

VALUATION MODEL OF CROWDFUNDING CAMPAIGNS APPLYING SIMPLE ADDITIVE WEIGHTING METHOD

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Abstract: Every investor has some difficulties when investing into crowdfunding campaigns, as it is not clear how to evaluate specific crowdfunding campaign or what success factors to choose. The aim of this study is to propose the crowdfunding campaign assessment model, test it empirically and illustrate how to select the most appropriate crowdfunding campaign for individual investor to invest. Multi-criteria methods, used in the evaluation process, enable to get objective answers about the effectiveness of the optimal crowdfunding campaign comprehensively by presenting some generalized indicators and considering both quantitative and qualitative data. The obtained empirical results comparing two crowdfunding campaigns show that the proposed method could be used for evaluating complex processes of the optimal crowdfunding investments, and could be adapted for various situations.

Keywords: crowdfunding, crowdfunding campaign, valuation model, multi-criteria decision method, simple additive weighting

INTRODUCTION

The crowdfunding industry increased significantly after the 2008 global financial crisis, as the typical financial system, especially the banking sector, was no longer trusted. Since then, crowdfunding has thrived globally (Jalal et al., 2024). Crowdfunding, being one of the key applications of Fintech that may disrupt traditional financial intermediation, is an emerging financing alternative form that connects those who can invest money directly with those who need financing for a specific project (Pandey et al., 2024; Wan et al., 2023). It is an internet-based way for companies, organizations or individuals to raise money through either donations or investments from multiple individuals (Hussain et al., 2023). The basic principle of crowdfunding is therefore to pool money from a group of individuals instead of professional parties (Mora-Cruz & Palos-Sanchez, 2023). The definitions of crowdfunding might be different, but they summarize the following key components: 1) raise funds in minor amounts; 2) many-to-many platform and 3) use of digital technology (Hussain et al., 2023; Mora-Cruz & Palos-Sanchez, 2023).

These days many crowdfunding campaigns are emerging. Due to the high variety of crowdfunding campaigns, it is very difficult to select the right one. In order to select the most wanted campaign, the crowdfunding campaigns must be evaluated whether it is worth to invest or not. It is very difficult to assess the crowdfunding campaign, as most campaigns are from

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new companies which still do not have much accounting information or any tangible wealth. Also, there are not many specific success factors of crowdfunding campaigns to look.

The proposed model identifies the success factors and evaluates new campaigns from investor's perspective and reflects both their financial performance and overall attraction. This model is based on a multi-criteria decision weighting methodology and to be more precise – Simple Additive Weighting (SAW) method. The main benefits of this method are 1) ability to combine; 2) find relations; 3) evaluate both quantitative and qualitative criteria. This model follows main concept of all multi-criteria evaluation methods – it integrates the criteria values and weights into a single magnitude.

The general Simple Additive Weighting model framework is adopted to fit specifically crowdfunding campaigns. This model can be used by any individual investor having chosen the proposed criteria to evaluate the crowdfunding campaigns and make investment decisions for the most exciting campaigns. For application purposes, two different campaigns were discussed in the evaluation model.

The main goal of the paper is to propose the crowdfunding campaign assessment model, test it empirically and illustrate how to select the most appropriate crowdfunding campaign for individual investor to invest. Three tasks were developed:

- 1) To identify the main success factors that influence the value of crowdfunding campaigns.
- 2) To adopt the multi-criteria decision method based on SAW into crowdfunding campaign valuation process.
- 3) To test the model applicability and to evaluate two crowdfunding campaigns.

The paper is organized as follows: first, the literature review of financing crowdfunding campaigns and their success factors was conducted. Second, the applied methodology is described. Finally, the results, discussion, limitations and conclusions are discussed.

1. Literature review

1.1. Financing Crowdfunding Campaigns

An ecosystem of crowdfunding consists of three groups: the platform, campaign owners and backers. The dominant point of every crowdfunding ecosystem is a platform. A platform is a technologically supported solution used to link supply (those who provide funds) and demand (those who are seeking for funds). The supply side consists of lenders, investors, backers and donors. The demand side consists of individuals and various organizations that seek for financial support (Jenik et al., 2017; Kumar et al., 2024). Crowdfunding has become very novel and popular financing application worldwide (Huang et al., 2023; Liang et al., 2019). First studies that emphasised crowdfunding platforms, compared the decision-making process of equity crowdfunding with new venture capital funding (Hagedorn & Pinkwart, 2016; Löher, 2017).

