Investigating the Influence of ESG Information on Funding Success in Online Crowdfunding Platform by Using Text Mining Technique and Logistic Regression

Kyu Sung Kim*, Min Gyeong Kim*, Francis Joseph Costello*, Kun Chang Lee**

*Student, SKK Business School, Sungkyunkwan University, Seoul, Korea
*Student, SKK Business School, Sungkyunkwan University, Seoul, Korea
*Student, SKK Business School, Sungkyunkwan University, Seoul, Korea
**Professor, SKK Business School/SAIHST (Samsung Advanced Institute of Health Sciences & Technology),
Sungkyunkwan University, Seoul, Korea

[Abstract]

In this paper, we examine the influence of Environmental, Social, and Governance (ESG)-related content on the success of online crowdfunding proposals. Along with the increasing significance of ESG standards in business, investment proposals incorporating ESG concepts are now commonplace. Due to the ESG trend, conventional wisdom holds that the majority of proposals with ESG concepts will have a higher rate of success. We investigate by analyzing over 9000 online business presentations found in a Kickstarter dataset to determine which characteristics of these proposals led to increased investment. We first utilized lexicon-based measurement and Feature Engineering to determine the relationship between environment and society scores and financial indicators. Next, Logistic Regression is utilized to determine the effect of including environmental and social terms in a project's description on its ability to obtain funding. Contrary to popular belief, our research found that microentrepreneurs were less likely to succeed with proposals that focused on ESG issues. Our research will generate new opportunities for research in the disciplines of information science and crowdfunding by shedding new light on the environment of online micro-entrepreneurship.

▸Key words: Online crowdfunding platforms, ESG, Investment proposal, Funding Success,
Text Mining Analysis

[요 약]

　본 논문은 온라인 크라우드펀딩 플랫폼에서 환경, 사회 및 지배구조 (ESG) 관련 내용이 자금 조달의 성공에 미치는 영향에 대해 조사한다. 최근, 산업에서 ESG의 중요성이 증가하고 있으며 ESG와 관련된 내용을 포함한 투자 제안도 증가하고 있다. 이에 따라, ESG 개념을 포함한 대부분의 투자 제안은 이러한 사회적 현상으로 인해 더 높은 펀딩 성공률을 보일 것이라는 관행적인 믿음이 존재한다. 우리는 투자 제안서의 어떤 특성이 투자의 증가와 관련이 있는지를 알아보기 위해 Kickstarter 데이터셋에서 9000개 이상의 온라인 사업 제안을 분석하여 조사했다. 먼저, 우리는 어휘 기반 측정과 특성 공학을 사용하여 환경과 사회 점수가 재무 지표와 어떻게 관련되는지를 결정했다. 다음 단계에서는 로지스틱 회귀분석을 사용하여 프로젝트 설명에 환경 및 사회적인 단어를 포함하는 것이 자금 조달에 미치는 영향을 연구했다. 일반적인 믿음과는 달리, ESG 문제를 중심으로 한 투자 제안이 소규모 사업가들에게는 성공할 가능성이 더 낮다는 것을 발견했다. 본 연구는 온라인 소규모 사업가의 환경에 대한 새로운 통찰력을 제공하며, 정보과학 및 크라우드펀딩 연구 분야에서의 새로운 연구 기회를 창출할 것이다.

▸ **주제어**: 온라인 크라우드펀딩 플랫폼, ESG, 투자 제안서, 투자 유치 성공, 텍스트 마이닝 분석

I. Introduction

Since its creation, ESG, which stands for Environmental, Social, and Governance, has drawn considerable interest from academics, investors, and regulators due to the possibility that using ESG data rather than just financial information may boost the values of financial stakeholders. The primary reason that the ESG has drawn so much attention from financial-related groups like investors, academics, and regulators is that they have the potential to generate more market returns, or "alpha," and that these returns may be more morally and ethically justified than other types of purely financial returns [1].

