Financial Economics Letters

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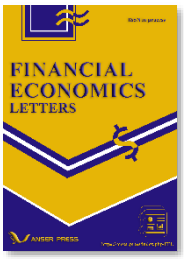

What Determines the Success of Video Game Crowdfunding Campaigns? The Role of Different Success Definitions and Funding Goals

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ABSTRACT

In the dynamic landscape of exponential growth in the games industry, crowdfunding has emerged as an important funding method for indie games. Previous research has provided inconsistent results on the factors behind its success. This study closes this gap by examining which factors influence success and how success factors vary with different definitions of success and funding goals. The results show that caution is needed when interpreting the results as they depend on model specifications even within the same dataset. Furthermore, the study proposes a framework, supported by an empirical analysis of 1,967 campaigns, to increase the probability of crowdfunding success.

KEYWORDS

Crowdfunding; Success Factors; Interrelationship; Kickstarter; Entrepreneurship; Reward-Based; Entrepreneurial Financing

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ISSN 2972-3426
doi: 10.58567/fel03040003

Received 6 May 2024; Accepted 13 June 2024; Available online 27 December 2024; Version of Record 15 December 2024

1. Introduction

The era when video games were considered a niche subculture has long passed (Mitterer & Steiner, 2020). Today, they are an essential component of our cultural fabric, influencing consumption patterns, community dynamics, and individual identity formation (Muriel & Crawford, 2018). The economic importance of the industry has increased significantly in recent decades (Lehtonen, Gustafsson & Hassan, 2023), with global revenues estimated at USD 180 billion in 2022 (Wijman, 2022). In particular, the rapid increase in game releases on the leading platform Steam underlines the growing relevance of the industry (Steam Spy, 2023), with a significant proportion being independent games, commonly referred to as indie games (Kontus, 2022). This trend towards the growing number of indie games has been observed since 2012 (Keijser, 2012). Independent game development typically involves creating games without the support of major publishers (Parker, 2011), driven not only by artistic autonomy but also by the increasing risks associated with game development (Clarke & Wang, 2020). Funding such ventures has become increasingly challenging due to technological advancements and increased competition, requiring unique selling propositions (Clarke & Wang, 2020; T.C., 2014; Morris, 2010). It is estimated that only a small percentage of video game projects are profitable, ranging from four to twenty percent (Zackariasson & Wilson, 2012[1]). Leading publishers tend to be risk averse and favor established brands or concepts (Clarke & Wang, 2020), and consequently, independent studios face the challenge of raising funds through traditional means, which has led to the emergence of alternative funding options, with crowdfunding becoming the main choice (Lax, 2017). Crowdfunding represents a relatively new and intriguing chapter in the field of entrepreneurial finance (Dushnitsky & Zunino, 2018) and has become a crucial component (Hsieh & Vu, 2021). Entrepreneurial finance can be defined as the provision of financing for entrepreneurial activities (Achleitner & Braun, 2015), a field that largely focuses on younger firms (Cumming et al., 2019a), which, in general, are unlisted companies (Achleitner & Braun, 2015). As previously stated, video games have witnessed a significant shift towards independent developers, that act as entrepreneurs. Achleitner & Braun (2015) define the term entrepreneurial finance to be more expansive than simply start-up financing. In contrast to traditional corporate finance, information asymmetries between entrepreneurs and investors play a more pivotal role (Han et al., 2020; Cumming et al., 2019a). Entrepreneurial signaling is believed to be an effective way to overcome information asymmetries (Connelly et al., 2011). This study aims to identify success factors for video game crowdfunding campaigns that are consistent across different metrics and funding goals. The findings offer valuable insights for aspiring entrepreneurs navigating this challenging landscape and improve the ability to access capital, which can be considered one of the most significant challenges for entrepreneurial firms (Denis, 2004).

2. Literature review

Crowdfunding can be described as a process in which the general public, sometimes declared as an open call, is asked for funds, usually via the Internet in exchange for some form of reward, voting rights or as a donation (Gierczak et al., 2016; Scholz, 2015; Dresner, 2014; Mollick, 2014; Belleflamme et al., 2014; Lehner, 2013; Schwienbacher & Larralde, 2012; Steinberg & DeMaria, 2012; Ordanini et al., 2011; Lambert & Schwienbacher, 2010). The most important feature is that many individuals support the campaign with small amounts of money (Scholz, 2015; Belleflamme et al., 2014; Lehner, 2013) and these essentially come from the unknown public, including ordinary people who are not traditional investors, which distinguishes crowdfunding from existing financing models such as venture capital (Ryu, 2020). Crowdfunding involves three parties: project founders, intermediaries, and capital providers (investors). Crowdfunding platforms serve as intermediaries, facilitating online interactions among project founders and capital providers (Günther & Riethmüller, 2020; Ryu, 2020; Kraus

[1] Originally from Laramée, F. D. (2003). Secrets of the Game Business. Charles River Media.

et al., 2016; Belleflamme et al., 2015). These platforms offer various transaction mechanisms, notably the 'All-or-nothing' and 'Keep-What-You-Get' models, with the former being the predominant form, where funds are only paid out when the funding target is reached (Günther & Riethmüller, 2020; Ryu, 2020; Gierczak et al., 2016) and therefore protect investors from undercapitalization of the capital acquirer (Günther & Riethmüller, 2020). The literature describes four primary types of crowdfunding: donation-based, lending-based, equity-based, and reward-based (Günther & Riethmüller, 2020; Ryu, 2020; Orthwein, 2015; Sixt, 2014), which differ in terms of investor returns and financing mechanisms. Rewards-based crowdfunding dominates the video game industry. The focus is not on the financial benefit for the investors but on the interest that certain products or services are realized (Günther & Riethmüller, 2020). Supporters typically receive non-monetary rewards (Günther & Riethmüller, 2020; Ryu, 2020; Sixt, 2014) and as the return is often significantly lower than the amount paid, this form of crowdfunding is characterized as a 'non-investment' model (Günther & Riethmüller, 2020; Sixt, 2014). Although crowdfunding has potential, success rates remain relatively low. Many campaigns fail to reach their funding targets (Miller, 2019), especially those for video games (Cha, 2017; Strickler & Benenson, 2012).

Several literature reviews have concluded that scientific research is still in its early stages (Lenart-Gansiniec & Chen, 2021; Kuppuswamy & Bayus, 2018; Kaartemo, 2017; Bouncken, Komorek & Kraus, 2015; Moritz & Block, 2014). Research is characterized by a lack of empirical data (Lenart-Gansiniec, 2021; Bouncken, Komorek & Kraus, 2015; Moritz & Block, 2014), limited peer-reviewed crowdfunding literature (Kuppuswamy & Bayus, 2018), and a lack of understanding regarding specific niches (Bogusz, 2019). Crowdfunding for video game projects is considered a niche area. According to Cha's (2017) study, there is limited academic research on crowdfunding for video game projects. Lax (2017) highlights the need for research on success factors for video game projects. Another noteworthy characteristic is the discrepancy in research findings (Deng et al., 2022, Jáki et al., 2022). A literature study by Jáki et al. (2022) identified 106 different success factors. Of these, only 41 were analyzed by multiple authors, and of these, 19 have varying interpretations. The researchers identified four primary categories of success factors: campaign settings, participants, communication, and networking. Nevertheless, the authors advise against relying on these factors as a guarantee of success, given the inconsistent interpretations of the results. In their analysis of 94 empirical papers, Deng et al. (2022) reached the same conclusion that numerous factors have an inconsistent relationship with crowdfunding success. One of the essential elements of research on success factors is the definition of success, which is necessary to ensure that the impact of the factors can be measured and compared (Schmalen et al., 2006). However, there is no consensus on how to define success, which not only affects the measurement of success but also determines the research method (Deng et al., 2022). Numerous studies exclusively focus on the financial dimension of crowdfunding, a perspective that has been challenged in recent literature (Shneor & Vik, 2020; Bogusz, 2019). Cai et al. (2021) state that social capital is becoming increasingly important in the context of crowdfunding and human and social capital have been observed as resources that projects seek to leverage. Social capital refers to resources that arise from social relationships (Payne et al., 2011). According to Gust (2016), launching a crowdfunding campaign can be influenced by the impact of a networked advertising campaign. Beier et al. (2014) suggest that crowdfunding can provide marketing opportunities and added value for a company. This is achieved by building and maintaining trust, which results in greater engagement and long-term activation (Macht, 2014). Günther & Riethmüller (2020), Brown et al. (2017), and Harzer (2013) support the idea that marketing aspects play a significant role in crowdfunding. Furthermore, Brown et al. (2017) argue that crowdfunding's autonomy and speed are important for entrepreneurs.

Additional inconsistencies may arise as factors predicting success may differ across differing funding ranges (Pinkow & Emmerich, 2021; Cha, 2017). The study by Pinkow & Emmerich (2021) indicates that individual success factors contribute less to the success probability of projects with an increasing funding goal. However, they note that this phenomenon is not well understood in the existing literature and that further research is needed to gain a

deeper understanding of its implications.

This study contributes to the existing literature on video game crowdfunding campaigns by identifying success factors that are consistent across different metrics and funding goals. To achieve this, the study follows the recommendations of Bouncken, Komorek & Kraus (2015), who state that to gain a comprehensive understanding of the dynamics of crowdfunding, it is essential to collect empirical data. The study acknowledges that crowdfunding is a financial instrument in transition (Ryu, 2020; Migicovsky, 2012), and thus special attention should be paid to the rapid development of crowdfunding (Jáki et al., 2022; Bouncken, Komorek & Kraus, 2015). To address this, the study follows the recommendations of Jáki et al. (2022), who advocate for the conduct of studies with updated data sets and rigorous methods to eliminate inconsistencies in the research findings.

