Essays on Crowdfunding

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Abstract

This thesis consists of three independent chapters: I examine the role of crowdfunding as an alternative financing tool, with a particular focus on the impact of external shocks, industry-specific responses, and the role of sustainable crowdfunding campaigns.

The first chapter investigates the influence of the COVID-19 pandemic on crowdfunding campaigns in the UK, analysing key metrics such as success rates, number of backers, campaign duration, funds raised, and campaign's location. It uses crowdfunding data from Crowdfunder, FundRazr, Indiegogo, and Kickstarter, COVID-19-related data from the Official Coronavirus Disease Situation Dashboard, and population data from the Office for National Statistics. Using OLS and LPM, the findings reveal that the pandemic did not lead to an increase in the number of backers or the raised amount; however, campaigns with shorter durations and lower goal amounts had higher success rates.

The second chapter extends this analysis by examining the differential impact of COVID-19 on campaigns requiring physical gathering. I then investigate the impact of the pandemic across various crowdfunding industries, including cultural, creative, and entertainment sectors, using a DiD model and data from four major crowdfunding platforms—Crowdfunder, FundRazr, Indiegogo, and Kickstarter. The chapter reveals that campaigns reliant on physical gatherings show a decrease in funds raised, while entertainment campaigns report an increase. This chapter offers new insights into how external shocks, such as a global pandemic, influence crowdfunding campaigns differently across industries. Heterogeneity analysis suggests the following: (1) campaigns following keep-it-all raised fewer funds, had fewer backers, and had a lower success rate; (2) campaigns with higher duration raised less money, had a lower success rate, and had fewer backers; (3) campaigns with higher goal amount had no impact on the raised amount, number of backers, or the success rate.

The third chapter explores the role of crowdfunding in supporting sustainable campaigns, focusing on campaigns aimed at promoting environmental and social responsibility. I further investigate whether sustainable campaigns initiated by females have increased the success, the raised amount, or the number of backers of campaigns. Despite growing global interest in sustainable development, such initiatives often face challenges securing traditional funding. This chapter applies OLS and LPM and uses data from UK-based crowdfunding campaigns between 2018 and 2022 to investigate whether campaigns with a sustainability focus are more likely to succeed in crowdfunding markets. The findings indicate that while sustainable campaigns do not necessarily outperform others in terms of success rates or raised amounts, campaigns initiated by women face particular challenges.

Overall, this thesis contributes to the literature by providing a comprehensive understanding of how crowdfunding responds to external shocks, industry-specific variations, and the growing need for financing sustainable ventures. Chapters two and three used manual classification to provide a unique dataset. The findings offer practical implications for both policymakers and practitioners interested in leveraging crowdfunding for social, economic, and environmental sustainability.

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Declaration

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Alanoud Bukashisha

Abbreviations

- `CEO` - Chief Executive Officer
- `DiD` - Difference in Differences
- `IPOs` - Initial Public Offering
- `LPM` - Linear Probability Model
- `OLS` - Ordinary Least Square
- `ONS` - Office for National Statistics
- `P2P` - Peer-to-peer
- `SMEs` - Small and Medium-sized Enterprises
- `UK` - United Kingdom
- `US` - United States
- `VC` - Venture capital

Chapter 1

Introduction

This thesis consists of three chapters focused on crowdfunding as an alternative finance model. The first chapter examines the impact of an external shock, specifically COVID-19, on crowdfunding campaigns. The second chapter investigates how this shock affected crowdfunding campaigns across different industries, highlighting industry-specific variations. The third chapter explores the role of sustainable campaigns, with a particular emphasis on how female-led sustainable campaigns impact success rates, raised amount, and number of backers.

Crowdfunding is a combination of crowdsourcing and microfinance; it started with the development of internet-based funding, and such a platform requires funding projects from many people online. Belleflamme et al. (2014) defined it as an open call process through the internet to provide financial resources from a group of people instead of professional parties (i.e. banks and financial institutions). It could be in the form of a donation, equity, loan, or exchange for a product as a reward. In contrast to traditional financial intermediaries, crowdfunding connects fund seekers with fund providers; they do not borrow, pool, or lend money on their account. Mainly, the role of the crowdfunding platform is to match project initiators with backers, as it provides information about the campaign, pledge levels, minimum amount, and information of the platform model, whether following the all-or-nothing or keep-it-all principle (Gerber et al. 2012; Mollick 2014; Walsh 2014). Several US crowdfunding platforms that exist today started in 2005, and in the following years, crowdfunding was introduced to the UK, Europe, China, and the rest of the world. However, today, leading platforms are in the US and the UK, whereas China used to be dominant in crowdfunding volumes. In 2017, China introduced strict regulations, leading to a dramatic decrease in crowdfunding volume.

Crowdfunding is an umbrella term that encompasses several distinct models, each with its own operational characteristics and funding mechanisms. Belleflamme et al. (2014) define crowdfunding as the process of collecting capital from a large external community "the crowd" to finance a project or venture. Bollaert et al. (2021) classify crowdfunding into four main categories: lending-based, reward-based, equity-based, and other emerging forms such as royalty or real estate-based crowdfunding.

Lending-based crowdfunding, often referred to as peer-to-peer (P2P) lending, allows firms or individuals to borrow funds from multiple investors through online platforms rather than through traditional banks. Borrowers typically have sufficient revenues to repay interest, and investors receive interest income in return. These platforms are frequently studied alongside other P2P lending markets. Reward-based crowdfunding, by contrast, involves project initiators who seek funds to launch a product or idea and offer contributors a non-financial reward, often early access to the product, public acknowledgement, or another form of recognition, if the campaign succeeds. Equity-based crowdfunding enables firms to issue shares, securities, or convertible notes that allow investors to obtain equity ownership or future claims on profits. Some platforms pool contributions through a financial vehicle that invests in start-ups on behalf of the crowd, and convertible instruments are commonly used when retail investors participate, as these avoid the need for a formal pre-money valuation of the venture. Other emerging forms of crowdfunding include royalty-based and real-estate models, which extend crowdfunding to additional asset classes and offer investors exposure to different sectors.

Recently, crowdfunding has become an alternative funding source to other traditional forms of finance (Galema 2020), with the advanced technology and heavy restrictions on bank, enabling crowdfunding to have a fingerprint in the SME credit market (Roure et al. 2018). There are two main reasons behind contributing to crowdfunding; according to Ryan and Deci (2000), the motivations behind investing in crowdfunding are Extrinsic and Intrinsic motivation. The first presents traditional investment decision-making, such as profit-seeking and obtaining rewards (seeking personal rewards). Further, pre-purchase products are often offered in crowdfunding and the ability to purchase at a discounted price. By surveying lenders, Pierrakis and Collins (2013) find that the main motivation behind individual decisions in lending money is the interest rate (represented 95% of the surveyed lenders). While intrinsic motivation includes charitable

and social contexts (altruism), the motivations are when backers want a certain project to be realised (Giudici et al. 2018), enjoy seeing projects succeed, want to be recognised by others as a part of the community (Gerber and Hui 2013), and identify with project goals (Boudreau et al. 2018).

Crowdfunding, a rapidly growing alternative financing model, has seen significant adoption in recent years, particularly in response to challenges posed by traditional finance systems. This thesis consists of three chapters that explore various dimensions of crowdfunding during COVID-19, across industries, and regarding sustainability. I focus specifically on non-investment crowdfunding campaigns (i.e. reward- and donation-based campaigns). Investment models were excluded because of limited data availability and fundamental differences in regulatory structures and investor motivations. Analysing these forms would require distinct analytical frameworks beyond the scope of this study. The first chapter investigates the impact of COVID-19 on crowdfunding campaigns, focusing on key metrics such as the success rate, number of backers, and raised amount. The second chapter builds upon the first by analysing the impact of COVID-19 on crowdfunding across different industries, revealing how various industries were differentially affected by the pandemic. Finally, the third chapter examines the role of crowdfunding in supporting sustainable campaigns and female-led campaigns.

In the first chapter, I address how COVID-19 impacted key crowdfunding metrics in the UK, including the campaign raised amount, the number of backers, duration, goal amount, and location. I draw on crowdfunding data from the Crowd Data Center, COVID-19-related data from the Official Coronavirus Disease Situation Dashboard, and population data from the Office for National Statistics to analyse UK crowdfunding campaigns from January 2018 to December 2021. Using OLS and LPM, the findings reveal that, contrary to expectations, the pandemic did not result in an increase in backers or raised funds. However, campaigns with shorter durations and lower goal amounts showed a higher likelihood of success. During COVID-19, the optimal duration of a campaign to be successfully funded is between 13 and 19 days. Furthermore, the lower the goal amount, the higher the chance of being successfully funded, as an increase of 1% in the goal amount drops the success rate by 0.07%. Finally, the campaign's location, whether located in a small or large city, did not affect the success rate even during the pandemic. From these results, it is very clear that using crowdfunding to fund a project helps fund seekers

to collect funds during pandemics; setting a lower number of days and a lower goal amount will increase the chances of a campaign being successfully funded. This chapter significantly contributes to understanding how crowdfunding campaigns adapt to external shocks, offering a detailed empirical analysis of UK-based crowdfunding during a period of global uncertainty.

The second chapter extends the analysis of the first chapter by focusing on how different crowdfunding industries reacted to the pandemic. The multi-level nature of our data allows us to investigate the effects of the pandemic on crowdfunding industries at various levels. I identify the treatment group as a campaign that requires gathering. Using a DiD model, I analysed crowdfunding campaigns initiated in the UK on four major platforms: Crowdfunder, FundRazr, Indiegogo, and Kickstarter, spanning the period from January 2018 to December 2021. This chapter aims to fill a gap by providing a detailed look at how various crowdfunding industries, namely the cultural, creative, and entertainment industries, were affected by COVID-19. I further looked at the impact of the pandemic on those relying on physical gatherings. The findings suggest that campaigns in cultural and creative industries experienced a significant decline in funds raised, while campaigns in entertainment sectors saw an increase in the number of backers and the raised amount during the pandemic. Specifically, the regression results indicate that the pandemic impacted crowdfunding campaigns that require gathering negatively, as the treatment effect corresponds to a 22% decrease in the raised amount. These results highlight how the COVID-19 pandemic acted as an external shock that influenced industries differently, a finding that contributes to the literature on crowdfunding industries during crises. This chapter contributes to the broader understanding of how the pandemic influenced crowdfunding at the industry level, providing new insights into the challenges and opportunities that arose during this period of uncertainty.

In the third chapter, I shift the focus to sustainable crowdfunding campaigns, exploring the role of crowdfunding in supporting environmentally and socially responsible ventures. This chapter investigates the role of crowdfunding in financing sustainable crowdfunding campaigns, using data from crowdfunding campaigns in the UK between 2018 and 2022. Using OLS and LPM, the findings suggest that while crowdfunding can support sustainable initiatives, campaigns focusing on sustainability did not necessarily perform better in terms of success rates or raised amounts. Furthermore, campaigns initiated by women faced additional challenges in raising

funds. This chapter contributes to the literature on sustainable entrepreneurship by offering new insights into the dynamics of crowdfunding for sustainability-focused projects, shedding light on both the potential and limitations of crowdfunding as a financing tool for environmentally and socially focused ventures.

Chapter 2

The Effect of COVID-19 on Crowdfunding: Evidence from the United Kingdom

Abstract

The COVID-19 pandemic has had a profound impact on individuals, businesses, and alternative finance systems, causing significant disruptions in the financial market. This chapter explores the effects of the COVID-19 pandemic on the raised amount, number of backers, duration, goal amount, and campaign location of crowdfunding campaigns based in the UK. Data for this analysis was obtained from the Crowd Data Center for crowdfunding data and from the Official Coronavirus Disease Situation Dashboard for COVID-19-related metrics, covering the period from January 2018 to December 2021. To assess the relationship between the pandemic and crowdfunding outcomes, Ordinary Least Squares (OLS) and Linear Probability Models (LPM) were employed. The findings reveal that COVID-19 did not lead to an increase in the number of backers or the total amount raised by campaigns. However, campaigns with shorter durations and lower funding goals were more successful during the pandemic, attracting more backers and raising more funds. Specifically, campaigns with durations ranging from 13 to 19 days proved to be the most successful in terms of funding during the COVID-19 crisis. Additionally, the study shows that the success rate of a campaign decreases by 0.07% for each 1% increase in the funding goal, emphasising the importance of setting more modest goals. The research also indicates that the location of the campaign, whether in a large or small city, did

not have a significant impact on its success, even amidst the challenges posed by the pandemic. These results suggest that crowdfunding remains a viable financing option during pandemics, with campaigns that feature shorter durations and lower goal amounts being more likely to succeed. Entrepreneurs and project creators should consider setting realistic goals and shorter timelines to increase their chances of success in the context of uncertainty and crisis situations like COVID-19.

2.1 Introduction

New financing tools have been introduced recently; firms and individuals are moving away from traditional finance and exploring other fintech options like crowdfunding, blockchain, big data, and cryptocurrencies. Crowdfunding gathers information on projects and measures the demand directly from individuals, which leads to improved capital allocation. Although crowdfunding is not a novel concept, as pooling resources to fund a common goal or to share tasks and responsibility has been a common practice, it has recently been merged with finance to facilitate financial activities due to the availability of the internet. Therefore, it is now more important than ever to understand the behaviour. Crowdfunding has grown rapidly in the last decade, especially after the financial crisis (Harrison and Baldock 2015; Short et al. 2017). The number of platforms and users increased over time due to the rise of Web 2.0 technology (Block et al. 2018). Using crowdfunding as a source of finance opens the doors to firms and individuals, allowing them to fund their ideas and innovations. Crowdfunding is the next step in a global world moving towards a society that encourages geographical diversification, economic stability, and equality (Brüntje and Gajda 2016). Therefore, it is crucial to study crowdfunding from different angles. Several researchers have studied the dynamics of crowdfunding; however, there is a gap in the literature regarding the impact of a shock on crowdfunding campaigns' raised amount, number of backers, duration, goal amount, and the location of the campaign.

Traditional financing such as bank loans and professional venture capital are offered to a limited number of relatively mature investors; therefore, alternative finance provides an effective solution for startup projects, which enter the market with limited product information and face difficulties in seeking funds from traditional financing solutions (Duan et al. 2020). It is crucial to support small firms, as they represent the heart of the economy in most countries (Kobe 2012). While most initiators and backers are private individuals (Gerber et al. 2012; Verstein 2011), organisational project initiators such as non-governmental organisations are minimal users (Belleflamme et al. 2014; Bradford 2012). Funding projects through the crowd has excellent benefits after raising funds and the end of the campaign, as they will have direct access to customers, media, employees, and venture capitalists (Signori and Vismara 2018). Farag and Johan (2021) indicates that since 2011, crowdfunding platforms have obtained an important position in financing entrepreneurs by acting as a source of external finance. Although crowdfunding is small in terms of economic activities, the growth is in both sectors (e.g. gaming, music, education, retail) and the overall value of the transaction (Agrawal et al. 2010b).

Due to the physical restrictions and lockdown, I expect businesses to change their source of funding, switching to an online source (i.e. crowdfunding), aiming to resolve the consequences of the pandemic; given that COVID-19 is a period of uncertainty, I expect a change in the number of backers, raised amount, and the success rate. This chapter aims to study the impact of COVID-19 on crowdfunding campaigns; I examine how COVID-19 changed the raised amount, number of backers, duration, goal amount, and location of campaigns initiated in the UK. To date, little is known about the effect of a pandemic on crowdfunding markets, so to understand the key challenges of a campaign during the pandemic, our empirical work studied crowdfunding from different angles; I used crowdfunding data from the Crowd Data Center, COVID-19-related data from the Official Coronavirus (COVID-19) Disease Situation Dashboard, and the population of cities across the UK from City Population and Office for National Statistics (ONS), for the period January 2018 to December 2021. I used OLS and LPM with the interaction between COVID-19 measures and our variable of interest to measure the differential effect of COVID-19 on the success rate, the raised amount, and the number of backers. I focus on UK crowdfunding campaigns as the UK has the most developed crowdfunding (Coakley et al. 2021), and Kickstarter is popular and considered one of the most successful crowdfunding platforms (Belleflamme et al. 2015; Strausz 2020a); therefore, it is a good starting point.

The results show that COVID-19 did not increase the number of backers or the amount raised in a campaign; however, campaigns with lower durations and lower goal amounts attracted a higher number of backers and raised more funds during the pandemic. During COVID-19, the optimal duration of a campaign for it to be successfully funded is between 13 and 19 days. Furthermore, the lower the goal amount, the higher the chance of being successfully funded. Finally, the campaign's location, whether located in a small or large city, did not affect the success rate even during the pandemic. This chapter makes a significant contribution to crowdfunding by addressing the research gap of the impact of external shock crowdfunding campaigns. The data I have spans over four years across multiple crowdfunding platforms, focusing on campaigns initiated across the UK.

I start this chapter with a literature review, dividing it into sub-sections, including crowdfunding and theories, determinants of crowdfunding success, crowdfunding and SMEs, the growth of crowdfunding and fintech, COVID-19 and crowdfunding, and non-investment crowdfunding. The chapter then moves on to objectives, hypothesis development, data collecting, methodology, results, robustness check, and conclusion.

2.2 Literature Review

2.2.1 Crowdfunding and Theories

Crowdfunding currently lacks a universally accepted theory of its own, although some initial attempts in this direction have been made; however, there is no a single dedicated theoretical framework for explaining or predicting crowdfunding success. Instead, most research in this field draws upon multiple theories adopted from various disciplines (Shneor and Zhao 2020). An institutional analysis of crowdfunding holds both theoretical and practical implications. Theoretically, insights derived from comprehending the mechanisms and dynamics of crowdfunding could facilitate empirical research on the factors influencing and outcomes associated with crowdfunding utilisation. This could extend the application of institutional entrepren-

eurship theory and enhance understanding of the motivations of crowdfunding stakeholders, including entrepreneurs and members of the crowd. This is especially significant due to the relative novelty of crowdfunding, as the behaviour of participants is not yet thoroughly understood (Belleflamme et al. 2014; Burtch et al. 2013).

SME theories can be applied to crowdfunding, starting with agency cost (Jensen and Meckling 1976; Ross 1973), which identifies problems such as information asymmetry, moral hazard, and adverse selection. Agrawal et al. (2014) and Giudici et al. (2012) find that problems associated with agency costs are major issues in crowdfunding, as the crowd is unable to determine the adequate due diligence of the project before making any financial contribution, meaning that the campaign initiator has information which may not be known to the contributor. Signalling theory (Ross 1973; Spence 1973; Weiss 1995) provides indicators to inform contributors of the credibility and importance of the project. Earlier researchers focused on signalling theories due to the high information asymmetry (Ho et al. 2021). Ross (1977) shows the role of incentive signalling in determining corporate financial structure. Regarding crowdfunding, the campaign initiator's experience and education are crucial (Gruber et al. 2012); furthermore, several backers can act as a positive signal and attract more backers (Belleflamme et al. 2015).

Option theory states that during uncertainty, investors can postpone their irreversible investment, even when it requires costs associated with the delay (Nguyen et al. 2019). Pecking order theory and bootstrapping explain how nascent entrepreneurs obtain finance, and they explain how reward-based crowdfunding fits into the knowledge of entrepreneurial finance. Pecking order theory has been applied to small businesses to explain the choice of financial sources. Originating from corporate finance theory, pecking order theory states that firms prefer using internal funds first, leaving external finance as a last resort due to the costs of finance and asymmetric information. When selecting external finance, debt is preferable to equity, as a preference for the cheapest source of finance (Myers and Majluf 1984). Later on, the theory was developed to fit developed and mature firms; it assumed that there were three sources of funding: retained earnings, debt, and equity. The assumptions associated with the theory are that there is no restriction when accessing retained earnings, debt, and equity; they follow a linear sequence; there is an availability of skills to evaluate different choices; the only cost

incurred is the cost of finance and providing information to the investor; and there is a desire to follow the growth stages model (Berger et al. 2021). Regarding startup businesses, there are some barriers, including a lack of trading history, limited assets, and supply constraints when it comes to sources of finance (Atherton 2012; Cosh et al. 2009).

Information asymmetries often associated with crowdfunding can be overcome with signalling theory (Connelly et al. 2011; Spence 1973). The theory states that entrepreneurs intentionally indicate positive qualities about themselves to investors. Effective signals are observable and represent a degree of cost. The receiver of the signal (i.e. investor) is more likely to offer financial benefits to the signal creator (i.e. entrepreneur). Signals may affect the success of a campaign positively or negatively in reward-based crowdfunding. Kunz et al. (2017) find that multiple rewards and presentations provide positive signals, whereas funding goal, duration, and delivery duration are negative signals. Each form of crowdfunding has its own problems. Risk related to product development and delivery is associated with reward-based crowdfunding specifically, while problems raised between shareholders and debt holders, such as underinvestment, risk shifting, and asset strapping, are related to equity crowdfunding and P2P crowd lending (Cumming and Johan 2019; Cumming et al. 2019; Strausz 2020a). When asymmetric information and coordination problems are present in crowdfunding, the first will leave contributors uncertain about the quality of the project, and they will make decisions from the information provided by another contributor. The second problem arises from interdependence between the entrepreneurs' and contributors' decisions on crowdfunding platforms, where the payoff of any user may depend heavily on other users' decisions; therefore, externalities prevail on crowdfunding platforms (Chu and Manchanda 2016; Cong et al. 2021). As a result, platforms use various designs, governance strategies, and price strategies to overcome asymmetric information and coordination problems (Belleflamme et al. 2015).

The concept of institutional entrepreneurship is grounded in institutional theory, as outlined by DiMaggio et al. (1983). They argue that institutions maintain themselves by establishing routines, regulating deviant behaviours, and shaping the identities and interests of agents. To survive, organisations must conform to institutional expectations, even if these expectations are not directly related to technical notions of performance achievement (Greenwood and Hinings 1996). Institutional entrepreneurs can take the form of individuals, organisations, or groups of

organisations. Viewing crowdfunding as a phenomenon, it can be seen as a form of institutional entrepreneurship, with both the crowd and the platforms they utilise acting as institutional entrepreneurs (Beugré 2014). Crowdfunding often arises due to institutional failure, as nascent firms frequently resort to crowdfunding when they encounter difficulties securing funding through conventional channels such as venture capital, angel investors, and bank loans (ibid.). Social exchange theory suggests that the decisions and actions individuals make in exchanges are driven by the perceived value of past rewards or the value of future rewards (Yang and Koh 2022). Crowdfunding is commonly viewed as a social activity involving exchanges (Agrawal et al. 2014; Frydrych et al. 2014). Social exchange theory provides insights into why entrepreneurs choose crowdfunding as a means of fundraising and marketing communication, as well as why individuals in the crowd choose crowdfunding as an opportunity to make investments or participate in community initiatives (Agrawal et al. 2014).