Despite this, the financial market is infamous for its volatility, randomness, and information asymmetry among investors, so such a foolish expectation by financial investors, particularly investors among those financial stakeholders, has been completely unmet. In addition, a lot of investors continue to think that ESG data is distorted in its serious relationship to non-alpha related perspectives of sustainability and other semi-philosophically righteous things like environmental protection, social justice, and financial transparency, even though this is not fully demonstrated by using serious empirical research. Such an unsupported view is partially correct [1,2]. However, the authors' reviews of the literature on online crowdfunding platforms with the same agenda-"whether ESG data is prepared primarily through non-alpha related perspectives and therefore will not significantly influence on market return"-led to a somewhat surprising research gap in that there are very few studies looking into the same agenda, despite the platforms' widespread popularity among business owners of all ranks.

Cumming et al. (2022) have collated 508 crowdfunding platforms from 38 OECD nations between 2007 and 2020 as one of the few research on the connection between ESG ideas and online crowdfunding platforms [2]. They then divided them into four variables: (1) ESG elements, (2) cultural considerations, (3) controls at the platform level, and (4) controls at the regional level. They handled ESG components manually from their 508 crowdfunding platforms and used ESG components without separating them into E, S, and G parts so that their final computational results could be

obtained, as shown in Table 1 in their paper (refer to page 70 in Cumming et al. [2].

We seek to address a number of research concerns as listed below on the basis of research motivation sparked by a brief overview of prior works.

First and foremost, we must concentrate only on E and S when examining potential effects of ESG data on online crowdfunding platforms because these platforms show a wide range of startups being started by microbusiness entrepreneurs, and the majority of these startups do not have the luxury of thinking seriously about G or governance due to a number of survival-related urgent issues like how to find angel investors for their businesses.

Second, we should just consider one typical online crowdfunding platform rather than a disproportionately large number of them, as was conducted in [3]. In this regard, we choose Kickstarter as our primary online fundraising site because it has been deemed one of the most effective platforms for micro-entrepreneurs.

The authors' conference article from the KMIS International Conference in 2022 [2] provides the basis for this paper. The value of investments in ESG-compliant financial assets has climbed from $23 trillion in 2016 to $35 trillion as of February 2022. The corporate strategy of "maximizing profits" has fallen out of favor as the best way to invest due to climate change and other external factors, such as the current pandemic [4,5].

Companies that have already established a strong record of ESG success are seeing a shift in investment from recent investors with a fresh view on ESG. Portfolios that include businesses that produce and disperse wealth, whether monetary or otherwise, have thus been the subject of extensive research [1,6-8]. In addition, several efforts have been made to successfully integrate ESG in the financial industry [9]. In order to raise money through crowdsourcing or donation platforms, emphasizing social principles has been shown to be counterproductive in the past [10,11]. In light of this pattern, we plan to look into how providing environmental and social value influences the attractiveness of investments in small businesses.

Crowdfunding typically involves sole proprietors or small businesses, therefore governance issues are less of a concern for them than they are for even medium- and large-sized enterprises [9]. Our focus is exclusively on micro-entrepreneurial proposals made on internet platforms such as Kickstarter, and specifically on their linguistic appeals to social and environmental ideals. Companies and fundraisers have attracted new backers whose priorities align with environmental and social issues by including them in their proposition statements. It has been stated that if an investor can show that they are committed to solving pressing social and environmental problems, they will be more likely to accept their investment proposal [11]. With the help of social psychology, we can formulate the following research question (RQ):

RQ: Is there a correlation between a microentrepreneur's demonstrated dedication to social and environmental causes and increased funding?

By showcasing its application (or lack thereof) in online crowdfunding, we hope to contribute to an understanding of environmental and social issues within the field of IS studies. We will also start a discussion on whether or not micro entrepreneurial investors will benefit from the embracement of the indiscreet usage of social issues by looking into the true significance of environmental and social expression communication in the crowdfunding arena.

II. Literature review

1. Crowdfunding and entrepreneurial pitches

Businesses of all sizes, from multinational conglomerates to one-person startups, face similar fundraising challenges. Crowdfunding, in particular, is an online method of collecting many little

donations from many different people. It has shown to be an effective complement to traditional advertising as a means of obtaining capital for startups and small businesses.

Significant campaign qualities that have contributed to success or increased funding have been the topic of previous study [12-14]. Historically, researchers have studied crowdfunding's efficacy by perusing existing crowdfunding platforms [12,15]. The attributes of investors and fundraisers have also been shown to be crucial to the success of crowdfunding. Researchers were able to better understand the motivations of fundraisers by examining their demographic data. Fundraising success has been demonstrated to correlate strongly with demographic features of stakeholders in the crowdfunding ecosystem [16-18].