3. Theoretical framework and hypotheses

3.1. Theoretical framework

Crowdfunding is a multidisciplinary field that overlaps with finance, economics, management, sociology, and information systems (Lax, 2017). This study proposes a framework that combines several theories, including information asymmetry theory, the SEC[2] classification of goods and services theory, investor relationship theory, price discrimination theory, behavior finance theory, media richness theory[3], and signaling theory (see Figure 1).

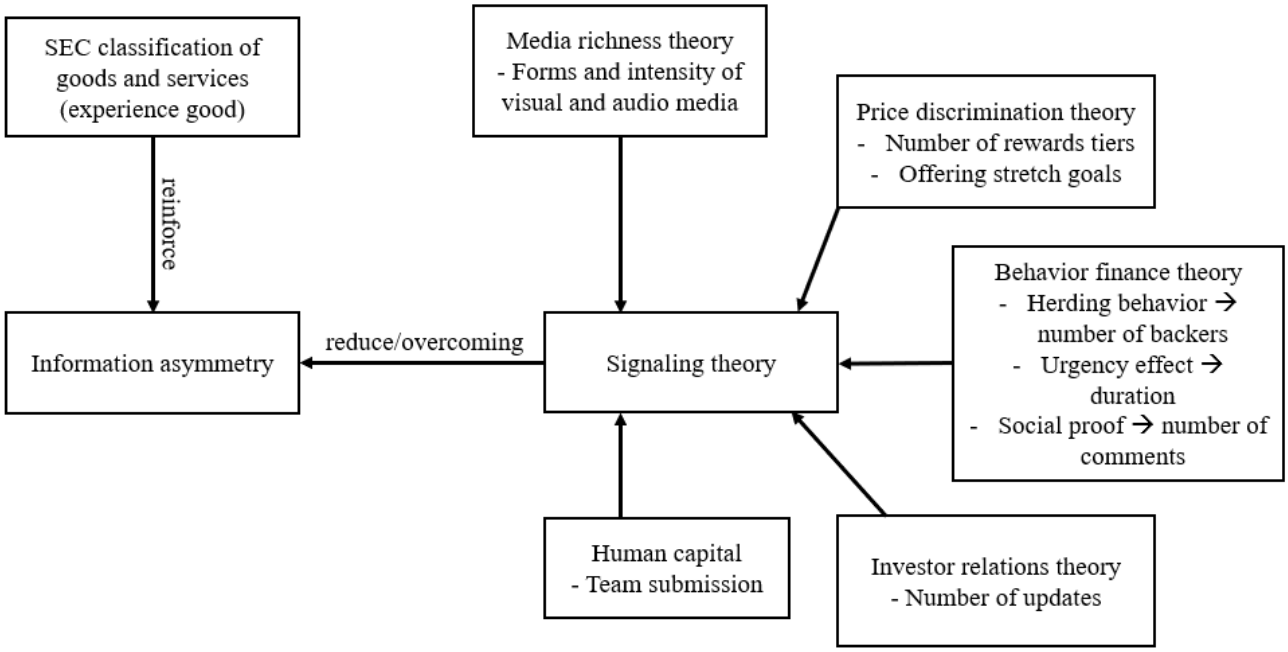

Figure 1. Theoretical framework.

3.1.1. Information asymmetry theory

Crowdfunding investors often lack experience (Piva & Rossi-Lamastra, 2017; Lukkarinen et al., 2016), particularly when compared to traditional investors (Volpe et al., 2002). Small investors must expend more effort to obtain information than larger and more experienced investors (Ahlers et al., 2015), making it difficult for them to assess the quality of crowdfunding projects (Hoenig & Henkel, 2015). Project founders possess more knowledge

[2] Search, Experience, Credence.
[3] The idea of using media richness theory comes from a study by Cha (2017).

about the project's qualities than external investors (Shane & Stuart, 2002). This unequal distribution of information is referred to in financial theory as information asymmetry (Vismara, 2016; Connelly et al., 2011).

The absence of verifiable information may cause potential investors to hesitate to invest in projects, and in some cases, a lack of information may result in no investment at all. As a result, crowdfunding campaigns face the problem of adverse selection due to information asymmetry. Therefore, information asymmetry is a major burden for all parties involved in crowdfunding (Shlyakhtovska, 2018).

The literature assumes that reducing information asymmetry will positively impact the campaign, as supporters have more certainty about the founder and the idea or concept, which increases the willingness to participate in the crowdfunding campaign (Van der Zee, 2018; Piva & Rossi-Lamastra, 2017). Reducing information asymmetry can be beneficial in this regard, although disclosing all information about video games in crowdfunding campaigns may increase the risk of idea theft (Arakji & Lang, 2007). Crowdfunding platforms can help reduce information asymmetry by providing extensive information about crowdfunding campaigns and acting as trusted intermediaries. In reward-based crowdfunding, there is an additional asymmetry of information regarding the quality of the rewards, as it is only known after delivery (Van der Zee, 2018). Backers make their decision based on consumption opportunities rather than their investment (Cumming et al., 2019b).

3.1.2. Classification of goods and services

Economists typically classify goods into three archetypes based on the difficulty of quality assessment for the buyer (Reik, 2016; Andersen & Philipsen, 1998). Video games are regarded as experience goods (Jöckel, 2008), meaning that their quality is only revealed upon consumption and cannot be determined before the purchase (Reik, 2016). As a result, advertisement faces a higher credibility problem (Ford et al., 1990). This results in a higher information asymmetry (Reik, 2016), particularly since it is a one-time purchase and the transaction costs for the investor are higher, making it more challenging to reduce information asymmetry.

3.1.3. Investor relations theory

The core concept of investor relations, as described by Streuer (2004), is to attract potential investors to participate in the company's capital raising through communication and active information. Schnorrenberg (2008) emphasizes that this is primarily achieved through a high level of transparency. Laskin (2018) views investor relations as a strategic function, with managing the expectations of the community being a key part of it. Valentine (2015) argues that digital channels, specifically online platforms, offer a fast, economical, and flexible way to disclose information to parties involved in the investment process. Therefore, this study examines, whether a transparent approach to the campaign impacts the campaign process.

3.1.4. Price discrimination theory

Price discrimination is a widespread practice in economics and is one of the most common forms of marketing (Varian, 1989). It refers to the practice of charging different prices to different customers for the same good or a slightly different version (Phillips, 2005). In crowdfunding, investors receive benefits in return, which serve as an incentive to support the project (Heyduck & Engelen, 2021). By offering various rewards, it is possible to better meet the preferences of individual investors (Günther & Riethmüller, 2020), especially because the crowd makes decisions from the consumer perspective and less from an investor perspective (Cumming et al., 2019b). Additionally, a wide range of reward options allows for coverage of different investor budgets, which is especially useful when the target audience is diverse and heterogeneous in terms of financial strength (Sixt, 2014). This is in line with theoretical considerations of price discrimination theory, where this practice relies on the different willingness of customers to pay (Belobaba, 2009; Phillips, 2005). Therefore, this study examines, if a broader

corridor of rewards predicts the success of crowdfunding campaigns.

3.1.5. Behavior finance theory

Crowdfunding's nature requires studying human behavior. Traditional financial theories assume that investors act rationally and consider all available information when making decisions (Kamoune & Ibenrissoul, 2022; Kroeber-Riel & Gröppel-Klein, 2019). Based on this assumption, the logical conclusion was once that markets are efficient, but it is now widely recognized that this is not the case, and consequently, behavioral finance has emerged to study investor decisions under uncertainty (Ryu, 2020). Findings from this field of research can help to understand why people choose to participate in crowdfunding, even if the financial benefits of reward-based crowdfunding are not or only partially given (Günther & Riethmüller, 2020; Sixt, 2014).

3.1.6. Media richness theory

Media richness theory focuses on the choice of communication medium and its ability to accurately convey information. The theory assumes that different media have varying levels of information richness (Daft & Wiginton, 1979). For example, email is considered a low-richness medium, while video calls and face-to-face interactions are considered rich media (Nerdinger et al., 2019). The measure of a medium's richness is based on its ability to convey information, facilitate personal communication, and provide prompt feedback (Nerdinger et al., 2019; Schwabe, 2001). Rich media can handle complex messages, thereby reducing equivocality (Cha, 2017; Lengel & Daft, 1984), which refers to ambiguous interpretations or easier said about possible misinterpretations of a message. The effectiveness of task performance is influenced by the selection of a medium and its ability to communicate information (Nerdinger et al., 2019; Cha, 2017; Daft & Lengel, 1986). This study, following Cha's (2017) approach, investigates the impact of media use on the success of crowdfunding campaigns.

3.1.7. Signaling theory

In research, it is believed that entrepreneur signaling is the most effective way to overcome information asymmetries (Connelly et al., 2011), and this theory is commonly used as a theoretical framework in publications on crowdfunding success factors (Shlyakhtovska, 2018). Signaling helps to resolve information asymmetries through direct or indirect actions (Connelly et al., 2011). The economic application of signaling focuses on the interaction between companies and potential investors, particularly in the context of startup financing (Hof, 2017). Mollick (2013) found that the signals used by backers in crowdfunding resemble those used by venture capitalists to distinguish project quality. According to Davies & Giovannetti (2018), in the context of crowdfunding projects, signaling strategies can help reduce the negative effects of asymmetric information by announcing key features of project quality.

