to the customer. Five-point Likert scale (5 best)
Scalability rating	Expert assessment of how easy it is to scale up the solution to the entire target market. Five-point Likert scale (5 best)
Terms rating	Expert assessment of valuation, the number of shares targeted, whether the targeted funding amount is sufficient to lift the company to the next level. Five-point Likert scale (5 best)
Stage rating	Expert assessment of the company's progress on its development path, remaining gap to the target state, status of the product, status of market validation, and existence of paying customers. Five-point Likert scale (5 best)
Average rating	Average of the above six ratings.
<b>Independent variables measuring easily observable campaign characteristics (H3b)</b>	
Funding target	Minimum funding target (in euros) set before campaign start. If the target is not reached in the predetermined timeframe, funds are returned to investors
Minimum investment	The minimum investment size (in euros) accepted in the campaign
Campaign duration	Time between campaign start and end dates (in days). The duration is set in advance and cannot be easily changed once the campaign is ongoing
Private networks	Share of the total amount raised (e.g., 0.1 means 10%) that was collected externally (i.e., not directly via the platform interface) into the campaign from the entrepreneur's own networks.
Social media networks	Number of times the campaign main page link was shared, commented on, or reacted to in Facebook. Total figure for the English and Finnish language versions of the campaign page.
Business model	Indicator valued 1 if the company's product is primarily sold to or used by consumers (B2C), and 0 otherwise (B2B)

during the campaign. Differences between the early and late samples are sizeable (Table 5b). In the early industry days, company age at campaign start was, on average, 3.8 years, while it had grown to 6.7 years in the later days ( $p < 0.001$ ). Similarly, less than half (43%) of companies were revenue generating in the early days, while the majority (84%) were revenue generating later on ( $p < 0.001$ ). Furthermore, the share of companies that had secured business angel or venture capital investments before or during the campaign rose from 7% to 42% ( $p < 0.001$ ). The results support H1b.

In addition, we use the Levene test for equality of variance to assess whether investment object quality in terms of traditional investment

**Table 3**  
Descriptive campaign statistics.

	Early campaigns ended in 2012–2014			Later campaigns ended in 2017–2019		
	Mean	Median	St.Dev	Mean	Median	St.Dev
Number of investors	25.65	7.00	61.91	193.95	91.00	240.76
Total raised	52,232	12,680	107,401	551,649	291,665	609,038
Team rating	3.10	3.00	0.90	3.35	3.00	0.77
Markets rating	2.15	2.00	0.82	2.56	2.00	0.76
Concept rating	2.62	3.00	0.80	2.87	3.00	0.77
Scalability rating	2.43	2.50	0.81	2.16	2.00	0.67
Terms rating	2.53	3.00	0.81	2.51	3.00	0.89
Stage rating	2.05	2.00	0.70	2.15	2.00	0.57
Average rating	2.48	2.50	0.56	2.60	2.67	0.47
Funding target	88,567	50,000	94,642	411,997	333,500	297,255
Minimum investment	553.02	250.00	1076.64	538.14	448.00	618.18
Campaign duration	88.23	92.00	46.20	56.49	56.00	17.65
Private networks	0.08	0.00	0.26	0.12	0.00	0.24
Social media networks	62.55	7.00	141.24	631.24	369.00	1050.71
Business model	0.50	0.50	0.50	0.52	1.00	0.50
Campaign updates	1.70	1.00	2.73	1.59	1.00	1.56
Number of words	1113.00	1004.00	583.15	4147.68	4065.00	1332.96
Forum posts	4.17	1.50	10.12	20.34	11.00	23.95
Company age	3.80	2.00	5.40	6.69	4.00	11.19
Revenue generating	0.43	0.00	0.50	0.84	1.00	0.37
Professional investor	0.07	0.00	0.25	0.42	0.00	0.50

Note:  $n = 60$  for early campaigns and  $n = 85$  for later campaigns.

criteria has become more consistent over time.<sup>1</sup> The standard deviation of the average rating is 0.560 for the early set and 0.467 for the later set, with a Levene statistic of 3.00 ( $p = 0.086$ ). Thus, while quality may have become somewhat more consistent over time, we cannot make such a conclusion at a 5% significance level.

## 5.2. Results on user (investor) maturation

### 5.2.1. All survey respondents

To assess investor sophistication, we assess survey respondents' investing experience, background, alternative uses of funds, decision criteria, as well as motivations both in 2015 and 2018 (see Table 6a). The share of investors with experience from investing in publicly listed shares, funds, and rental property increased from the 2015 survey to the 2018 survey ( $p < 0.05$  for each asset class). Similarly, investors' background indicates increasing knowledge, as investors' educational level increased from a bachelor's degree median (value 6 in the survey) to a master's degree median (value 7 in the survey) ( $p < 0.001$ ). The share of investors with an entrepreneurial background increased from 26% to 31% ( $p = 0.007$ ).