2. Environmental and social in the crowdfunding environment

There have been a number of investigations of the social issues that attract the most funding on crowdfunding sites. They used a variety of analytic tools to look for clues about societal issues in the campaigns' paperwork and remarks. Previous research [7,19,20] surveyed academics all across the world to learn more about their usage of ESG data. The global survey's findings led them to conclude that money, not morality, was the primary motivator for most investors. Most respondents said that ESG data should be included alongside other more conventional and material variables when evaluating investment returns.

This prompts the inquiry as to whether or not the use of an efficient expression strategy in small businesses and the emphasis on environmental and social issues in entrepreneur pitches will affect funding decisions. High degrees of emotional empathy were shown to exceed the impacts of cognitive empathy, and the study found that high levels of empathy in connection to social issues had

no direct effect on investment. Socially conscious projects that prompted cognitive empathy from backers and appeared to have a realistic chance of success received greater funding [21].

III. Dataset and Variable Construction

In the first stage of this paper, we determine the relationship between environmental and social scores and financial indicators using lexicon-based frequency measurement and Feature Engineering. In addition, we use logistic regression to examine the effect of including environmental and social terms in proposal descriptions on funding success. By doing so, we intend to investigate the effect of environmental and social content on the funding success of investment proposals in an online microentrepreneurial environment. Our research methodology is depicted in Figure 1.

1. Data description

The data sample for our empirical analysis consists of 11,189 campaigns posted on Kickstarter between 2016 and 2019. Statistics for 162 classes across 9 nations are included. The business owner manages the Kickstarter campaign and negotiates the pledge amount with the contributors to the service. Entrepreneurs use a wide range of techniques to tempt investors, and once the relevant details have been posted to the site, the project is kept active until the end date. We crawled the intended sum, checking the actual donation total, the number of images and videos used, and the content of any introductory materials. Among the completed projects, we found that 9,111 were scrapped before their goals were met, while just 2,078 were successful.

2. Text-based Feature Extraction

To the best of our knowledge, no previous studies have been conducted on a unified metric
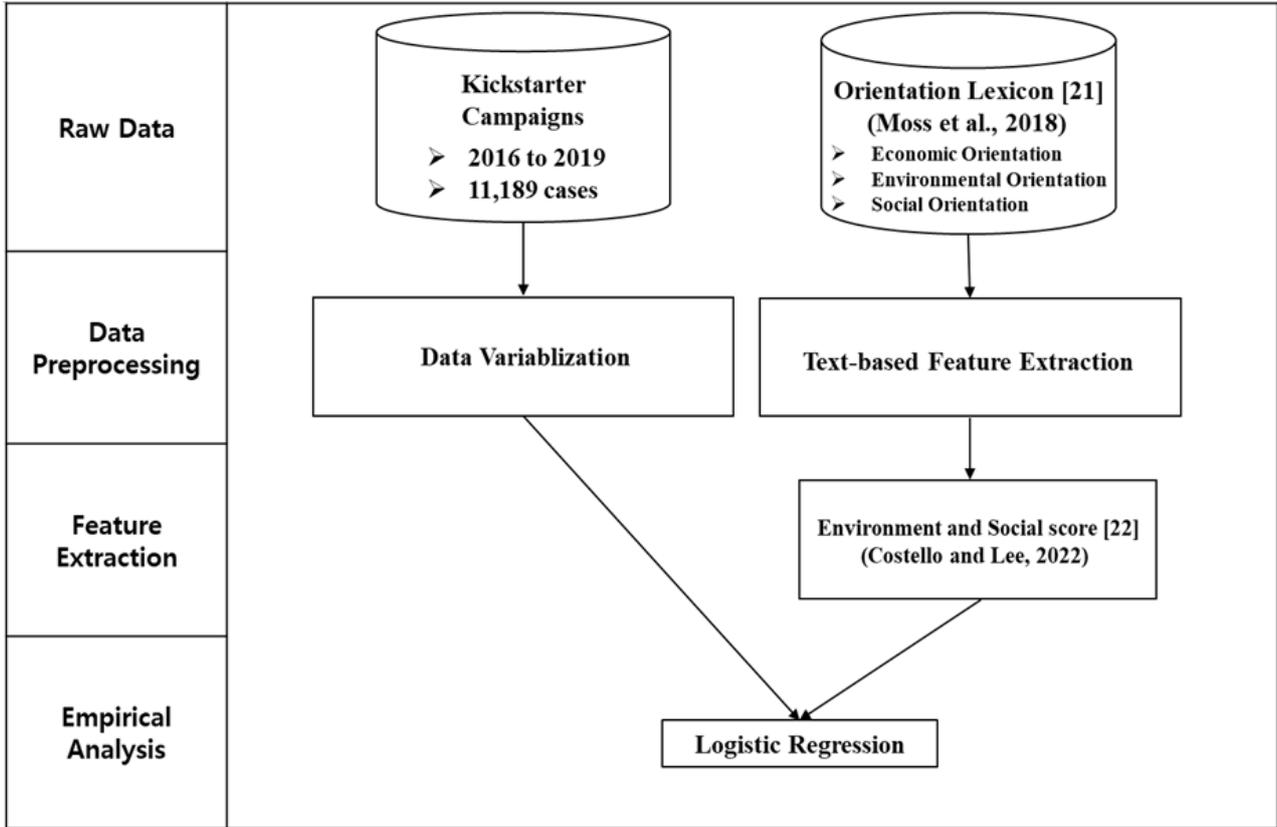
Fig. 1. Research Model