The signaling theory suggests that a company's actions, whether intentional or not, communicate messages to the market or its participants (Tewes, 2008). Decision makers actively look to find these signals to reduce information asymmetry (Spence, 1974). However, the effectiveness of these signals depends on whether the transmitted signal is perceived (Gulati & Higgins, 2003) and on the receiver's interpretation (Gulati & Higgins, 2003; Rynes et al., 1991). Misinterpretation can have negative consequences for the signal sender (Hof, 2017). This theory can also explain success factors that send positive signals to the recipient, increasing the campaign's chances of success. The study aims to identify these factors in crowdfunding campaigns.

3.2. Development of hypotheses

Crowdfunding involves financing a project through small contributions from a large group of investors, also known as the crowd (Lehner, 2013). Before making an investment decision, an investor analyzes the information

about the crowdfunding project, intending to assess the likelihood of a positive outcome for the project (Shlyakhtovska, 2018). Given the distinctive attributes of crowdfunding, it is not uncommon for investors to lack experience and expertise (Piva & Rossi-Lamastra, 2017; Lukkarinen et al., 2016), particularly in comparison to traditional investors (Volpe et al., 2002). Moreover, the effort required by small investors to obtain information is considerably greater than for larger and more experienced investors (Ahlers et al., 2015). Consequently, they encounter significant challenges in assessing the quality of projects seeking crowdfunding (Hoenig & Henkel, 2015). This phenomenon appears to be particularly relevant in the context of crowdfunding for video games, where a high level of information asymmetry exists, leading to significant uncertainty about the project. Video games are regarded as experience goods (Jöckel, 2008), meaning that their quality is only revealed upon consumption and cannot be determined before the purchase (Reik, 2016). One method of gauging the success chances is to examine the number of individuals who have already expressed support for it. This approach suggests that if a campaign has already attracted the backing of others, it is likely to be perceived as a worthwhile endeavor and must have good qualities. Otherwise, the other people would not have put their money on the line. This is a description of the herding effect, which can be seen as a form of signaling in capital markets (Günther & Riethmüller, 2020), more concretely as a trust signal (Sixt, 2014). Baddeley (2010) defines herding as a phenomenon in which individuals choose to follow and imitate group behaviors rather than make independent decisions. According to Keynes (1930), individuals may tend to follow the crowd in the face of uncertainty, believing that the collective possesses superior information. As stated by Song et al. (2019), the credibility of a project increases when there is a large number of supporters or when there is a rapid growth in support. Consequently, as the number of supporters reaches a sufficient level, the project develops its own dynamics, as outlined by Sixt (2014), and creates a positive imitative effect. Hence, a crowdfunding campaign with a greater number of backers is more likely to be successful, as it creates a trust signal that encourages others to follow suit.

H1: A crowdfunding campaign's likelihood of success increases with a higher number of backers.

When planning a crowdfunding campaign, it is necessary to determine the duration of the project. Current research suggests that project duration is a significant factor in determining success, but there is no consensus on the optimal duration. However, there is widespread agreement that the campaign should not be too long (Heyduck & Engelen, 2021; Sterblich et al., 2015; Mollick, 2014; Sixt, 2014; Harzer, 2013). A longer duration may be perceived as a sign of a lack of self-confidence (Mollick, 2014). Potential investors may doubt that insecure founders will be able to carry out a project to their satisfaction, leading them to decide against investing (Sudek, 2006). Matej (n.d.) takes the standpoint:

> *"Even if you have a reason why, but don't have a reason why you should act right now, chances are that you still won't do anything. That's why companies have to create a sense of urgency."*

In literature, the phenomenon of urgency taking precedence over importance is referred to as the mere urgency effect (Zhu et al., 2018). Sterblich et al. (2015) suggest that potential investors may delay or even forget their decision to participate in a campaign if they believe they have plenty of time to decide. Harzer (2011) argues that a shorter time frame can lead to impulse support. Empirical investigations support these considerations. They found out that individual success rates decrease linearly with the length of the financing periods (Harzer, 2013[4]). Stagnation often occurs in the middle of the project period (Harzer, 2013). Rao et al. (2014) discovered that the financial inflow during the first 10%, and at 95-100% of the campaign duration has the strongest influence on the success of the crowdfunding campaign. Beier & Wagner (2015) support this claim and state that the early days of a campaign are crucial as they typically generate a larger amount of the targeted funding and also trigger social

[4] Originally quoted a study from Kickstarter.

behaviors such as herd behavior or social proof, which can impact the campaign's ongoing. Consequently, a shorter duration of the campaign serves as an indicator of the founders' confidence and also can create a sense of urgency, which both influence the campaign's likelihood of success.

H2: The duration of the funding period negatively affects the campaign's success.

Human capital is widely recognized as a crucial factor for corporate success (Wujarso et al., 2021; Barlett & Ghoshal, 2002; Hitt & Duane, 2002). It can be defined as the abilities and knowledge that individuals possess (Goldin, 2016; Moog, 2004). The main advantage of a team lies in its ability to combine distinct individual human capital attributes (Beier & Wagner, 2014; Paulus et al., 2001), which can help prevent critical errors (Paulus et al., 2001). Kenwright (2022) argues that a successful video game studio requires employees with both hard and soft skills, as video games combine elements from various art forms (Smuts, 2005) and therefore require different types of people, such as artists, programmers, and producers (Hodent, 2021). Marchand & Henning-Thurau (2013) argue that high-level creativity is inherent in this field, and Kenwright (2022) notes that creativity is the most in-demand soft skill of the future. Creativity usually requires a mix of individual and group contributions (Sutton, n.d.). As the industry becomes more complex (Blow, 2004), it is increasingly likely that individuals may not possess the necessary skills to generate creative solutions on their own (Parjanen, 2012). Therefore, a team-based approach to a campaign is more likely to succeed, as they possess a greater quantity of human capital and are more likely to possess the numerous skills required for the development of video games.

H3: A crowdfunding campaign is more likely to succeed when it comes from a team, as opposed to one person.

Crowdfunding brings together individuals who share an interest in a product idea and its development (Harzer, 2013). A project is defined by its unique conditions (Meyer & Reyer, 2016), and due to information asymmetry, assessing the project's status can be challenging. Project founders are better informed about the qualities of the project than external investors (Shane & Stuart, 2002). Regular updates serve to mitigate this imbalance by providing backers with timely and relevant information about the project's progress, which mitigates uncertainties and reduces perceived risks associated with investing. In many cases, the sole source of new information is an update from the project founder. Updates serve to inform capital providers about the latest project information (Block et al., 2018). This aligns with investor relationship theory, which emphasizes the importance of communication and trust-building between investors and firms (Schnorrenberg, 2008; Streuer, 2004). The advent of new information and communication media has greatly enhanced the potential for communication and, as a consequence, the demand regarding the communication behavior of companies. (Kirchhoff, 2005). By maintaining transparent and frequent communication through updates, campaign initiators foster stronger relationships with backers, increasing their confidence and commitment to the project. Regular updates can also generate positive emotions such as excitement (Kraus et al., 2016; Kuppuswamy & Bayus, 2013) or trust. The establishment of trust and the fostering of an equal partnership between investors and companies is beneficial, particularly in the context of the increased competition for capital that has resulted from the globalization of financial markets (Kirchhoff, 2005). The establishment and maintenance of trust facilitate greater engagement and long-term activation (Macht, 2014). Crowdfunding represents an opportunity for businesses to engage with customers at an early stage of product development, thereby facilitating the collection and analysis of customer feedback (Günther & Riethmüller, 2020). Updates can demonstrate that the organization is receptive to feedback and capable of adapting to changing circumstances. Furthermore, the initiators signal their commitment, competence, and accountability, which enhances the perceived quality of the project and reinforces donors' confidence in the project's potential for success.

Providing updates on the project progress is a crucial success factor, as supported by the literature (Ribeiro-Navarrete et al., 2021; Guo et al., 2019; Borello et al., 2019; Li et al., 2018; Tu et al., 2018; Block et al., 2018; Xu et al., 2014; Sixt, 2014; Kuppuswamy & Bayus, 2013). Empirical evidence suggests that crowdfunding campaigns with frequent updates are more likely to receive funding than those with infrequent updates (Xu et al., 2014). Therefore,

by addressing information asymmetry, strengthening investor relationships, and leveraging signaling mechanisms, regular updates contribute to increasing the likelihood of crowdfunding campaign success.

H4: A crowdfunding campaign's likelihood of success increases with a higher number of updates.

Individuals can interact with each other and the campaign founder through the comment section, providing an opportunity to obtain information (Wang et al., 2018). Individuals may use the opinions of others to inform their own views or investment decisions, a phenomenon known as social proof. Social proof is when we look at what others are doing to figure out how we should behave (Talib & Saat, 2017). Scott & Barden (2022) identify situations where social proof dynamics intensify, which may be applied to the crowdfunding context. These include situations where there is uncertainty about appropriate behavior (Baron et al., 1996), and when a sizable group sets the norm for behavior (Milgram et al., 1969). The presence of a greater number of comments on a crowdfunding campaign can significantly reduce information asymmetry by providing potential backers with valuable insights into what others think about the project. Each comment represents a unique perspective, opinion, or question from individuals who have engaged with the campaign. By reading through these comments, potential backers gain access to a diverse range of viewpoints, experiences, and concerns related to the project. This allows them to gather perspectives beyond what is provided by the campaign's official materials. As a consequence of this, a growing number of comments will provide potential supporters with sufficient and clear information, thereby enabling them to make an informed choice (Wang et al., 2018). This will consequently reduce the uncertainty and risk associated with investing in a crowdfunding campaign. In accordance with the signaling theory, a high number of comments could be indicative of a vibrant and supportive community surrounding the campaign. This perception of community support serves to enhance the credibility of the campaign. Current literature suggests that a higher number of comments is associated with higher success rates (Pinkow & Emmerich, 2021; Wang et al., 2018; Li & Jarvenpaa, 2015; dos Reis, 2015; Xiao et al., 2014). Consequently, a higher number of comments not only addresses information asymmetry by providing additional information but also serves as a powerful signal of social proof, ultimately enhancing the likelihood of the crowdfunding campaign's success.