However, there is not enough knowledge about the crowdfunding success targets should be evaluated. Additionally, studies on campaign success factors and investment criteria in equity crowdfunding is rare. On the other hand, knowledge of the crowdfunding success factors is required in order to better understand the dynamics of crowdfunding and its campaign success rates (Fan-Osuala et al., 2018). While the number of crowdfunding campaigns is

increasing, it is essential to understand what motivates people to fund these campaigns. The success of crowdfunding campaigns is influenced by various factors, including social capital theory (Butticè et al., 2017; Colombo et al., 2015; Skirnevskiy et al., 2017), signal theory (Ahlers et al., 2015; Courtney et al., 2017), the herding effect (Mohammadi & Shafi, 2018), and local bias (Mendes-Da-Silva et al., 2016). Therefore, success factors for crowdfunding campaigns will be discussed from traditional funding, venture capital and business angels theories. Moreover, crowdfunding can be comparable with traditional e-commerce transactions (Ahlers et al., 2015).

1.2. Success Factors for Crowdfunding Campaigns

Success factors for crowdfunding campaigns were taken from crowdfunding, venture capital and business angel theory and e-commerce literature. Most combinations of success factors were adapted from other study (Venslavienė et al., 2021) and are given in the table 1. According to the existing literature of crowdfunding theory, success factors are splitted into 4 categories: campaign characteristics, networks, understandability and quality signals (Cumming et al., 2020; Ferreira & Pereira, 2018). Those 4 categories included other sub-factors, in total counting 15 success factors from crowdfunding theory. While discussing Venture Capital and Business Angels theory, there were found 6 success factors (Huang et al., 2023; Liu et al., 2023; Zhu et al., 2023). Finally, from e-commerce theory, there were found three main factor groups related with risk, including 10 related risks. To summarize, 6 global factor groups including 24 success factors affect crowdfunding campaigns.

Table 1. *Success factors for crowdfunding campaigns found in the literature*

Theory	Global Success Factor	Codes	Success factor	Codes	Description
Crowdfunding theory	Campaign characteristics	C1	Campaign duration	SC11	duration of the project campaign
			Funding target	SC12	minimum sum needed to launch the project
			Min. Investment	SC13	minimum amount to invest to participate in the project campaign
			Provision of financials	SC14	financial forecasts/projections, early financial statements
			Number of early backers	SC15	number of investors who invest before the campaign is launched
			Capital raised	SC16	total capital raised for one project
			Number of investors	SC17	actual number of investors investing in the same project
	Networks	C2	Social media networks	SC21	the followers' social network of the project owner
			Private networks	SC22	family and friends who support the project
	Understandability	C3	Understandability	SC31	is it oriented to business (B2B) or customer (B2C)
Information about risk			SC32	if the crowdfunding campaign is giving information about the risk	

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			Environment commitments	SC33	if the crowdfunding campaign is committed to the environment
	Quality signals	C4	Updates	SC41	how often updates are sent to audience
			Spelling mistakes	SC42	are there any spelling errors in the campaign text
			Video	SC43	is there a descriptive video about the campaign/product
Venture Capital and Business Angels	Company ratings	C5	Team rating	SC51	industry expertise
					educational background
					Experience
					the balance between team members' skill sets
					perceived motivation, drive, passion, commitment, honesty
		Markets rating	SC52	attainable market that determines the company's growth potential.	
		Concept rating	SC53	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	
		Scalability rating	SC54	value of the solution to the customer	
		Terms rating	SC55	it is easy to scale up the solution to the entire target market.	
		Stage rating	SC56	valuation	
				whether the targeted funding amount is sufficient to lift the company to the next level	
progress of the company on its development path					
remaining gap to the target state					
E-commerce theory	Risk	C6	Risks associated with the project	SC61	status of the product
					status of market validation
					existence of paying customers
					product risk/funding object risk
			Risks associated with the project initiator	SC62	Social risk
					psychological risk
					post-funding risk/ repayment risk
			Risks associated with the intermediary	SC63	project initiator risk/owner risk/seller risk
					time risk/convenience risk
					delivery risk
					intermediary risk/privacy risk
					financial risk
					performance risk/operating risk

Source: Adapted from (Venslavienė et al., 2021)

These success factors should be used in evaluation model for crowdfunding campaigns.