for qualitative environmental and social score across crowdfunding. As a result, we combined two approaches to rating textual appeals like those made in the areas of economics, ecology, and society. The proposed method makes use of the term frequency-inverse document frequency (TF-IDF) score and the frequency extraction of a word board from a lexicon [21,22].

The first method employs lexicon-based frequency measurement. To this end, we drew economically, environmentally, and socially relevant terminology from a lexicon with a good reputation in the academic community. A total of 179 words representing economic, environmental, and social value orientations are included in the final English lexicon (Table 1).

Costello and Lee [22] describe TF-IDF-based Feature Engineering, which is adopted for the second method. Based on the frequency of the retrieved phrases, we calculated an environment score and a social score by using the following equations (See equation 1 ~ 6).

$$TF\_ENV_{(t,d)} = \left(\frac{count\ of\ environmental\ terms\ t \in d}{length\ of\ document\ d} \right) (1)$$

$$TF\_S_{(t,d)} = \left(\frac{count\ of\ social\ terms\ t \in d}{length\ of\ document\ d} \right) (2)$$

$$IDF_t = \log\left(\frac{Number\ of\ Documents}{DF\ within\ ENV(SOC)\ terms} \right) (3)$$

$$ENVIRONMENTAL_{(d)} = TF_{ENV_{(t,d)}} \times IDF_t \ (4)$$

$$SOCIAL_{(d)} = TF\_SOC_{(t,d)} \times IDF_t \ (5)$$

$$ES\_score_{(d)} = ENVIRONMENTAL_{(d)} + SOCIAL_{(d)} \ (6)$$

Table 1 shows the results of an experiment in which successful and unsuccessful business proposals were assigned the economic expressions specified there. Therefore, we looked into how ratings of the environment and society relate to financial indicators. Table 2 also shows the implementation of standard language statistical indicators such as Flesch's [23], SMOG's [24], the VADER mood score [25], etc.