H5: A crowdfunding campaign's likelihood of success increases with a higher number of comments.

In most forms of crowdfunding, investors expect a return on their investment, except for donation-based crowdfunding. Investors receive benefits as an incentive for supporting the project (Heyduck & Engelen, 2021). By offering different rewards, the preferences of individual investors can be better considered (Günther & Riethmüller, 2020). This approach offers the opportunity to provide more individual and exclusive rewards to donors (Harzer, 2013). This is important because reward-based crowdfunding decisions are often made from the consumer's perspective rather than the investor's (Cumming et al., 2019b). It also allows for coverage of different project supporter budgets, which is particularly useful when supporters have varying financial strength (Sixt, 2014), as is often the case in crowdfunding. Kuppuswamy & Bayus (2013) suggest that offering different levels of rewards can attract more investors to a project. Pinkow (2023) found that offering incentives that are sufficiently appealing to the needs of the target audience, not only attracts the core audience in the first place but also encourages them to engage in repeated funding behavior.

However, stretch goals are often overlooked because they are difficult to validate quantitatively (Lax, 2017). Stretch goals are very ambitious and cannot be assumed to be achievable at all (Kreuzer, 2018). They are completely optional, and even if they are not reached, the campaign can still be considered a success. The use of stretch goals can serve to incentivize backers with additional rewards or project enhancements as funding milestones are reached. This strategy taps into the psychological principle of goal pursuit, motivating backers to increase their contributions to unlock these enticing rewards. Similar to initial rewards, stretch goals are argued to be important for achieving higher funding goals (Lax, 2017). Xu et al. (2014) suggest that these additional rewards can be metaphorically viewed as offering discounts on the product to attract customers.

Consequently, the implementation of a greater number of reward tiers and the establishment of stretch goals contribute to the success of crowdfunding campaigns, since these elements serve to maximize the engagement and commitment of backers, whether through the use of dynamic goal-setting or diversified reward structure.

H6: Offering stretch goals is associated with a higher likelihood of success for a crowdfunding campaign.

H7: A crowdfunding campaign's success is more likely with a greater number of reward tiers.

In a study by Cha (2019) on the impact of legitimacy on crowdfunding, it was found that a prototype has the greatest impact in communicating the idea and proving the capabilities of the team. Legitimacy is defined as the alignment of an organization or individual's actions and results with societal values, norms, and expectations (Cha, 2019). Indie games account for a significant proportion of releases (Kontus, 2022). However, potential supporters who are unfamiliar with these creators may doubt the credibility of their crowdfunding initiatives (Cha, 2019). Therefore, it is important to convince potential investors to participate in the crowdfunding campaign. For this project to succeed, it is crucial that the project explanations are clear and comprehensible (Günther & Riethmüller, 2020). The project presentation should be uploaded to the crowdfunding platform's project page, which must be designed before the campaign begins (Bischof, 2015). The objective is to create a professional impression that provides potential investors with a comprehensive understanding of the project idea (Mai, 2014) and is a critical factor that affects the success of funding (Mason & Rogers, 1997). The project description often includes a combination of text, images, audio, and video to introduce the concept. The combination is optimal for presenting a broad spectrum of information, which is essential for video games. Video games present a complex medium and therefore have a more challenging time communicating ideas without showing output material (Cha, 2019; Cha, 2017). This is particularly relevant when showcasing gameplay[5], which is often considered a crucial aspect of a game (Tyler, 2023; Fabricatore, 2007). In accordance with the media richness theory, the incorporation of multimedia elements into a fundraising campaign can enhance its appeal and engagement potential. This is because multimedia offers a high level of richness compared to text-based descriptions alone. It combines visual, auditory, and often narrative elements, which can captivate and engage potential supporters and showcase the idea more effectively. Glenberg & Langston (1992) found that pictures facilitate comprehension. The use of any type of graphical or pictorial movement facilitates the visualization of ideas, actions, and complex cognitive tasks (Park & Hopkins, 1993).

Moreover, a brief video, commonly referred to as a pitch, is frequently included in idea presentations (Heyduck & Engelen, 2021; Keil, 2015) to provide a visually engaging presentation (Günther & Riethmüller, 2020) and serve as a rapid illustration of the ideas (Mollick, 2014). It is crucial to utilize the limited attention span of investors (Harzer, 2013) through the use of concise illustrations. Research has demonstrated that the attention span of viewers rapidly diminishes after a brief period (Bellan, 2018). Crowdfunding is regarded as a highly competitive field, particularly on Kickstarter (Manthorp, 2019). As a result, this aspect appears to be of particular importance. Additionally, it presents an opportunity to introduce potential supporters to the individual behind the project idea. The personal touch can evoke emotions, which play a significant role in influencing perceptions and decisions. Sympathy and empathy are recommended to win potential supporters (Heyduck & Engelen, 2021). Facial expressions of joy and sadness also positively influence funding decisions, while intensive facial expressions can negatively affect funding behavior (Raab et al., 2020). A study by Duan et al. (2020) found that the facial trustworthiness of an entrepreneur's face is linked to the success of their crowdfunding campaign. Specifically, those who appear trustworthy raise more capital and gain more supporters for their crowdfunding campaign than those who do not appear trustworthy. Introduction videos have been demonstrated to enhance the probability of project success (Mollick, 2014). A significant proportion of platform operators consider them to be one of the most crucial elements of a project presentation in terms of its probability of success (Harzer, 2013).

[5] Gameplay refers to the way a game is designed and the options available to the player in terms of game mechanics.

As a result, integrating an introduction video and employing an array of multimedia elements enhances communication, facilitating the demonstration and exposition of the project's concepts and ideas. Simultaneously, this approach allows the developers to showcase their competencies while allowing them to express their unique attributes. Consequently, the implantation of such strategies contributes to the enhanced efficacy and potential success of the crowdfunding campaign.

H8: Including an introduction video in the project description is linked to a higher probability of success for a crowdfunding campaign.

H9: A crowdfunding campaign is more likely to succeed when it includes a higher number of videos, static images, animated graphics, and audio recordings.

4. Empirical method

The study utilized an indirect method to establish empirical links between potential success factors (independent variables) and success measures (dependent variables). This approach was selected for two reasons. Firstly, quantitative research methods are more suitable for determining success factors than qualitative methods (Baumgart & Evanschitzky, 2009; Haenecke, 2002). Secondly, this approach was chosen to ensure the comparability of the results with previous studies. Multiple linear regression was used for metric-dependent variables, while logistic regression was used for binary-dependent variables. This approach aligns with existing research and is regarded as an appropriate methodology for measuring crowdfunding success (Deng et al., 2022).

For a deeper understanding of the variables utilized in this study, refer to Chapter 4.2, which offers an explanation of both the dependent and independent variables. Additionally, Table 1 presents an overview of how the variables are measured.

4.1. Data

This study examines 1,967 campaigns on Kickstarter, a global crowdfunding platform, from September 12, 2009, to October 1, 2023. The platform was selected for three reasons. First, it is a well-known and reliable platform for funding video games (Bidaux, 2022). Second, it is the most accessible (Lichtig, 2015). Third, it is the platform most commonly used among researchers (Deng et al., 2022; Lichtig, 2015), thus offering the ability to compare results to previous research. In comparison to previous research (Cha, 2017; Pinkow & Emmerich, 2021), this sample is larger, which allows for a more pronounced view of crowdfunding. The original data set was sourced from Mouillé (n.d.) and is accessible on Kaggle. Kaggle is an online platform for data analysis, which was acquired by Google in 2017 (Lardinois et al., 2017). The target audience for the platform includes data scientists, companies, and organizations (Luber & Litzel, 2020). The data set originated from Kickstarter and initially comprised information on over 300,000 projects between 2009 and 2017. Geensen (2019) revealed that the data set contains errors in certain instances. For example, certain campaigns were considered a success despite falling short of funding targets. Consequently, the remaining crowdfunding campaigns were subjected to a comprehensive review, during which any identified errors were corrected. It was found that less than one percent of the campaigns were erroneous, thereby justifying the continued use of the data set for the study. However, for the data set to be suitable for analysis, certain adjustments were necessary, which were made as part of the data preparation process. The data set was filtered to include only campaigns from the video games category. Additionally, the set also included campaigns that were still active, canceled, or paused. These were removed to ensure that only successful or unsuccessful campaigns were considered. Furthermore, campaigns with a zero number of supporters were excluded, as Lichtig (2015) posits that this can be classified as unusual. This study follows the approach of Koch & Siering (2019), limiting the analysis to campaigns in USD, as this approach has the advantage of comparability and avoids potential biases due to currency conversion. To ensure a representative sample that is not biased by the

selection criteria, no further filtering was applied to the source material. As the source material only extended up to 2017, the author expanded the data set to adhere to the recommendations of Jáki et al. (2022), who advocate for the conduct of studies with updated data sets. The newly collected data points were randomized to eliminate the potential for selection bias. The information that was not available in the original data set[6] was then supplemented with information from the campaign page on Kickstarter of each respective project. This was conducted by the author.

This yielded a final data set comprising 1,967 campaigns. For the sub-models, the data set was divided into three categories based on the target capital, as previous research suggests that success factors may differ across different ranges (Pinkow & Emmerich, 2021; Cha, 2017). These categories align with how Kickstarter separates funding goals: $1,000 to $10,000, $10,000 to $100,000, and $100,000 to $1,000,000. The data was analyzed using the statistical software SPSS. Descriptive statistics for the final data set and the subsets can be found in Tables 2 to 5.