Investors increasingly perceive equity crowdfunding as a form of financial investing, rather than consumption. The money invested in campaigns increasingly comes from the investment or financial pocket, rather than the consumption pocket. (See Thaler's mental accounting.<sup>2</sup>) If the equity crowdfunding investment opportunities had not been available, 66% of respondents to the 2018 survey would have invested the money in public shares, 21% in mutual funds, and 12% would have used it to reduce debt. All these represent statistically significant ( $p <$

<sup>1</sup> We maintain caution and do not compare the absolute levels of expert ratings between the early and later samples in the main results because of a risk of inconsistency across time. Given the time gap between the expert's performing of the early and later campaign sets' ratings, the expert may have adjusted his requirement level to become higher for the later set. Performing such a comparison using the expert's estimate of later campaigns generally meriting a one-unit higher rating would suggest that team ( $p = 0.09$ ), markets ( $p = 0.006$ ), concept ( $p = 0.052$ ), and scalability ( $p = 0.023$ ) have improved, whereas deal terms and company stage have not changed significantly.

<sup>2</sup> The concept of mental accounting, introduced by R. Thaler [62], refers to people's tendency to mentally allocate their money into separate categories based on, e.g., the intended use or source of the money.

0.05) increases from the 2015 portions. At the same time, only 27% of 2018 respondents would have used the money for consumption, which represents a large decrease from 2015 when 46% saw consumption as an alternative ( $p < 0.001$ ).

When making investment decisions, investors increasingly focus on traditionally important investment target evaluation criteria, including company valuation, equity retention, as well as historical and forecast financials ( $p < 0.001$ ). At the same time, campaign momentum, as indicated by the amount already invested by others and the number of investors/investments, has also gained importance ( $p < 0.05$ ).

Investors' motivations have become increasingly extrinsic and financially oriented. Investors' willingness to earn a return, be it through selling their stake or through dividends, has strongly increased ( $p < 0.001$ ). Simultaneously, investors have become less motivated by a wish to earn product-related privileges, be part of the phenomenon, or by a willingness to help ( $p < 0.001$ ). That being said, these intrinsic motivations still remained relevant in the latter survey set, with average ratings at similar levels as the ratings for earning a return.

### 5.2.2. Investors who responded to both surveys

When we compare the previous results for all survey respondents to equivalent results on the subset of respondents who responded to both surveys, we find that the increased user sophistication is mostly due to new, more knowledgeable and experienced investors joining the industry, and to a lesser extent to long-standing investors thinking and behaving in a new way. This is evidenced by Table 6b, which shows the same items as Table 6a, but only for the paired sub-sample of 141 investors who responded to both surveys.

However, several investors who previously did not have experience from investing in publicly listed shares, had gained such experience by the 2018 survey (77% in 2015 vs. 84% in 2018,  $p = 0.041$ ). Individuals' educational level had also increased with time ( $p < 0.001$ ).

The money invested comes increasingly from investors' investment pocket rather than from their consumption pocket. If the ECF investment opportunity/opportunities had not been available, 49% of 2015 respondents would have invested the money in publicly listed shares, a portion that had grown to 65% among the same group of respondents by 2018 ( $p < 0.001$ ). Similarly, the share of respondents who would have invested the money in mutual funds grew from 12% to 23% ( $p = 0.003$ ), and the share of respondents who would have used the money for debt reduction grew from 7% to 17% ( $p = 0.013$ ). In contrast, the share of