2. Methodology

When assessing crowdfunding campaigns, investors usually do not have full information and have to turn their attention to secondary sources of information to help find out qualitative differences among crowdfunding campaigns. Thus, usually crowdfunding campaigns have both quantitative and qualitative success factors. Therefore, in order to create a model, six main factor groups were analyzed. Since these success factors are multidimensional, there is a need to apply methods that can link all criteria to one descriptive measure. Multi-criteria evaluation methods are the ones which can analyze those factors (Barretta et al., 2023; Hashemi et al., 2022; Khan et al., 2022). Multi-criteria decision making (MCDM) is applied to preferable decisions among available classified alternatives by multiple attributes (Taherdoost & Madanchian, 2023; Zavadskas et al., 2022). Multi-criteria decision method is a method that does the analysis of several unrelated criteria. In this method environmental, economic, technological and social factors are discussed for the choice of the project and for making the choice sustainable (Alvarez et al., 2021).

In this paper, Simple Additive Weighting method, one of MCDM methods, will be used to create valuation model. SAW method is the oldest, one of the simplest, widely known and practically used (Amalia & Alita, 2023; Kelen et al., 2023; Rusidah et al., 2023; Sinaga & Riandari, 2020). The criterion of the method S_j clearly demonstrates the main concept of multi-criteria evaluation methods – the integration of the criteria values and weights into a single magnitude (Amalia & Alita, 2023; Sinaga & Riandari, 2020). The sum S_j of the weighted normalized values of all the criteria is calculated for the j -th object:

$$S_j = \sum_{i=1}^m \omega_i r_{ij}, \quad (1)$$

Where ω_i is weight of the i -th criterion r_{ij} is normalized i -th criterion's value for j -th object; $i = 1, \dots, m$; $j = 1, \dots, n$; m is the number of the criteria used, n – is the number of the objects (alternatives) compared.

The largest value of criterion S_j corresponds on the best alternative (Rajagukguk et al., 2022). All the compared alternatives must be ranked in the decreasing order of the calculated values of the criterion S_j .

Adopting the SAW method in the crowdfunding campaign evaluation process several steps should be done:

- 1) Weights are given for each criterion as the importance of attribute
- 2) A value (score) is given for each alternative by criteria assessment
- 3) When there is already normalized matrix, every member of that matrix is multiplied by its weight and summed with other members of the alternative
- 4) The alternative with the highest score is selected.

Model consists of three stages. First, choose criteria. Second, use SAW to weight the evaluative criteria and the last, third stage gives the optimal crowdfunding campaign to fund for investor.

3. Application of valuation model crowdfunding campaigns

In order to have more specific and detailed valuation of factors, all factors were defined and grouped in smaller groups of sub-factors. Also, this way is easier for experts to evaluate

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factors more precisely. After the expert evaluation, all sub-factors should be combined into factor groups with global weights and those factor groups will be used in the model to choose the most optimal crowdfunding campaign to invest in.

When all factors are set, the factor weights can be found. Here expert estimates are chosen. This estimation is very subjective, therefore five professionals with experience in investing into crowdfunding platforms were chosen. Three of them constantly invest into crowdfunding campaigns, while the other two are the owners of crowdfunding campaigns. The results of expert evaluations are given in table 2.