2.2.2 Determinants of Crowdfunding Success

The advantage of using crowdfunding as a source of finance is allowing different projects, regardless of their purpose (as some are innovative, creative, sustainable, or charity campaigns), to collect funds. In terms of research on crowdfunding, it is challenging due to the data obstacle making it harder to study the market; therefore, research in the area is limited, and there is a lot to explore. Although crowdfunding has become an essential source of funding for young ventures, in terms of academic research, it is challenging due to the lack of data and the relative newness of the area; empirical papers on crowdfunding are limited (Cumming and Groh 2018). Unlike traditional sources of finance, Mollick (2014) finds that crowdfunding has other dimensions than collecting funds. What distinguishes crowdfunding is that it has been used to measure the demand for the proposed project (product or service). For example, the Pebble smartwatch was initially rejected for venture capital but then was able to collect a large amount of funds through Kickstarter (Dingman et al. 2013).

On the other hand, a lack of demand makes it easier to fail the campaign. Therefore, project marketing is another aspect when seeking funds through crowdfunding. In 2005, P2P started with Zopa and grew quickly; over the past 15 years, it became the largest form of fintech, as it opened the doors to institutional investors, which now provide the largest share of funding among many platforms. Moreover, it continues to grow; according to Transparency Market Research, global fintech lending is expected to be worth nearly $900 billion in 2024.[1] Since the start of crowdfunding finance, researchers have studied different aspects of crowdfunding, including factors of success affecting crowdfunding campaigns (Bollaert et al. 2021; Duan et al. 2020; Signori and Vismara 2018); capital raising process (Buchak et al. 2018; Lambert 2022; Li and Martin 2019); and credit rationing (Galema 2020). Mollick (2014) studied the dynamics of crowdfunding success; he finds that personal networks, project quality, and geography are associated with the success of crowdfunding. His research focused on reward-based campaigns extracted from Kickstarter. Other papers have focused on lending crowdfunding, equity crowdfunding, donation crowdfunding or reward-based crowdfunding. Studies have been conducted worldwide, including in the UK, USA, China, Europe, and some on Middle Eastern crowdfunding platforms.

Looking at the literature searching for factors affecting crowdfunding, I find that the financial characteristics of the campaign have a high impact on the success rate. Gleasure and Feller (2016) and Josefy et al. (2017) find that a higher goal amount positively impacts the total amount raised. In contrast, some studies find that campaigns with a higher goal amount have less chance of reaching their goal (Anglin et al. 2018; Colombo et al. 2015; Mollick 2014; Piva and Rossi-Lamastra 2018; Skirnevskiy et al. 2017; Vulkan et al. 2016). In theoretical models, Hornuf and Schwienbacher (2017a) and Strausz (2020a) predict that setting higher goal amounts makes campaigns less likely to reach their funding goal. Another factor that may positively impact the campaign's success rate is the number of backers and the average number of backers (Josefy et al. 2017; Lukkarinen et al. 2016), as a higher number of backers will have a higher percentage of success.

[1] Peer to Peer (P2P) Lending Market Share Report. Last access: 20 January 2022

In 2001, ArtistShare was launched; it was the first commercial crowdfunding website, and hundreds of crowdfunding platforms have been launched since. To successfully raise funds, it is crucial to understand the determinants of successful fundraising. Different researchers found different factors of success: high-quality information about the risk of the project, early-stage investors' commitment that draws funding from the crowd, and facial trustworthiness are the main findings of crowdfunding success (Butticè et al. 2017; Colombo et al. 2015; Duan et al. 2020). Researchers in the field studied various factors affecting crowdfunding success, such as a study done by Duan et al. (2020) examining appearance-based trustworthiness and its effect on crowdfunding success, the appearance based on facial trustworthiness. They used campaigns initiated on Kickstarter in technology and found that entrepreneurs who look more trustworthy are more likely to succeed in the crowdfunding market. Moreover, project success is more consistent for female than male entrepreneurs. Similarly, Researchers found various factors affecting crowdfunding success positively, including social networking on Facebook, which is a proxy of the number of Facebook friends of the fund seeker (Mollick 2014) or the number of members on the fund seeker's Facebook (Saxton and Wang 2014).

Researchers studied the impact of the goal amount on campaigns' success, and studies have been done across different platforms covering different crowdfunding models, including equity, reward, loan, and donation. Although the majority found that goal amount and success are negatively related, some researchers found that goal amount positively impacts the success of a campaign, while others found no impact of goal amount on the success rate. According to Koch and Siering (2015), the rationale behind the negative relation between success rate and goal amount is that campaigns with a higher goal might be judged as riskier, and the backers may develop a higher aversion to the project.

Vulkan et al. (2016) studied the European equity crowdfunding platform; they reported a negative relation between the goal set by a campaign and the probability of success; they found that campaigns with higher investment goals tend to have a slower start in raising funds. Furthermore, they found that setting higher goals reduces the amount raised and attracts fewer backers. When examining the impact of goals on reward-based platforms, Mollick (2014) finds that increasing the goal amount set by a campaign is negatively related to success probability on Kickstarter and SEEDER platforms. Similarly, Zhao et al. (2022b) studied self-funding beha-

viour and its relation to crowdfunding success; they find that higher goal amounts and duration negatively impact the success rate. Hou et al. (2015) find that project goal and duration significantly negatively impact the success rate of reward-based crowdfunding campaigns. Similarly, Cordova et al. (2015) find that the funding goal amount is associated negatively with chances of success, while project duration positively correlates with the success rate of reward-based crowdfunding.

Although a few researchers find a positive relationship between duration and success rate, the majority find that duration impacts success negatively. Mollick (2014) finds that a longer duration signals a lack of confidence in the project initiator to raise money successfully. Kunz et al. (2017) claim that higher duration may indicate that the project initiator does not focus on reaching the campaign's goal quickly, which leads to lower backer confidence in the project initiator's ability to reach their funding goal. Calic and Mosakowski (2016) find that duration does not impact the amount attained from backers. Burtch et al. (2013) find that in donation-based crowdfunding, the longer the campaign duration, the higher the success rate, as it is associated with higher project visibility leading to collecting more funds.

The intention is to seek funds through crowdfunding, and, to successfully raise funds, a campaign should attract backers who wish to provide funds (Belleflamme et al. 2015). Agrawal et al. (2014) find that the number of backers is crucial to creators, as the value of the platform increases with the number of backers; on the other hand, from the backer's point of view, the value of the platform increases by the number of creators and other backers. It is difficult for crowd funders to assess the quality of projects directly; therefore, they are likely to follow the funding pattern of other crowd funders (Zhang and Liu 2012), as investors prefer to invest in well-funded campaigns (Agrawal et al. 2014; Colombo et al. 2015; Zhang and Liu 2012). Higher numbers of backers help campaigns reach their goal as the campaign will raise more funds, leading to a higher success rate. Li et al. (2014) find that backers are mainly interested in backing campaigns with many backers; this phenomenon is called herding and bystander effect.

Regarding the location, crowdfunding relaxed the geographical constraints among funders (Agrawal et al. 2010a), which may be a positive factor during a crisis. However, given that geographical constraints disappear when it comes to crowdfunding, the size of the city and the population may not affect the success chances of a campaign; therefore, campaigns initiated in cities with large populations may not have any advantage over campaigns initiated in cities with small populations.

2.2.3 Crowdfunding and SMEs

Worldwide, commercial banks' credit consists of four types of loans: asset-based loans, cash flow loans, trade finance agreements and leases; all are senior and have different types of collateral (Ivashina et al. 2022). However, seeking loans requiring collateral may be challenging for small businesses, especially during pandemics; therefore, alternative finance is a potential source of finance for small businesses. Crowdfunding has similar outcomes to raising capital from traditional finance sources; therefore, it has the potential to substitute banks, and it has been playing an essential role during crises (Wash 2013). Furthermore, it can be a good alternative to traditional finance during COVID-19 since crowdfunding platforms operate online (Brown et al. 2020). Crowdfunding is a popular way for businesses and individuals to raise funds for their projects in terms of equity, P2P, reward or even as a donation; limited research has explored the various signals that attract potential donors to donate. Although traditional methods to access finance are increasingly popular, crowdfunding is an innovative, new, and growing phenomenon (Tomczak and Brem 2013). Research in the field is limited, and the phenomenon is still evolving as a way of access to finance for entrepreneurial projects (Giudici et al. 2012; Lehner and Nicholls 2014).

Cowling et al. (2021) find that some small businesses obtained funds easily before the global financial crisis and faced rejection when obtaining loans during the global financial crisis. They added that during the COVID-19 crisis, the level of uncertainty and asymmetric information is high; therefore, the cost of screening will discourage more firms from making loan applications. Small business owners should know two important things: first, they will not be treated well during pandemics and crises (Udell 2020), and second, crises happen regularly (Cowling et al. 2021).

Crowdfunding presents a good alternative to various finance sources, Ley and Weaven (2011) find that venture capitalists leave a funding gap in the early stage of new business development, and crowdfunding can fill that gap. Accordingly, crowdfunding is a relatively new alternative method of accessing finance for SMEs and early-stage projects; it has been identified as one of the alternative mechanisms for individuals and businesses to fund their capital needs. Back in 2007, during the financial crisis there was a huge reduction in the availability of business finance for early-stage and existing businesses (Saridakis et al. 2013; Smallbone et al. 2012). Crowdfunding solves the inherent financial constraint, especially for early-stage businesses. As startups find difficulties in attracting finance from angel investors, banks, and venture capitalists, many entrepreneurs are directly tapping into a large online community of investors searching for funding opportunities (Agrawal et al. 2014; Belleflamme et al. 2014; Kuppuswamy and Bayus 2018). COVID-19 has a similar impact to previous crises; looking back to 2007 and 2016, during financial crises and Brexit, many firms scaled back on investment and innovation (Brown et al. 2019). Consequently, traditional finance is insufficient to meet the needs of many nascent entrepreneurs, and as an alternative to the traditional equity and debt financing methods, reward-based crowdfunding could be an efficient way to acquire capital.

2.2.4 The Growth of Crowdfunding and Fintech

The digitalisation of finance opens the door for investors to expand a range of investments by providing new investment opportunities to new asset classes that are generally restricted to institutional or accredited investors. Fintech has the potential to allow retail investors to choose among different projects, firms, or borrowers to fund rather than let banks or other financial

intermediaries decide for them. Investors want to know about their investments, and using digital finance will meet their needs (Bollaert et al. 2021). The characteristics of technology by themselves contain the seeds of their regulation; usually the crowdfunding network provided by the platform could reduce adverse selection issues, and the knowledge of the crowd may decrease adverse selection and moral hazard problems. However, some lack the financial resources to solve the issues (Cumming et al. 2020). Alternative investments include investment by business angels, venture capital, private equity, crowdfunding, and different forms of fintech (Allen et al. 2021). There are many areas to examine alternative finance. However, few researchers study alternative finance investment (Farag and Johan 2021). Cumming and Vismara (2017) state that the reasons behind limited research on crowdfunding are difficulties in accessing data, having data that is not representative or self-disclosed, and obtaining data from primary sources, making research or replication more difficult.

Tang (2019) investigates whether P2P substitutes for banks or not, and they find that P2P is a substitute only in the US unsecured consumer loan market. It is not the perfect substitute, as only inframarginal borrowers have the advantage over P2P lenders. They add that the quality of aggregate P2P borrowers becomes worse when low-quality bank borrowers move to P2P platforms (Buchak et al. 2018). However, in some cases, P2P could complement banks; it is when P2P platforms provide small loans, and mainly, they provide lower fixed costs than banks. Buchak et al. (ibid.) find evidence of banks and P2P being complemented, as fintech lenders are active in the refinancing market and serve more creditworthy borrowers. Due to the massive growth of fintech, shadow banking has increased remarkably (Farag and Johan 2021). Shadow banking is a great tool for filling the gap, as traditional banks have more regulatory constraints (Buchak et al. 2018).

Fuster et al. (2019) find that fintech positively impacts the growth of alternative finance, such as crowdfunding, due to the connection between investors and projects via different crowdfunding platforms; they add that it has been growing significantly because of the recent advances in fintech. Although crowdfunding is one type of alternative financing, it is related to other finance and economics, including banks, cryptocurrencies, and economic development. To keep up with banks' roles in both credit and deposit markets, Thakor (2020) suggested that banks could either build their own online P2P lending platform or join existing P2P platforms. They added

that P2P is more of a computer program that matches investors and borrowers, so it cannot be considered a profit-maximising firm and cannot replace banks. In contrast, Thakor and Merton (2018) claim that P2P are profit-maximising entities that make subjective decisions and often require users' trust. Banks and P2P platforms are substitutes, as Saiedi et al. (2020) find that lower trust in banks is linked with a higher level of participation in P2P platforms. As crowdfunding could be a substitute for other forms of finance, although some empirical studies find that it is not a direct substitute, it has advantages that may be the preferred option for firms (Bollaert et al. 2021). Among other advantages, it could be considered as a marketing strategy as it attracts investors in its early stages and facilitates selling their products (Belleflamme et al. 2015; Chemla and Tinn 2020), where it is not the case when seeking funds from banks, by missing the advertisement part; they will hope to sell their product in the future. Generally, entrepreneurs stop their projects if they do not get enough funds to cover their expenses, especially in reward-based crowdfunding (Bollaert et al. 2021).

The reason behind the growth of fintech and the formation of online financial markets is the technological advances, which show the relative inefficiency of traditional financing channels. In traditional financial intermediaries such as banks and the stock market, investment efficiency comes after careful screening and the efficiency in distributing returns. Introducing technology to the financial sector, fintech firms bring novel and innovative methods to the market by introducing new possibilities to attract new investors; furthermore, market participants potentially will switch to more productive and efficient means of intermediation (ibid.). Digitalisation of finance provides new opportunities for innovative entrepreneurial projects to receive funding; it facilitates the funding process by providing alternative financing sources. Crowdfunding is a novel form of finance for entrepreneurial startups with significant financial constraints in the research and development and early marketing stages. Usually, it fills the gap in the financing cycle before venture capital.

Kim and Stähler (2021) examine alternative finance with a model where the borrowers can choose either crowdfunding lending platforms or traditional banks. They find that entering fintech into the market could increase the money supply and change investment. Furthermore, they investigate the effect of P2P lending on small business loans; they conclude that the entry of lending platforms is correlated with the decline of bank small business loans. Similarly,

Gopal and Schnabl (2020) find that significant growth of the fintech lending sector after the financial crisis is related to the reduction in traditional bank lending to small firms. However, Cornelli et al. (2020) find that the new credit entrants complement the traditional banking sector when controlling for country-level variables. One advantage of digitalising finance is opening the door to financial inclusion and having opportunities to access financial services. On the one hand, rising social funds from entrepreneurs is a clear sign of trustworthiness and benevolence (Kromidha and Robson 2016; Kunz et al. 2017). On the other hand, social capital obstructs entrepreneurs by monitoring activities from backers; therefore, they tend to perceive more trustworthiness and have a higher chance of achieving successful crowdfunding campaigns (Duan et al. 2020).

2.2.5 COVID-19 and Crowdfunding

Negative economic shocks affect the demand and supply of external finance; loan demand likely decreases when bank capital decreases during shocks, which is what happened during the financial crises; the number of unsuccessful loan applications was massive (Cowling et al. 2021). On the other hand, several studies found that the demand for external finance increases during economic crises (Binks et al. 1992; Bank of England 1993). So far, three financial turmoils have significantly impacted credit availability, especially for new and small businesses in the UK: the global financial crises, Brexit, and the COVID-19 pandemic (Cowling et al. 2021). After the global financial crisis, financial institutions such as banks raised their lending standard due to the greater regulation and during COVID-19; therefore, there is a potential to shift investors' preference towards an alternative form of finance (Nigmonov and Shams 2021). The opportunity to seek external funds using crowdfunding as a source of finance is overcoming geographical distance by using online platforms, making crowdfunding a good funding choice during COVID-19 restrictions, such as a lockdown.

Given that negative economic shocks usually generate an increase in uncertainty, COVID-19 provides an opportunity to explore and understand alternative finance during pandemics. As the economic implications of the spread of COVID-19 are uncertain, it is expected to impact on labour markets, production supply chains, financial markets, and GDP levels (Brodeur et

al. 2021). The pandemic has slowed down economic activities, and the GDP fell by 5.2% in 2020 relative to 2019 [2] Baker et al. (2020) find that COVID-19 led to massive spikes in uncertainty, and there are no close historical parallels. They add that the negative impact varies between countries, cities, and industries depending on the stringency of restrictions and distancing measures. During the pandemic there were liquidity crunches, credit squeezes, increase in non-performing assets, and a default rate, which leads to lower returns from loans and investments and a decrease in the market interest rate (Goodell 2020; Gurhy and Zhao 2020; Larbi-Odam et al. 2020).

According to Zhao et al. (2022b), new businesses and SMEs offer minimal information to banks regarding financial statements and public credit ratings, making funding through banks even worse during pandemics. They add that many small firms moved from traditional finance to other financial sources. Chodorow-Reich et al. (2022) find that during COVID-19, when SMEs obtain loans from banks, they face wider spreads and higher collateral conditions than larger firms. Similarly, Zhang et al. (2021a) find that during the COVID-19 pandemic, fintech is more effective in reducing the negative impact of the pandemic on SMEs. Furthermore, Berger et al. (2021) find that borrowers pay higher interest and obtain shorter loan maturities. Li et al. (2021) find that COVID-19 adversely affects banking stability, which leads to a significant increase in fintech loans and the US P2P lending market. Recently, crowdfunding has become an essential alternative to traditional financing, helping entrepreneurs access capital (Cassar 2004; Cosh et al. 2009); however, there is a lack of studies on crowdfunding; as there is a limited number of papers published aiming to study the different aspects of COVID-19 and crowdfunding, there are some limitations and missing information in the area.

Ho et al. (2021) focus on donation crowdfunding campaigns during the pandemic, studying the signals affecting potential backers. They focused on food relief campaigns, concluding that there are three different signal success measures. First, there were signals originating from the campaign, including title, description, spelling errors, location, and picture. The second signal originated from the fundraiser, including social networks and updates. Finally, signals originated from the social interaction of the fundraiser with the crowd, specifically comments, followers,

[2] World Bank Group. Last access: 20 October 2022

and shares. However, it needs further investigation, as their data is limited to one industry, which is food relief campaigns, obtained from GoFundMe. Comparing different industries across crowdfunding platforms will give a broader idea of the sector. Although COVID-19 continued for a longer period, nearly three years, their data period was for five months only, from 1 March 2020 to 29 July 2020; having a longer period will give a better indication.

McKitrick et al. (2021) studied the pattern of Canadian crowdfunding campaigns created in response to COVID-19, focusing on one platform for six months, from January to June. They used web scraping to collect data from the GoFundMe platform. Using web scraping in collecting data means that it took a snapshot (January 2020) of the campaigns when money was raised, leading to missing campaigns during the pandemic. Furthermore, considering a larger sample size will give a better indication of the situation. Similarly, Igra et al. (2021) examined COVID-19-related crowdfunding at the start of the pandemic using data from the GoFundMe platform. They have collected data using web scraping over seven months, starting in January 2020. They studied the impact of demographic factors and COVID-19 on success, concluding that countries with higher levels of education are more likely to initiate campaigns. Both papers focused on campaigns that mentioned COVID-19 in their title or description, they used one platform, and their research was in the early months of the pandemic. They have not used any COVID-19-related data and focused on one type of crowdfunding. When considering one crowdfunding platform (i.e. GoFundMe), comparing different types of crowdfunding is not possible as they use one type of crowdfunding, which is donation crowdfunding. When considering a short period, data may not be representative and, for comparison purposes, should include data from before the start of the pandemic.

Another research by Battaglia and Busatob (2020) studied whether Italian equity crowdfunding is a safe haven to invest in during the COVID-19 pandemic; they studied to what extent female founders, social capital, and equity offered to attract backers to finance the campaign. They used COVID-19-related information, such as whether the campaign was launched during the pandemic and if the project was launched by a company located in the red zone. The limitation of the study is the time span; their data covers 2014 to 2020. Including data beyond 2020 may give a better indication of the effect of the pandemic on crowdfunding. Moreover, their sample size is 79 campaigns, and including more campaigns will provide a comprehensive view of the

situation. For comparison purposes and to have a comprehensive view, other types of platforms could be included. This review is pertinent to understanding the spheres of crowdfunding during COVID-19. Cumming et al. (2021) compared the differential effect of COVID-19 on three alternative sources of finance; consumer bank loans, P2P, and equity crowdfunding. They find that consumer bank lending dropped significantly at the start of COVID-19, while equity and P2P were much more stable in the US during the pandemic. Ljumovic et al. (2022) explored the impact of COVID-19 on crowdfunding campaign characteristics; they compared goal, duration, raised amount and the number of backers, among others. They used Kickstarter; and found that during COVID-19, campaigns have lower goals, a higher amount of funds pledged, and a higher number of backers.

2.2.6 Non-investment Crowdfunding

This chapter focuses on non-investment crowdfunding; therefore, this section provides more details on reward and donation-based crowdfunding. Both of these types of crowdfunding are the largest operational models of crowdfunding (Antonenko et al. 2014). In general, crowdfunding campaigns, regardless of their type, benefit from fundraising and marketing (Brown et al. 2017). According to Zhao et al. (2022a), reward-based crowdfunding provides non-financial rewards, and they do not consider it as an investment. They add, in contrast to traditional finance, equity, and lending-based crowdfunding, a fundraiser is not obligated to provide detailed information about risks. The differences in crowdfunding are not only based on the type of investment or the return on investment, as they vary in the complexity of the process; donation-based crowdfunding has the lowest complexity, while equity is the most complicated (Hemer 2011).

Reward-based crowdfunding is the oldest and the most popular way of the alternative finance model (Baeck et al. 2014). It is a non-investment form of finance as, usually, backers get a tangible but non-monetary reward in exchange for their financial support; the reward often depends on the pledge amount (Burtch et al. 2013; Thürridl and Kamleitner 2016; Zhang et al. 2017; Lin et al. 2016). Gerber and Hui (2013) find that crowdfunding supporters are motivated by personal rewards and support for other people as part of a community of like-minded people. Baeck et al. (2014) studied reward-based crowdfunding campaigns by distributing a survey

among fundraisers and backers; they find that most campaigns are small businesses with little trading history; half of them found difficulties when seeking funds from traditional sources of finance and are very unlikely to raise funds without crowdfunding, which indicates the efficiency of reward-based crowdfunding. Belleflamme et al. (2014) considered different factors of crowdfunding, including price discrimination, information asymmetry, product quality uncertainty and community benefits; they find that reward-based crowdfunding is preferable to equity crowdfunding; furthermore, they find that such a type of crowdfunding is optimal when the initial capital requirement is small. Researchers studied different aspects of reward-based crowdfunding; Stanko and Henard (2017) reviewed over 190 campaigns and found that the number of backers influences future performance; therefore, they identify reward-based crowdfunding as a relatively risk-free way to generate new product awareness. After reviewing 158 campaigns created using Kickstarter, Mollick (2014) found that 90% of the successful campaigns were still going for up to 4 years after the campaign.