**Table 4**  
Pairwise correlations for all campaigns.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) Investors (ln)	1.00																			
(2) Total raised (ln)	0.81*	1.00																		
(3) Team rating	0.27*	0.20*	1.00																	
(4) Markets rating	0.18*	0.18*	0.31*	1.00																
(5) Concept rating	0.19*	0.13	0.42*	0.46*	1.00															
(6) Scalability rating	0.02	-0.03	0.40*	0.41*	0.37*	1.00														
(7) Terms rating	0.20*	0.13	0.38*	0.34*	0.43*	0.40*	1.00													
(8) Stage rating	-0.05	-0.04	0.36*	0.34*	0.43*	0.40*	0.19*	1.00												
(9) Average rating	0.22*	0.15*	0.74*	0.64*	0.73*	0.69*	0.54*	0.64*	1.00											
(10) Funding target (ln)	0.52*	0.57*	0.16*	0.24*	0.23*	-0.12	0.18*	-0.03	0.18*	1.00										
(11) Minimum investment (ln)	-0.10	-0.020	0.12	0.09	0.11	0.01	0.06	0.11	0.12	0.15	1.00									
(12) Campaign duration (ln)	-0.13	-0.16*	-0.16*	-0.01	-0.10	-0.08	-0.05	-0.16*	-0.14	-0.00	-0.22*	1.00								
(13) Private networks	0.04	0.19*	-0.08	-0.07	0.01	-0.12	0.01	-0.01	-0.06	0.11	0.01	-0.00	1.00							
(14) Social media networks (ln)	0.72*	0.59*	0.24*	0.08	0.10	-0.07	0.11	-0.01	0.13	0.41*	0.13	-0.17*	0.02	1.00						
(15) Business model	0.27*	0.16*	0.02	-0.28*	-0.09	0.03	0.11	-0.08	-0.07	-0.03	-0.26*	-0.04	0.00	0.12	1.00					
(16) Campaign updates	0.04	-0.04	0.05	-0.09	-0.01	0.05	0.02	-0.05	-0.01	-0.04	-0.02	0.15*	-0.05	0.09	0.07	1.00				
(17) Number of words	0.60*	0.54*	0.32*	0.21*	0.18*	-0.05	0.07	0.14	0.22*	0.62*	0.26*	-0.18*	0.02	0.59*	0.05	-0.04	1.00			
(18) Forum posts	0.63*	0.49*	0.22*	0.32*	0.26*	0.11	0.10	-0.05	0.26*	0.41*	0.06	-0.06	-0.03	0.45*	0.02	0.06	0.34*	1.00		
(19) Company age	0.18*	0.17*	0.13	0.11	0.04	0.03	0.21*	-0.03	0.13	0.25*	0.01	0.08	0.08	0.15*	-0.03	0.06	0.26*	0.08	1.00	
(20) Revenue generating	0.32*	0.36*	0.05	0.01	-0.01	-0.07	0.31*	0.05	0.10	0.35*	-0.05	-0.07	0.06	0.27*	0.19*	0.01	0.34*	0.10	0.11	1.00
(21) Professional investor	0.33*	0.34*	0.16*	0.36*	0.32*	0.12	0.05	0.16*	0.29*	0.30*	0.16*	-0.17*	-0.02	0.21*	-0.13	0.01	0.39*	0.31*	-0.00	0.14

Significance: \*  $p < 0.05$ .

**Table 5a**  
Independent-samples Mann-Whitney test results for information quality.

	Early campaigns		Later campaigns		p-value
	Mean	Median	Mean	Median	Mann-Whitney
Campaign updates	1.700	1.000	1.588	1.000	0.143
Number of words	1113	1004	4148	4065	0.000
Forum posts	4.167	1.500	20.341	11.000	0.000

respondents who would have otherwise used the money for consumption decreased from 47% to 36% ( $p = 0.020$ ).

Investors increasingly focus on company valuation (average rating 3.5 in 2015 and 3.7 in 2018,  $p = 0.051$ ) and on historical financials (average rating 3.0 in 2015 and 3.3 in 2018,  $p = 0.003$ ) when making their investment decisions. Finally, and importantly, investors are increasingly motivated by extrinsic, rather than intrinsic, reasons also when looking at changes at the level of individuals. In particular, investors increasingly wish for a small chance of earning a high return upon selling their shares (average rating 3.0 in 2015 vs. 3.4 in 2018,  $p = 0.001$ ) and to earn extra privileges as an owner-customer of the target company (2.9 in 2015 and 3.2 in 2018,  $p = 0.026$ ). Simultaneously, investors are decreasingly motivated by a wish to help the entrepreneur (4.0 in 2015 and 3.8 in 2018,  $p = 0.045$ ).

Results for both the full sample of respondents and the paired sub-sample of two-time respondents support H2. Equity crowdfunding investors have become more knowledgeable and more experienced over time, with the shift driven by both the investor base being joined by new investors, and to a lesser extent by earlier investors starting to think and behave in new ways.

### 5.3. Evolution of campaign success factors

We now move from substantiating the existence of industry maturation to assessing its effect on fundraising. Specifically, comparing the drivers of equity crowdfunding investments from the early years of the industry with the later growth stage, we analyze whether investors' focus on traditional investment decision criteria has increased and whether their emphasis on easily observable campaign characteristics has decreased. All regression models use normal (and not robust) standard errors due to the small sample size. Building on hypotheses 3a and 3b, specifically, greater weight is likely to be placed on evaluations of entrepreneurial team quality, firm developmental stage, and terms of investment than on other more easily observable campaign and product characteristics featured on campaign webpages.