Table 2. *Expert estimation of factor weights*

No	Success factor	Codes	1	2	3	4	5	Total	Weights
1	Campaign duration	SC11	8	3	2	4	1	18	0.036
2	Funding target	SC12	4	4	3	3	1	15	0.030
3	Min. Investment	SC13	10	5	3	2	1	21	0.042
4	Provision of financials	SC14	3	3	2	3	5	16	0.032
5	Number of early backers	SC15	0	4	4	2	8	18	0.036
6	Capital raised	SC16	0	3	5	4	7	19	0.038
7	Number of investors	SC17	0	3	3	2	6	14	0.028
8	Social media networks	SC21	3	2	4	3	2	14	0.028
9	Private networks	SC22	3	2	20	9	6	40	0.080
10	Understandability	SC31	6	4	5	3	1	19	0.038
11	Information about risk	SC32	10	3	1	2	4	20	0.040
12	Environment commitments	SC33	5	2	1	3	3	14	0.028
13	Updates	SC41	3	2	1	2	4	12	0.024
14	Spelling mistakes	SC42	5	3	1	2	3	14	0.028
15	Video	SC43	0	4	1	3	5	13	0.026
16	Team rating	SC51	7	5	10	6	4	32	0.064
17	Markets rating	SC52	5	3	2	3	4	17	0.034
18	Concept rating	SC53	3	7	10	6	4	30	0.060
19	Scalability rating	SC54	0	3	4	3	5	15	0.030
20	Terms rating	SC55	0	5	4	3	2	14	0.028
21	Stage rating	SC56	0	5	4	3	2	14	0.028
22	Risks associated with the project	SC61	10	10	4	8	8	40	0.080
23	Risks associated with the project initiator	SC62	5	8	3	11	5	32	0.064
24	Risks associated with the intermediary	SC63	10	7	3	10	9	39	0.078
	Total		100	100	100	100	100	500	1.000

Simple additive weighting method uses the typical normalization. The values of the criterion S_j of the method range from 0 to 1 for all the alternatives considered, while the sum of the criterion values is equal to unity allowing for graphical (geometrical) interpretation of the method.

The global weights of each criterion should be estimated for further calculations. The global weights will show the most important factors from the whole group. The global weights are calculated in a very simple way – by finding simple arithmetic average from each sub-factor group. The results of global weights are found in table 3. The results shall be used in the valuation model to get which one of crowdfunding campaigns is more attractive to invest. The most important factors are related with Risk and with Networks, while the least important are quality signals.

Table 3. *Global weights of each factor group*

Global Factor	Success Codes	Success factor	Codes	Total	Weights	Global weights
Campaign characteristics	C1					0.0346
		Campaign duration	SC11	18	0.036	
		Funding target	SC12	15	0.030	
		Min. Investment	SC13	21	0.042	
		Provision of financials	SC14	16	0.032	
		Number of early backers	SC15	18	0.036	
		Capital raised	SC16	19	0.038	
		Number of investors	SC17	14	0.028	
Networks	C2					0.054
		Social media networks	SC21	14	0.028	
		Private networks	SC22	40	0.080	
Understandability	C3					0.0353
		Understandability	SC31	19	0.038	
		Information about risk	SC32	20	0.040	
		Environment commitments	SC33	14	0.028	
Quality signals	C4					0.0260
		Updates	SC41	12	0.024	
		Spelling mistakes	SC42	14	0.028	
		Video	SC43	13	0.026	
Company ratings	C5					0.0407
		Team rating	SC51	32	0.064	
		Markets rating	SC52	17	0.034	
		Concept rating	SC53	30	0.060	
		Scalability rating	SC54	15	0.030	
		Terms rating	SC55	14	0.028	
		Stage rating	SC56	14	0.028	
Risk	C6					0.0740
		Risks associated with the project	SC61	40	0.080	
		Risks associated with the project initiator	SC62	32	0.064	
		Risks associated with the intermediary	SC63	39	0.078	

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The next step is to find out the most attractive crowdfunding campaign to invest in. There were analyzed two different crowdfunding campaigns from different sectors. The first crowdfunding campaign is in real estate and oriented to both foreign and local markets, while the second is innovative with unique product in the industry, but oriented only to local market. Moreover, both already have some early investors. Further, Crowdfunding Campaign 1 is considered to be on lower risk, while Crowdfunding Campaign 2 is the opposite – very risky.