Table 1. Dictionary of Economic, Environmental, and Social expressions

Feature	Words
Economic	affluen*, asset*, buy*, capital, cash, client*, contract*, cost*, cost-effective, customer*, earn*, economic*, economy, efficien*, employ*, expan*, fee, fees, financ*, fund*, grew, grow*, high-yield, hire*, hiring, income, interest, invest*, job*, lend*, livelihood, loan*, market*, monetary, money, money-saving, money-transfer, output, paid, pay*, performance, producti*, profit*, prosper*, purchas*, renovat*, rent, rental*, rented, renting, rents, repaid, repay*, return, revenue*, rich*, salar*, sale*, saving*, shareholders, sold, staff*, stipend*, transact*, turnover*, valuation, wage*, wealth, work*, worth, yield*
Environment	air, biofertilizer*, biogas*, carbon, climate, conservation, conserve, conserved, conserves, conserving, contaminat*, eco-activis*, eco-friendly, ecolog*, emission*, emit*, energy, energy-efficien*, environment*, erod*, erosion, externalit*, fertilis*, fertiliz*, greenlife, landscaping, natural, pollut*, preserv*, purifi*, recharge*, re-charge*, recycl*, salvag*, solar*, sustainability, sustainable, toxic*, unpollut*, unspoil*, wast*, water*
Social	accountable, benefice*, beneficiar*, benefit*, benevolen*, brotherhood, care*, caring, charit*, civic, class, classes, communit*, compassion*, concern, concerned, cooperat*, cultivating, development, educat*, empower*, equal, equality, familial, families, family, freedom*, graduation, happiness, happy, harmony, harvesting, harvests, health*, help*, humanity, humankind, immuniz*, independen*, joy, justice, kind*, learn*, liberat*, liberty, life, mankind, partnership*, peace*, prosper*, reading, responsibilities, rights, social, societ*, SROI, success, support*, teach*, tender*, trustworth*, virtu*, welfare, wellbeing, well-being, wisdom

Table 2. Summary Statistics

Variable	Mean	Median	S.D.	Definition
Success	0.186	0.000	0.389	Variable that is 1 in case of funding success and 0 in failure.
Rate	99.446	3.587	3196.408	Achieving the funding pledge amount (%)
Video	0.631	1.000	0.483	Include video or not
Image	0.500	1.000	0.500	Include image or not
SNS	0.210	0.000	0.407	Open SNS or not
Notional	239.840	156.000	240.367	Number of notional words
Flesch	65.558	66.780	17.350	Flesch Readability
SMOG	10.538	10.700	2.742	SMOG readability
ES_SCORE	0.859	0.531	1.487	Sum of environmental and social score
ENV	0.124	0.000	0.378	Environmental Score
SOC	0.735	0.424	1.414	Social Score
Economic dummy	0.771	1.000	0.420	Include economic words or not

IV. Empirical Analysis and Results

We used a two-stage empirical study to look into how mentioning environmental and social factors in the project description affected financial returns. To begin, we created a dependent variable that would be given the value 1 if the financing target was achieved and the value 0 otherwise. Important variables thought to have an effect on the dependent variable are also included in the model to ensure its validity (See equation 7).

$$\ln\left(Success_i = \frac{p}{(1-p)}\right) = \alpha_i + \beta_1 ES\,Score_i + \qquad (7)$$
$$\beta_2 Economic_i + \beta_3 Interaction_i + Controls + \epsilon_i$$

As can be seen in Table 3, the dummy variables introduced into the model for logistic regression ensure that no bias is introduced by the category or nationality of the project. Using a total of 11,189

Table 3. Summary Statistics

Variables	DV: Funding Success (success: 1 / failure: 0)					
	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	-8.042*** (-6.261)	-8.06*** (-6.287)	-8.19*** (-6.342)	-8.183*** (-6.373)	-8.205*** (-6.365)	-8.205*** (-6.433)
ES_Score	-4.504*** (-0.293)		-4.29*** (-0.283)	-4.421*** (-0.312)		
Environmental		0.214 (0.029)			0.228 (0.031)	1.176 (0.212)
Social		-5.014*** (-0.381)			-4.803*** (-0.37)	-5.071*** (-0.424)
Economic			3.702*** (0.432)	3.563*** (0.417)	3.656*** (0.427)	3.63*** (0.432)
Economic ×ES_Score				1.974* (0.013)		
Economic × Environmental						-1.258 (-0.199)
Economic ×Social						3.247** (0.024)
Video	14.891*** (1.588)	14.796*** (1.579)	14.791*** (1.579)	14.797*** (1.58)	14.699*** (1.57)	14.648*** (1.566)
Image	10.412*** (0.957)	10.332*** (0.951)	10.349*** (0.953)	10.353*** (0.953)	10.276*** (0.947)	10.217*** (0.942)
SNS	-9.477*** (-5.706)	-9.468*** (-5.7)	-9.452*** (-5.694)	-9.452*** (-5.694)	-9.445*** (-5.688)	-9.441*** (-5.687)
Notional	13.138*** (0.002)	12.892*** (0.002)	12.172*** (0.002)	12.163*** (0.002)	11.937*** (0.002)	11.737*** (0.002)
Sentiment	2.98** (0.368)	3.094** (0.383)	2.466* (0.306)	2.474* (0.307)	2.579* (0.321)	2.595** (0.323)
Flesch	1.054 (0.005)	1.165 (0.006)	0.856 (0.004)	0.916 (0.004)	0.963 (0.005)	1.053 (0.005)
SMOG	2.338* (0.064)	2.311* (0.063)	1.958† (0.053)	2.046* (0.056)	1.934† (0.053)	2.059* (0.057)
Nationality Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Category Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.539	0.54	0.541	0.541	0.541	0.542
AIC	5304.838	5300.325	5292.561	5293.287	5288.412	5287.058
BIC	6608.276	6611.086	6603.322	6611.37	6606.495	6619.787
Deviance	4948.838	4942.325	4934.561	4933.287	4928.412	4923.058