Table 7a presents linear regressions of the number of investors for the two sub-samples. Results for the early campaigns (Models 1 and 2) are aligned with research from the industry's early years [21]. Traditional investment criteria do not predict campaign traction, whereas easily observable campaign characteristics do. Such easily observable campaign characteristics include the funding target, social media networks, and a consumer-oriented business model, which have positive effects on traction, and the minimum investment, which has a negative effect. However, the situation changes in the later-stage sample (Models 3 and 4). Traditional investment criteria related to the team, terms, and average rating become positive significant predictors of traction, whereas the business model loses its significance. Accordingly, an assessment of the full sample shows that industry stage moderates the effects of the average rating and the business model on the number of investors. A move from the early to the later stage has a positive effect on the effect of the average rating (Model 6) and a negative effect on the effect of the business model (Model 7). The one variable keeping its significance across industry stages is social media networks. The effect sizes are economically meaningful. In Model 5, which represents main effects for the full sample, we observe the following effect sizes, in each case holding the other variables fixed. When the average rating increases by one unit, the number of investors increases by 41% ( $e^{0.343} - 1 =$

**Table 5b**  
Mann-Whitney and chi-square test results for investment object quality.

	Early campaigns		Later campaigns		p-value	
	Mean	Median	Mean	Median	Mann-Whitney	Chi-square
Company age	3.800	2.000	6.694	4.000	0.000	
Revenue generating	0.433	0.000	0.835	1.000		0.000
Professional investor	0.067	0.000	0.424	0.000		0.000

**Table 6a**  
Mann-Whitney and chi-square tests for full sample of survey results.  $N = 911$  for 2015 survey and  $N = 1343$  for 2018 survey.

	2015 survey		2018 survey		p-value	
	Mean	Median	Mean	Median	Mann-Whitney	Chi-square
<b>Investing experience</b>						
Publicly listed shares	0.700	1.000	0.876	1.000		0.000
Mutual funds	0.497	0.000	0.552	1.000		0.011
Flat or house (rented out)	0.207	0.000	0.269	0.000		0.001
<b>Investor's background</b>						
Education	5.583	6.000	5.984	7.000	0.000	
Entrepreneur	0.256	0.000	0.308	0.000		0.007
<b>Alternative uses for the money invested in ECF</b>						
Publicly listed shares	0.319	0.000	0.660	1.000		0.000
Mutual funds	0.081	0.000	0.212	0.000		0.000
Savings account	0.332	0.000	0.348	0.000		0.425
Debt reduction	0.085	0.000	0.115	0.000		0.018
Consumption	0.463	0.000	0.266	0.000		0.000
<b>Investment decision criteria</b>						
Product uniqueness	4.041	4.000	4.028	4.000	0.377	
Justification of use of funds	4.226	4.000	4.186	4.000	0.025	
Company valuation	3.356	4.000	3.903	4.000	0.000	
Amount already invested in campaign	3.221	3.000	3.340	3.000	0.028	
Number of investors or investments	2.896	3.000	3.096	3.000	0.000	
Equity share offered	3.002	3.000	3.497	4.000	0.000	
Historical financials	2.891	3.000	3.585	4.000	0.000	
Forecast financials	3.248	3.000	3.843	4.000	0.000	
<b>Motivations for investing</b>						
<i>Financial motivations</i>						
Moderate return upon selling	2.730	3.000	3.730	4.000	0.000	
High return upon selling	2.597	3.000	3.648	4.000	0.000	
Dividends	2.597	3.000	3.200	3.000	0.000	
<i>Non-financial motivations</i>						
Privileges as owner-customer	3.042	3.000	2.821	3.000	0.000	
Be part of phenomenon	4.222	5.000	3.684	4.000	0.000	
Help the entrepreneur	4.146	4.000	3.526	4.000	0.000	
Reveal something about oneself	2.724	3.000	2.471	2.000	0.000	

0.41). When the funding target increases by 1%, the number of investors increases by 0.4%. Similarly, a 1% increase in the minimum investment causes a 0.4% decrease in the number of investors, and a 1% increase in the number of social media reactions causes a 0.4% increase in the number of investors. Finally, consumer-oriented companies attract 96% more investors than business-oriented companies ( $e^{0.671} - 1 = 0.96$ ). As a robustness check, we add the measures of campaign information quality and investment object quality as controls (Model 8). This has no meaningful impact on the other variables' significance or effect sizes, except for the average rating, which becomes insignificant (in comparison to Model 5), probably because the rating partly reflects these specific quality indicators.

The explanatory power of traditional criteria increased from 5.1% for early campaigns to 22.8% for later campaigns, which strongly suggests that traditional investment criteria, as a whole, have become more important determinants of ventures' fundraising success in equity crowdfunding.

Table 7b presents the same linear regression models for the amount raised. Again, traditional criteria do not predict campaign success in the early sample, whereas certain criteria (scalability and terms) become positive significant predictors in the later sample. As before, the business model loses its significance in the later sample.

Similarly, the explanatory power of traditional criteria increased from 2.3% in the industry's early days to 21.7% in the later days. As with the number of investors, the effects on the amount raised are economically meaningful. Model 5 suggests the following effect sizes, in each case holding the other variables fixed. When the funding target increases by 1%, the amount raised increases by 0.8%. A 1% increase in the minimum investment decreases the amount raised by 0.5%. When the share of funding from private networks increases by 0.1 units (i.e., 10 percentage points), the amount raised increases by 18% ( $e^{1.671 \times 0.1} - 1 = 0.18$ ). A 1% increase in the number of social media reactions causes a 0.4% increase in the number of investors. In both Table 7a and Table 7b, company stage has a negative effect on fundraising capacity in the later industry stage.