4.2. Variables

4.2.1. Dependent Variables

Three dependent variables are used. The first variable measures the success of a crowdfunding campaign, which is coded as 1 if the campaign reaches its goal and 0 if it does not. The second variable is the logarithm of the total amount of capital raised. The third variable is the success rate, which is calculated as the total amount of funds raised divided by the funding target. The fourth variable is the number of backers and is only analyzed in models 2 and 3. The variables were selected because they represent the four most common methods for measuring success, as outlined by Deng et al. (2022). As the majority of studies employ one or more of these success factors, a more comprehensive comparison of the results can be achieved.

4.2.2. Independent Variables

The independent variables are: (1) number of backers; (2) duration of the campaign; (3); team submission; (4) number of updates; (5) number of comments; (6); submission introduction video; (7) submission stretch goals; (8) number of reward tiers; (9) number of videos; (10) number of static images; (11) number of animated graphics; (12); number of audio recordings.

Table 1. Variable description

Variable	Variable description
Success	Coded 1, if the campaign met the target goal
USD pledged (ln)	Ln (USD pledged +1)
Funding ratio	USD pledged divided by funding goal
Number of backers	Number of backers of the project
Duration	Duration between start and end
Team (dummy)	Coded 1, if submitted by a team
Number of updates	Number of updates on the project page
Number of comments	Number of comments on the project page
Introduction video (dummy)	Coded 1, if submitted an introduction video
Stretch Goals (dummy)	Coded 1, if the campaign has stretch goals
Number of reward tiers	Number of reward tiers backers can choose from
Number of videos	Number of videos (except introduction video)
Number of static images	Number of static images on the project page
Number of animated graphics	Number of animated graphics on the project page
Number of audio recordings	Number of audio recordings on the project page

Source: Author

[6] The variables listed in Table 1, below the variable Duration, are hereby defined.

5. Results

In the first step, this study uses OLS regression and logistic regression with the so-called baseline model (M1), including all variables from Table 1. The model does not have any problems with multicollinearity, as the variance inflation factor (VIF) ranges from 1.072 to 2.022. Autocorrelation is not indicated by the Durbin-Watson statistic. This study uses the adjusted R^2 to determine how much of the variance the model explains, including an F-test, as shown in Table 6. To properly address the ongoing discussion regarding the selection of performance indicators, the baseline model [M1] is modified to allow for the examination of the impact of independent variables on the indicator backers, which can be seen in models 2 [M2] and 3 [M3], which are presented in the appendix. As the results are similar, model 1 is used for further analysis. To prevent distortion of the standard error of the regression coefficients due to heteroscedasticity (Backhaus et al., 2015), this study tested for heteroscedasticity and followed the guideline from Long & Ervin (2000) to correct the model for heteroscedasticity whenever it is suspected. Long & Ervin (2000) also argue that the decision to correct should not be based solely on the screening test results. Hayes & Cai (2007) recommend using an HC estimator routinely and double-checking the results obtained with the standard OLS regression and with an HC estimator. Therefore, this study uses robust standard errors in case an indication for heteroscedasticity is found[7]. In the literature, HC3 is commonly recommended (Hayes & Cai, 2007; Cribari-Neto et al., 2005; Long & Ervin, 2000), which is also used in this study. For statistical tests, a significance level of 0.05 or 0.01 is commonly used (Sill, 2022). Thiese et al. (2016) suggest viewing the p-value as a spectrum rather than a binary metric. This idea is supported by the American Statistical Association (ASA), which explicitly states that results should be considered in the overall context of the study and not be reduced to the p-value[8] (Wasserstein et al., 2019; Wasserstein & Lazar, 2016). The study relies on ASA recommendations (Wasserstein & Lazar, 2016). Significance levels are still provided for practical reasons but within a wider range.

Table 2. Descriptive Statistics – full sample[9].

	N	Minimum	Maximum	Mean	Std. Deviation
Success (dummy)	1967	0	1	0.27	0.444
Usd pledged	1967	1.00	5545991.70	71515.3558	310017.67627
Funding ratio	1967	0.000001000000000	37.460683333333300	0.736521448726504	1.946593572611880
Backers	1967	1	87142	1261.89	5329.322
Duration	1967	4	90	36.06	12.022
Team (dummy)	1967	0	1	0.68	0.465
No. of updates	1967	0	273	13.70	25.040
No. of comments	1967	0	393159	832.05	9748.422
Introduction video (dummy)	1967	0	1	0.83	0.372
Stretch goals (dummy)	1967	0	1	0.48	0.500
No. of reward tiers	1967	0	45	10.71	6.580
No. of videos	1967	0	34	0.92	2.053
No. of statical images	1967	0	106	16.55	17.307
No. of animated graphics	1967	0	57	2.39	5.703
No. of audio recordings	1967	0	17	0.33	1.072
Valid N (listwise)	1967				

Source: Author

Table 3. Descriptive Statistics – $10,000 to $100,000.

	N	Minimum	Maximum	Mean	Std. Deviation
Success (dummy)	552	0	1	0.53	0.500
Usd pledged	552	1.0	2564821.0	45236.172	172475.1188
Funding ratio	552	0.000019488238848	37.460683333333300	1.431310292776400	2.985318060109070
Backers	552	1	58561	895.01	3623.995
Duration	552	4	89	34.43	11.082
Team (dummy)	552	0	1	0.79	0.409
No. of updates	552	0	126	16.22	19.808

[7] Based on common screening test (graphical and analytical nature) and comparison between the results of standard OLS and HC estimator.

[8] This is a very simplified representation of the discussion about the statistical relevance of p-values.

[9] The full sample contains one value less than the subsamples, otherwise they are equal.

No. of comments	552	0	28231	160.88	1255.781
Introduction video (dummy)	552	0	1	0.89	0.312
Stretch goals (dummy)	552	0	1	0.67	0.471
No. of reward tiers	552	1	45	11.19	5.586
No. of videos	552	0	20	0.88	1.832
No. of statical images	552	0	96	22.60	18.184
No. of animated graphics	552	0	43	5.58	8.286
No. of audio recordings	552	0	17	0.62	1.554
Valid N (listwise)	552				

Source: Author

Table 4. Descriptive Statistics – $100,000 to $1,000,000.

	N	Minimum	Maximum	Mean	Std. Deviation
Success (dummy)	864	0	1	0.19	0.389
Usd pledged	864	1.00	5545991.70	132667.5264	438937.79966
Funding ratio	864	0.000001000000000	12.047264700000000	0.460626212625250	1.250079234814790
Backers	864	1	87142	2259.36	7368.599
Duration	864	7	60	37.75	12.038
Team (dummy)	864	0	1	0.70	0.459
No. of updates	864	0	273	16.90	31.639
No. of comments	864	0	393159	1779.94	14624.139
Introduction video (dummy)	864	0	1	0.81	0.390
Stretch goals (dummy)	864	0	1	0.45	0.498
No. of reward tiers	864	1	41	12.46	7.500
No. of videos	864	0	16	1.19	2.246
No. of statical images	864	0	106	17.58	18.072
No. of animated graphics	864	0	57	1.11	3.815
No. of audio recordings	864	0	6	0.19	0.692
Valid N (listwise)	864				

Source: Author

Table 5. Descriptive Statistics – $1,000 to $10,000.

	N	Minimum	Maximum	Mean	Std. Deviation
Success (dummy)	552	0	1	0.14	0.349
Usd pledged	552	0.0	49574.0	1948.542	4960.9640
Funding ratio	552	0.000000000000000	14.679666666666700	0.472234348413488	1.220055686501800
Backers	552	0	2505	65.24	194.154
Duration	552	5	90	35.09	12.611
Team (dummy)	552	0	1	0.56	0.497
No. of updates	552	0	161	6.13	14.054
No. of comments	552	0	2453	18.05	117.345
Introduction video (dummy)	552	0	1	0.81	0.396
Stretch goals (dummy)	552	0	1	0.33	0.469
No. of reward tiers	552	0	38	7.48	4.440
No. of videos	552	0	34	0.51	1.872
No. of statical images	552	0	72	8.85	11.369
No. of animated graphics	552	0	29	1.19	3.218
No. of audio recordings	552	0	6	0.27	0.905
Valid N (listwise)	552				