***p < 0.001; **p < 0.01; *p < 0.05; †p < 0.1.

data points over 162 categories and 9 countries, we estimate the empirical model to determine the impact of including the words "environmental/social" in a project's description on its ability to secure funding. The results of the estimation are shown in Table 3. Estimates from a logistic regression model, shown in Table 3, column 1, confirm previous research [10,21] on investors' sensitivity to social value. The direction of our estimated ES _score (-0.293) is consistent with that of previous crowdsourcing efforts.

The outcomes of our study's focus on the interaction between economic and non-economic representations are shown in Table 3, columns 3 and 4. Research in column 3 shows that having an economic expression either increases your likelihood of getting funded or decreases it significantly (z-value = 3.720, p< 0.001). There is a statistically significant relationship between Economic and ES _score, as shown in column 4 (z = 1.974, p< 0.05). Economic expression, the surrounding environment, and social expression are all interconnected, and their interrelationships can be examined in columns 5 and 6. The study found no statistically significant interaction between environmental expression and economic

expression. The significance level and z-score for social expression are higher than those for ES score (z value: 3.247, p <0.001), indicating a significant influence.

We found that when the non-economic narrative is employed solely, it might have a negative effect on the outcome of a project, especially in the areas of the environment and society. However, when coupled with economic narratives, a synergistic effect is generated. Thus, we find that a hybrid expression method that combines economic stories with environmental/social ones is more effective for crowdfunding campaigns.

V. Discussion and Conclusion

This study involved examining business proposals posted on online crowdfunding sites. We analyzed a dataset collected through the crowdfunding platform Kickstarter to look for connections between environmental and social concerns brought up in pitches to potential backers.

We were able to determine if the entrepreneurial suggestions were important to the success of the crowdfunding campaign by looking at whether or not certain environmental and social indicators were present. In addition, it could judge the viability of business plans that included economic considerations.

Additionally, the financing rate for business proposals that use economic, environmental, and social expressions is much greater than the funding rate for proposals that focus solely on social issue expressions. Our investigation yielded primarily these types of conclusions. Including references to the environment and society in business proposals decreases the chances of raising money through crowdfunding. However, it was found that business proposals that included economic jargon were much more likely to be funded through a crowdfunding campaign. Ecological expression, a hybrid method, which combines environmental and social expression, has been shown to increase the success rate of fund-raising pitches from entrepreneurs.

Our empirical research has the potential to be incorporated as a new metric used in management decision making across industries. Our reliable research contradicts conventional wisdom in the field of social psychology, allowing them to shift their approach to one that is more modern and effective. As a result, they will be more equipped to make practical, long-lasting changes to their own approaches to environmental and social management. Furthermore, it will provide an opportunity to reevaluate how they bring in money.

There are two ways in which this research advances knowledge in the academic world. First, this study's approach to text-based feature extraction for environmental and social expressions lays a solid foundation for future improvements in text analysis. Displaying relevant data requires rapidly recovering values buried within statements.

Second, the rather unstructured crowdfunding ecosystem provides an opportunity to reevaluate the environmental and social expression method. Since prior research is vague and limited, this study fills in the gap by providing actual evidence on the role of environmental and social values within the crowdfunding ecosystem.

Lastly, the findings of this study have the potential to contribute by presenting results that contradict the conventional belief that ESG-related content in the crowdfunding proposal has a positive effect on the fundraising rate. Micro-entrepreneurs can implement new strategies for their proposals or utilize methods that provide investors with more reliable information. In addition, crowdfunding industry professionals can propose new guidelines to facilitate successful fundraising and consider the market stimulation that may result from these efforts.