## 6. Discussion

This study presents evidence for maturation in ECF practice. Specifically, we aimed to provide evidence for a shift from introduction to growth stage. Such a shift is characterized by increasing levels of investor sophistication, investment case quality, and the growing relative importance of traditional investment criteria (vs. other content elements) in predicting campaign success. Such evidence is important for understanding the nuances required when studying a 'moving target' such as ECF.

First, in accordance with lifecycle theories, we provide evidence for evolution of the core product offerings in ECF. Such evolution is evident in terms of increasing quality of investment objects (confirming H1b) and increasing quality of information provided to investors about these objects (confirming H1a).

In the earlier years of ECF, platforms were introducing an innovation into investment markets, while lacking a track record and operating under regulatory uncertainties, hence suffering from both liability of newness and regulatory ambiguities [2]. Both conditions negatively influence platforms' ability to attract high quality investment objects, who are concerned with associated risks [45,56]. In an effort to build

**Table 6b**

Wilcoxon signed-rank and McNemar chi-square tests for sub-sample of investors who responded to both surveys. The distributions of differences between 2015 and 2018 values are close to symmetrical, as indicated by histograms, allowing for the use of the Wilcoxon signed-rank test.  $N = 141$ .

	Survey 2015		Survey 2018		p-value	
	Mean	Median	Mean	Median	Wilcoxon	McNemar
<b>Investing experience</b>						
Publicly listed shares	0.773	1.000	0.844	1.000		0.041
Mutual funds	0.610	1.000	0.638	1.000		0.627
Flat or house (rented out)	0.241	0.000	0.298	0.000		0.134
<b>Investor's background</b>						
Education	5.674	6.000	6.028	7.000	0.000	
Entrepreneur	0.284	0.000	0.333	0.000		0.143
<b>Alternative uses for the money invested in ECF</b>						
Publicly listed shares	0.489	0.000	0.652	1.000		0.000
Mutual funds	0.121	0.000	0.227	0.000		0.003
Savings account	0.333	0.000	0.404	0.000		0.154
Debt reduction	0.071	0.000	0.170	0.000		0.013
Consumption	0.468	0.000	0.362	0.000		0.020
<b>Investment decision criteria</b>						
Product uniqueness	3.922	4.000	3.901	4.000	0.844	
Justification of use of funds	4.291	4.000	4.191	4.000	0.166	
Company valuation	3.532	4.000	3.723	4.000	0.051	
Amount already invested in campaign	3.319	3.000	3.383	3.000	0.530	
Number of investors or investments	2.936	3.000	3.064	3.000	0.368	
Equity share offered	3.142	3.000	3.305	3.000	0.191	
Historical financials	3.007	3.000	3.291	3.000	0.003	
Forecast financials	3.496	4.000	3.610	4.000	0.283	
<b>Motivations for investing</b>						
<i>Financial motivations</i>						
Moderate return upon selling	3.213	4.000	3.369	4.000	0.356	
High return upon selling	3.035	3.000	3.355	4.000	0.001	
Dividends	2.915	3.000	3.057	3.000	0.109	
<i>Non-financial motivations</i>						
Privileges as owner-customer	2.936	3.000	3.156	3.000	0.026	
Being part of phenomenon	3.972	4.000	3.957	4.000	0.965	
Help the entrepreneur	3.957	4.000	3.759	4.000	0.045	
Reveal something about oneself	2.589	2.000	2.468	2.000	0.211	

legitimacy and track record, platforms are forced to first accommodate campaigns of viable, though somewhat lower quality cases. With time, a track record is gradually established, regulations are clarified and amended, and evidence of responsible and successful ECF practice accumulates. At this stage, fund seeking ventures, which may be considered as higher quality investment objects, are more willing to use ECF services.

This process serves as a learning curve for platform operators, who through experience and ongoing dialogue with stakeholders improve their platform functionalities, information disclosure requirements and interfaces, and most importantly the advice and support they provide to new fundraising ventures. In this respect, platforms develop and polish their services from what can be considered as a 'minimum viable product' providing stakeholders with proof of concept [57]. As a result, platforms improve their case recruitment, information presentation, and service efforts. In turn, the quality of investment cases increases, and so does the quality of the information that is provided about them. Indeed, a growing body of research highlights the importance, methods, and implications of case screening by platforms [2,58]. For example, Cumming et al. [59] found that due diligence conducted by platforms was associated with a higher share of successful campaigns, higher number of funders, and larger amounts of capital raised.