Donation-based crowdfunding is when individuals donate a small amount for a specific charitable project, and in return, the donor expects no financial reward from the fund seeker (Baeck et al. 2014; Kshetri 2015; Mollick 2014; Zhang et al. 2017). The benefit of initiating charitable projects through crowdfunding platforms is that donors donate money directly to the beneficiaries without an intermediary (i.e. charity organisation). Philanthropic motive is the main reason that makes the backers donate, as they are looking at the core values and ideas of the fundraisers (Ekedahl and Wengström 2010). Pitschner and Pitschner-Finn (2014) find that non-profit projects receive more money from each crowdfunder and are more likely to have a successful campaign. Similarly, Belleflamme et al. (2013) and Pierrakis and Collins (2013) find that non-profit initiatives in crowdfunding tend to be more successful at reaching the fundraising goal. Social media plays a crucial role in getting backers' support in donation-based crowdfunding campaigns, as donors reported that their first introduction to a donation-based campaign was through a recommendation by family, friends, or other social connections (Baeck et al. 2014). Donation and reward-based crowdfunding are non-monetary returns, so they may have similar success factors. Kickstarter and Indiegogo are the most common reward-based

crowdfunding platforms (Li and Martin 2019). Mainly, Kickstarter has creative projects on its website, such as movies and gaming, while Indiegogo launches other activities, usually banned by Kickstarter; both platforms are examples that could generate the social information required to better understand the crowd's behaviour (Kuppuswamy and Bayus 2018).

2.3 Objectives and Motivation of the Study

Recently, crowdfunding literature examined different types of crowdfunding and studied the impact of different factors influencing campaigns' success.

It is important to understand the crowdfunding market and the different factors affecting it positively and negatively. Given that crowdfunding is a relatively new source of finance and most finance crises happened before the introduction of crowdfunding, this chapter focuses on the impact of COVID-19 on crowdfunding; I extend the existing literature by examining the impact of COVID-19 on the success rate, the raised amount, and the number of backers.

I aim to understand the market given COVID-19-related data, such as the number of deaths due to COVID-19 and positive confirmed cases, and campaign facts, such as the target goal, number of backers, campaign duration, raised amount, and size of the city where the campaign was initiated. Mainly, campaign initiators will benefit from our study; they will indicate whether crowdfunding provides a successful funding source during an unstable economy. Further, they will understand the relation between campaigns' goals, duration, and location, and the success rate during pandemics.

Most reward-based crowdfunding studies focus on the US or China due to the maturity of the market; things have changed as China has strict restrictions when it comes to crowdfunding. Crowdfunding in the UK has developed rapidly (Zhang et al. 2020); given that UK crowdfunding is the most developed across the world (Coakley et al. 2021) and given that Kickstarter is one of the most popular and successful crowdfunding platforms (Belleflamme et al. 2015; Strausz

2020a), a good starting point is to study the impact of COVID-19 on crowdfunding success in the UK. As COVID-19 is an uncertain period, fund seekers, the behaviour of backers, and the determinant of success may change during an unpredictable pandemic. The determinant of the success of crowdfunding from various aspects has been examined in previous studies (i.e. Koch and Siering (2015), Kunz et al. (2017), Lukkarinen et al. (2016) and Mollick (2014)). I am taking this literature a step ahead by examining the impact of COVID-19 on the success, the raised amount, and the number of backers.

I argue that COVID-19 could affect the crowdfunding market, precisely the success rate, the number of backers, and the raised amount, as well as campaign duration, goal amount, and the campaign's location. To that end, this chapter will examine the impact of the pandemic on the success rate, the raised amount, and the number of backers of crowdfunding campaigns. Therefore, our chapter contributes to a better understanding of the effect of a pandemic on crowdfunding.

2.4 Hypotheses Development

2.4.1 Raised Amount and COVID-19

Seeking funds from business angels, venture capitalists, or even traditional financing such as banks is one of the main challenges for startups launching their businesses (Cosh et al. 2009). The difficulties of obtaining funds through traditional finance become even worse during pandemics; therefore, crowdfunding is considered as a fast way to obtain funds during stable economic conditions and pandemics (Wenzlaff and Röhler 2011; Zheng et al. 2016), as it is available to everyone to invest or raise funds. Griffin (2012) states that during financial crises, fundraisers face difficulties when seeking funds through banks; thus, I expect investors to use alternative financing sources.

When it comes to donation-based crowdfunding, Igra et al. (2021) find that during the COVID-19 period, there was a substantial increase in online crowdfunding campaigns related to COVID-19, which raised more money and had a longer narrative description; further, campaigns were more likely to be shared on social media than other campaigns. Furthermore, during the global economic uncertainty due to COVID-19, financial transactions using fintech increased, consequently reducing risks, saving customers' pecuniary funds, and becoming more competitive than the traditional banking system (Vasenska et al. 2021). Therefore, I expect crowdfunding campaigns during the pandemic to raise more funds. Therefore, the first hypothesis is formulated as follows:

H1: Campaigns raised more funds during COVID-19.

2.4.2 Number of Backers and COVID-19

The number of backers and the number of campaigns impact the success rate, as platforms with a high number of campaigns tend to increase the probability of matching projects with backer taste (Belleflamme et al. 2015). Although most studies show that the crowd relies on signals when deciding to back a project, especially regarding reward-based and donation crowdfunding, Kuppuswamy and Bayus (2018) shows the opposite. They find that potential pledgers feel the commitment to contribute to projects with a lower number of backers. Shneor and Zhao (2020) claim that campaigns are more likely to reach their goal if they can attract a large number of investors and a large amount of funds. Limited researchers examine the impact of the number of backers on the campaign's success. During crises and pandemics such as COVID-19, Mamaro and Sibindi (2022) find that the number of backers is positively and significantly related to campaign success. They added that the number of backers, presence on social media, duration of the campaign, and the state of the COVID-19 pandemic are signals to the entrepreneurs of the campaign's successful performance. Given that crowdfunding is an online process, I assume it will receive more attention during pandemics. Based on the above discussion, I formulate the following hypothesis:

H2: Campaigns initiated during COVID-19 attracted more backers.

2.4.3 Duration and COVID-19

Duration is the number of days the campaign specifies to receive its funding goal from backers. Zhou et al. (2018) find that project properties such as project category, funding goal and campaign duration may influence the funding success; a longer duration period may have a negative impact on the success rate of a campaign. Cumming et al. (2021) claim that confident fund seekers are more likely to reduce the duration period of the campaign, as they believe that it will be funded rapidly. At the same time, they believe that the longer the funding period, the higher the possibility of receiving funds from fraudsters. Similarly, (Burtch et al. 2013) find that in donation-based crowdfunding, the longer the campaign duration, the higher the success rate. Given that COVID-19 is an uncertain period, I expect the higher the duration of a campaign, the lower the success rate during the pandemic. We, therefore, derive our third hypothesis as follows:

H3: During COVID-19, campaigns with longer duration have a lower success rate.

2.4.4 Goal Amount and COVID-19

When investigating the relationship between campaign goals and the success rate of crowdfunding campaigns, Cordova et al. (2015) investigate technology projects from four different reward-based crowdfunding platforms. They find that an increase in the goal is associated with a lower success rate. Further, they investigate the influence of communication and public project perception on success, and they claim that setting a realistic crowdfunding goal has a noticeable impact on the success of campaigns. Frydrych et al. (2014) find that differences across projects affect project progress and success; precisely, lower funding goals positively impact the success rate of campaigns. Similarly, Kuppuswamy and Bayus (2018) and Mollick (2014) find that campaigns with a lower funding goal and shorter project duration are major success factors. Based on the above discussion, I expect that during COVID-19, campaigns with a higher goal will have a lower success rate. The following hypothesis is formulated:

H4: During COVID-19, campaigns with a higher goal have a lower success rate.

2.4.5 Campaigns Location and COVID-19

When it comes to crowdfunding and the geographical location, Lin et al. (2016) find that crowdfunding platforms (precisely lending-based crowdfunding) tend to indicate home bias, where investors prefer to invest in companies and stocks located in the same area, often compromising better alternatives with lower risks and higher returns if it is located in geographically more distant areas. One of the advantages of having crowdfunding campaigns is removing the geographical location and any distance related to economic frictions (Agrawal et al. 2014). However, Chan et al. (2018) find that the location of the project may be an important factor influencing the crowdfunding success rate; they find that projects located near banks are less likely to fund their projects. Tang et al. (2022) state that distance-related problems should be irrelevant to online financing due to the transparency of the information related to the investment. However, they claim that spatial distance positively affects crowdfunding campaigns by increasing the number of potential funders and reducing investment risks by spreading the cost over many investors.

Mollick (2014) found that projects located where there is more population has a higher success rate; on the other hand, they conclude that companies succeeding in obtaining crowdfunding can meet their financial goals when backed by business angels, but funders are less subject to geographic and gender biases. They studied the dynamics of the reward-based crowdfunding platform (Kickstarter) and find that success is driven by factors such as personal networks, projects, and geography; precisely, they conclude that cities significantly affect the success rate, as a larger population is associated with a higher success rate. Gallemore and Nielsen (2019) investigated the success rate of the US campaigns launched on Indigogo; based on geography, they find that rural areas have a lower success rate than urban areas, and wealthy areas have the highest success rate. Researchers have not found a cutoff point when investigating geographical location or the size of the cities with crowdfunding success.

According to the ONS,[3] in the UK, major towns or cities have a population of 75,000 or more. Given that crowdfunding is an online platform, and backers can contribute remotely, I expect that the size of the city, which is defined by its population, will have no impact even during pandemics. Therefore, I can construct the following hypothesis:

H5: During COVID-19, the size of cities has no impact on the success rate.

2.5 Data

As an exploratory empirical study, the goal of this chapter is to develop an insight into crowdfunding during COVID-19. The above mentioned hypotheses will be answered quantitatively using OLS and LPM. I start this section with the sample construction and methodology, which are structured based on our data and the chapter's objective.

2.5.1 Sample Construction

In the coming section, I describe crowdfunding data used in the empirical analysis, outline the methodology and present some descriptive analysis. Our data contains all crowdfunding campaigns in the UK, listed on the Crowdfunder, FundRazr, Indiegogo, and Kickstarter platforms from January 2018 to December 2021. Given that the restriction of social life and lockdown was mainly based on the number of COVID-19 cases, I used COVID-19-related data from the Official Coronavirus (COVID-19) Disease Situation Dashboard; the website publishes the number of daily-confirmed COVID-19 cases and the number of daily deaths due to COVID-19, and data is updated weekly. I calculated monthly COVID-19 data, given that the average campaign duration is 31 days. I used the 2021 population of cities across the UK published by the City Population website and the ONS. Table 2.1 below provides the description of the variables used.

[3] Towns and cities in the UK Last access: 30 January 2023

Based on the British Foreign Policy Group website, the first confirmed COVID-19 case in the UK was on 29/1/2020;[4] for this chapter, when saying before the pandemic it means before 29/1/2020, while during the pandemic means from 29/1/2020 onwards. I used the 2021 population published by the City Population website[5] and ONS.[6]

To assess the intensity of the pandemic, scholars used different measures of COVID-19, including a dummy variable that equals one if the campaign was initiated during the pandemic and zero otherwise (Battaglia and Busatob 2020; Cumming et al. 2022; Yang and Koh 2022; Zribi 2022), whether the campaign title included the term "COVID-19" or other terminology such as coronavirus (Igra et al. 2021; McKitrick et al. 2021), number of confirmed COVID-19 cases (Cumming et al. 2021; Ho et al. 2021; Igra et al. 2021), and number of deaths due to COVID-19 (Lu et al. 2022). I used the number of confirmed cases for our main result, and the number of deaths due to the pandemic as a robustness test to check for the model's validity.

2.5.2 Criterion of Exclusion from Sample

The data shows that the fundraising goal amount ranges between £0 and £820,000,000. Following Mollick (2014), I have eliminated extreme values of fundraising goals; the data contained 814 campaigns with a goal below £100[7] and 86 campaigns with a goal above £1,000,000.[8] According to the Kickstarter website,[9] the campaign's duration is between 1 day and 60 days; they added that the recommended duration is 30 days or shorter as there is a negative relation between success rate and duration. On the other hand, Crowdfunder[10] suggested having a duration of 4 to 5 weeks as the ideal length of time, and recommended a maximum of 8 weeks (56 days).

[4] COVID-19 Timeline Last access: 29 March 2023
[5] Population Statistics in Maps and Charts Last access: 19 February 2023
[6] Office for National Statistics Last access: Last access: 2 February 2023
[7] Of the 814 projects with a goal of less than £100, 26% of the campaigns failed to achieve their goal.
[8] The 86 projects with a goal above £1M failed to achieve their goal, and the highest amount received was 55,000, which was 0.22% of their target amount.
[9] What is the maximum project duration? Last access: 21 February 2023
[10] How long can my project run for? Last access: 21 February 2023

Indiegogo follows a slightly different approach, as the maximum duration of a campaign is 60 days; however, if you set your campaign for less than 60 days, they allow for unlimited extension times for a total duration of 60 days. They recommended a duration of 30 to 40 days. Lastly, FundRazr does not set any limits in terms of duration. Based on the discussion above, I eliminated all campaigns with a duration period of zero days, more than 60 days, duration for Kickstarter and Indiegogo, and a duration of more than 56 days for Crowdfunder.

I have taken out all campaigns that did not provide their campaign location. In addition, I eliminated campaigns that provide the street name and those located in a small city where the population is unavailable. Data transformation using the natural logarithm is needed as the number of backers, raised amount, and goal amount are skewed. Since the continuous variables of number of backers and the raised amount contained zero, I added one (log (1+x)) to avoid missing values, as it is a simple and convenient way to eliminate the problem of log zero (Bellégo et al. 2022).

After data cleaning, I ended up with 24,243 campaigns, 16,041 before COVID-19 and 8,202 during COVID-19; the descriptive statistic is shown in Table 2.2 below. Along with crowdfunding data, I used the Official Coronavirus (COVID-19) disease situation dashboard.[11]

2.6 Empirical Methodology

I aim to study the impact of COVID-19 on crowdfunding campaigns from different perspectives, including raised amount, number of backers, duration, goal amount, and the location of the campaign. Some studies measure success using different ways, such as the number of backers, the amount raised, the average funding amount, and funding reached (binary variable). Funding reached, in other words, success, which is a binary variable equal to one if the project reaches 100% of the target or more and zero otherwise (Ahlers et al. 2015; Colombo et al. 2015; Vismara 2018). A successful campaign reaches its funding goal or higher, as campaigns can raise more

[11] Coronavirus (COVID-19) in the UK Last access: 17 January 2023

than their target. Hekman and Brussee (2014) find other ways to measure success, such as the percentage of goal achieved, the amount pledged, the number of days to reach the goal, and the number of backers. The higher, the better for all variables suggested by Hekman and Brussee (ibid.), except for the duration.

2.6.1 Linear Probability Model (LPM)

LPM is simple to estimate as I can interpret the result similarly when interpreting OLS, except that the outcome is a probability. When having limited dependent variables, an LPM is usually a good starting point simply because it is OLS; however, it predicts the probability of success with a linear regression (Baltagi 2021). Using LPM can produce values for the probability outside the [0,1] domain. Therefore, the logit or probit model is preferred (Zhao et al. 2022b). However, when controlling for multiple fixed effects, LPM is appropriate, as using fixed effects in discrete choice models leads to biased results (Greene et al. 2002). Moreover, using robust or cluster standard errors will overcome the heteroscedasticity problem when using LPM (Belleflamme et al. 2015).

2.6.2 Empirical Model

Apart from the data visualisation in Table 2.2 and Figure 2.1, I used OLS to measure the effect of COVID-19 on the raised amount and the number of backers, and I used LPM with an interaction term between COVID-19 and duration, goal, and the size of the city separately to measure the differential effect of COVID-19 on the success rate, raised amount, and the number of backers. Some variables are specified by the initiator (fund seeker), such as goal amount, location, duration, start, and end dates, while the crowdfunder controls other variables, such as the number of backers and the amount pledged (Hekman and Brussee 2014). To account for autocorrelation and heteroscedasticity, I used clustered standard errors at the city level for all equations below.

2.6.2.1 Campaign Raised Amount During COVID-19

To identify the effect of COVID-19 on the raised amount, I estimate the following equation:

$$Raised_{ict} = \beta_0 + \beta_1 COVID_{ct} + controls_{ict} + \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \tag{2.1}$$

The subscripts i denotes campaign, c denotes city, and t denotes time. δ_t, γ_c, and η_k are time, city, and industry fixed effects, respectively. As *Control* variables, I used platform and flexibility. To support the hypothesis, I expect the coefficient β_1 to be positive and significant.

2.6.2.2 Number of Backers during COVID-19

$$Backers_{ict} = \beta_0 + \beta_1 COVID_{ct} + controls_{ict} + \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \tag{2.2}$$

Here in equation (2), I study the impact of COVID-19 on the number of backers, for which I expect β_1 to be positive and significant.

I used LPM and OLS to test hypotheses 3, 4, and 5, where the dependent variables are the success of the campaign, which is a binary variable equal to 1 if the campaign reaches its target and zero otherwise, the number of backers, and the raised amount. X is our variable of interest, including duration, goal amount, and the size of the city. As *Control* variables, I used platform and flexibility. δ_t is a set of time dummies, γ_c is a set of city dummies, and η_k is a set of industry dummies to control for time, city, and industry fixed effect, respectively.

$$Y_{ict} = \beta_0 + \beta_1 \chi_{ict} * COVID_{ct} + \beta_2 COVID_{ct} + controls_{ict} + \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \tag{2.3}$$

There is mixed evidence on how the duration and goal of a campaign affect the success rate; therefore, I control for both duration and goal, and their quadratic form.

2.6.2.3 Duration, Goal, and Location

2.6.2.3.1 Campaign Duration and COVID-19

I start by examining the differential effect of duration during COVID-19 on the success rate using the following equation:

$$\begin{aligned} Y_{ict} &= \beta_0 + \beta_1 Duration_{ict} + \beta_2 Duration_{ict}^2 + \beta_3 (Duration_{ict} * COVID_{ct}) \\ &+ \beta_4 (Duration_{ict}^2 * COVID_{ct}) + \beta_5 COVID_{ct} + controls_{ict} + \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \end{aligned} \tag{2.4}$$

The equation above aims to study the impact of the campaign's duration during COVID-19 on success; I also assess the effect of vector X on the number of backers and the raised amount, where the main coefficient is β_3. The coefficient of duration is expected to be positive, while its squared form is expected to be negative. Eventually, people will not back a project after exceeding a certain number of days. To support the hypothesis, I expect to have a significant negative coefficient of the interaction term $Duration * COVID$ for Equation 2.4.

2.6.2.3.2 Goal of Campaigns and COVID-19

I then examine the differential effect of goal amount during COVID-19 on the success rate, number of backers, and raised amount using the following equation:

$$\begin{aligned} Y_{ict} =& \beta_0 + \beta_1 Goal_{ict} + \beta_2 Goal_{ict}^2 + \beta_3 (Goal_{ict} * COVID_{ct}) + \beta_4 (Goal_{ict}^2 * COVID_{ct}) \\ &+ \beta_5 COVID_{ct} + controls_{ict} + \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \end{aligned} \tag{2.5}$$

Here, I investigate whether, during COVID-19, setting higher crowdfunding goals reduces the chance of campaigns achieving their target. I expect the goal amount and its squared term to be negative. To support the hypothesis, I expect a negative coefficient of the interaction term $Goal * COVID$. To support the hypothesis, I expect to have a significant negative coefficient of the interaction term $Goal * COVID$.

2.6.2.3.3 Large Cities and COVID-19

Finally, I examine the impact of initiating a campaign in a large city during COVID-19 on the success rate, number of backers, and raised amount. In the sample, I define a large city as one with a population of 75,000 or more. I used the following equation:

$$\begin{aligned} Y_{ict} = & \beta_0 + \beta_1 (LargeCity_{ict} * COVID_{ct}) + \beta_2 COVID_{ct} + controls_{ict} + \\ & \delta_t + \gamma_c + \eta_k + \varepsilon_{ict} \end{aligned} \tag{2.6}$$

I tested the impact of COVID-19 on success. I also assessed the effect of vector X on the number of backers and the raised amount of campaigns located in large cities (based on the population) using the $LargeCity * COVID$ interaction term. Given that crowdfunding is a 100% online platform and people can contribute worldwide, I expect that the size of the city does not negatively affect the success rate.

2.7 Results

I build our results in the following steps: First, I look at the descriptive statistics of variables before and during the pandemic. Second, I run OLS to get the first indication of the effect of COVID-19 on the raised amount and the number of backers. Third, I use OLS and LPM models to understand how COVID-19 affects duration, goal amount, and the location of the campaign, by including an interaction term between our variable of interest and COVID-19. Finally, to check the validity of our model, as a robustness check, I use an alternative COVID-19 measure.

2.7.1 Descriptive Statistics

This section provides descriptive statistics on the data used in our study, presented in the form of tables and figures. Table 2.1 below provides a list of the variables used in the model, with the definition and the source of each variable. Based on the literature, during COVID-19, I expect some variables to negatively impact the success rate, such as goal amount and duration. At the same time, I expect that the pandemic increased the number of backers and the raised amount of the campaigns. I expect that the size of the city does not affect the success of campaigns during the pandemic. Table 2.2 provides the sample statistics of variables use in our study before and during COVID-19.

Table 2.1: Variables Definition

Variable	Definition	Source
Success	Binary variable = 1, when the campaign reaches its target amount, 0 otherwise	The Crowd Data Center
Raised Amount	The natural logarithm of the amount raised by campaign	The Crowd Data Center
Number of Backers	The natural logarithm of the number of backers	The Crowd Data Center
Platform	Categorical variables indicate type of platform; Crowdfunder, FundRazr, Indiegogo, and Kickstarter	The Crowd Data Center
Goal Amount	The natural logarithm of the target amount set by the campaign	The Crowd Data Center
Duration	The natural logarithm of number of days for which a project accepts funding	The Crowd Data Center
Flexible Funds	Binary variable =1, when offering keep-it-all, zero otherwise	The Crowd Data Center
Large Cities	Binary variable = 1 if city has population of 75,000 or more, zero otherwise	City Population and Office for National Statistics (ONS)
COVID-19 Cases	The natural logarithm of monthly number of confirmed COVID-19 cases of cities across the UK	The Official Coronavirus (COVID-19) Disease Situation Dashboard
Number of Deaths	The natural logarithm of monthly number of deaths due to COVID-19 of cities across the UK	The Official Coronavirus (COVID-19) Disease Situation Dashboard

Table 2.2: Descriptive Statistics

	Before COVID					During COVID					
Variable	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	t-test
Duration (days)	16,041	31.18	13.95	1	155	8,202	32.11	12.5748	1	60	-0.94***
Goal Amount	16,041	12,681.61	49,818.47	100	1,000,000	8,202	11,856.30	49442.4	100	1,000,000	825.31
Raised Amount	16,041	5,318.38	37,389.16	0	1,668,626	8,202	9,212.91	62105.3	0	3,448,262	-3,894.53***
No. of Backers	16,041	92.28	656.51	0	58,730	8,202	150.73	657.777	0	20,398	-58.45***
No. of COVID-19 Cases	16,041	0	0	0	0	8,202	4.89	3.44111	0	10.70	-4.89***
No. of COVID-19 Deaths	16,041	0	0	0	0	8,202	1.70	1.64051	0	6.44	-1.70***

Figure 2.1 shows the percentage of successful and failed campaigns before and during COVID-19.