Source: Author

Table 6 shows the results. Hypothesis 1 suggests that the likelihood of success for a crowdfunding campaign increases with a higher number of backers, which is slightly supported. M1 shows a neutral impact (b = 0.000, p <.01 [M1, all performance indicators]), but considering the sub-models (M1S1, M1S2, M1S3), which will be introduced later, a small positive impact is observed. Hypothesis 2 claimed that the funding period has a negative influence and was supported by the data (Exp [B] = .970, p <.10 [M1, M2], Exp [B] = .971, p <.01 [M3], related to the funding ratio β = -.019, p <.10 [M2], β = -.027, p <.05 [M3] and the number of backers β = -.017, p <.10 [M3]). Hypothesis 3 proposed that submitting a campaign as a team has a positive impact on the campaign's success and was supported (Exp [B] = 2.152, p <.01 [M1], Exp [B] =2.290, p <.01 [M2], Exp [B] = 1.831, p <.01 [M3], related to USD pledged β = .153, p <.01 [M1], β = .158, p <.01 [M2], β = .160, p < .01 [M3], funding ratio β = .030, p < .01 [M2], β = .032, p < .05 [M3], and the number of backers β = .026, p <.05 [M2], β = .028, p <.05 [M3]). The study supported Hypothesis 4, which suggests that a higher number of updates increases the likelihood of success (M1, M2 across all performance indicators p <.05). Hypothesis 5 claimed that the campaign's likelihood of success increases with a higher number of comments. Due to the different results obtained from the three models (M1 = slightly negative

respectively neutral impact, M2 = p > 0.10, M3 slightly positive impact), H5 was not supported. Hypothesis 6 assumed that offering stretch goals increases the likelihood of success, which was supported (Exp [B] = 2.668, p < .01 [M1], Exp [B] = 2.557, p <.01 [M2], Exp [B] = 3.413, p <.01 [M3], related to USD pledged β = .133, p <.01 [M1], β = .132, p <.01 [M2], β = .171, p <.01 [M3], and funding ratio β = .085, p <.01 [M1], β = .079, p <.01 [M2], b = .121, p <.01 [M3]). Hypothesis 7 suggested that a crowdfunding campaign's success is more likely with a greater number of reward tiers. This hypothesis was not supported by the results, which showed both positive and negative impacts depending on the model and indicator used. Hypothesis 8 posited that the inclusion of an introduction video is associated with a higher likelihood of success and was supported (Exp [B] = 1.972, p <.05 [M3], related to USD pledged β = .093, p <.01 [M1], β = .092, p <.01 [M2], β = .091, p <.01 [M3], and funding ratio β =.019, p <.05 [M1], β = .016, p <.10 [M2]). Hypothesis 9 proposed that the success of the campaign is impacted by the number of videos, static images, animated graphics, and audio recordings used. The impact of the number of videos is not consistent and can be either positive or negative. Additionally, in most models, it appears to have a negative influence if p <.10. The use of static images, animated graphics, and audio recordings has a positive influence on the success of various performance indicators (M1, M2, M3 with p <.10). Therefore, the hypothesis was only partially supported.

Table 6. Regression analysis – baseline model (M1).

Variable	Performance indicator:									
	USD pledged (ln)				Success (0/1)			Funding ratio		
	b	*SE b*	β	*VIF*	b	SE b	*Exp (B)*	*b*	*SE b**	β
Constant	3.478	.195			-2.701	.503	.067	.195	.086	
Backers	.000****	.000	.165	1.674	.000****	.000	1.000	.000****	6.668E-5	.531
Duration	-.003	.004	-.013	1.072	-.030****	.010	.970	-.002	.002	-.014
Team	1.067****	.107	.153	1.334	.767****	.257	2.152	.066	.044	.016
No. of updates	.036****	.002	.276	1.678	.158****	.011	1.171	.013***	.006	.171
No. of comments	-1.790E-5****	.000	-.054	1.374	.000****	.000	1.000	-3.358E-5	4.217E-5	-.168
Introduction video	.812****	.127	.093	1.206	.330	.367	1.390	.101***	.047	.019
Stretch goals	.866****	.113	.134	1.715	.981****	.218	2.668	.332****	.083	.085
No. of reward tiers	0.111****	.009	.226	1.790	-.119****	.021	.887	-.023***	.010	-.079
No. of videos	.025	.022	.016	1.093	-.254****	.057	.776	-.068****	.018	-.072
No. of static images	.022****	.004	.117	2.022	.011**	.007	1.011	.006	.004	.052
No. of animated graphics	.045****	.008	.079	1.202	.098****	.015	1.103	.045****	.010	.131
No. audio recordings	-.030	.043	-.010	1.128	.129**	.069	1.138	.133***	.059	.073
Adjusted R^2	.654				.511 or .742*****			.404		
F-test	(12, 1954) = 310.482, p < .001				-			(12, 1954) = 111.860, p < .001		
Durbin- Watson	1.603				-			1.699		

*Notes: *Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. ***** Logistic regression was performed and therefore the Cox & Snell/Nagelkerke R^2 were used. Source: Author*

Secondly, this study analyzed whether the funding goal affects the variables that predict crowdfunding success, which may vary across the different target capital ranges. The results of sub-model 1 (M1S1), shown in Table 7, suggest that a higher funding goal leads to significantly greater importance of being a team (β = .040/.150/224). Additionally, a higher funding goal increases the need for communication between the parties in the form of updates (β = .193/.293/.267). Furthermore, stretch goals appear to have a greater impact on success when the funding goal is higher (β = .0.78/.179/.109). The results from sub-model 2 (M1S2), as shown in Table 8, suggest that a higher funding goal increases the need to acquire backers (β =.459/.944/.680). Similar to sub-model 1, the importance of a team (β =.007/.032/.000) and provident frequent updates (β = .135/.133/.218) appear to increase as the financing target increases, although both effects are smaller. The results from sub-model 3 (M1S3), as shown in Table 9, support the evidence from sub-models 1 and 2 regarding that a higher funding goal leads to greater importance of teamwork (Exp [B] = 1.580/8.462/9344108). Similar to model 1, the importance of stretch goals appears to increase as the financing target increases (Exp [B] = .789/1.288/3.676). Note that in model 3, the sample

between $10,000 to $100,000 fails the Hosmer-Lemeshow-Test (p <.001), resulting in a poor fit. However, overall, across all sub-models, the results indicate that the funding goal influences the effects of the independent variables.

Table 7. Regression analysis – baseline model, different funding goals, and USD pledged as success measurement (M1S1).

Variable	Funding goal category:								
	$1000 < x < $10.000			$10.000 < x < $100.000			$100.000 < x < $1.000.000		
	b	SE b	β	*b*	SE b*	β	*b*	*SE b*	β
Constant	2.922	.284		4.754	.529		3.743	.315	
Backers	.003****	.000	.283	.000**	.000	.226	9.735E-5****	.000	.200
Duration	.013***	.006	.076	-.013	.009	-.055	-.013***	.006	-.043
Team	.176	.145	.040	1.002****	.248	.150	1.752****	.0184	.224
No. of updates	.030****	.007	.193	.040****	.006	.293	.030****	.003	.267
No. of comments	-.001**	.001	-.076	.000	.001	-.101	-1.352E-5***	.000	-.055
Introduction video	.734****	.184	.132	.907***	.349	.103	.757****	.195	.082
Stretch goals	.367***	.178	.078	1.041****	.225	.179	.786****	.176	.109
No. of reward tiers	.100****	.020	.202	.079****	.018	.162	.108****	.012	.226
No. of videos	.026	.038	.022	-.081**	.048	-.054	.078***	.032	.049
No. of static images	.030****	.008	.155	.016****	.004	.105	.011***	.005	.056
No. of animated graphics	.047***	.023	.069	.020***	.009	.060	.046***	.019	.049
No. audio recordings	-.027	.087	-.011	-.013	.039	-.007	-.048	.102	-.009
Adjusted R^2	1.825			.581			.704		
F-test	(12, 539) = 41.091, p < .001			(12, 539) = 64.617, p < .001			(12, 851) = 171.829, p < .001		
Durbin- Watson	1.825			1.624			1.672		
VIF	Between 1.051 and 2.191			Between 1.060 and 3.876			Between 1.117 and 2.125		

*Notes: *Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. Source: Author*

Table 8. Regression analysis – baseline model, different funding goals, and funding ratio as success measurement (M1S2).

Variable	Funding goal category:								
	$1000 < x < $10.000			$10.000 < x < $100.000			$100.000 < x < $1.000.000		
	b	SE b*	β	b	SE b*	β	*b*	*SE b*	β
Constant	.024	.066		.089	.251		-.082	.124	
Backers	.003****	.001	.459	.001****	.000	.944	.000****	.000	.680
Duration	.000	.001	.001	.000	.006	-.001	.001	.002	.014
Team	.017	.052	.007	.235****	.083	.032	.001	.072	.000
No. of updates	.012	.010	.135	.020***	.009	.133	.009****	.001	.218
No. of comments	.004****	.001	.380	.000	.000	-.132	-1.225E-5****	.000	-.143
Introduction video	.042	.036	.014	-.029	.118	-.003	.028	.077	.009
Stretch goals	.139**	.079	.054	.231***	.110	.036	.049	.069	.020
No. of reward tiers	-.002	.009	-.006	-.016	.016	-.029	-.005	.005	-.032
No. of videos	-.004	.012	-.006	-.065****	.024	-.040	-.014	.012	-.025
No. of static images	.006	.004	.055	.011**	.006	.067	.008****	.002	.110
No. of animated graphics	-.013	.016	-.035	.008	.008	.023	.003	.007	.009
No. audio recordings	.010	.032	.008	.005	.031	.002	.029	.040	.016
Adjusted R^2	*.746*			*.828*			*.620*		
F-test	*(12, 539) = 135.774, p < .001*			*(12, 539) = 221.376, p < .001*			*(12, 851) = 118.564, p < .001*		
Durbin- Watson	*2.021*			*1.878*			*1.951*		
VIF	*Between 1.051 and 2.191*			*Between 1.060 and 3.876*			*Between 1.117 and 2.125*		

*Notes: *Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. Source: Author*

Table 9. Regression analysis – baseline model, different funding goals and binary success (0/1) as success measurement (M1S3).