Second, and also in line with lifecycle theories, we provide evidence for evolution of the user segments attracted to ECF intermediation. Here, user profiles shift away from early-stage innovators who find value in risky experimentations to early majority users who find value in the quality of products on offer [30,32]. Such evolution is evident in our findings on increasing sophistication of investors (confirming H2), as well as in the growing importance of traditional investment criteria over other easily observable campaign elements in predicting campaign success (confirming H3a and H3b).

Here, again, in the earlier years of ECF, platforms are investment

market innovators that operate without an established track record and under regulatory ambiguities [2]. These conditions negatively influence platforms' ability to attract more sophisticated investors, who are concerned with portfolio risk management, legal compliance, investor protections, and their reputation. Under such conditions, ECF platforms first rely on a base of what has been referred to as largely 'unsophisticated investors' [34,41]. These investors either originate in the campaign owners' own networks [45], grassroots movement idealists that want to challenge traditional finance and/or enhance financial democracy and inclusion [16], as well as curious investors with a certain degree of tolerance towards higher risk.

With time, evidence of responsible and successful ECF practice accumulates as platforms establish a track record, evidence of increasing quality in investment cases amounts, and regulations are clarified (as in our case with the Finnish Crowdfunding Act 2016 and recently the ECSP regime). At this stage, more sophisticated investors are more willing to use ECF services and tap into what seems a more legitimate and well performing fundraising channel. Indeed, ECF platforms may serve as a channel for concept market validation, initial due diligence, and critical market information source, as captured by arguments on the merit of the 'wisdom of the crowd' [60], which are otherwise more difficult and expensive to establish without them. To further accommodate more sophisticated and professional investors, platforms introduce certain benefits, such as early access to pre-launch closed rounds [21], as well as set higher information disclosure requirements for fund seeking platforms. The combination of these benefits can serve as an important incentive for attracting a greater share of more sophisticated investors to ECF in later years.

Finally, as both the quality of information about investment objects and the sophistication levels of investors increase, the relative importance of different determinants of campaign success also changes. More specifically, while in earlier years more easily observable campaign

**Table 7a**  
Linear regressions of the natural logarithm of the number of investors.

	Early campaigns		Later campaigns		All campaigns			
	Traditional criteria	Criteria average + ECF success factors	Traditional criteria	Criteria average + ECF success factors	Criteria average + ECF success factors	Moderation of traditional criteria	Moderation of business model	With controls
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Team rating	0.065 (0.252)		0.465* (0.266)					
Markets rating	0.097 (0.299)		-0.175 (0.255)					
Concept rating	0.190 (0.303)		0.303 (0.266)					
Scalability rating	0.231 (0.313)		0.437 (0.307)					
Terms rating	-0.025 (0.262)		0.404** (0.202)					
Stage rating	-0.553 (0.362)		-0.711** (0.316)					
Average rating		0.154 (0.233)		0.724*** (0.270)	0.343* (0.189)	-0.010 (0.261)	0.364* (0.187)	-0.022 (0.173)
Funding target (ln)		0.317** (0.156)		0.306* (0.169)	0.399*** (0.122)	0.366*** (0.122)	0.381*** (0.121)	0.236** (0.110)
Minimum investment (ln)		-0.326*** (0.104)		-0.155 (0.258)	-0.387*** (0.105)	-0.359*** (0.105)	-0.377*** (0.104)	-0.391*** (0.093)
Campaign duration (ln)		-0.184 (0.119)		-0.906** (0.368)	-0.145 (0.126)	-0.176 (0.126)	-0.151 (0.125)	-0.083 (0.112)
Private networks		0.520 (0.489)		-0.608 (0.470)	-0.026 (0.374)	-0.020 (0.371)	-0.022 (0.371)	0.040 (0.325)
Social media networks (ln)		0.210*** (0.063)		0.595*** (0.058)	0.421*** (0.046)	0.421*** (0.045)	0.413*** (0.045)	0.332*** (0.045)
Business model		1.234*** (0.257)		0.413 (0.249)	0.671*** (0.189)	0.673*** (0.187)	1.090*** (0.288)	0.619*** (0.171)
Later industry stage					0.228 (0.317)	-1.551 (0.970)	0.627* (0.377)	-0.375 (0.353)
Average rating * Later industry stage						0.712* (0.368)		
Business model * Later industry stage							-0.701* (0.366)	
Campaign updates								-0.033 (0.039)
Number of words (ln)								0.353* (0.207)
Forum posts								0.026*** (0.005)
Company age								0.008 (0.009)
Revenue generating								0.156 (0.194)
Professional investor								0.584*** (0.211)
Constant	1.964** (0.860)	-0.189 (1.963)	1.923* (0.972)	-0.238 (2.857)	-1.535 (1.570)	-0.318 (1.676)	-1.611 (1.555)	-1.480 (1.849)
Observations	60	60	85	85	145	145	145	144
R <sup>2</sup>	0.051	0.588	0.228	0.658	0.678	0.687	0.686	0.774
Adjusted R <sup>2</sup>	-0.056	0.533	0.168	0.627	0.659	0.666	0.665	0.749