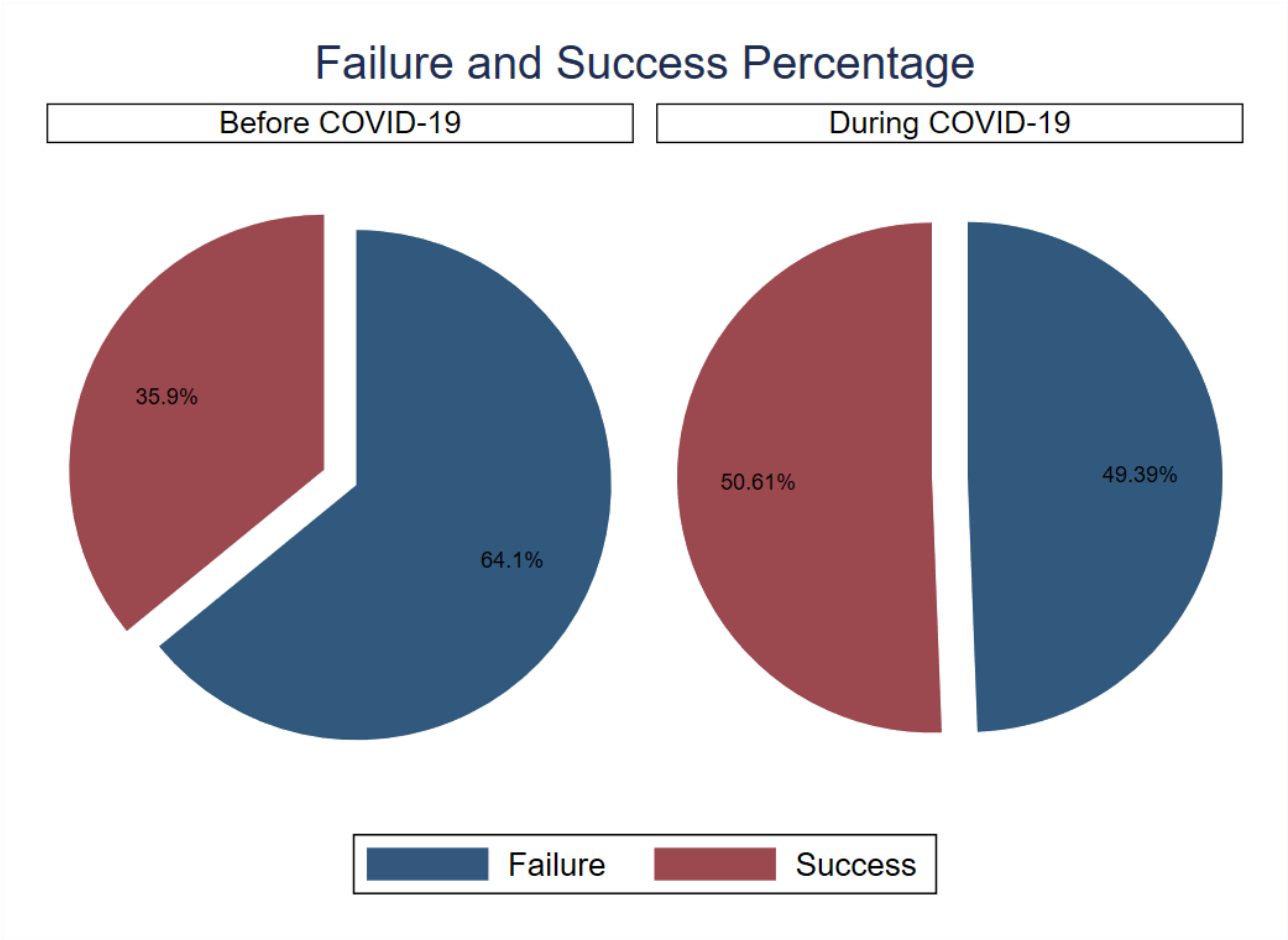

Figure 2.1: Success and failure percentage before and during pandemic

Table 2.2 above provides the first glimpse into the characteristics of the projects aiming to raise funds through crowdfunding platforms; it presents statistics before and during COVID-19. Clearly, I can notice changes in the number of campaigns initiated during COVID-19. Although the number of campaigns dropped by almost 50%, on average, campaigns raised more funds (73%) and had a higher number of backers (39%) during COVID-19. Figure 2.1 above shows the percentage of failed and successful campaigns before and during COVID-19; it shows an increase in the percentage of successful campaigns during COVID-19.

2.7.2 Baseline Regression

To answer the first and second hypotheses, I used OLS to measure the impact of COVID-19 on the number of backers and the raised amount. I used the natural logarithm of monthly confirmed COVID-19 cases to measure the intensity of COVID-19. To better understand how COVID-19 affected the characteristics and determinants of campaigns' success, I estimate OLS and LPM to test hypotheses 3 to 5, using a binary variable, success, log number of backers, and log raised amount as dependent variables. Our variables of interest include duration, goal amount, and the size of the city. I used an interaction term between our variable of interest and the number of confirmed COVID-19 cases to measure the differential effect of COVID-19 on the success rate, number of backers, and raised amount.

2.7.2.1 Hypothesis 1: Raised Amount and COVID

The main success drivers of a campaign are the number of backers and the funds they are providing. To provide empirical evidence, I present the results of Equation 2.1 in Table 2.3, which investigates the effect of COVID-19 on the raised amount of crowdfunding campaigns. In column (1), where no controls or fixed effects are included, the coefficient for COVID-19 is positive and statistically significant at the 1% level. Specifically, the coefficient is 0.0762, suggesting that an increase in COVID-19 cases is associated with a slight increase in the raised amount of crowdfunding campaigns. This result could reflect an initial increase in interest and support for crowdfunding campaigns due to heightened public awareness and economic uncertainty caused by the pandemic. This finding is consistent with previous studies that have suggested crowdfunding can act as an alternative financing mechanism during times of economic distress (Cumming and Groh 2018; Brown et al. 2020). However, as I introduce control variables and fixed effects, the significance of this effect diminishes.

In column (2), I add control variables, and the coefficient for COVID-19 decreases to 0.0523, but remains statistically significant at the 1% level. This suggests that even after accounting for other factors, there remains a small positive relationship between COVID-19 and the raised amount, though the effect is weaker. The presence of control variables captures other campaign-specific and external factors that could also influence the amount raised, which might explain the reduction in the magnitude of the COVID-19 coefficient.

When I introduce time fixed effects in column (3), the coefficient for COVID-19 further decreases to 0.0130, and it becomes statistically insignificant. This indicates that once I account for variations in the data across time, the effect of COVID-19 on the raised amount becomes less pronounced. The lack of statistical significance in this model suggests that the pandemic's effect on crowdfunding may have been temporary or offset by other factors over time. This aligns with findings from studies like those of Cowling et al. (2021), who note that external economic shocks like COVID-19 may have initial effects on crowdfunding, but these effects can diminish as the economic landscape evolves.

In column (4), I include both time and city fixed effects. The coefficient for COVID-19 becomes negative (-0.0187), but remains statistically insignificant. This result suggests that once I account for both time and geographic variation, COVID-19 no longer appears to have a significant effect on the raised amount. The negative sign may indicate that in certain cities or regions, the pandemic might have led to lower fundraising levels, potentially due to local economic constraints or lower backer confidence. As discussed by Zhang et al. (2021a), factors such as local economic conditions and regional restrictions could exacerbate the uncertainty faced by campaigns, leading to reduced support in some areas.

Finally, in column (5), where I add industry fixed effects alongside all previous controls, the coefficient for COVID-19 becomes even more negative (-0.0132), and remains statistically insignificant. The inclusion of industry fixed effects captures industry-specific variations that may influence the amount raised. This final model suggests that, after accounting for multiple

factors—such as time, city, and industry—COVID-19 does not have a statistically significant impact on the amount raised by campaigns. This finding is consistent with Ho et al. (2021) and McKitrick et al. (2021), who also found no significant long-term impact of COVID-19 on crowdfunding success once other variables were controlled for.

The results indicate that while COVID-19 was initially associated with an increase in the raised amount of crowdfunding campaigns, the effect becomes statistically insignificant once control variables, time, city, and industry fixed effects are introduced. Thus, based on these findings, I do not support H1, which posited that campaigns would raise more funds during COVID-19. The initial positive relationship observed in the base model likely reflects a short-term increase in crowdfunding activity, which disappears as more controls are included and fixed effects come into play. This result is consistent with research indicating that while crowdfunding can serve as an alternative finance source during crises (Giudici et al. 2012; Cowling et al. 2021), the actual effect may depend on various contextual factors such as backer behaviour and market conditions during the pandemic.

Table 2.3: Raised Amount and COVID-19

Dependent Variable: Log Raised Amount COVID-19 Measure: Log Monthly Confirmed Cases					
	(1)	(2)	(3)	(4)	(5)
COVID	0.0762***	0.0523***	0.0130	-0.0187	-0.0132
	(0.00466)	(0.00551)	(0.0142)	(0.0121)	(0.0122)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.007	0.135	0.143	0.200	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above investigates the impact of COVID on the raised amount of campaigns, where COVID is the log monthly confirmed cases. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.7.2.2 Hypothesis 2: Number of Backers and COVID

For the second hypothesis, the results of Equation 2.2 are in Table 2.4, which investigates the effect of COVID-19 on the number of backers for crowdfunding campaigns. The dependent variable is the log of the number of backers. In column (1), where no controls or fixed effects are included, the coefficient for COVID-19 is positive and statistically significant at the 1% level. Specifically, the coefficient is 0.0547, suggesting that an increase in COVID-19 cases is associated with a slight increase in the number of backers for crowdfunding campaigns. This result may reflect initial increased engagement and participation in crowdfunding platforms during the early months of the pandemic. This observation aligns with previous studies that have found that external crises can lead to increased interest in alternative finance, such as crowdfunding, during times of uncertainty (Cumming and Groh 2018; Cowling et al. 2021).

However, when I introduce control variables in column (2), the coefficient for COVID-19 decreases to 0.0333, but it remains statistically significant at the 1% level. The introduction of control variables accounts for campaign-specific factors that could influence the number of backers, such as campaign goal, campaign quality, and backer demographics. The reduction in the coefficient size indicates that part of the initial effect observed in column (1) is explained by these additional factors. The positive relationship between COVID-19 and the number of backers, though still statistically significant, is weaker, suggesting that the initial increase in engagement might be driven by factors other than COVID-19 itself.

In column (3), I add time fixed effects, which capture any time-varying factors that might influence the number of backers, such as seasonal trends, changes in crowdfunding behaviour, or broader economic conditions. After accounting for these time-specific factors, the coefficient for COVID-19 decreases further to 0.00720 and becomes statistically insignificant. This result suggests that the effect of COVID-19 on the number of backers diminishes once time-related factors are considered. This aligns with findings from studies like Zhang et al. (2021a) and Goodell (2020), which highlight how external shocks like COVID-19 may have short-term effects on crowdfunding activity, but these effects may fade as backers adapt to the ongoing crisis.

In column (4), I introduce city fixed effects to account for geographic variation in the impact of COVID-19. After including these geographic controls, the coefficient for COVID-19 turns negative (-0.00974) and remains statistically insignificant. The negative sign could suggest that, in certain cities, the pandemic may have dampened backer participation, possibly due to local economic hardships or stricter lockdown measures. This finding echoes research by Cowling et al. (2021), who noted that the severity of COVID-19's economic impact varied across different regions, potentially influencing backer behaviour. Once city-specific factors are controlled for, COVID-19 no longer appears to have a positive impact on the number of backers.

Finally, in column (5), I add industry fixed effects alongside all previous controls. The coefficient for COVID-19 becomes even more negative (-0.00706) and remains statistically insignificant. This suggests that after accounting for time, city, and industry effects, there is no statistically significant relationship between COVID-19 and the number of backers. The inclusion of industry fixed effects captures industry-specific trends that may influence backer behaviour, further indicating that the initial positive effect seen in earlier models was likely due to other factors unrelated to COVID-19. This finding aligns with existing studies such as Ho et al. (2021) and McKitrick et al. (2021), who observed that the effect of COVID-19 on crowdfunding success varied by sector and geography.

Thus, based on these findings, I do not support H2, which hypothesised that the number of backers would increase during COVID-19. While the initial models suggest a small positive relationship between COVID-19 and the number of backers, this effect dissipates as I account for other variables, indicating that the pandemic did not lead to a significant increase in backer participation in crowdfunding campaigns. These results are consistent with the literature that suggests crowdfunding activity can be influenced by a range of factors beyond the external shock itself, including the economic and regional contexts in which campaigns operate (Zhang et al. 2021a; Cowling et al. 2021).

Table 2.4: Number of Backers and COVID-19

Dependent Variable: Log Number of Backers COVID-19 Measure: Log Monthly Confirmed Cases					
	(1)	(2)	(3)	(4)	(5)
COVID	0.0547***	0.0333***	0.00720	-0.00974	-0.00706
	(0.00318)	(0.00292)	(0.00622)	(0.00825)	(0.00810)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.008	0.052	0.060	0.093	0.111
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above investigates the impact of COVID on the number of backers, where COVID is the log monthly confirmed cases. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.7.2.3 Hypothesis 3: Success, Duration, and COVID

Table 2.5 shows the result of Equation 2.4; in Panel A, I find that the log duration is consistently positively associated with campaign success, with a significant coefficient of 0.412 in column (1). This suggests that longer campaign durations are associated with higher success probabilities, aligning with previous research that shows longer campaigns increase project visibility and provide more time for backers to engage with campaigns (Burtch et al. 2013). As I progressively add control variables and fixed effects in columns (2) to (5), the magnitude of the coefficient decreases but remains statistically significant across all models. This indicates that, overall, longer campaign durations tend to increase the likelihood of success, even after accounting for additional factors.

However, I also observe that the coefficient for log duration squared is negative and statistically significant in all models, indicating an inverted U-shaped relationship between duration and success rate. This result suggests that while longer campaign durations initially increase the probability of success, there is a diminishing return to duration. After a certain point, extending the campaign duration may become detrimental to its success rate, likely due to backers' diminishing interest or perceived lack of campaign confidence (Mollick 2014). The turning point, where the effect of duration becomes negative, is calculated to be approximately 13 days. This is consistent with Burtch et al. (2013), who found that while longer campaigns may initially boost success chances, they can eventually signal a lack of confidence in campaign leadership, leading to reduced support.

Interestingly, the interaction term for log duration $\times$ COVID is negative and statistically significant in all models, with a coefficient ranging from -0.0386 in column (1) to -0.0216 in column (5). This suggests that, during COVID-19, longer campaign durations decreased the probability of success, reflecting the heightened uncertainty and risk aversion among backers during the pandemic. This aligns with findings by Mollick (2014), who finds that during periods of economic instability, backers may become more cautious, reducing their support for campaigns that extend over longer periods.

Finally, the interaction term for log duration squared × COVID is statistically insignificant across all models, suggesting that the inverted U-shaped relationship between duration and success is not significantly affected by COVID-19. This could imply that the diminishing returns from extending campaign duration remain similar to those observed in stable periods.

In Panel B, the relationship between campaign duration and the number of backers follows a similar pattern. The coefficient for log duration is positive and statistically significant across all models, with a coefficient ranging from 1.301 in column (1) to 0.858 in column (5). This indicates that longer campaign durations tend to attract more backers, consistent with the idea that longer campaigns provide more time for potential backers to discover and engage with the project. This finding aligns with previous studies like Gleasure and Feller (2016), which suggest that campaigns with extended durations are more likely to capture the attention of a larger pool of backers.

However, as with the number of backers, the coefficient for log duration squared is negative and statistically significant in all models, indicating diminishing returns to the number of backers as campaign duration increases. This is consistent with the inverted U-shaped relationship observed in Panel A.

The interaction term for log duration × COVID is negative but statistically insignificant across all models, suggesting that the effect of campaign duration on the number of backers is insignificant during COVID-19. This could imply that, while campaign durations tend to attract more backers overall, the pandemic did not lead to a significant change in the backer participation relative to the campaign length. This finding contrasts with the significant effects on campaign success, suggesting that factors other than backer volume, such as campaign visibility or confidence, may have influenced success rates during COVID-19.

Finally, Panel C shows the effect of campaign duration on the raised amount. The coefficient for log duration is positive and statistically significant across all models, ranging from 1.261 in column (1) to 1.378 in column (5), indicating that longer campaign durations lead to higher amounts raised. This is consistent with previous research, which suggests that extended dura-

tions give campaigns more time to attract backers and raise funds (Burtch et al. 2013). However, as in the previous panels, the negative coefficient for log duration squared suggests that the relationship between duration and raised amount is not linear, and there are diminishing returns as the campaign duration increases.

The interaction term for log duration × COVID is negative and statistically significant in all columns. This suggests that during COVID-19, longer campaigns raised less money, indicating that backers may have been less willing to contribute to long-duration campaigns due to the uncertain economic environment. This result aligns with studies like those of Mollick (2014), who noted that during periods of crisis, extended durations could signal a lack of confidence, leading to reduced fundraising success.

In contrast, the interaction term for log duration squared × COVID is positive in all specifications (with a coefficient of 0.0223 in column (5)), but it is only marginally significant. This suggests that while the overall relationship between campaign duration and raised funds is still negative during COVID-19, the effects may not be uniform across all campaigns. Some campaigns may still benefit from longer durations during the pandemic, particularly if they are able to maintain backer engagement and confidence over time.

The linear combination test of the interaction term between duration and COVID-19 shows that higher duration is associated with a higher failure rate, as a campaign with a duration of 26 days will decrease the chance of success by 0.42%, while campaigns with 60 days will decrease the chances of success by 1.14%.

The results of Equation 2.4 provide strong support for H3, showing that campaign duration plays a significant role in the success rate, the number of backers, and the raised amount. Specifically, longer campaign durations tend to increase the likelihood of success and the number of backers, but the effect diminishes as duration increases beyond a certain point. However, our results also suggest that during COVID-19, the positive effects of duration on success and

funds raised are muted. The interaction terms between campaign duration and COVID-19 indicate that, during the pandemic, longer durations were associated with lower success rates and reduced amounts raised, likely due to increased uncertainty and backer risk aversion (Burtch et al. 2013; Mollick 2014).

Thus, while H3 is supported in that longer durations generally lead to higher success and more funds raised, COVID-19 appears to have dampened these effects, reinforcing the idea that uncertainty during a crisis can influence backer behaviour and campaign outcomes.

Table 2.5: Duration and COVID-19

	(1)	(2)	(3)	(4)	(5)
COVID-19 measure: Log Monthly Confirmed Cases					
Panel A: Success (yes=1)					
Log Duration	0.412***	0.190***	0.197***	0.142***	0.136***
	(0.0221)	(0.0252)	(0.0270)	(0.0181)	(0.0166)
Log Duration Squared	-0.0881***	-0.0419***	-0.0428***	-0.0277***	-0.0262***
	(0.00614)	(0.00661)	(0.00708)	(0.00399)	(0.00339)
Log Duration X COVID	-0.0386***	-0.0252***	-0.0264***	-0.0195**	-0.0216**
	(0.00644)	(0.00751)	(0.00731)	(0.00853)	(0.00927)
Log Duration Squared X COVID	0.00356***	0.000645	0.000904	-0.000268	5.53e-05
	(0.00108)	(0.00124)	(0.00119)	(0.00127)	(0.00135)
COVID	0.109***	0.0873***	0.0838***	0.0701***	0.0739***
	(0.00974)	(0.0119)	(0.0118)	(0.0154)	(0.0166)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.053	0.203	0.213	0.276	0.298
Panel B: Log Number of Backers					
Log Duration	1.301***	0.901***	0.908***	0.886***	0.858***
	(0.0648)	(0.0605)	(0.0612)	(0.0587)	(0.0528)
Log Duration Squared	-0.238***	-0.156***	-0.158***	-0.157***	-0.149***
	(0.0159)	(0.0141)	(0.0147)	(0.0143)	(0.0119)
Log Duration X COVID	-0.0580	-0.0345	-0.0426	-0.0413	-0.0557
	(0.0357)	(0.0361)	(0.0364)	(0.0343)	(0.0377)
Log Duration Squared X COVID	0.00642	0.00162	0.00349	0.00300	0.00551
	(0.00537)	(0.00540)	(0.00542)	(0.00512)	(0.00561)
COVID	0.172***	0.131**	0.111*	0.0946	0.117*
	(0.0621)	(0.0636)	(0.0655)	(0.0587)	(0.0634)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.026	0.061	0.068	0.101	0.118
Panel C: Log Raised Amount					
Log Duration	1.261***	1.261***	1.300***	1.448***	1.378***

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Table 2.5: Duration and COVID-19 (Continued)

	(0.108)	(0.108)	(0.111)	(0.141)	(0.124)
Log Duration Squared	-0.202***	-0.202***	-0.210***	-0.256***	-0.233***
	(0.0241)	(0.0241)	(0.0252)	(0.0353)	(0.0299)
Log Duration X COVID	-0.175**	-0.175**	-0.181**	-0.205***	-0.230***
	(0.0848)	(0.0848)	(0.0856)	(0.0755)	(0.0863)
Log Duration Squared X COVID	0.0137	0.0137	0.0151	0.0181	0.0223*
	(0.0126)	(0.0126)	(0.0127)	(0.0115)	(0.0131)
COVID	0.484***	0.484***	0.450***	0.464***	0.504***
	(0.146)	(0.146)	(0.154)	(0.124)	(0.140)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.145	0.145	0.154	0.212	0.245
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above investigates the impact of duration during COVID on success, number of backers and the raised amount. Success is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly confirmed cases; I further introduced an interaction term between duration and COVID and its quadratic term; where duration is the number of days on which campaigns accept funding. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.7.2.4 Hypothesis 4: Success, Goal Amount, and COVID

I present the results of Equation 2.5 in Table 2.6. In Panel A, the coefficient for log goal is consistently negative and statistically significant across all models. In column (1), the coefficient is -0.172, suggesting that higher campaign goals are associated with a lower probability of success. This aligns with previous research by Cumming et al. (2020), who found that campaigns with higher goals tend to have lower success rates, as backers perceive higher goals as riskier and less likely to be achieved. As I introduce control variables and fixed effects in columns (2) to (5), the magnitude of the coefficient decreases but remains statistically significant, indicating that this negative relationship persists even after accounting for other factors.

In addition, the coefficient for log goal squared is positive and statistically significant in columns (2) to (5), which suggests an inverted U-shaped relationship between the goal amount and the success rate. This finding implies that while higher goals tend to decrease the success probability, there is an optimal goal amount beyond which success rates may improve. This result is consistent with Kunz et al. (2017), who identified an inverted U-shaped relationship between campaign characteristics (like funding goal and duration) and success rates, highlighting the importance of balancing goal size with backer expectations.