Variable	Funding goal category:								
	$1000 < x < $10.000			$10.000 < x < $100.000			$100.000 < x < $1.000.000		
	b	SE b	*Exp (B)*	b	SE b	Exp (B)	*b*	*SE b*	Exp (B)
Constant	-4.461	1.130	.012	-3.101	1.041	.045	-23.237	2166.2	.000
Backers	.015****	.005	1.015	.009****	.001	1.009	0.001****	.000	1.001
Duration	-.003	.020	.997	-0.10	.017	.990	.016	.016	1.016
Team	.458	.488	1.580	2.136****	.631	8.462	16.050	2166.2	9344108
No. of updates	.162****	.036	1.176	.140****	.026	1.151	.181****	.032	1.198
No. of comments	.029	.018	1.029	-.005	.003	.995	.000	.000	1.000
Introduction video	.105	.811	1.110	-.535	.599	.586	-1.405	1.767	.045
Stretch goals	-.237	.555	.789	.253	.430	1.288	1.302	.814	3.676
No. of reward tiers	-.077	.065	.926	-.150****	.046	.861	.038	.048	1.039
No. of videos	.043	.092	1.044	.070	.086	1.073	-.295***	.115	.745
No. of static images	.014	.018	1.014	.009	.014	1.009	-.037	.023	.964
No. of animated graphics	.061	.061	1.063	.012	.023	1.012	.219****	.066	1.245
No. audio recordings	.130	.222	1.138	.054	.122	1.055	.210	.300	1.234
Cox & Snell and Nagelkerke R^2	*.410 and .736*			*.611 and .815*			*.575 and .932*		
Hosmer-Lemeshow-Test	*.442*			*< .001*			*1.000*		

*Notes: *Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. Source: Author*

6. Robustness

The primary objective of this study is to identify success factors that are consistent across different metrics and funding goals, which is achieved by examining the stability of the main estimates across different types of model specifications. In empirical studies, a robustness check is commonly performed to avoid misspecifications and explore the stability of their main estimates (Neumayer & Plümper, 2017; Lu & White, 2014). According to Leamer (1983), this should be done routinely. As there is no commonly accepted definition of robustness (Neumayer & Plümper, 2017), this study defines a robustness test as a way to see how the conclusion holds under changes in the model specification, which is a common practice in the literature (e.g. Neumayer & Plümper, 2017; Lu & White, 2014; Keller, 2013). Neumayer & Plümper (2017) conceptualize robustness as a degree rather than an absolute. This study aligns with this interpretation and, therefore, the presented results are utilized as a complement to the previously presented results.

First, this study employed three different model specifications to identify an indication of the robustness and stability of the findings. The baseline model [M1] includes all relevant variables and thus provides a comprehensive overview of the factors influencing crowdfunding success. Nevertheless, to ensure the robustness of the results, this study developed two additional models with reduced variable sets, which can be seen in models 2 [M2] and 3 [M3], which are presented in the appendix. Model 2 [M2] excludes the number of backers, while model 3 [M3] excludes both the number of backers and the number of updates. The rationale behind these adjustments is twofold. Firstly, the number of backers can be considered a way to measure crowdfunding success, which is regularly found in the literature (Deng et al., 2022). Therefore, it can also be considered as a dependent variable. Including it as an independent variable could potentially lead to confusion in the analysis, as it is both a cause and an effect of campaign success. By excluding it, the aim was to provide a clearer understanding of how other factors influence success. Secondly, updates are a major driver of success in crowdfunding campaigns, and their strong influence could potentially overshadow other variables. By excluding updates in M3, this study aimed to determine whether their presence diminishes the significance or strength of other predictors. This approach permitted the observation of whether other variables became significant or exhibited increased β coefficients when updates were not considered. These robustness checks indicated that the inclusion of all variables in the baseline model did not

introduce significant bias or instability. Therefore, model 1 appeared to be a robust and comprehensive representation of the factors influencing crowdfunding success.

Secondly, this study followed the approach of Pinkow & Emmerich (2021), who compared the development of mean and median values for the analyzed variables for successful and unsuccessful crowdfunding projects when the funding goal increased. This is illustrated in Figure 2. The number of backers, updates, reward tiers, static images, videos, and comments, as well as the dummy value of the variable team, exhibited significant increases in means and median values with the level of funding goal for successful projects. In contrast, unsuccessful projects demonstrated no or only minimal development in these variables. Given that the duration of a campaign is negatively correlated with its success, the graph should be interpreted in the opposite direction. In addition to the findings of the regression analysis, this further indicates that the funding goal affects the determinants of crowdfunding success. This is consistent with the findings of Pinkow & Emmerich (2021).

Together, these methodological steps provide evidence for the robustness and validity of the presented results, thereby supporting the overall conclusion of this research.

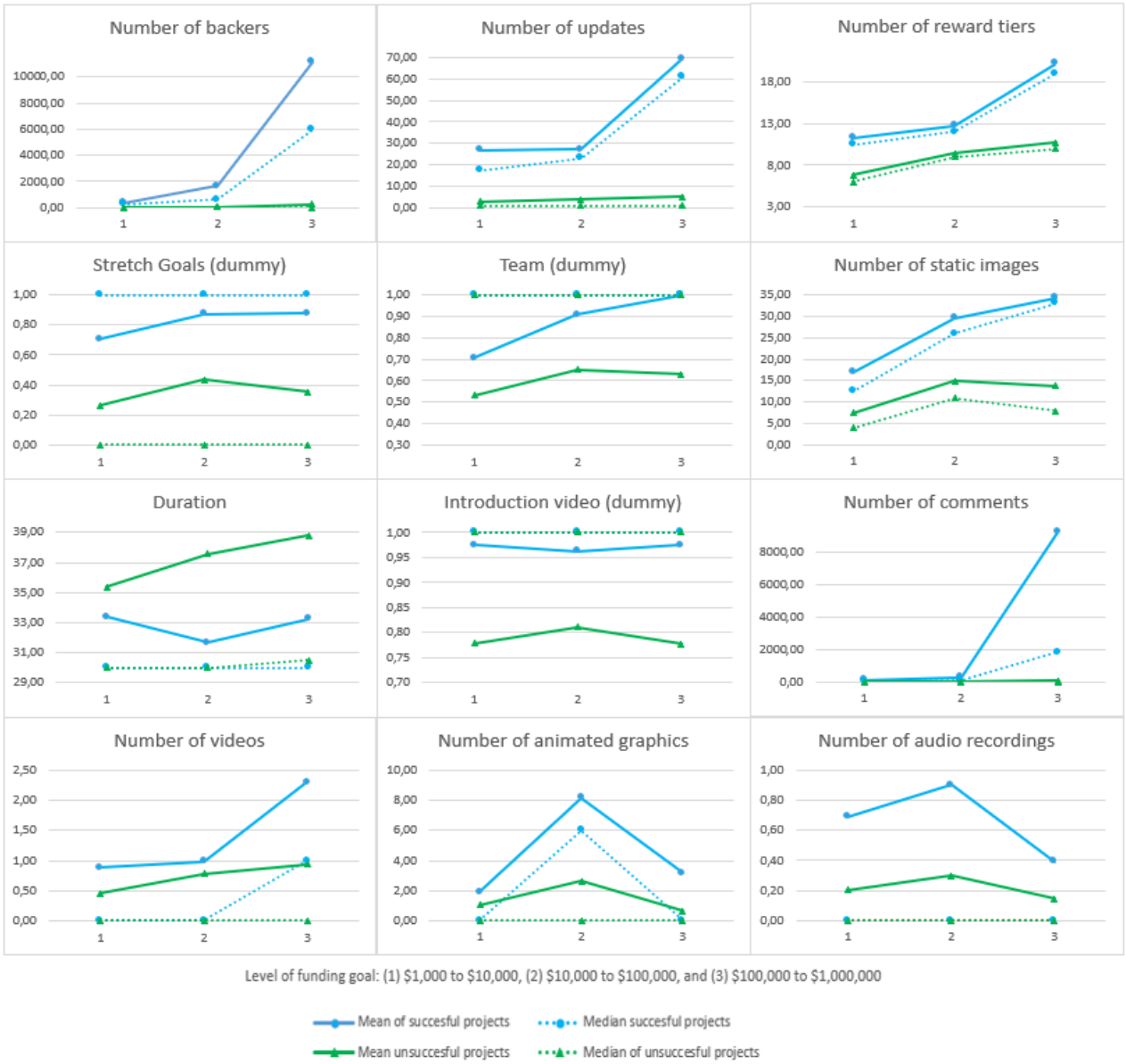

Figure 2. Comparison of successful and unsuccessful campaigns.
Source: Author, graphical representation was adapted from Pinkow & Emmerich (2021)

7. Discussion

First, this study provides an overview of the current state of research and the current challenges it faces. Secondly, it presents a theoretical framework that explains the dynamics of crowdfunding campaigns and their success. This framework considers the multidisciplinary nature of the field (Lax, 2017), requiring entrepreneurs to consider theories from various research fields to launch a successful campaign. Thirdly, this study provides empirical insights into the elements that make a crowdfunding campaign more successful and how they behave under model settings. This is important for two reasons.