In sum, we hope that our research will shed new light on the dynamics of online micro-entrepreneurship, opening up new avenues

for inquiry in the domains of information science and crowdfunding.

VI. Limitations and Future research

For future studies, it will be important to use datasets that are more extensive and that span several domains in order to identify the specific elements that have led to our current understanding of this phenomena. In upcoming research, we plan to look into these factors that lower funding rates in further detail.

In future research, we plan to use multiple types of analytical methodologies to further enhance our forecasting powers. Implementing not only Machine Learning but also Deep Learning approaches can aid with crowdfunding situation understanding.

ACKNOWLEDGEMENT

REFERENCES

[1] Gholami, R., Watson, R.T., Hasan, H., Molla, A., and Bjorn-Andersen, N. "Information systems solutions for environmental sustainability: How can we do more?," Journal of the Association for Information Systems, Vol. 17. No. 8, August, 2016. DOI: 10.17705/1jais.00435

[2] Kim, K.S., Kim, M.G., Costello, F.J., & Lee, K.C. "A computational text mining approach to exploring the significance of presenting environmental and social issues in online crowdfunding business pitches," In KMIS International Conference, pp. 415-421, June, 2022.

[3] Cumming, D., Meoli, M., Rossi, A., & Vismara, S. "ESG and Crowdfunding Platforms," University of Bergamo (Italy), Working Paper. 2022.

[4] Kao, T.W., Hsiao, S.H., Su, H.C., and Ku, C.H. "Deriving

Execution Effectiveness of Crowdfunding Projects from the Fundraiser Network," Journal of Management Information Systems, Vol. 39, No. 1., pp. 276-301. April, 2022. DOI: 10.1080/ 07421222.2021.2023404

[5] Gibson, M.S. "Is Corporate Governance Ineffective in Emerging Markets?," Journal of Financial and Quantitative Analysis, Vol. 38, No. 1, pp. 231-250. April, 2009. DOI: 10.2307/4126771

[6] Acs, Z.J., Boardman, M.C., and McNeely, C.L. "The social value of productive entrepreneurship," Small Business Economics, Vol. 40, No. 3, pp. 785-796. December, 2013. DOI: 10.1007/s11187-011-9396-6

[7] Goh, J.M., Gao, G., and Agarwal, R. "The Creation of Social Value: Can an Online Health Community Reduce Rural-Urban Health Disparities?" MIS Quarterly, Vol. 40, No. 1, pp. 247-264. March, 2016. DOI: 10.25300/MISQ/2016/40.1.11

[8] Steininger, D.M., Mikalef, P., Pateli, A., and Ortiz, G.A. "Dynamic capabilities in information systems research: A critical review, synthesis of current knowledge, and recommendations for future research," Journal of the Association for Information Systems, Vol. 23, No. 2, pp. 447-490. March, 2022. DOI: 10.17705/1jais.00736

[9] Nhi, N.Y., Xuezhong, H., Shaowu, L., and Guandong, X. "Deep learning for decision making and the optimization of socially responsible investments and portfolio," Decision Support Systems, Vol. 124,113097. September, 2019. DOI: 10.1016/j.dss.2019.1130 97

[10] Zadeh, A.A., and Serafeim, G. "Why and How Investors Use ESG Information: Evidence from a Global Survey," Financial Analysts Journal, Vol. 74, No. 3, pp. 87-103. December, 2018. DOI: 10.2469/faj.v74.n3.2

[11] Nakagawa, K., and Kosaka, G. "What social issues do people invest in? An examination based on the empathy–altruism hypothesis of prosocial crowdfunding platforms," Technovation, 102508. June, 2022. DOI: 10.2469/faj.v74.n3.2

[12] Li, G., and Wang, J. "Threshold effects on backer motivations in reward-based crowdfunding," Journal of Management Information Systems, Vol. 36, No. 2, pp. 564-573. June, 2019. DOI: 10.1080/07421222.2019.1599499

[13] Lee, S.J., Krishnan, V., Park, J. H., and Lee, J.H. "Timing of promotion for charity crowdfunding projects: An empirical study of the role of mid-period momentum," Proceedings In 39th International Conference on Information Systems, ICIS 2018. December, 2018.