The interaction term for log goal $\times$ COVID is positive in column (1), but becomes statistically insignificant in later models. This suggests that while COVID-19 might have had a small positive effect on the relationship between goal amount and success rate in the initial model, the impact of COVID-19 on the goal amount's effect on success is muted once I control for additional factors. This finding is consistent with the overall theme from the literature, where crises (such as COVID-19) do not necessarily lead to large shifts in crowdfunding dynamics (Cowling et al. 2021).

The log goal squared × COVID interaction term is negative and statistically significant in column (2), suggesting that during COVID-19, the negative effect of higher goals on the success rate was slightly worsened. This is consistent with the notion that the increased uncertainty during the pandemic might have made backers more cautious, further reducing the likelihood of success for campaigns with higher goals (Mollick 2014).

In Panel B, the relationship between log goal and the number of backers is generally positive, with the coefficient for log goal ranging from 0.626 in column (1) to 0.751 in column (5), all of which are statistically significant. This suggests that setting a higher goal is associated with attracting more backers, possibly because larger goals may signal a more serious or ambitious campaign, thus drawing more interest. This is consistent with the idea that backers are drawn to projects with clear, well-defined objectives, especially when they believe in the project's potential (Zhang and Liu 2012).

However, the coefficient for log goal squared is negative and statistically significant across all models, suggesting that the relationship between the goal amount and the number of backers follows an inverted U-shape. The turning point is £5,210, where the number of backers will decrease for campaigns with a higher goal than this. This finding implies that while higher goals may initially attract more backers, there is a threshold beyond which further increases in the goal amount begin to discourage backer participation. The log goal × COVID interaction term is consistently negative and statistically significant across all models, with the coefficient ranging from -0.0128 to -0.0353. This suggests that during COVID-19, the negative impact of higher goals on backer participation worsens, possibly due to the increased risk aversion and uncertainty during the pandemic (Zhao et al. 2022a). As COVID-19 created a more uncertain economic environment, backers may have been less willing to support high-risk campaigns, leading to a decrease in the number of backers for campaigns with higher goals.

Finally, in Panel C, I examine the impact of the goal amount on the raised amount. The coefficient of log goal is consistently positive and statistically significant across all models, ranging from 1.749 in column (1) to 2.033 in column (5). This indicates that campaigns with higher goals tend to raise more funds, supporting the idea that larger goals can signal more ambitious projects, which may attract more financial support (Gleasure and Feller 2016). However, the

coefficient for log goal squared is negative and statistically significant, suggesting diminishing returns to the raised amount as the goal increases. This reflects the inverted U-shaped relationship, where very high funding goals may lead a reduction of the raised amount, even though they initially appear to attract more funds. It shows that the higher the goal amount, the higher the raised amount, to a point where £10,357 is the turning point.

The log goal × COVID interaction term in Panel C is statistically insignificant across all models, suggesting that during COVID-19, the impact of the goal amount on the raised amount was not significantly altered by the pandemic. This indicates that, unlike the number of backers and the success rate, the effect of the goal amount on the funds raised remained relatively stable during the pandemic. This is consistent with findings in the literature, as Mollick (2014) finds that while crowdfunding dynamics may shift during times of crisis, the fundamental relationship between goal amount and the raised amount remains largely unaffected by external factors. The negative interaction term for log goal squared × COVID is statistically insignificant, reinforcing the idea that the overall relationship between goal amount and raised funds does not change dramatically due to COVID-19.

The linear combination test of the interaction term between goal and COVID-19 shows that a campaign with a high goal amount is associated with a lower success rate; a campaign with a goal of £700 will decrease the chances of success by 1.35%, wile campaigns with a goal of £23,295 will have a lower success rate, as the rate will decrease by 43%.

The results from Equation 2.5 provide strong support for H4, which hypothesised that higher goal amounts would negatively impact the success rate, number of backers, and raised amount. In particular, the negative relationship between goal amount and success rate is robust across all models, and I find that during COVID-19, this relationship is further increased. Similarly, while higher goals initially attract more backers and funds, these effects are mitigated by the uncertainty of the pandemic, as evidenced by the negative interactions between goal amount and COVID-19. The inverted U-shaped relationship between goal amount and the dependent variables highlights the importance of setting an optimal goal that balances ambition with realism, particularly during times of economic uncertainty.

Thus, H4 is supported, as our results show that during COVID-19, campaigns with higher goals are less likely to succeed and tend to raise fewer funds, particularly as backers become more cautious in an uncertain economic environment.

Table 2.6: Goal Amount and COVID-19

	(1)	(2)	(3)	(4)	(5)
Panel A: Success Rate					
COVID-19 measure: Log Monthly Confirmed Cases					
Log Goal	-0.172***	-0.0980***	-0.0936***	-0.0838***	-0.104***
	(0.0154)	(0.0151)	(0.0156)	(0.0244)	(0.0220)
Log Goal X COVID	0.00847*	0.00307	0.00288	0.00101	0.000515
	(0.00462)	(0.00423)	(0.00412)	(0.00401)	(0.00430)
Log Goal Squared	0.00522***	0.00165*	0.00136	0.00105	0.00243**
	(0.000856)	(0.000846)	(0.000880)	(0.00134)	(0.00117)
Log Goal Squared X COVID	-0.000648**	-0.000308	-0.000284	-0.000192	-0.000139
	(0.000277)	(0.000256)	(0.000251)	(0.000245)	(0.000264)
COVID	-0.00783	0.00243	-0.00215	0.00365	0.00484
	(0.0187)	(0.0168)	(0.0162)	(0.0160)	(0.0169)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.108	0.248	0.258	0.281	0.302
Panel B: Log Number of Backers					
Log Goal	0.626***	0.770***	0.821***	0.805***	0.751***
	(0.0539)	(0.0525)	(0.0520)	(0.0961)	(0.0914)
Log Goal X COVID	-0.0128	-0.0252	-0.0310**	-0.0317**	-0.0353**
	(0.0160)	(0.0155)	(0.0148)	(0.0149)	(0.0153)
Log Goal Squared	-0.0395***	-0.0462***	-0.0493***	-0.0487***	-0.0439***
	(0.00327)	(0.00321)	(0.00319)	(0.00522)	(0.00500)
Log Goal Squared X COVID	0.000418	0.00120	0.00161*	0.00163*	0.00191*
	(0.00103)	(0.001000)	(0.000965)	(0.000987)	(0.00103)
COVID	0.151**	0.151**	0.134**	0.135**	0.148***
	(0.0598)	(0.0598)	(0.0575)	(0.0565)	(0.0570)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.014	0.059	0.068	0.097	0.114
Panel C: Log Raised Amount					
Log Goal	1.749***	2.002***	2.069***	2.141***	2.033***

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Table 2.6: Goal Amount and COVID-19 (Continued)

	(0.0973)	(0.0916)	(0.0915)	(0.142)	(0.130)
Log Goal X COVID	0.0302	0.00646	-0.00716	-0.0199	-0.0239
	(0.0359)	(0.0341)	(0.0350)	(0.0343)	(0.0345)
Log Goal Squared	-0.0990***	-0.108***	-0.113***	-0.119***	-0.110***
	(0.00603)	(0.00575)	(0.00574)	(0.00786)	(0.00756)
Log Goal Squared X COVID	-0.00232	-0.000643	0.000192	0.000973	0.00133
	(0.00241)	(0.00230)	(0.00234)	(0.00230)	(0.00230)
COVID	-0.0149	0.0403	0.0341	0.0796	0.0943
	(0.131)	(0.123)	(0.125)	(0.123)	(0.123)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.029	0.172	0.180	0.214	0.248
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above investigates the impact of the campaign's goal amount during COVID on success, number of backers, and raised amount. Success is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly confirmed cases; I further introduced an interaction term between goal amount and COVID and its quadratic term, where goal is the amount of money which the campaign requires to succeed. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.7.2.5 Hypothesis 5: Success, City, and COVID

I present the results of Equation 2.6 in Table 2.7, which investigates the effect of city size (based on population) on the success rate, number of backers, and raised amount for crowdfunding campaigns during the COVID-19 pandemic. In Panel A, the interaction term for large city × COVID is negative and statistically significant in column (1), with a coefficient of -0.00860. This suggests that, during COVID-19, campaigns located in larger cities tend to have a slightly lower probability of success compared to those in smaller cities. However, as I introduce control variables and fixed effects in columns (2) to (5), the magnitude of this effect decreases, and it becomes statistically insignificant. This indicates that once I account for other factors, such as campaign characteristics and time, the size of the city has little impact on the success rate of crowdfunding campaigns.

This finding aligns with the literature; Blaseg et al. (2021), examined the use of equity crowdfunding and found that ventures in larger cities are less likely to use crowdfunding as an external source of funding. They suggest that access to traditional financing is more readily available in large cities, making crowdfunding less essential. This is also consistent with the notion that crowdfunding platforms, being online-based, overcome geographical constraints, and city size should not play as significant a role in determining success (Giudici et al. 2012; Brown et al. 2020). Thus, the lack of significance in later models may reflect the idea that city size is not a critical factor in crowdfunding success, especially during COVID-19.

In Panel B, I observe a similar pattern. The coefficient for large city × COVID is negative and statistically significant in column (1), with a coefficient of -0.0299, indicating that campaigns in larger cities tend to attract fewer backers during COVID-19. However, as I introduce control variables and fixed effects in columns (2) to (5), the magnitude of this effect decreases, and it becomes statistically insignificant in column (5). This suggests that the negative impact of city size on the number of backers during the pandemic is not robust once other factors, such as time, city, and industry effects, are controlled for.

The negative interaction between city size and COVID-19 on backer participation may reflect the increased economic uncertainty during the pandemic, which affected backer behaviour across various regions. However, similar to the success rate, once fixed effects and controls are added, the influence of city size becomes less pronounced, reinforcing the idea that crowdfunding platforms' online nature mitigates the importance of location, especially during crises (Cowling et al. 2021; Giudici et al. 2012).

Finally, in Panel C, the coefficient for large city × COVID is negative but statistically insignificant across all models, suggesting that city size does not significantly affect the amount raised during COVID-19. This is consistent with the findings from Panel A and Panel B, where city size does not appear to play a major role in the outcomes of crowdfunding campaigns during the pandemic. Although campaigns in larger cities may have better access to traditional financing (Blaseg et al. 2021), this advantage does not seem to extend to crowdfunding, especially as the online nature of the platform neutralises geographical constraints.

The coefficient of COVID is statistically significant and positive in columns (1) and (2), with a decreasing magnitude as more controls are added. This suggests that while COVID-19 may have initially had a positive effect on the funds raised, the effect diminishes once other factors are controlled for, particularly as campaigns with higher visibility during the pandemic may have attracted more backers or funding early on (Brown et al. 2020).

The results provide empirical support for H5, which posits that the size of the city does not significantly affect crowdfunding outcomes during COVID-19. In particular, the interaction term for large city × COVID is either statistically insignificant or only weakly significant, suggesting that during the pandemic, city size does not play a critical role in determining the success rate, number of backers, or raised amount for crowdfunding campaigns.

This finding aligns with previous literature, such as Blaseg et al. (2021), which suggests that large cities may have less reliance on crowdfunding due to better access to traditional financing. Furthermore, the online nature of crowdfunding platforms allows campaigns to overcome geographical limitations, making city size less relevant for campaign outcomes. Therefore, even though larger cities may traditionally offer greater access to financial resources, crowdfunding success seems more dependent on other factors, particularly during the pandemic.

Thus, H5 is supported, as I find that the size of the city does not significantly influence the success rate, number of backers, or raised amount for crowdfunding campaigns during COVID-19. The results emphasise that crowdfunding platforms, being online-based, mitigate the impact of geographical factors, making location less important for campaign outcomes.

Table 2.7: Cities and COVID-19

	(1)	(2)	(3)	(4)	(5)
COVID-19 Measure: Log Monthly Confirmed Cases					
Panel A: Campaigns' Success (yes=1)					
Large City X COVID	-0.00860**	-0.00605	-0.00631	-0.00158	-0.000214
	(0.00423)	(0.00409)	(0.00414)	(0.00370)	(0.00363)
COVID	0.0280***	0.0143***	0.00981**	0.00220	0.00156
	(0.00399)	(0.00393)	(0.00447)	(0.00397)	(0.00391)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.016	0.188	0.199	0.268	0.290
Panel B: Number of Backers					
Large City X COVID	-0.0299*	-0.0252	-0.0317**	-0.0272*	-0.0237
	(0.0176)	(0.0161)	(0.0160)	(0.0163)	(0.0163)
COVID	0.0830***	0.0574***	0.0353**	0.0158	0.0152
	(0.0173)	(0.0160)	(0.0159)	(0.0167)	(0.0167)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.008	0.052	0.060	0.093	0.111
Panel C: Raised Amount					
Large City X COVID	-0.0413	-0.0327	-0.0389	-0.0380	-0.0330
	(0.0380)	(0.0337)	(0.0335)	(0.0321)	(0.0305)
COVID	0.115***	0.0829**	0.0453	0.0171	0.0179
	(0.0377)	(0.0335)	(0.0338)	(0.0321)	(0.0306)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.007	0.135	0.144	0.201	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above investigates the impact of the size of the city where the campaign was initiated during COVID on success, number of backers and raised amount. Success is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly confirmed cases; Large City is a binary variable = 1 if the campaign was initiated in a large city and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.8 Robustness Test

To validate the robustness of our results, I used an alternative measure of COVID-19 intensity, specifically the natural logarithm of the number of deaths due to COVID-19, as shown in Tables 2.8 to 2.12 below. The results were consistent with our main analysis, where I used the log of monthly confirmed COVID-19 cases. In both cases, I observed that during the pandemic, the duration of a campaign and the goal amount had a negative impact on the success rate. Additionally, the location of the campaign, whether initiated in a large or small city, did not significantly affect the success rate. These findings suggest that our conclusions hold regardless of the specific COVID-19 measure used, reinforcing the robustness of the relationship between campaign characteristics and success during the pandemic.

Table 2.8: Robustness Test – Raised Amount and COVID-19

Dependent Variable: Log Raised Amount COVID-19 Measure: Log Monthly Number of Deaths					
	(1)	(2)	(3)	(4)	(5)
COVID	0.125***	0.0713***	0.0157	-0.0391*	-0.0291
	(0.0174)	(0.0190)	(0.0351)	(0.0230)	(0.0226)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.003	0.133	0.143	0.200	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above is the robustness check of H1, where I investigate the impact of COVID on the raised amount of campaigns, where COVID is the log monthly number of deaths due to COVID-19. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

Table 2.9: Robustness Test – Number of Backers and COVID-19

Dependent Variable: Log Number of Backers COVID-19 Measure: Log Monthly Number of Deaths					
	(1)	(2)	(3)	(4)	(5)
COVID	0.101***	0.0544***	0.0226	-0.00645	-0.000959
	(0.00884)	(0.00801)	(0.0149)	(0.0159)	(0.0153)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.005	0.050	0.060	0.093	0.111
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above is the robustness check of H2, which investigates the impact of COVID on the number of backers, where COVID is the log monthly number of deaths due to COVID-19. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

Table 2.10: Robustness Test – Duration and COVID-19

COVID-19 Measure: Log Monthly Number of Deaths					
Panel A: Success (yes=1)					
	(1)	(2)	(3)	(4)	(5)
Log Duration	0.423***	0.199***	0.206***	0.152***	0.146***
	(0.0195)	(0.0236)	(0.0254)	(0.0172)	(0.0163)
Log Duration Squared	-0.0904***	-0.0440***	-0.0454***	-0.0306***	-0.0290***
	(0.00552)	(0.00608)	(0.00649)	(0.00357)	(0.00319)
Log Duration X COVID	-0.0925***	-0.0672***	-0.0714***	-0.0546**	-0.0582**
	(0.0245)	(0.0220)	(0.0210)	(0.0262)	(0.0281)
Log Duration Squared X COVID	0.00906**	0.00332	0.00441	0.00158	0.00214
	(0.00383)	(0.00340)	(0.00321)	(0.00383)	(0.00409)
COVID	0.245***	0.205***	0.202***	0.169***	0.176***
	(0.0365)	(0.0347)	(0.0334)	(0.0451)	(0.0485)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.047	0.201	0.212	0.276	0.297
Panel B: Log Number of Backers					
Log Duration	1.302***	0.887***	0.897***	0.874***	0.843***
	(0.0621)	(0.0595)	(0.0605)	(0.0582)	(0.0521)
Log Duration Squared	-0.237***	-0.152***	-0.156***	-0.155***	-0.146***
	(0.0151)	(0.0136)	(0.0142)	(0.0139)	(0.0117)
Log Duration X COVID	-0.0421	0.00543	-0.0232	-0.0226	-0.0497
	(0.118)	(0.113)	(0.111)	(0.104)	(0.109)
Log Duration Squared X COVID	-0.00179	-0.0119	-0.00514	-0.00571	-0.00105
	(0.0173)	(0.0166)	(0.0163)	(0.0151)	(0.0158)
COVID	0.256	0.175	0.162	0.137	0.180
	(0.204)	(0.198)	(0.198)	(0.182)	(0.190)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.023	0.059	0.068	0.100	0.118
Panel C: Log Raised Amount					
Log Duration	1.948***	1.284***	1.332***	1.483***	1.410***

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Table 2.10: Robustness Test – Duration and COVID-19 (Continued)

	(0.0836)	(0.108)	(0.110)	(0.143)	(0.128)
Log Duration Squared	-0.346***	-0.208***	-0.220***	-0.268***	-0.244***
	(0.0185)	(0.0232)	(0.0238)	(0.0345)	(0.0298)
Log Duration X COVID	0.0280	0.0320	0.0426	0.0504	0.0595
	(0.0389)	(0.0377)	(0.0377)	(0.0348)	(0.0383)
Log Duration Squared X COVID	-0.373	-0.396	-0.445*	-0.503**	-0.557**
	(0.262)	(0.250)	(0.250)	(0.227)	(0.252)
COVID	1.048**	1.036**	1.025**	1.075***	1.161***
	(0.439)	(0.419)	(0.432)	(0.372)	(0.412)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.023	0.143	0.153	0.211	0.245
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above is the robustness check of H3, where I investigate the impact of duration during COVID on the success rate, number of backers, and the raised amount. Success is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly number of deaths due to COVID-19; I further introduced an interaction term between duration and COVID and its quadratic term, where duration is the number of days for which the campaign accepts funding. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

Table 2.11: Robustness Test – Goal Amount and COVID-19

Dep. Var. = Campaigns' Success (yes=1)					
COVID-19 Measure: Log Monthly Number of Deaths					
	(1)	(2)	(3)	(4)	(5)
Log Goal	-0.163***	-0.0916***	-0.0915***	-0.0819***	-0.103***
	(0.0188)	(0.0180)	(0.0170)	(0.0258)	(0.0231)
Log Goal X COVID	0.0122	0.000655	0.00367	-0.00159	-0.00132
	(0.0152)	(0.0146)	(0.0116)	(0.0110)	(0.0121)
Log Goal Squared	0.00457***	0.00124	0.00122	0.000912	0.00234*
	(0.00109)	(0.00103)	(0.000964)	(0.00143)	(0.00123)
Log Goal Squared X COVID	-0.00103	-0.000344	-0.000490	-0.000235	-0.000208
	(0.000915)	(0.000887)	(0.000701)	(0.000667)	(0.000733)
COVID	0.00139	0.0260	0.00814	0.0270	0.0247
	(0.0596)	(0.0557)	(0.0452)	(0.0437)	(0.0470)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.103	0.247	0.258	0.282	0.302
Dep. Var. = Log Number of Backers					
Log Goal	0.630***	0.768***	0.801***	0.787***	0.731***
	(0.0521)	(0.0505)	(0.0523)	(0.0970)	(0.0921)
Log Goal X COVID	-0.0183	-0.0442	-0.0531	-0.0509	-0.0558
	(0.0425)	(0.0428)	(0.0409)	(0.0405)	(0.0414)
Log Goal Squared	-0.0400***	-0.0461***	-0.0481***	-0.0475***	-0.0426***
	(0.00316)	(0.00310)	(0.00321)	(0.00533)	(0.00510)
Log Goal Squared X COVID	0.000269	0.00181	0.00242	0.00212	0.00253
	(0.00284)	(0.00289)	(0.00274)	(0.00273)	(0.00281)
COVID	0.218	0.277*	0.256*	0.251*	0.269*
	(0.162)	(0.159)	(0.152)	(0.150)	(0.152)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.011	0.058	0.068	0.097	0.114
Dep. Var. = Log Raised Amount					
Log Goal	1.776***	2.017***	2.058***	2.129***	2.017***

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Table 2.11: Robustness Test – Goal Amount and COVID-19 (Continued)

	(0.0962)	(0.0873)	(0.0889)	(0.145)	(0.131)
Log Goal X COVID	0.0866	0.0491	0.0230	0.00183	0.00174
	(0.102)	(0.101)	(0.0982)	(0.0952)	(0.0962)
Log Goal Squared	-0.101***	-0.109***	-0.112***	-0.118***	-0.108***
	(0.00592)	(0.00543)	(0.00554)	(0.00790)	(0.00751)
Log Goal Squared X COVID	-0.00706	-0.00454	-0.00294	-0.00183	-0.00159
	(0.00677)	(0.00682)	(0.00653)	(0.00633)	(0.00637)
COVID	-0.108	-0.0290	-0.0238	0.0598	0.0577
	(0.370)	(0.363)	(0.354)	(0.347)	(0.349)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.026	0.170	0.180	0.214	0.248
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above is the result of the H4 robustness check, where I investigate the impact of the campaign's goal amount during COVID on success, number of backers, and raised amount. Success rate is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly number of deaths due to COVID-19; I further introduced an interaction term between goal amount and COVID and its quadratic term, where goal is the amount of money which the campaign requires to succeed. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

Table 2.12: Robustness Test – Cities and COVID-19

Dep. Var. = Campaigns' Success (yes=1)					
COVID-19 Measure: Log Monthly Number of Deaths					
	(1)	(2)	(3)	(4)	(5)
Large City X COVID	-0.0251***	-0.0211**	-0.0171**	-0.00508	-0.00193
	(0.00971)	(0.00874)	(0.00848)	(0.00911)	(0.00860)
COVID	0.0612***	0.0336***	0.0258***	0.00781	0.00627
	(0.00862)	(0.00774)	(0.00819)	(0.00910)	(0.00860)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.010	0.187	0.199	0.268	0.290
Dep. Var. = Number of Backers					
Large City X COVID	-0.0666	-0.0593	-0.0568	-0.0339	-0.0240
	(0.0465)	(0.0432)	(0.0425)	(0.0398)	(0.0387)
COVID	0.162***	0.110**	0.0727*	0.0250	0.0212
	(0.0457)	(0.0428)	(0.0408)	(0.0392)	(0.0381)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.005	0.050	0.060	0.093	0.111
Dep. Var. = Raised Amount					
Large City X COVID	-0.0669	-0.0576	-0.0562	-0.0541	-0.0395
	(0.0795)	(0.0719)	(0.0740)	(0.0675)	(0.0646)
COVID	0.186**	0.123*	0.0601	0.0110	0.00744
	(0.0770)	(0.0697)	(0.0725)	(0.0648)	(0.0617)
N	24,243	24,243	24,243	23,575	23,575
R^2	0.003	0.133	0.143	0.200	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: The table above is the result of the H5 robustness check, where I investigate the impact of the size of the city where the campaign was initiated during COVID on success, number of backers, and raised amount. Success is a binary variable =1 if the campaign reaches its target or higher; 0 otherwise. The number of backers and the raised amount are continuous numbers. COVID is the log monthly number of deaths due to COVID-19; Large City is a binary variable = 1 if the campaign was initiated in a large city and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the city level.