First, as noted by Bogusz (2019), there is a need for a better understanding of crowdfunding niches. Cha (2017) highlights the lack of scientific research in this area, while Lax (2017) emphasizes the need for research on success factors for video game projects. Campaigns for video game projects have a lower success rate compared to other crowdfunding categories (Cha, 2017). The evidence found in this study suggests that the factors that contribute to success in general, as found in existing literature, also apply to video games. The reason for the lower success rate of campaigns for video games is still unclear. Future research should investigate why these campaigns are less successful on average. Second, there has been an increased amount of research on success factors, but these studies have produced inconsistent results, possibly due to different understandings of how success should be defined (Deng et al., 2022). Therefore, this study follows Jáki et al. (2022), who concluded that conducting studies with fresh datasets and rigorous methods is necessary to eliminate inconsistencies between studies. The study's results show that a variable can vary depending on the model and success measure used, particularly how success is defined. These findings are consistent with those of Deng et al. (2022) and Jáki et al. (2022), and provide an explanation for the discrepancies observed between studies, as the results are sensitive to changes in model specification, even when using the same dataset. Therefore, it is essential to proceed with caution when interpreting results. Researchers are strongly advised to exercise rigorous testing of their data, with a particular focus on the broader context of their results. This is of particular importance, as the lack of empirical data represents a significant challenge in this field of research (Lenart-Gansiniec, 2021; Bouncken, Komorek & Kraus, 2015; Moritz & Block, 2014). Despite the inherent challenges in model specification, including defining success and the implications for the research method used and the results, this study found that the number of backers and updates positively impact success across all models. This finding is consistent with the results of previous studies on updates (Ribeiro-Navarrete et al., 2021; Guo et al., 2019; Borello et al., 2019; Li et al., 2018; Tu et al., 2018; Block et al., 2018) and the number of backers (Song et al., 2019; Vulkan et al., 2016; Hobbs et al., 2016). Hobbs et al. (2016) propose that the number of backers should be approximately one to two percent of the target goal. This study found that video game campaigns that were successful had a higher percentage of backers of the target goal (mean = 5.42%, median = 3.15%), while unsuccessful campaigns had a significantly lower percentage (mean = 0.27%, median = 0.07%). The observed discrepancies between the studies may be attributed to variations in the sample size and the chosen categories. As the study examined the impact of the funding goal on crowdfunding determinants and the number of backers was found to be a consistent success factor, the same analyses were conducted for different funding categories. The findings revealed a slight decline in the percentage of backers of the target goal with an increase in the funding goal[10]. One potential explanation for this phenomenon is that the perceived risk is higher and the rewards seem less attractive if they do not scale with the funding goal. Another reason might be a limited backers pool. Future research should be conducted to validate these findings and develop a better understanding of this mechanism.

[10] $1,000 to $10,000: successful campaigns (mean = 8,76%, median = 5,69%), unsuccessful campaigns (mean 0,51%, median = 0,25%); $10,000 to $100,000: successful campaigns (mean = 5,27%, median = 3,09%), unsuccessful campaigns (mean 0,29%, median = 0,09%); and $100,000 to $1,000,000: successful campaigns (mean = 4,07%, median = 2,80%), unsuccessful campaigns (mean 0,09%, median = 0,01%).

Additional inconsistencies may arise from different funding goals, as factors that predict crowdfunding success may differ depending on the target capital range (Pinkow & Emmerich, 2021; Cha, 2017). While Cha (2017) had the theoretical assumption and postulated it as a future research need, Pinkow & Emmerich (2021) had empirical data to support this claim. Compared to Pinkow & Emmerich (2021), this study used a significantly larger dataset and examined different funding goal categories[11]. This study confirms the findings of Pinkow & Emmerich (2021) and additionally proves that this also applies to higher funding goal categories, thus indicating that there is an interrelation between the goal and independent variables that influence success and exits in general. This idea is further supported by the fact that Pinkow & Emmerich (2021) used StartNext instead of Kickstarter, which was used in this study, resulting in a different data basis. This supports the idea that interrelationships between factors are important, which is in line with recent research (Pinkow & Emmerich, 2021, Koch & Siering, 2019). The fact that certain factors become more important as the funding target increases may be due to the increasing importance of overcoming information asymmetries. While fewer signals are needed to overcome information asymmetries or to convince the investor in the case of smaller funding targets, this increases as the funding target increases. Another complicating factor for video games is that they are an experiential good (Jöckel, 2008) and therefore have a greater credibility problem (Ford et al., 1990). Stronger signals are needed to eliminate or at least reduce this problem. Pinkow & Emmerich (2021) also expect that clear signals will become more important, especially for projects with higher funding goals. This has significant implications for entrepreneurs seeking to secure larger sums of capital. Before launching a campaign, they must devise a strategy to effectively convey their message to potential funders. To achieve this, entrepreneurs must begin planning early, allowing them to send more compelling signals or a greater number of signals. Since the time required for crowdfunding is often underestimated by entrepreneurs (Hobbs et al., 2016), it is important to highlight this aspect.

This study is subject to some limitations. Firstly, the data utilized is limited to that sourced from Kickstarter, which may not be indicative of other crowdfunding platforms or forms of crowdfunding. The findings from Kickstarter are consistent with those of Pinkow & Emmerich (2021) for StartNext in terms of indicating that the funding goal influences success factors. However, future research should examine data collected from other platforms or forms of crowdfunding to confirm these findings. Second, the study did not consider any potential interactions between success factors, except for the funding goal. Koch & Siering (2019) found that these interactions play a role in understanding success factors. Future research should explore interactions between the factors identified in this study. Third, this study uses the most common performance indicators found in the literature (Deng et al., 2022). Recent literature (Shneor & Vik, 2020; Bogusz, 2019) has criticized the common measurement of success and there is an ongoing discussion about how to measure success, including the role of non-financial variables. Future research may investigate this further.

Funding Statement

This research received no external funding.

Acknowledgments

I appreciate the helpful suggestion by all colleagues at the Department of Economics at the University of Rostock. I would like to extend special thanks to my doctoral advisor, Doris Neuberger, from the University of Rostock.

[11] Pinkow & Emmerich (2021) used a dataset with n = 338. Funding goal was between < 4000€ and > 15000€ (they used additional categories between these two).

Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

Appendix

A1. Regression analysis – baseline model without backers (M2).

Variable	Performance indicator:												
	USD pledged (ln)				Success (0/1)			Funding ratio			Number of backers		
	b	*SE b*	β	*VIF*	*b*	SE b	*Exp (B)*	*b*	*SE b**	β	*b*	*SE b**	β
Constant	3.440	.199			-2.815	.500	.060	.122	.092		-379.280	342.438	
Duration	-.004	.004	-.014	1.072	-0.30****	.010	.970	-.003**	.002	-.019	-3.942	3.019	-.009
Team	1.097****	.109	.158	1.333	.829****	.259	2.290	.124****	.047	.030	298.229***	145.158	.026
No. of updates	.043****	.002	.333	1.475	.171****	.011	1.186	.028****	.006	.356	74.145***	29.959	.348
No. of comments	4.807E-6	.000	.014	1.085	.000	.000	1.000	1.046E-5	6.06E-5	.052	.227	0.464	.415
Introduction video	.802****	0.130	.092	1.206	.234	.361	1.264	0.83**	.049	.016	-92.525	140.230	-.006
Stretch goals	.854****	.0115	.132	1.714	.939****	.215	2.557	.309****	.090	.079	-121.094	253.488	-.011
No. of reward tiers	.117****	.009	.239	1.781	-.102****	.020	.903	-.012	.013	-.039	60.708	50.226	.075
No. of videos	.023	.022	.015	1.093	-.236****	.055	.790	-.073****	.020	-.077	-25.219	52.404	-.010
No. of static images	.021****	.004	.113	2.021	.011	.006	1.011	.004	.005	.038	-8.590	10.333	-.028
No. of animated graphics	.045****	.008	.079	1.202	.101****	.015	1.107	.044****	.012	.130	-2.205	29.698	-.002
No. audio recordings	-.021	.043	-.007	1.127	.124**	.068	1.132	.150***	.064	.083	89.697	125.568	.018
Adjusted R²	.638				.506 or .735*****			.234			.399		
F-test	(11, 1955) = 315.628, p < .001				-			(11, 1955) = 55.73, p < .001			(11, 1955) = 119.86, p < .001		
Durbin-Watson	1.738				-			1.858			2.035		

*Notes: * Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. ***** Logistic regression was performed and therefore the Cox & Snell/Nagelkerke R2 were used. Source: Author*

A2. Regression analysis – baseline model without backers and updates (M3).

Variable	Performance indicator:												
	USD pledged (ln)				Success (0/1)			Funding ratio			Number of backers		
	b	*SE b*	β	*VIF*	*b*	SE b	*Exp (B)*	*b*	*SE b**	β	*b*	*SE b**	β
Constant	3.248	.219			-2.771	.406	.063	-.002	.127		-710.675	507.641	
Duration	-.006	.004	-.022	1.072	-.029****	.008	.971	-.004***	.002	-.027	-7.321**	3.742	-.017
Team	1.112****	.120	.160	1.333	.605****	.193	1.831	.134***	.054	.032	324.869***	150.098	.028
No. of comments	2.689E-5****	.000	.081	1.026	.002****	.000	1.002	2.465E-5	9.288E-5	.123	.265	.516	.485
Introduction video	.786****	.142	.091	1.206	.679***	.298	1.972	.072	.050	.014	-119.869	165.041	-.008
Stretch goals	1.108****	.126	.171	1.694	1.227****	.169	3.413	.473****	.095	.121	316.854	238.139	.030
No. of reward tiers	.169****	.009	.343	1.638	-.001	.013	.999	.021	.018	.072	148.704**	88.072	.184
No. of videos	.053***	.025	.034	1.088	-.050	.035	.951	-.053****	.018	-.056	26.929	57.732	.010
No. of static images	.029****	.004	.157	1.995	.015****	.005	1.015	.010**	.006	.085	5.661	11.523	.018
No. of animated graphics	.049****	.009	.087	1.201	.095****	.013	1.099	.047****	.012	.138	5.346	30.039	.006
No. audio recordings	-.039	.048	-.013	1.127	.110***	.055	1.116	.138***	.069	.076	57.344	137.845	.012
Adjusted R²	.562				.351 or .510*****			.148			.317		
F-test	(10, 1956) = 253.405, p < .001				-			(10, 1956) = 35.238, p < .001			(10, 1956) = 92.254, p < .001		
Durbin-Watson	1.594				-			1.796			1.888		

*Notes: * Robust standard errors (HC3) were used. **p < .10; ***p < .05; ****p < .01. ***** Logistic regression was performed and therefore the Cox & Snell/Nagelkerke R2 were used. Source: Author*

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