Dependent variable: number of investors (ln). Standard errors in parentheses. Two-tailed *p*-values: \*\*\* *p* < 0.01, \*\* *p* < 0.05, \* *p* < 0.1.

elements played an important role in investment behavior of less sophisticated investors, in later years criteria known to influence sophisticated investors' behavior took a more dominant role in determining campaign success. Earlier research has indirectly associated sophistication with a distinction between in-crowd and out-crowd [61]. In-crowd includes individuals in an entrepreneur's social and professional networks, while out-crowd includes individuals with no prior connection with the fundraising entrepreneur. This research showed that the

two groups' funding is associated with different types of campaign information generally aligning with our own findings.

### 6.1. Limitations

While our study provides interesting insights, it also has some limitations that should be acknowledged. First, we do not provide evidence for investment object quality based on post-campaign survivability and



**Table 7b**  
Linear regressions of the natural logarithm of the total amount raised.

	Early campaigns		Later campaigns		All campaigns			
	Traditional criteria	Criteria average + ECF success factors	Traditional criteria	Criteria average + ECF success factors	Criteria average + ECF success factors	Moderation of traditional criteria	Moderation of under-standability	With controls
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Team rating	0.393 (0.556)		0.148 (0.324)					
Markets rating	0.286 (0.659)		-0.159 (0.310)					
Concept rating	-0.029 (0.669)		0.210 (0.324)					
Scalability rating	0.016 (0.692)		0.754** (0.373)					
Terms rating	-0.277 (0.578)		0.681*** (0.246)					
Stage rating	-0.613 (0.798)		-0.904** (0.384)					
Average rating		0.108 (0.635)		0.667* (0.392)	0.150 (0.365)	-0.212 (0.509)	0.202 (0.358)	-0.241 (0.378)
Funding target (ln)		0.630 (0.426)		0.655*** (0.244)	0.833*** (0.234)	0.799*** (0.237)	0.789*** (0.231)	0.644*** (0.240)
Minimum investment (ln)		-0.517* (0.282)		0.300 (0.374)	-0.485** (0.202)	-0.456** (0.204)	-0.461** (0.198)	-0.415** (0.204)
Campaign duration (ln)		-0.434 (0.325)		-1.301** (0.533)	-0.425* (0.243)	-0.457* (0.245)	-0.440* (0.238)	-0.293 (0.244)
Private networks		3.391** (1.331)		0.157 (0.680)	1.671** (0.722)	1.677** (0.722)	1.680** (0.709)	1.581** (0.710)
Social media networks (ln)		0.224 (0.171)		0.617*** (0.084)	0.419*** (0.088)	0.419*** (0.088)	0.400*** (0.087)	0.382*** (0.099)
Business model		1.714** (0.700)		0.166 (0.360)	0.620* (0.365)	0.622* (0.365)	1.659*** (0.550)	0.647* (0.375)
Later industry stage					0.872 (0.611)	-0.951 (1.890)	1.865** (0.720)	0.466 (0.772)
Average rating * Later industry stage						0.730 (0.716)		
Business Model * Later industry stage							-1.742** (0.699)	
Campaign updates								-0.105 (0.085)
Number of words (ln)								-0.124 (0.453)
Forum posts								0.023** (0.010)
Company age								0.012 (0.020)
Revenue generating								0.607 (0.425)
Professional investor								1.048** (0.460)
Constant	9.019*** (1.898)	4.705 (5.348)	10.282*** (1.183)	2.237 (4.137)	2.388 (3.029)	3.636 (3.266)	2.199 (2.974)	5.165 (4.037)
Observations	60	60	85	85	145	145	145	144
R <sup>2</sup>	0.023	0.353	0.217	0.509	0.541	0.545	0.562	0.584
Adjusted R <sup>2</sup>	-0.088	0.266	0.157	0.465	0.514	0.515	0.532	0.539

Dependent variable: total amount raised (ln). Standard errors in parentheses. Two-tailed p-values: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

growth. While this may be a reliable indicator for product maturation, such information is not available before and during the crowdfunding campaign process, and hence cannot truly affect investment decisions. So, while it could be measured post-hoc (while requiring data collection cycles), it may only be relevant for further documenting the maturation, but not differences in investment decision making that occurred before.

Second, given the ratings that measure traditional investment criteria were based on an expert's campaign evaluations, they

unavoidably include some subjectivity. However, we have aimed to limit bias and ensure high reliability by i) hiding campaign outcome data from the expert, ii) ensuring the expert familiarized himself with all (other) campaign data that was available to investors, iii) not using a chronological campaign order, iv) engaging an expert who is trained and accustomed to rating start-ups, v) ensuring that he rigorously utilized the rating framework and the respective variable definitions, and vi) excluding non-Finnish-language campaigns.