2.9 Conclusion

The literature on crowdfunding has extensively explored the determinants of campaign success, but this study adds to the existing body of knowledge by investigating the impact of COVID-19 on these determinants. Using data from 24,243 crowdfunding campaigns across the UK between 2018 and 2021, I examine how the pandemic influenced key factors such as campaign duration, goal amount, and city size. To capture the intensity of COVID-19, I used both the number of COVID-19 confirmed cases in the main results and the number of deaths due to COVID-19 as a robustness check.

Employing OLS and LPM, I incorporated interaction terms between COVID-19 and campaign characteristics to measure the pandemic's specific effects. Our findings suggest that while COVID-19 did not significantly impact the number of backers or the raised amount, several other campaign characteristics were influenced by the pandemic. Specifically, campaigns with shorter durations and lower funding goals attracted more backers and raised more funds, highlighting that backers were more likely to support campaigns that appeared more achievable during a period of heightened uncertainty.

I also observed that the relationship between campaign duration and success rate is generally positive; however, during COVID-19, this relationship weakened, as longer campaigns faced slightly lower success rates. This may reflect the increased risk aversion among backers during the pandemic, who preferred campaigns that appeared more urgent or were able to demonstrate quicker progress. Similarly, campaigns with higher funding goals experienced lower chances of success during COVID-19, supporting the notion that backers were less willing to support riskier projects during the crisis.

Lastly, our analysis found that the location of the campaign, whether in a large or small city, did not affect its success rate, even during the pandemic. This reinforces the idea that the online nature of crowdfunding platforms allows campaigns to overcome geographical barriers, making city size less relevant in determining campaign outcomes, particularly during times of crisis, as highlighted in previous research.

The direct effect of COVID-19 on the raised amount and number of backers, when considered alone, is insignificant. However, when I account for how COVID-19 interacts with other campaign characteristics, such as campaign duration and goal amount, the results show a positive impact. Specifically, campaigns with shorter durations and lower goal amounts were more likely to succeed during the pandemic. Therefore, while COVID-19 itself may not have a uniform positive effect, its impact is conditional on the specific features of the campaigns, and in those cases, it did lead to a positive outcome in terms of raised amounts and number of backers.

These findings not only contribute to the growing body of literature on crowdfunding but also offer practical guidance for entrepreneurs seeking funding in times of economic uncertainty. This study highlights the importance of crowdfunding as a source of finance during crises. Policymakers should consider supporting crowdfunding platforms by promoting best practices, such as encouraging shorter campaign durations and lower goal amounts, to improve campaign success rates during uncertain times. Additionally, given that city size did not significantly impact success, efforts to enhance digital financial inclusion, particularly for entrepreneurs in smaller regions, could further democratise access to funding. Future research could explore the long-term effects of COVID-19 on crowdfunding, particularly as markets recover. Additionally, comparing the impact of COVID-19 across different crowdfunding models (leading, equity-based, etc.) could provide deeper insights. Finally, studying how government interventions or technological innovations on crowdfunding platforms influence campaign outcomes during crises would be valuable.

Chapter 3

Crowdfunding Industries After an Exogenous Shock

Abstract

The COVID-19 pandemic introduced significant challenges for individuals and businesses relying on traditional financing methods, prompting a shift toward alternative funding sources such as crowdfunding. Given the uncertainty surrounding the pandemic's duration and the rapid spread of the virus, its impact on global economic and financial markets was profound. The pandemic affected all industries, presenting both risks and opportunities. However, studies exploring the impact of COVID-19 on alternative finance, particularly crowdfunding, are still limited. As physical restrictions varied across sectors, I hypothesise that crowdfunding industries would respond differently. The aim of this chapter is to assess the incremental impact of COVID-19 on crowdfunding industries using a quasi-experimental approach, specifically the DiD model.

Our analysis includes 23,933 crowdfunding campaigns from four platforms (Crowdfunder, FundRazr, Indiegogo, and Kickstarter) covering the period from January 2018 to December 2021 in the UK. The multi-level structure of the data enables an investigation of the pandemic's effects on crowdfunding across different levels. Campaigns that required physical gatherings form the treatment group. The regression results reveal a negative impact on campaigns requiring gath-

erings, with the treatment effect corresponding to a 22% decrease in funds raised. However, the impact varied across industries. While cultural and creative industries saw a decline in funds raised during the pandemic, entertainment industries experienced an increase in funds raised for campaigns involving gatherings.

3.1 Introduction

Extensive studies have explored crowdfunding campaigns from different aspects, including factors of success affecting crowdfunding campaigns (Duan et al. 2020; Mollick 2014; Signori and Vismara 2018), capital raising process (Lambert 2022; Li and Martin 2019), credit rationing (Galema 2020), and the impact of COVID-19 on demographic factors (Igra et al. 2021). In this chapter, I explore the impact of COVID-19 on crowdfunding industries, which has been understudied in the literature.

Crowdfunding has experienced rapid growth in the past decade, particularly following the financial crisis (Harrison and Baldock 2015; Short et al. 2017). The spread of platforms and users can be attributed to the advancement of Web 2.0 technology (Block et al. 2018). Leveraging crowdfunding as a financing source provides firms and individuals with opportunities to fund their ideas and innovations. It represents a progressive step in a global society moving towards geographical diversification, economic stability, and equality (Block et al. 2018; Brüntje and Gajda 2016).

The COVID-19 outbreak brought new challenges to individuals and firms financing their projects using traditional finance, leading to the use of other financing sources, such as crowdfunding. No one was certain about the duration of the pandemic; the quick spread of COVID-19 had enormous impacts on economic and financial markets worldwide. It has affected all industries and brought both threats and opportunities to industries; studies are limited regarding the pandemic's impact on alternative finance, and the literature that examines the impact of COVID-19 on crowdfunding industries is less developed.

This chapter will provide a forward-looking view of crowdfunding by studying the crowdfunding industries after an exogenous shock and learning how the pandemic affected the raised amount, number of backers, and success rate of crowdfunding industries. I expect that crowdfunding industries react differently due to physical restrictions.

I aim to identify the incremental impact of COVID-19 on crowdfunding industries using a quasi-experimental technique by using the DiD model. I used crowdfunding data from four platforms (Crowdfunder, FundRazr, Indiegogo, and Kickstarter) spanning January 2018 to December 2021 across the UK. The multi-level nature of our data allows us to investigate the effects of the pandemic on crowdfunding industries at various levels. I grouped crowdfunding campaigns to create a treatment group. I identify the treatment group as a campaign that requires gathering.

To first examine the impact of COVID-19 on crowdfunding campaigns, I started with the parallel trend graph, comparing the raised amount of campaigns before and during COVID-19. Then, I employed DiD to identify the shock effect on the raised amount, success rate, and the number of backers from 2018 to 2021, given an exogenous shock. To formulate the treatment group, I went manually through each campaign's website to identify whether the campaign requires gathering by searching for keywords that indicate gathering requirements (i.e. venue, festival, restaurant, tickets, play, gym, trip, shop, centre). After data filtering, I ended up with 23,933 crowdfunding campaigns. I used three dependent variables: the raised amount, the success rate, and the number of backers.

The graph suggests that the raised amount has changed after the pandemic. Furthermore, the regression results indicate that the pandemic impacted crowdfunding campaigns requiring gathering negatively, as the treatment effect corresponds to a 22% decrease in the raised amount. However, the results do not hold across industries. Cultural and creative industries raised less money during the pandemic, while entertainment industries reported an increase in the raised amount for campaigns requiring gathering. I further used the number of backers and the success rate as dependent variables. Industries that reported an increase in the raised amount have also shown an increase in the number of backers and the success rate (entertainment industries), and industries that reported a reduction in the raised amount have also reported a reduction in the success rate and number of backers (cultural and creative industries). Further, I

conducted heterogeneity analysis to examine the funding flexibility, goal amount, and duration period. Lastly, I conducted robustness checks to validate the main results. I used an alternative treatment group and an alternative industry classification. Overall, I find similar results to the main results.

This chapter makes several significant contributions to the existing literature on alternative finance; the unique dataset allows us to study crowdfunding from different angles. First, it expands the understanding of crowdfunding determinants of success across different industries during external shocks, which is understudied in the literature. Second, I used crowdfunding data from cities across the UK from four crowdfunding platforms, which enabled us to generalise the results. Third, using daily data for four years allows a comparison between pre- and post-pandemic. Finally, the manual classification provides a unique dataset and contributes to the crowdfunding literature from a new angle; it can be further utilised in other research.

The chapter is organised as follows. The next section introduces the relevant literature, sections 3.3 and 3.4 state the objectives of the chapter and developed hypotheses, respectively. Section 3.5 shows the data collection and exclusion criteria. Section 3.6 reports the methodology, and section 3.7 reports research findings and discussion. Heterogeneity and robustness checks are presented in sections 3.8 and 3.9, respectively. The conclusion is shown in the last section of this chapter.

3.2 Literature Review

Researchers have shown interest in crowdfunding because of its widespread adoption. Initial research has primarily concentrated on different areas. Firstly, several studies have explored the definition of crowdfunding and its associated business model. Crowdfunding's concept stemmed from crowdsourcing, a broader notion involving the crowd to gather ideas, feedback, and solutions to enhance business operations (i.e. Belleflamme et al. (2014) and Kuppuswamy and

Bayus (2013)). Secondly, researchers have delved into the motivations driving entrepreneurs and backers to engage in crowdfunding endeavours by examining factors that impact crowdfunding performance (i.e. Agrawal et al. (2010b), Kuppuswamy and Bayus (2013) and Mollick (2014)).

Collecting funds from crowdfunding can be for startups and existing businesses; the first is collecting funds to start their business, while the latter can utilise crowdfunding to collect money and provide financial relief (Farhoud et al. 2021; Saleh et al. 2021). Further, entrepreneurs can use crowdfunding as an exit strategy according to Chandler et al. (2021), the fine art sector has been hard hit due to the recent pandemic, since with the social distancing, concerts and other performances have been untenable; therefore, entrepreneurial businesses using crowdfunding to provide financial relief is common among the fine arts sectors. Further, they conclude that crowdfunding is a mechanism for existing ventures to operate by providing funding sources for new venture funding and can be used to facilitate founder exit strategies.

Mainly, crowdfunding is developed for arts and creativity-based industries, but fundraisers have been using crowdfunding platforms to finance projects from different industries (Belleflamme et al. 2014). On one hand, crowdfunding platforms tend to focus on certain industries; most campaigns initiated on Kickstarter are creative and tech-innovative campaigns, while Indiegogo expands to community projects, health, and food-related campaigns (Handke and Dalla Chiesa 2022). On the other hand, backers tend to back certain campaigns among others; Mollick (2014) finds that campaigns related to gaming, design, and technology have a higher success rate. They added that the design had the highest number of backers (253) and the highest percentage funded (2.40%), with an average duration of 38 days. Kuppuswamy and Bayus (2013) find that backers are attracted to back certain projects more than others due to the nature of the project. Handke and Dalla Chiesa (2022) find that it is difficult to predict the demand for creative works before finished goods are released (e.g. fashion).

SMEs in the creative industries are vital in driving economic growth in the UK. Despite 84% of creative companies employing fewer than ten people, the industry sustains 1.5 million jobs and contributes 10.6% of the UK's export earnings, ranking it third in economic contribution (Creative Industries Council Skillset Skills Group 2012). However, these SMEs face challenges

in accessing resources (Hussain et al. 2006; Tucker and Lean 2003), hindering their ability to bring original content to the market (De Buysere et al. 2012) and compelling them to prioritise immediate commercial demands over creativity (Powell and Ennis 2007). The structural issues have been exacerbated by the 2008 financial crisis, resulting in more cautious lending practices by banks towards SMEs (De Buysere et al. 2012). Consequently, the "crowd" has emerged as a valuable source of additional support (Brabham 2008), with crowdfunding representing a potential new avenue for financing (Belleflamme et al. 2014; De Buysere et al. 2012).

3.2.1 Industries and Crises

Looking at existing businesses, travel, hospitality, retail trade sector, and music have been negatively affected by the COVID-19 pandemic (Harper 2020; Pacella et al. 2021; Ratten 2021; Serafini and Novosel 2021). The pandemic changed the industry's demand and supply; the tourism sector's price decreased in parallel with the reduction in demand (Bakar and Rosbi 2020). Bashir et al. (2020) found that the transportation and travel industries are the most hit; as a result of the restrictions on travel, the travel insurance industry is at a standstill (Babuna et al. 2020). The spread of COVID-19 has restricted economic activities; examining the stock market performance of different industries during the global financial crisis and COVID-19, Chen and Yeh (2021) find that the worst-performing industries (based on cumulative abnormal return) were precious metals, petroleum and natural gas, entertainment, aircraft, restaurants, hotels, and motels. Further, COVID-19 led to massive spikes in uncertainty, and the negative impact on industries varies between countries and cities depending on the stringency of restrictions and distancing measures (Bakar and Rosbi 2020). At the same time, the best-performing industries were coal, candy and soda, agriculture, pharmaceutical products, and computer software (Chen and Yeh 2021).

The ongoing COVID-19 pandemic has affected businesses, leading to severe disruption for many industries; it is considered the greatest economic threat since the great depression (Das 2022). Therefore, the UK government provides several loans for existing micro, small, medium-sized, and large businesses, such as the Recovery Loan Scheme, Coronavirus Business Interruption

Loan Scheme, Coronavirus Large Business Interruption Loan Scheme and the Bounce Back Loan Scheme. Businesses from all industries can apply for the loans mentioned above except for banks, building societies, insurers, reinsurers, public sector bodies, and state-funded primary and secondary schools.[1]

Cowling et al. (2012) studied whether external finance becomes challenging for entrepreneurs during financial crises; they found that larger firms are likely to maintain external finance while smaller firms are denied credit. They added that firms in transport and communications, construction, non-metals manufacturing, and other manufacturing sectors are less likely to apply for finance and are less likely to secure finance if they apply. Roper and Turner (2020) find that after the global financial crisis, the recovery of firms was uneven, as for some industries, it took a period from four to six years to recover; further, the size of the firms matters, as small firms were significantly affected by the financial constraints compared to the larger firms. Further, Dolenc et al. (2012) find that some economic activities faced a decline due to the Great Recession; the construction and financial sectors suffered the most, while retail has grown.

The restrictions and lockdown due to COVID-19 led to the cancellation of cultural events, exhibitions, concerts, performances, and festivals; it has pushed many businesses to operate rapidly and develop new ways to survive, where museums started online exhibitions, and musicians delivered concerts virtually (Khlystova et al. 2022). The negative impact of the pandemic affected the employment rate, and it has fallen sharply in all major industries, specifically the leisure and hospitality industries.[2] According to Gu et al. (2021), the response to the shock depends on the type of the firm; during COVID-19, manufacturing, hospitality, cultural, sports, and entertainment industries were the most adversely impacted relative to other industries. Both demand and supply shocks happened, where demand shocks constrained industries such as transport, catering, and tourism, while manufacturing-related firms faced supply shocks (Chang et al. 2007; Eaton et al. 2011; Hepburn et al. 2020; Keogh-Brown and Smith 2008).

[1] Recovery Loan Scheme - GOV.UK Last access 20 May 2023

[2] The April 2020 Report of the U.S. Bureau of Statistics available at: CPS Home: U.S. Bureau of Labour Statistics Last access 20 May 2023

Although the pandemic had a negative impact on several industries, it had a substantial positive impact on the products and services provided by the information technology industry; it has expanded significantly, and existing businesses became more recognisable, such as MS Teams, WebEx, and Zoom (Dwivedi et al. 2020; Marabelli et al. 2021). Further, the usage of social media such as Facebook, LinkedIn, Instagram, Snapchat, and TikTok increased massively (Bae et al. 2021; Cifuentes-Faura 2020; Ferrara et al. 2020; Marabelli et al. 2021). Another area that has been positively affected is the gaming industry, as user engagement grew considerably during the pandemic; the reason behind the positive impact is that people were housebound and had limited leisure activities (Amin et al. 2020).

Examining traditional financing, López-Cabarcos et al. (2020) studied the gaming and eSports industries and found that both sectors were the least affected by the pandemic. They analysed the relationship between financial (VIX and gold index) and social (COVID-19-related data) variables with the returns offered by video games and eSports. They find that the influence of COVID-19 variables is weaker than the financial variables. On the other hand, some industries had a negative impact and need more time to recover; for example, the travel and tourism industry needs ten months to recover (Škare et al. 2021). Similarly, COVID-19 affected the insurance industry negatively, with a profit drop of 17% (Babuna et al. 2020).

Various researchers argue that COVID-19 affects firms and industries differently; Albuquerque et al. (2020) find that the stocks of publicly traded firms with higher environmental and social ratings have a significantly higher return and lower volatility than other firms. On the other hand, Papanikolaou and Schmidt (2022) find that the impact of COVID-19 is asymmetric; some industries suffered more than others. Other studies discuss the emergency responses to COVID-19 as an exogenous shock. For example, Brown and Rocha (2020) studied the uncertainty caused by the crisis and its impact on the availability of finance to start ups and SMEs. They used COVID-19-related data to measure the intensity of the crisis. They found that the pandemic had affected entrepreneurial finance. Although the firms hardest hit were start ups, they benefited the most from early-stage seed finance. Kuckertz et al. (2020) investigated the impact of COVID-19 shock on start ups; they conclude that, although start ups successfully leverage their available resources, potentially, their growth and innovation are at risk.

3.2.2 Crowdfunding and Crises

The pandemic has presented significant challenges and uncertainties regarding funding sources for SMEs. Crowdfunding offers entrepreneurs the opportunity to access finance. Chandler et al. (2021) claim that besides the use of crowdfunding for startups, the pandemic has introduced a new crowdfunding landscape by considering crowdfunding to provide financial relief where businesses continue to operate and using crowdfunding to facilitate financial obstacles. Further, they find that businesses engaged in the fine arts have been particularly hard hit due to social distancing; therefore, they have been using crowdfunding to provide financial relief. On the other hand, some used crowdfunding as an exit strategy. Additionally, it can be recognised as a means of mitigating chronic funding gaps in early-stage venturing, a problem exacerbated by recent financial crises (Moritz and Block 2016).

In the realm of crowdfunding, there is limited empirical evidence on how the pandemic has affected campaign success. During and after the pandemic, there was an expectation for increased demand for finance to counter its adverse effects on the economic outlook; however, the supply of finance could be limited due to the heightened risks involved (Vu and Christian 2024).

Studying the average success rate of crowdfunding campaigns and the number of investors before and after Brexit, Vu and Christian (ibid.) found a positive relationship between competition and crowdfunding success and a positive association between the pandemic and crowdfunding success. However, Brexit seems to negatively influence SMEs' equity financing through online crowdfunding. Given the COVID-19 pandemic, Chandler et al. (2021) expect that COVID-19 will significantly impact crowdfunding campaigns and backers during unpredictable pandemics. In addition, they claim that due to social distancing and nationwide lockdowns, certain campaigns that are related to digitisation may attract millennials to their products. Saleh et al. (2021) studied the differences between COVID-19-related campaigns and compared them to non-COVID-19-related campaigns using campaigns initiated on GoFundMe; they found that there was a significant increase in web-based crowdfunding campaigns, driven mainly by COVID-19-

related initiatives. However, as the pandemic continued, the number of campaigns per COVID-19 case dropped more than tenfold. They added that COVID-19-related campaigns exhibited notable traits and tended to raise more funds, feature longer narrative descriptions, and receive more shares on Facebook compared to other campaigns during the study period.

Ho et al. (2021) studied donation-based campaigns focusing on food relief campaigns initiated on GoFundMe. They find that the location of the campaign matters and has an impact on its success rate. They concluded that locations with more COVID-19 cases received more donations. Contradicting the previous studies, Courtney et al. (2017) and Zhang et al. (2021b) find that the crowdfunding industry faces low success rates as social entrepreneurs compete with numerous similar campaigns simultaneously, posing a significant challenge for both campaign creators and crowdfunding platforms. Yang and Koh (2022) explore the impact of COVID-19 on restaurant crowdfunding lunched on Kickstarter. They reveal that mentioning COVID-19-related information on a project's description page or being in a pandemic red zone did not significantly impact funding. Therefore, restaurant entrepreneurs can focus on providing detailed project descriptions without overly emphasising the pandemic. Backers appear less concerned about the pandemic when a restaurant project is in the planning stage. Additionally, entrepreneurs may exhibit confidence in establishing businesses in red zone areas, as new restaurants can invigorate communities and contribute to local economic recovery. By supporting new restaurant ventures in heavily impacted areas, backers can play a role in revitalising the local economy.

Early crowdfunding studies focused on: the motivations of fundraisers to utilise crowdfunding, determinants of successful crowdfunding practices, alignment of legal frameworks with crowdfunding realities, motivations for fund providers, the roles of social networks and signalling in crowdfunding, and classifications and strategies of crowdfunding intermediaries, which are all essential aspects of the crowdfunding landscape (Moritz and Block 2016). Recent literature about COVID-19 and crowdfunding is descriptive research and focused on the medical industry, social work-related areas and studying a single industry. Unsurprisingly, COVID-19 has captured the attention of scholars to study the impact of the pandemic on different aspects; when it comes to studying the effect of COVID-19 on the crowdfunding industries, a limited number of studies have been published, and there is more to explore. Given the discussion above, the analysis at the industry level of crowdfunding campaigns has been understudied in earlier work.

3.2.3 Industry-Based Classifications of Crowdfunding

Crowdfunding campaigns can be classified not only by their funding models but also by the industries in which they operate. This subsection presents an industry-based classification of crowdfunding, informed by relevant literature. Researchers have examined how campaigns differ across industries in terms of risk disclosure, number of backers, amount raised, and success factors. By grouping crowdfunding campaigns by sector, we aim to highlight how industry context influences campaign characteristics and outcomes.

3.2.3.1 Profit and Non-profit

Crowdfunding can be broadly classified into commercial (i.e. profit) and philanthropic (i.e. non-profit). Commercial entrepreneurs seek the creation of economic value by introducing new products or providing services for customers (Parhankangas and Renko 2017); therefore, the success rate may differ between the two types of campaigns; for example, Glaeser and Shleifer (2001) suggested a framework in which profit-oriented enterprises might excessively prioritise profits, potentially neglecting aspects like product or service quality. Such a focus may not align with the expectations of backers and other entities supporting particular initiatives. Further, in donation-based crowdfunding platforms, participants engage in crowdfunding without expecting rewards; instead, they contribute money and time out of sympathy and empathy (Meer 2014). In this context, both the complexity of the process and the associated risks are minimal, and backers act like donors when backing non-profit campaigns (Gerber et al. 2012; Hemer 2011; Meer 2014). In reward-based campaigns, there is a risk associated with buying novel, not fully developed products as it may never reach the market or be delivered late (Mollick 2014).