[14] Burtch, G., Hong, Y., and Liu, D. "The role of provision points in online crowdfunding," Journal of Management Information Systems, Vol. 35, No. 1, pp. 117-144. March, 2018. DOI: 10. 1080/07421222.2018.1440764

[15] Yang, L., Wang, Z., and Hahn, J. "Scarcity strategy in crowdfunding: An empirical exploration of reward limits," Information Systems Research, Vol. 31, No. 4, pp. 1107-1131.

October, 2020. DOI: dx.doi.org/10.1287/isre.2020.0934

[16] Banerjee, S., and Bose, I. "An attractive proposition? Persuading retail consumers to prefer reward-based crowdfunding for owning upcoming technologies," Information & Management, Vol. 59, No. 6, 103663. September, 2022. DOI: 10.1016/j.im.2022.103663

[17] Tajvarpour, M.H., and Pujari, D. "Bigger from a distance: The moderating role of spatial distance on the importance of traditional and rhetorical quality signals for transactions in crowdfunding," Decision Support Systems, Vol. 156, 113742. May, 2022. DOI: 10.1016/j.dss.2022.113742

[18] Bapna, S., and Ganco, M. "Gender gaps in equity crowdfunding: Evidence from a randomized field experiment," Management Science, Vol. 67, No. 5, pp. 2679-2710. October, 2021. DOI: 10.1287/mnsc.2020.3644

[19] Ketter, W., Padmanabhan, B., Pant, G., and Raghu, T.S. "Special Issue Editorial: Addressing Societal Challenges through Analytics: An ESG ICE Framework and Research Agenda," Journal of the Association for Information Systems, Vol. 21, No. 5, 9. September, 2020. DOI: 10.17705/1jais.00631

[20] Pan, S.L., Carter, L., Tim, Y., and Sandeep, M.S. "Digital sustainability, climate change, and information systems solutions: Opportunities for future research," International Journal of Information Management, Vol. 63, 102444. April, 2022. DOI: 10.1016/j.ijinfomgt.2021.102444

[21] Moss, T.W., Renko, M., Block, E., and Meyskens, M. "Funding the story of hybrid ventures: Crowdfunder lending preferences and linguistic hybridity," Journal of Business Venturing, Vol. 33, No. 5, pp. 643-659. September, 2018. DOI: 10.1016/j.jbusvent.2017.12.004

[22] Costello, F.J., and Lee, K.C. "Exploring investors' expectancies and its impact on project funding success likelihood in crowdfunding by using text analytics and Bayesian networks," Decision Support Systems, Vol. 154, 113695. March, 2022. DOI: 10.1016/j.dss.2021.113695

[23] Flesch, R. "A new readability yardstick," Journal of Applied Psychology, Vol. 32, No. 3, 221. 1948. DOI: 10.1037/h0057532

[24] McLaughlin, G. H. "SMOG grading-a new readability formula," Journal of Reading, Vol. 12, No. 8, pp. 639-646. May, 1969.

[25] Hutto, C., and Gilbert, E. "Vader: A parsimonious rule-based model for sentiment analysis of social media text," In Proceedings of the International AAAI conference on Web and Social Media, Vol. 8, No. 1, pp. 216-225. June, 2014. DOI: 10.1609/icwsm.v8i1.14550

Authors

Kyu Sung Kim is a Master student in SKK Business School at Sungkyunkwan University. He is interested in artificial intelligence, deep learning, text mining, and neuroscience.

Min Gyeong Kim is a Ph.D. student in SKK Business School at Sungkyunkwan University. He is interested in agent based modeling, interpretable AI, fuzzy logic, and neuroscience.

Francis Joseph Costello is a Ph.D. candidate in SKK Business School at Sungkyunkwan University. He is interested in artificial intelligence, deep learning, text mining, and neuroscience.
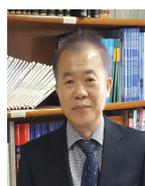
Kun Chang Lee is a full professor of MIS in SKK Business School at Sungkyunkwan University. His recent research interests include emotion mining, health informatics, Human-Robot Interaction (HRI), and artificial intelligence techniques in decision making analysis