## 7. Conclusions

This paper has documented the transformation of the equity crowdfunding industry from the introduction stage to the growth stage, thereby showing that the industry has begun following the pathway outlined in industry lifecycle theory. We have shown that the equity crowdfunding industry is converging towards traditional entrepreneurial finance practice, yet maintaining certain unique features stemming from digitality, platform nature, and investor diversity. Professional investment criteria have gained relevance as determinants of campaign success, while certain success factors typically attributed to crowdfunding, notably easily observable campaign characteristics, have lost their relevance. These changes were supported by our observations of product maturation, as reflected in changes in campaign information quality and investment object quality, and user maturation, as reflected in investors having become more sophisticated. Investors' motivations had also become increasingly extrinsic and financially oriented. The full maturity and eventual decline of the industry remain to be observed in the future.

### 7.1. Implications for research

The main implication of our findings is that future research into ECF may consider industry maturation as a possible explanation for differences observed between findings emerging in recent studies versus those presented in earlier publications. Some of the most influential publications in the field represent realities of the first years of a new emerging industry. Hence, comparison of recent studies with earlier ones can help flesh out what remains consistent across lifecycle development stages, as well as what aspects change and evolve. In the current study, we have highlighted manifestations of product and customer maturation showing increasing quality of investment objects, as well as higher levels of sophistication among investors. Future studies may re-visit our findings, as well as explore other aspects of maturation. Such aspects may include differing promotional and competitive strategies at both the campaign and platform level, among others.

While we have presented some of the first evidence for a shift from an introduction to a growth stage in the lifecycle of ECF, we have done so specifically in the Finnish market context. Other studies may test the boundaries of these findings' generalizability. Here, researchers are encouraged to explore changes in other national and international market contexts varying by their institutional environments and their accommodation and fit with ECF practice. Such exploration may examine whether maturation follows similar trends or takes on different characteristics.

When taking a longer time perspective, industry maturation is likely to continue with advancements into more mature stages of both industry and product lifecycles, which go beyond the growth stage. Studies examining such shifts may further assist us in understanding the implications of such developments as well as their manifestations. Furthermore, it may be interesting to study markets in which ECF may experience contraction and regression rather than growth (for example China).

### 7.2. Implications for practice

Our findings have important implications for the stakeholders involved in equity crowdfunding markets, as maturation in the equity crowdfunding industry seems to follow a specific path. First, this implies that on the one hand fundraisers need to meet higher quality demands, but on the other hand that old challenges are resurfacing, and some higher risk ventures may be again excluded from investment markets. Similarly, this has implications for platform management. On the one hand they need to accommodate support and features that cater to the needs of more knowledgeable and sophisticated investors; or reposition and distinguish themselves as catering to early-stage high-risk

investments while going against the stream. Furthermore, from an investor perspective, less professional investors may enjoy the increase of quality of information disclosure and business ideas. However, at the same time their relative influence is again sidelined by more dominant and better endowed professional investors, potentially crowding them out of the investment channel originally established to cater for them. Finally, from a regulator perspective, increasing professionalism of investors and platform operations reduces concerns and needs for excessive new regulation aimed at the crowdfunding industry. Hence, overall, while the industry enjoys the blessings of growing professionalism, it also suffers the pains of replacing idealism with pragmatism.

Specifically, our findings suggest that with lifecycle progression, ECF platforms will cater to more sophisticated investors while hosting campaigns of higher quality cases. This may require platform investments in customer relations and service features that better cater to the needs and concerns of more sophisticated investors, as well as to managers of more attractive fundraising ventures, as investment objects.

In parallel, increasing sophistication of investors and quality of investment cases establishes higher bars for inclusion of new fundraising ventures in ECF platforms. As a result, cash strapped promising new businesses may once again find themselves outside of investment circles, further contributing to the chronic SME funding gap.

At the platform level, these pressures are also likely to initiate an ideological dilemma, where owners of ECF platforms will need to strike a critical balance between idealism and pragmatism. This will require defining the extent to which ECF platforms revert to practices of traditional financial institutions, as well as whether and how to continue promoting the democratization of finance by catering to unsophisticated investors, as well as smaller and riskier ventures. Our study shows that, at least in the shift between introduction and growth, investor diversity can be maintained in parallel to its growing sophistication, and that investment object diversity can be maintained in parallel to its growing quality.

### Credit author statement

Anna Lukkarinen: conceptualization, methodology, formal analysis, writing – original draft, writing – revision & response letter.

Rotem Shneor: conceptualization, writing – original draft, writing – review & editing, supervision.

Jyrki Wallenius: conceptualization, writing – revision & editing (minor role), supervision.

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