3.2.3.2 Cultural and Creative Sectors

In reward-based crowdfunding, campaigns come from commercial ventures and initiatives led by entrepreneurs in the creative and cultural fields. Cultural entrepreneurs possess a distinct entrepreneurial identity; their focus extends beyond purely economic goals to primarily create cultural value for the public (Dacin et al. 2010; Throsby 2008). Throsby (2008) claims that the heart of the economy is the cultural industries, and there is a growing interest in the literature on cultural crowdfunding (Cicchiello et al. 2023); however, it is still in its infancy. Cultural production refers to campaigns that create, produce, distribute, and consume cultural products and services (Venkatesh and Meamber 2006). Cultural crowdfunding refers to using crowdfunding to finance cultural expression production, distribution, and consumption (Shneor and Zhao 2020). Throsby (2008) classified industries that produce cultural goods and services into four groups. The first group is Core Creative Arts, including literature, music, and performing and visual arts. The second group is Other Core Cultural Industries, including film, museums, galleries, libraries, and photography. The third is Wider Cultural Industries, including heritage services, publishing and print media, sound recording, television and radio, and video and computer games. Finally, related sectors include advertising, architecture, design, and fashion. Further, Dacin et al. (2010) identify cultural entrepreneurs who recognise and capitalise on openings within the cultural realm (i.e. arts, theatre, music, film) and strive to create cultural significance accessible to everyone. Other organisations classified crafts as part of the cultural and creative industries.[3]

At the start of the crowdfunding platform, cultural and creative industries were widespread, and the most important area of the application of crowdfunding, being defined by Handke and Dalla Chiesa (2022) as follows: fine art, comics, dance, fashion, film, video, music, writing, and theatre. According to Tarrida,[4] cultural-related campaigns (i.e. music, film, and video) initiated on Kickstarter have completed the most successful fundraising. On the other hand, gaming has the largest number of campaigns, followed by technology-related campaigns.

[3]OECD iLibrary; European Commission; Informed Last access 15 May 2024
[4]Tarrida is a crowdfunding consultant website, tarrida.co.uk. Last access on 16 June 2023.

Creative industries have been acknowledged as an important channel for economic growth and development (Cooke and De Propris 2014; Henry 2007; Landoni et al. 2020; UNCTAD 2018). Defined by the UK's Department for Digital, Culture, Media and Sport (DCMS)[5] as industries which have their origin in individual creativity, skill, and talent, this includes advertising and marketing, architecture, design and designer fashion, film, TV, video, radio and photography, IT, software and computer service, music, performing and visual arts, and publishing. Although creative sectors include multiple industries, Hobbs et al. (2016) focused on the film industry and claimed that it is representative of the creative sector; they investigated the determinants of success in crowdfunding campaigns. According to Khlystova et al. (2022), over the last decade, creative industries have become an important part of the global economy; further, they profoundly impact social and cultural aspects of people's lives. They added that the creative industries were estimated to comprise over 7% of the world's GDP.

3.2.3.3 Entertainment Sector

Anything that brings pleasure, diversion, or fun can be considered entertaining (Getz and Page 2016); however, entertainment industries are defined by Stein and Evans (2009) as media (TV, radio), recorded music, video games, film, publishing, theatre, sports, theme parks, casinos and gambling, travel and tourism, museums, shopping, and special events. Bi et al. (2017) studied signals of quality and electronic word of mouth across science, technology, agriculture, and art projects. They find that both factors have positive effects on funder decision investment. Further, they claim that when backers want to back a campaign from the entertainment sector, they may care about the online reviews of the activity. Other researchers on crowdfunding campaigns were more precise, as they focused on the gaming sector instead of the entertainment sector (i.e. Cha (2017), Jose Planells (2017), Nucciarelli et al. (2017) and Song et al. (2019)).

[5] DCMS Sector Economic Estimates Methodology Last access 20 May 2023

3.2.3.4 Technology Sector

Technology vs non-technology campaigns is another possible classification; Kim et al. (2022) studied the level of risk disclosure between technology and non-technology projects, and they find that long-term effects may vary between technology and non-technology projects. Specifically, backers interested in technology are expected to possess greater sophistication and risk tolerance, potentially being well-informed about risks before the policy implementation. They defined technology projects as all projects in the technology, games, and design categories.

3.3 Objectives and Motivation

COVID-19 provides an opportunity to explore the unprecedented pandemic on crowdfunding industries. Although the pandemic may affect industries differently, in this chapter, I want to know to what extent the pandemic affects the success of campaigns across industries. Crowdfunding platform projects are typically categorised based on their content and the campaign's objectives. Kickstarter, for instance, classifies projects like music, food, lifestyle, gaming, etc. These categories may attract diverse investors as they reflect individual preferences and interests. The pandemic has brought challenges and uncertainties over stable funding sources; considering crowdfunding industries, there is limited empirical evidence on how the pandemic has changed the determinants of crowdfunding success across industries. In this chapter, I argue that the success of campaigns is more likely to change for some industries during the pandemic, and I expect changes in the success of certain campaigns, as backers react to projects differently; when contemplating investment decisions, funders often assess the production characteristics of a science and technology campaign. Conversely, individuals seeking to back an entertainment campaign place greater emphasis on evaluating the online feedback and reviews associated with said venture (Bi et al. 2017). I focused on crowdfunding industries to complement the current literature by looking at the alternative finance industries, precisely crowdfunding. COVID-19 presents an opportunity to study crowdfunding during exogenous shocks.

I am focusing on crowdfunding campaigns initiated in the UK as it is the most developed (Coakley et al. 2022). I used reward-based campaigns for the following reasons: the entrepreneurs act as sellers (Zhao and Vinig 2017), considered pre-order products (Ma et al. 2022), and reward-based platforms are related to e-commerce businesses (Shin and Lee 2020). I extend the data by analysing donation-based crowdfunding, which is considered the most traditional form of crowdfunding (Lehner 2016; Mollick 2014). Previous literature used non-investment crowdfunding campaigns for analysis; others have focused on one platform, which is Kickstarter, the largest crowdfunding platform (i.e. Dai and Zhang (2019), Huang et al. (2022), Koch and Cheng (2016), Mitra and Gilbert (2014), Qiu (2013), Ryoba et al. (2020) and Xiao et al. (2014)). Kickstarter allows business and non-profit entities to fund projects on their website.[6] Further, researchers found similar success factors between reward and donation-based platforms (i.e. Fondevila-Gascón et al. (2015), Hörisch (2015), Kim et al. (2016) and Liao et al. (2015)).

Gu et al. (2021) wrote the closest paper to ours. They examined the impact of COVID-19 on the economic activities of different industries in China. They measured the activity of industries using daily electricity usage. Using DiD, they found that the pandemic negatively affected manufacturing industries while positively impacting construction, information transfer, computer services and software, health care, and social work. The difference with them is that I am using crowdfunding campaigns and examining different types of industries. As a further step, I looked at campaigns within the industry to account for gathering activities. Second, I shed light on non-investment campaigns in the UK.

Crowdfunding is a great financing tool, given the recent pandemic, as campaigns raised more funds during COVID-19. On average, campaigns raised £5,300 before the pandemic; on the other hand, they raised £9,200 during the pandemic.[7] However, there are differences among campaigns where some provide services for the crowd and require gathering in public (i.e. film, theatre, restaurants), while other industries do not require any gathering (i.e. video games, websites, apps); I expect that campaigns that require gathering found difficulties in raising funds. Further, given that backers are attracted to products from certain industries (Chan et al. 2018), COVID-19 allows us to assess the impact of the exogenous shock on crowdfunding campaigns.

[6] Can business and non-profit entities raise funds for projects? Last access: 28 February 2024
[7] Author's calculation.

The existing literature has not examined whether certain industries could raise more funds and attract more backers. Various industries raise the question of whether COVID-19 affected all industries simultaneously. Handke and Dalla Chiesa (2022) claim that crowdfunding is useful for cultural projects; however, social distancing and lockdown may change the situation. Researchers have studied the impact of COVID-19 on industries worldwide, either focusing on one industry or comparing different industries. This study aims to explore how different campaigns of the online crowdfunding market, which is an alternative way of financing, performed during COVID-19 by studying the impact of the pandemic on the raised amount, the success rate, and the number of backers across different industries.

3.4 Hypotheses Development

The baseline hypothesis of our study is that COVID-19 affected crowdfunding industries differently; I tested multiple crowdfunding groups to answer the following hypotheses.

3.4.1 Gathering and COVID-19

Given the unprecedented challenges posed by the COVID-19 pandemic, certain sectors reliant on in-person gatherings, such as art, concerts, and performances, have been disproportionately impacted due to widespread social distancing measures and gathering restrictions (Chandler et al. 2021). The COVID-19 pandemic and associated policy measures implemented to contain it have resulted in significant economic contractions worldwide (Hanspal et al. 2020); several businesses were closed while others have some constraints due to the lockdown. Andersen et al. (2022) found that consumer spending behaviour varied across sectors during the lockdown, with spending in the closed sector dropping by 70% and gradually recovering in the constrained sector, while the open sector consistently exceeded expectations by more than 10% following the lockdown.

Khlystova et al. (2022) note that due to the cancellation of social and cultural events, some businesses have developed new ways to sustain themselves, such as musicians delivering their concerts virtually. Industries like travel, hospitality, retail trade, and music have been negatively affected by the COVID-19 pandemic (Harper 2020; Pacella et al. 2021; Ratten 2021; Serafini and Novosel 2021). The pandemic negatively affected the travel and tourism industries and took more than the average recovery time (Škare et al. 2021). Industries mentioned earlier require gathering, and the service delivered to the customers requires their physical attendance, which was challenging during the lockdown. Further, De Vet et al. (2021) claim that sectors that require physical proximity (i.e. cultural and creative industries) have been hit by the pandemic hard. However, Yang and Koh (2022) find that backers appear less concerned about the pandemic when a restaurant project is in the planning stage. Additionally, entrepreneurs may exhibit confidence in establishing businesses during the pandemic, as new restaurants can invigorate communities and contribute to local economic recovery. By supporting new restaurant ventures in heavily impacted areas, backers can play a role in revitalising the local economy.

Given that the United Kingdom applied restrictions on gathering-related activities (e.g., social events and sports activities), it is worth investigating how a crowdfunding campaign's funding has been affected. Based on the aforementioned context, I hypothesise the following:

H1: During the COVID-19 pandemic, crowdfunding campaigns requiring in-person gatherings experienced a reduction in funding.

3.4.2 Cultural and Creative Industries During COVID-19

The cultural industries have become an increasingly important focus of attention for cultural policy in several countries in recent years, and governments have begun to recognise the role of creativity as a key resource in driving innovation and promoting competitive advantage in a globalised world (Anheier and Isar 2008). Literature has shown that creative industries have more funding opportunities when they turn to crowdfunding, especially in industries where the crowd is the end-user (i.e. theatre and film industries)(Mollick and Nanda 2016). Creative indus-

tries have gained popularity over other crowdfunding industries, as Marchegiani (2018) reveals that one of the main reasons to participate in crowdfunding is the opportunity to contribute to creative campaigns. Similarly, Bürger and Kleinert (2021) find that cultural project backers are motivated by the opportunity to support capital-constrained cultural entrepreneurs and connect with like-minded individuals.

Although cultural industries show importance for the economy and have drawn the attention of investors, I expect that the pandemic had a negative impact on cultural industries due to restrictions on public gatherings and cultural events. Based on the discussion above, I formulate the following hypothesis:

H2: Cultural and creative industries that require gathering experienced a decline in the amount raised during COVID-19.

3.4.3 Entertainment Industries and COVID-19

During the recent pandemic, researchers have studied how industries have changed. Chen and Yeh (2021) find that entertainment is among the worst-performing industries. Similarly, Gu et al. (2021) investigated the impact of COVID-19 on different industries and find that manufacturing, hospitality, cultural, sports, and entertainment industries were the most adversely impacted relative to other industries. Differences were noticed within the industries, as Ryu and Cho (2022) investigated the impact of COVID-19 on different domains of the global entertainment industries; they claim that physical location-based entertainment (i.e. movies) suffered, while digitalised entertainment (i.e. video games, online streaming platforms) benefited from the lockdown situation. Although during the pandemic, people stayed at home due to the lockdown and therefore had more time for entertainment and leisure activities, I expect similar results with the crowdfunding campaigns, as some entertainment industries require socialising (i.e. film, theatre, sports, theme parks, travel and tourism, museums, and events) which was challenging during the lockdown. Further, I expect campaigns that provide e-products to have benefited. Based on the above discussion, the following hypothesis has been formulated:

H3: The entertainment industry with gathering requirements faced significant challenges during COVID-19.

3.5 The Impact of COVID-19 on Traditional Finance

The COVID-19 pandemic led to a significant tightening of credit conditions in traditional financial markets, particularly for small and medium-sized enterprises (SMEs) and early-stage firms. Similar to earlier crises, (i.e. 2007–2008 financial crisis, 2016 Brexit), many firms reduced investment and innovation as uncertainty and financial constraints increased (Brown et al. 2019). During the pandemic, conventional lenders, including banks and venture capital firms, became more risk-averse, making it difficult for startups to secure external funding (Agrawal et al. 2014; Belleflamme et al. 2014; Kuppuswamy and Bayus 2018). Gopal and Schnabl (2020) note that the expansion of fintech lending following the global financial crisis was directly related to a reduction in traditional bank lending to small firms, a pattern that re-emerged during COVID-19.

According to the British Business Bank (2021), almost half (46%) of UK SMEs that applied for finance in the previous three years did so primarily to deal with COVID-19-related disruptions. Meanwhile, 39% avoided seeking finance altogether to prevent additional debt. These patterns underscore the extent of financial strain among SMEs and the limited effectiveness of traditional lending channels during the crisis.

Empirical evidence confirms that negative economic shocks reduced both the demand for and the supply of external finance. Cowling et al. (2021) report that the number of unsuccessful loan applications increased sharply as banks tightened their lending standards. Similarly, Chodorow-Reich et al. (2022) show that SMEs obtaining bank loans during COVID-19 faced higher collateral requirements and wider interest spreads than larger firms. Berger et al. (2021) also find that borrowers paid higher interest rates and obtained shorter loan maturities. According to Zhao et al. (2022b), information asymmetries further limited bank lending to new firms and SMEs, prompting many businesses to seek financing from alternative sources.

The decline in traditional bank lending during COVID-19 coincided with increased activity in alternative financial markets. Zhang et al. (2021b) and Li et al. (2021) demonstrate that fintech and peer-to-peer lending became more effective in mitigating the negative effects of the pandemic on SMEs, while Nigmonov and Shams (2021) argue that tighter lending standards encouraged investors to shift their preferences toward alternative forms of finance. Consequently, crowdfunding has emerged as an important substitute and complementary source of capital, particularly during lockdowns when geographical and institutional barriers to traditional finance were most severe (Cassar 2004; Cosh et al. 2009).

Understanding the contraction in traditional finance during the pandemic provides important context for the analysis that follows, which examines whether crowdfunding markets demonstrated greater resilience under similar economic conditions.

3.6 Data

In the following section, I describe the data used in the empirical analysis.

3.6.1 Sample Construction

I conducted hypothesis testing using crowdfunding data from campaigns initiated across four platforms in the UK: Crowdfunder, FundRazr, Indiegogo, and Kickstarter.[8] Crowdfunder is a UK-based platform, while the others are US-based platforms, where the UK market is among the top three. I divide our analysis period from 1 January 2018 to 28 January 2020 (before COVID-19) and from 29 January 2020 to 31 December 2021 (during COVID-19). I estimated the average changes in the success indicators of crowdfunding campaigns in two groups before and during COVID-19.

[8]Data available to download from The Crowd Data Center

3.6.1.1 Gathering vs Non-gathering

The crowdfunding campaigns are from various industries; some require gathering, while others do not. Businesses with physical locations suffered while online businesses benefited from the lockdown situation (Ryu and Cho 2022). Looking at the crowdfunding campaigns, not all campaigns from certain industries require gathering (i.e. from Table 3.4, 66% of campaigns from the sports industry require gathering); therefore, I went through all campaigns manually to identify campaigns that require gathering to have accurate classifications and reliable results. To clarify the gathering requirement of the campaigns, I categorised them based on whether they require gathering (e.g. performance, festival, restaurant) or do not require gathering (e.g. website, app, products). I reviewed each campaign's website, read its description, and manually searched for keywords such as venue, festival, restaurant, tickets, play, gym, trip, shop, centre. This process allowed us to group campaigns accordingly, resulting in the classification presented in Table 3.2.

The classification of gathering vs non-gathering stemmed from the COVID-19 restrictions imposed by the UK government. Initially, these restrictions included limitations on gatherings, social events, travel, attractions, sports activities, and meetings with family and friends. Over time, the government gradually eased these restrictions, with a significant relaxation announced on 19 July 2021.[9] However, self-isolation requirements for individuals with COVID-19 remained mandatory for five days until they were withdrawn on 3 August 2022.[10] On 24 February 2022, the UK government published "living with COVID" guidance on GOV.UK,[11] aimed to remove the remaining domestic restrictions while continuing to protect the population.[12] Additionally, UK Prime Minister Boris Johnson announced in the same month that free COVID-19 tests would no longer be available to the public starting from April.[13] Following these developments, although some restrictions were relaxed in mid-2021, all COVID-19 restrictions ultimately ended in August 2022.

[9] Coronavirus advice on accessing green spaces safely Last access: 30 January 2024
[10] Self-isolation Last access: 31 January 2024
[11] 2 Years of COVID-19 Last access: 31 January 2024
[12] Living with COVID-19 Last access: 31 January 2024
[13] COVID-19 Timeline Last access: 31 January 2024

3.6.1.2 Types of Campaigns

In our empirical setting, all industries are affected at the same time by the outbreak of the pandemic. However, I expect the effect of COVID-19 to differ from one industry to another, as industries are expected to have a variation of negative impacts. Using crowdfunding campaign data, I provide compelling evidence for the recent pandemic's differential effect on the success of certain campaigns.

3.6.1.3 Control Variables

I used the goal amount, the duration of the campaign, the flexibility of the campaign, the gender of the campaign's initiator, and the platform on which the campaign was initiated as control variables. Further, I used the size of the city where the campaign was initiated. To account for the size of the city, I used the 2021 population of cities across the UK published by the City Population website and the ONS. According to the ONS,[14] in the UK, major towns or cities have a population of 75,000 or more; therefore, the variable city is a dummy variable equal to 1 if the city has a population of 75,000 or more, zero otherwise.

3.6.2 Exclusion Criteria

Following Mollick (2014), I have eliminated extreme values of fundraising goal; data contained 814 campaigns with a goal below £100 and 86 campaigns with a goal above £1,000,000. Based on the campaigns' duration window of each platform, I eliminated all campaigns with a duration period of zero days, more than 60 days, duration for campaigns initiated on Kickstarter[15] and Indiegogo,[16] and a duration of more than 56 days for campaigns initiated on Crowdfunder.[17] Furthermore, I have eliminated campaigns where the website was not working. As a result, I ended up with 23,933 crowdfunding campaigns from 4 crowdfunding platforms across the UK.

[14] Towns and cities in the UK Last access: 30 January 2023
[15] What is the maximum project duration? Last access: 21 February 2023
[16] Deadlines – Indiegogo Help Center Last access: 21 February 2023
[17] How long can my project run for? | Crowdfunder Help Centre Last access: 21 February 2023

Data transformation using the natural logarithm is needed as the number of backers, raised amount, and goal amount are skewed. Since the continuous variables number of backers and the raised amount contained zero, I added one (log (1+x)) to avoid missing values, as it is a simple and convenient way to eliminate the problem of log zero (Bellégo et al. 2022).

3.7 Methodology

The unexpected pandemic allows us to use DiD estimation to identify the effect of the shock on different outcomes. Given that the pandemic started in the UK in early 2020,[18] this gives us two pre-pandemic and two during-pandemic periods. I aim to identify the incremental impact of COVID-19 on crowdfunding campaigns using a quasi-experiential technique, specifically DiD. There are various ways to group campaigns. Delgado et al. (2016) claim that clustering industries could be based on economic activities, knowledge, skills, inputs, demand, technology, labour, or occupational links. Further, Handke and Dalla Chiesa (2022) classified industries based on their cultural and creative activities. Given that COVID-19 differs from other shocks, as a lockdown and social distancing were applied worldwide, I grouped crowdfunding campaigns mainly based on the campaign's activity. Although it is an exogenous shock that happened to all campaigns simultaneously, I identify our treatment group as follows: industries that are expected to experience changes in the raised amount, success rate, and the number of backers due to COVID-19.

To test Hypothesis 1, I consider campaigns requiring gathering as a treatment group. Moving to Hypothesis 2, I investigate the impact of the pandemic on the cultural and creative industries, differentiating between campaigns with gathering requirements and non-gathering requirements. The third hypothesis examines the impact of the pandemic on the entertainment industry. Our identification rests on the parallel trend assumptions that the treatment group would follow a trajectory similar to that of the control group before the pandemic. The multi-level nature of our data enables us to examine the impact of the pandemic on crowdfunding industries

[18] Based on the COVID-19 Timeline website, the first day of COVID-19 is 29 January 2020. Last access: 29 March 2023

while controlling for general heterogeneity by using multiple fixed effect models (Cameron and Trivedi 2013). Researchers used different variables to capture the success of the campaign, namely success (goal reached or not), the amount raised, number of backers, the ratio of a pledge to goal, speed of funding, and social media shares (Shneor and Zhao 2020). I used the raised amount, the success rate, and the number of backers for the main result.

The DiD specification can be described as follows.

$$y_{ijt} = \beta_0 + \beta_1(Treatment_i * Post_t) + \beta_2 Treatment_i + \beta_3 Post_t + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \quad (3.1)$$

Where y_{ijt} is the log raised amount, success rate, or log number of backers (I investigate three different dependent variables) of a specific campaign i, of industry j, at time t. As control variables, I used platform, flexibility, duration, gender, size of the city, and goal amount of campaigns. Table 3.1 below provides the definition of the variables. δ_t, γ_c and η_j represent time, city, and industry fixed effects, respectively. The standard error ε_{ijt} is clustered at the industry level. I incorporate time fixed effects to capture time-specific factors that affect all units equally over time. Additionally, city fixed effects are included to account for unobserved heterogeneity across different cities. Further, I include industry fixed effects to account for unobserved heterogeneity.