With proper descriptions of the crowdfunding campaigns, it is likely to assess crowdfunding campaigns by scores. In other words, the factor matrix should be normalised. As input data for calculation are the factors and their values of importance, the matrix should be normalised according to these conditions by evaluating the values of factors in the interval from 1 to 5, where:

- 1) Negative value of factors (decreasing value of factors).
- 2) Insufficient value of factors (remaining the same).
- 3) Medium value of factors (medium increasing).
- 4) Sufficient value of factors (sufficient increasing).
- 5) High value of criteria (high increasing).

The normalized values of alternatives are provided in table 4. The estimation of aggregated values was done by applying the formula (1). The final results are presented in table 5. Based on the results, it is possible to draw some conclusions. As the optimal alternative, it should be selected the second crowdfunding campaign since its aggregated value is 1.0303 that is higher than the first crowdfunding campaign with aggregated value of 0.7982.

Table 4. *Global Normalized values for Crowdfunding campaigns*

Global Success Factor	Codes	Crowdfunding Campaign 1	Crowdfunding Campaign 2
Campaign characteristics	C1	5	4
Networks	C2	3	4
Understandability	C3	4	3
Quality signals	C4	2	3
Company ratings	C5	3	3
Risk	C6	2	5

Table 5. *Crowdfunding campaign value calculation using SAW method*

Global Success Factor	Codes	Crowdfunding Campaign 1	Crowdfunding Campaign 2	Global weights	Value of Crowdfunding Campaign 1	Value of Crowdfunding Campaign 2
Campaign characteristics	C1	5	4	0.0346	0.1729	0.1383
Networks	C2	3	4	0.0540	0.1620	0.2160
Understandability	C3	4	3	0.0353	0.1413	0.1060
Quality signals	C4	2	3	0.0260	0.0520	0.0780
Company ratings	C5	3	3	0.0407	0.1220	0.1220
Risk	C6	2	5	0.0740	0.1480	0.3700
Aggregated value					0.7982	1.0303

For this analysis six factor groups and 24 sub-factors were selected and 2 alternatives created. Multi-criteria evaluation method was applied to perform quantitative evaluation on these success factors. First, all values and weights of all factors were estimated and then they were applied to evaluation model. The overall conclusion from evaluation of those two alternatives shows not very wide dispersion, so it can be assumed that the factors and factor weights are selected correctly and the aggregated value sum of 1.0303 shows that alternative 2 is more attractive to choose for a decision considering the investment idea in some crowdfunding campaigns.

DISCUSSION

This paper provides the estimation framework to determine the optimal crowdfunding campaigns to invest. A new valuation model was proposed applying simple additive weighting methods which is part of multi-criteria evaluation method. The model suggests that crowdfunding investors should focus not only on traditional financial factors but also on their given parameters and conditions. The model works properly and helps for investors to decide on the best crowdfunding campaign. Moreover, it might be recommended to select more success factors or to use more combinations of other methods of multi-criteria evaluation to normalise the factors used and to pool the alternatives of various crowdfunding campaigns. The results from the implementation with more multi-criteria methods might show stronger and more effective results from different perspectives.

CONCLUSIONS

Before investing into new crowdfunding campaigns, investors must evaluate whether it is worth to invest or not. It is quite difficult to evaluate crowdfunding campaigns as most of them are very new in the market and there is little financial data.

The valuation model to assess crowdfunding campaigns was proposed in this paper. Moreover, the multi-criteria valuation method simple additive weighting was applied. Comparing with other models, simple additive weighting is effective, as different factors can be chosen by different investor according to his personal preferences.

For this analysis six factor groups and 24 sub-factors were selected and 2 alternatives created. Multi-criteria evaluation method was applied to perform quantitative evaluation on these success factors. First, all values and weights of all factors were estimated and then they were applied to evaluation model. Simple additive weighting method has worked properly and proved that it was the right method to apply in the model. The results of this method helped to choose the most optimal crowdfunding campaign to invest in. It can be concluded that the created model can be extensively applied for evaluating and selecting most optimal crowdfunding campaign. The overall conclusion from evaluation of those two alternatives shows not very wide dispersion, so it can be assumed that the factors and factor weights are selected correctly.

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