β_1 is our coefficient of interest, which captures the impact of the treatment group on the outcome during the pandemic. Specifically, β_1 captures the DiD over time; a significant negative sign of our variable of interest indicates that the pandemic decreases the dependent variable of the treated group, while a significant positive sign indicates an increase. Since I have different research questions associated with different hypotheses, I included a triple interaction term to investigate the heterogeneity across crowdfunding industries. I used Equation 3.2 below to test hypotheses 2 and 3.

$$
\begin{aligned}
y_{ijt} =& \beta_0 + \beta_1(Treatment_i * Industry_j * Post_t) + \beta_2(Treatment_i + Post_t) \\
&+ \beta_3(Industry_j * Post_t) + \beta_4(Industry_i * Treatment_i) + \beta_5 Treatment_i \\
&+ \beta_6 Post_t + \beta_7 Industry_j + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt}
\end{aligned} \tag{3.2}
$$

Given that the same campaign can be assigned to multiple categories, as these classifications are provided subjectively by the fundraiser, and there is no consistent or systematic classification into industries by the platform itself. I ensure the quality of the sectoral assignment of each campaign by including industry fixed effects to account for unobserved heterogeneity across different industries. Further, I conduct additional tests by changing the dependent variable to the success rate and the number of backers, as the literature showed that the success rate and the number of backers had been used to measure the campaign's performance (i.e., Lukkarinen et al. (2016), Mollick (2014), Vismara (2016) and Vulkan et al. (2016)). Finally, I conduct robustness checks by using alternative treatment groups, different cultural and creative industry classification, and different entertainment industry classification. All robustness checks conducted are detailed in section 3.9.

Main results treatment group:

$$
Treatment = \begin{cases} 1 & \text{for campaigns that require gathering} \\ 0 & \text{for control group} \end{cases}
$$

$$
Post = \begin{cases} 1 & \text{from 29 January 2020 onwards} \\ 0 & \text{before 29 January 2020} \end{cases}
$$

Table 3.1: Variables Definition

The table below shows the list of variables used in the methodology with the definition of each variable

	Variable	Definition
Dependent Variables	Success	Binary variable = 1, when the campaign reaches its target amount, 0 otherwise
	Raised Amount	The natural logarithm of the amount raised by campaign
	Number of Backers	The natural logarithm of the number of backers
Control Variables	Platform	Categorical variables indicate type of platform; Crowdfunder, FundRazr, Indiegogo, and Kickstarter
	Goal Amount	The natural logarithm of the target amount set by the campaign
	Duration	The natural logarithm of number of days for which a project accepts funding
	Flexibility	Binary variable =1, when offering keep-it-all, 0 otherwise
	Gender	Categorical variables indicate the gender; Male, Female, and Not available
	Large Cities	Binary variable = 1 if a city has a population of 75,000 or more, 0 otherwise

3.8 Results

I start this section with univariate analysis by reporting descriptive statistics of gathering-related campaigns, cultural and creative industries, and entertainment industries before and during the pandemic, and further by reporting campaigns requiring gathering by industry. I then discuss the results of running Equation 3.1 and Equation 3.2 above to test our hypotheses.

3.8.1 Univariate Analysis

Table 3.2 presents the number and the percentage of campaigns that require gathering, revealing that across all industries, 29% of campaigns necessitate gathering. Table 3.3 reports the summary statistic. Although overall the number of campaigns has decreased, during the pandemic, I observe an increase in the number of backers and the raised amount; however, there is a variation across industries and between campaigns that require gathering and campaigns with non-gathering requirements. The comparison of crowdfunding campaigns before and during COVID-19 reveals significant shifts in the crowdfunding landscape. Overall, campaigns during the pandemic experienced an increase in the number of backers but a decrease in the total amount raised per backer. This trend suggests that while more people became involved in crowdfunding efforts during COVID-19, their contributions were generally smaller. Additionally, the cultural and creative industries showed more resilience in maintaining raised funds, especially for non-gathering campaigns, while gathering campaigns in all industries were impacted more severely. Statistical analysis reveals that these differences are significant, with most of the metrics showing a clear shift in campaign dynamics during the pandemic. The findings underline the changes in crowdfunding behaviour and highlight the challenges faced by campaign initiators in achieving campaign goals during COVID-19.

In Table 3.4, I delve into the distribution of campaigns requiring gathering across industries. Notably, only five industries—animals, art, personal, radio and podcast, and religion—had campaigns that did not require gathering. Fifteen industries had over 50% of campaigns requiring gathering, including business, community, dance, and others. In contrast, 18 industries had a minor percentage of campaigns requiring gathering, such as art, charity, crafts, and others.

Table 3.2: Campaigns Requiring Gathering

Gathering	No.	Percent
Yes	6,869	29
No	17,064	71
Total	23,933	100

Table 3.3: Descriptive Statistics

	Before COVID-19					During COVID-19					
	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max	Obs	t-test
Panel A: All Campaigns											
Goal (£)	12,448	49,517	100	1,000,000	15,771	11,561	48,089	100	1,000,000	8,162	887
Raised (£)	5,395	37,697	0	1,668,626	15,771	9,253	62,254	0	3,448,262	8,162	-3,858***
Number of Backers	93	657	0	58,730	15,771	151	659	0	20,398	8,162	-58***
Duration (days)	31	14	1	155	15,771	32	13	1	60	8,162	-1***
Progress towards Goal (% of goal raised)	133	630	0	47,700	15,771	300	1,632	0	79,361	8,162	-167***
Raised Amount per Backer	522	6,331	0	434,709	14,532	1,171	17,860	0	1,094,446	7,831	-649***
Panel B: All Campaigns – gathering											
Goal (£)	11,689	39,261	100	1,000,000	5,213	12,994	55,940	100	1,000,000	1,656	-1,305
Raised (£)	2,313	6,823	0	130,067	5,213	4,053	20,427	0	489,200	1,656	-1,740***
Number of Backers	61	256	0	9,059	5,213	95	348	0	6,308	1,656	-34***
Duration (days)	33	14	1	142	5,213	34	12	1	60	1,656	-1**
Progress towards Goal (% of goal raised)	51	63	0	2,046	5,213	74	215	0	7,906	1,656	-23***
Raised Amount per Backer	164	1,226	0	42,048	4,735	347	2,159	0	45,660	1,576	-183***
Panel C: All Campaigns - non-gathering											
Goal (£)	12,823	53,863	100	1,000,000	10,558	11,196	45,875	100	1,000,000	6,506	1,627**
Raised (£)	6,916	45,747	0	1,668,626	10,558	10,576	68,901	0	3,448,262	6,506	-3,660***
Number of Backers	109	782	0	58,730	10,558	166	717	0	20,398	6,506	-57***
Duration (days)	30	14	1	155	10,558	32	13	1	60	6,506	-2***
Progress towards Goal (% of goal raised)	173	765	0	47,700	10,558	357	1,820	0	79,361	6,506	-184***

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Table 3.3: Descriptive Statistics (Continued)

Raised Amount per Backer	694	7,657	0	434,709	9,797	1,378	19,949	0	1,094,446	6,255	-684***
Panel D: Cultural and Creative Industries – overall											
Goal (£)	8,299	34,029	100	1,000,000	6,273	7,155	31,222	100	1,000,000	3,887	1,144**
Raised (£)	4,722	24,155	0	943,493	6,273	6,834	31,145	0	793,608	3,887	-2,112***
Number of Backers	96	483	0	25,544	6,273	152	682	0	20,398	3,887	-56***
Duration (days)	30	13	1	60	6,273	32	12	1	60	3,887	-2***
Progress towards Goal (% of goal raised)	174	897	0	47,700	6,273	338	1,985	0	79,361	3,887	-164***
Raised Amount per Backer	466	3,601	0	104,097	5,940	715	7,484	0	303,167	3,757	-249**
Panel E: Cultural and Creative Industries – gathering											
Goal (£)	8,787	32,599	100	500,000	1,093	14,706	58,854	100	523,105	215	-5,919**
Raised (£)	1,720	3,443	0	43,246	1,093	3,360	14,634	0	198,638	215	-1,640***
Number of Backers	67	358	0	9,059	1,093	99	302	0	3,329	215	-32
Duration (days)	33	14	1	60	1,093	36	13	6	60	215	-3**
Progress towards Goal (% of goal raised)	60	58	0	418	1,093	70	93	0	1,063	215	-10**
Raised Amount per Backer	171	1,386	0	40,910	1,019	128	463	0	5,055	207	43
Panel F: Cultural and Creative Industries – non-gathering											
Goal (£)	8,196	34,325	100	1,000,000	5,180	6,713	28,748	100	1,000,000	3,672	1,483**
Raised (£)	5,355	26,491	0	943,493	5,180	7,037	31,837	0	793,608	3,672	-1,682***
Number of Backers	102	505	0	25,544	5,180	155	698	0	20,398	3,672	-53***
Duration (days)	30	12	1	60	5,180	31	12	1	60	3,672	-1***
Progress towards Goal (% of goal raised)	198	985	0	47,700	5,180	354	2,041	0	79,361	3,672	-156***
Raised Amount per Backer	527	3,903	0	104,097	4,921	749	7,697	0	303,167	3,550	-222*
Panel G: Entertainment Industries – overall											

Continued on next page

Table 3.3: Descriptive Statistics (Continued)

Goal (£)	14,174	57,359	100	1,000,000	6,003	14,669	56,748	100	1,000,000	3,603	-495
Raised (£)	7,649	54,901	0	1,668,626	6,003	12,463	87,147	0	3,448,262	3,603	-4,814***
Number of Backers	116	934	0	58,730	6,003	158	650	0	15,790	3,603	-42**
Duration (days)	31	14	1	62	6,003	32	13	1	60	3,603	-1***
Progress towards Goal (% of goal raised)	141	435	0	12,773	6,003	290	1,326	0	52,649	3,603	-149***
Raised Amount per Backer	803	9,499	0	434,709	5,576	1,697	25,437	0	1,094,446	3,455	-894**
Panel H: Entertainment Industries – gathering											
Goal (£)	9,064	38,966	100	1,000,000	2,512	10,299	47,664	100	1,000,000	1,275	-1,235
Raised (£)	2,103	6,147	0	124,913	2,512	3,379	16,566	0	484,745	1,275	-1,276***
Number of Backers	65	262	0	7,405	2,512	98	374	0	6,308	1,275	-33***
Duration (days)	33	13	1	60	2,512	33	12	1	60	1,275	0
Progress towards Goal (% of goal raised)	56	60	0	856	2,512	74	235	0	7,906	1,275	-18***
Raised Amount per Backer	207	1,463	0	42,048	2,314	258	1,624	0	45,660	1,215	-51
Panel I: Entertainment Industries – non-gathering											
Goal (£)	17,851	67,330	100	1,000,000	3,491	17,062	61,032	100	1,000,000	2,328	789
Raised (£)	11,639	71,542	0	1,668,626	3,491	17,438	107,404	0	3,448,262	2,328	-5,799
Number of Backers	153	1,203	0	58,730	3,491	191	758	0	15,790	2,328	-38
Duration (days)	30	14	1	62	3,491	32	13	1	60	2,328	-2***
Progress towards Goal (% of goal raised)	202	560	0	12,773	3,491	409	1,628	0	52,649	2,328	-207***
Raised Amount per Backer	1,226	12,342	0	434,709	3,262	2,478	31,543	0	1,094,446	2,240	-1,252

Table 3.4: Campaigns Requiring Gathering: Percentage and Absolute Counts by Industry

Gathering	Yes	(%)	No	(%)	Total	(%)
Animals	0	0	13	100	13	0.1
Art	613	24	1,989	76	2,602	10.9
Business	193	56	151	44	344	1.4
Charity	152	33	313	67	465	1.9
Comics and Graphic Novels	0	0	967	100	967	4
Community	579	54	490	46	1,069	4.5
Crafts	33	7	465	93	498	2.1
Dance	37	97	1	3	38	0.2
Design	46	3	1,494	97	1,540	6.4
Education	10	17	50	83	60	0.3
Environment	61	41	87	59	148	0.6
Events	9	75	3	25	12	0.1
Experimental	48	92	4	8	52	0.2
Family	12	67	6	33	18	0.1
Fantasy	18	69	8	31	26	0.1
Fashion	22	1	1,806	99	1,828	7.6
Film	3,303	88	430	12	3,733	15.6
Food	378	46	450	54	828	3.5
Gaming	35	1	2,877	99	2,912	12.2
Health	22	17	104	83	126	0.5
Heritage	41	85	7	15	48	0.2
Music	254	17	1,261	83	1,515	6.3
Other	58	31	131	69	189	0.8
Personal	0	0	4	100	4	0
Photography	85	22	301	78	386	1.6
Politics	98	91	10	9	108	0.5
Publishing	32	2	1,992	98	2,024	8.5
Radio and Podcast	0	0	45	100	45	0.2
Religion	0	0	26	100	26	0.1
Small Business	29	53	26	47	55	0.2
Social Enterprise	74	59	52	41	126	0.5
Sports	156	66	80	34	236	1
Technology	24	2	1,122	98	1,146	4.8
Theatre	419	97	11	3	430	1.8
Transmedia	1	5	18	95	19	0.1
Travel	15	23	49	77	64	0.3
Video/Web	5	8	60	92	65	0.3
Writing	7	4	161	96	168	0.7
Total	6,869	29%	17,064	71%	23,933	100%

3.8.2 Pre-Trend Graph

Figure 3.1 below offers the first insight into the potential impact of the pandemic on crowdfunding campaigns. The graph presents the median of the logarithm of the raised amount for each year, distinguishing between campaigns with gathering requirements (treatment) and non-gathering (control). A comparison of the pre-pandemic trend between the two groups shows no obvious difference, suggesting the parallel trend assumption required for DiD estimation is satisfied. Following COVID-19, there was a diversion in the treatment and control groups, as campaigns with gathering requirements (treatment) exhibited a reduction in the raised amount starting from February 2020 and continued decreasing till April. The raised amount of campaigns experienced an increase from April 2020 onwards, which is the time when the lockdown was first announced in the UK.[19] This is mainly due to the way entrepreneurs use crowdfunding campaigns; it has been used to raise funds for startups, to provide financial relief (Farhoud et al. 2021; Saleh et al. 2021), and as an exit strategy (Chandler et al. 2021).

[19] Timeline of UK government coronavirus lockdowns Last access 8 May 2024

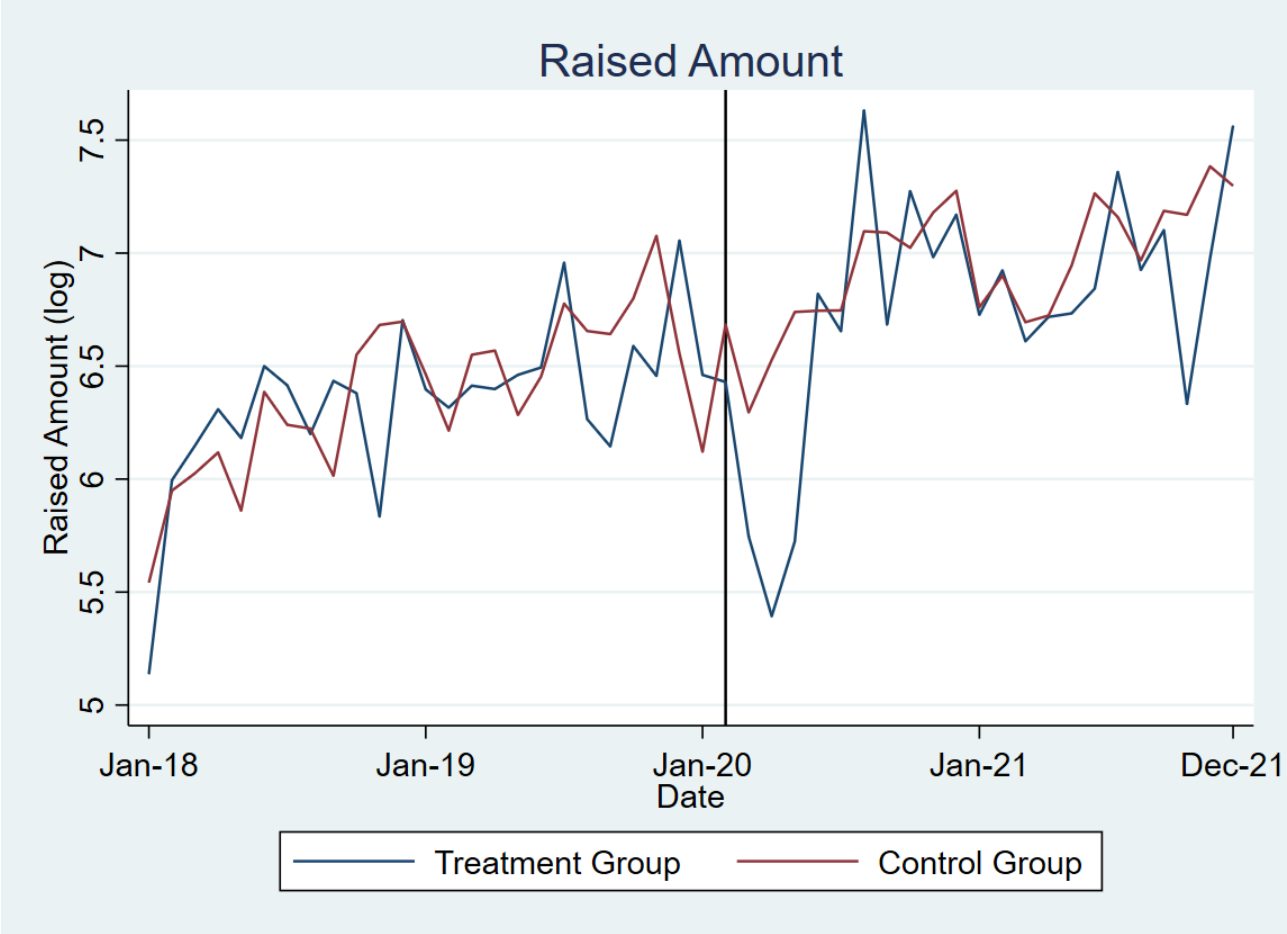

Figure 3.1: Parallel trends assumption before and during COVID-19

3.8.3 Baseline Regressions

In the following section, I run the baseline regression where I examine the impact of COVID-19 on the raised amount of crowdfunding campaigns and across industries (cultural and creative industries and entertainment industries). I further run several tests to enhance the main finding by examining the impact on the success rate and the number of backers. As crowdfunding campaigns are more likely to succeed when they can attract both a substantial number of backers and a significant fund, the success rate, number of backers, and raised amount can be used interchangeably. The literature showed that the success rate and the number of backers have been used to measure the campaign's performance (i.e. Lukkarinen et al. (2016), Mollick (2014), Vismara (2016) and Vulkan et al. (2016)). I specifically examine the impact of COVID-19 and delve into the challenges faced by those industries, mainly to understand to what extent the pandemic affected certain industries.

3.8.3.1 Hypothesis 1: Impact of COVID-19 Across Campaigns

I start by considering whether COVID-19 impacted campaigns that require gathering differently to campaigns with non-gathering requirements. As traditional financing literature shows that certain industries have been hit hard (existing companies) due to COVID-19, I extend the alternative finance literature by examining the impact of COVID-19 on crowdfunding campaigns and crowdfunding industries. I use Equation 3.1 above to test Hypothesis 1. I examine the relative change in the raised amount of crowdfunding campaigns requiring gathering during the pandemic, which reports the estimation of DiD fixed effect model on the raised amount. The main parameter of interest is the interaction between the *Post* dummy, which takes the value of one from 29/1/2020 onwards, zero otherwise, and the *Treatment* dummy variable, which takes the value of one for campaigns requiring gathering, zero otherwise. I further examine the impact on the success rate of the campaign and the number of backers.

The results are presented in Table 3.5. From Panel A, I find that campaigns that require gathering raised less money than campaigns that do not require gathering. The effect is strong in statistical significance and magnitude; precisely, the reduction of the raised amount was 15% and 22%. Although the coefficients are negative, in columns 5 and 6, when I control for industry fixed effect, the results become insignificant. In Panel B I used success rate as the outcome variable; it considers the amount raised and whether the campaigns attracted sufficient backers to reach their goal. I get similar results when using the success rate as the dependent variable. Looking at the main parameter of interest $Treatment * Post$, from columns (1) to (6), I find that the chance for a campaign to be successfully funded has decreased; the reduction was between 18.53% and 1.03% for the campaigns requiring gathering. When I add control variables and multiple fixed effects, the effect remains significant at a 1% level. The decrease of the success rate for campaigns requiring gathering is a reflection of the reduction in the raised amount (Panel A) and the number of backers (Panel C).

The number of backers provides information about the level of support and engagement from the backers of the campaign, which may be influenced by factors such as the campaign's appeal, marketing strategies, and outreach efforts. In Panel C, I used the number of backers as the dependent variable. Looking at the main parameter of interest $Treatment * Post$, from columns (1) and (6), I find that the number of backers for the treatment group has decreased; the reduction was between 30% and 5%. When I add control variables, the effect remains significant, controlling for time fixed effect and city fixed effect. Although the coefficients are negative, in columns 5 and 6, when I control for industry fixed effect, the results become insignificant.

Given the discussion above, I support **H1**, as the pandemic had a negative impact on crowdfunding campaigns that require gathering.

Table 3.5: Gathering-Related Campaigns

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post	-0.191**	-0.222**	-0.199**	-0.222***	-0.162	-0.156
	(0.0879)	(0.101)	(0.0850)	(0.0793)	(0.105)	(0.105)
Treatment	-0.0886	0.181	0.175	0.148	0.224	0.217
	(0.247)	(0.161)	(0.158)	(0.157)	(0.175)	(0.200)
Post	0.494***	0.368***	-	-	-	-
	(0.0674)	(0.0670)				
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.007	0.154	0.218	0.261	0.293	0.362
Panel B: Success Rate						
Treatment*Post	-0.0533	-0.0749***	-0.0558***	-0.0567***	-0.0402***	-0.0413***
	(0.0359)	(0.0146)	(0.00957)	(0.0102)	(0.0114)	(0.0132)
Treatment	-0.132**	0.0153	0.0106	0.0138	0.0269	0.0310
	(0.0510)	(0.0228)	(0.0213)	(0.0222)	(0.0300)	(0.0350)
Post	0.138***	0.0585***	-	-	-	-
	(0.0227)	(0.00801)				
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.037	0.247	0.309	0.334	0.351	0.399
Panel C: Log Number of Backers						
Treatment*Post	-0.125*	-0.207***	-0.136*	-0.152**	-0.113	-0.131
	(0.0699)	(0.0729)	(0.0723)	(0.0686)	(0.0686)	(0.0828)
Treatment	-0.170	0.0468	0.0328	0.0225	0.0795	0.0730

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.123)	(0.0718)	(0.0746)	(0.0742)	(0.0829)	(0.0890)
Post	0.412***	0.268***	-	-	-	-
	(0.0556)	(0.0449)				
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.014	0.055	0.121	0.157	0.173	0.237
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table reports the DiD fixed effect model investigating the effect of COVID-19 on crowdfunding campaigns that require gathering estimating Equation 3.1. The key dependent variables are log raised amount, success rate and log number of backers. The main parameter of interest is the interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, and *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, industry, and city*industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level

3.8.3.2 Hypothesis 2: Impact of COVID-19 on Cultural and Creative Industries

I then move to examine the impact of COVID-19 on the cultural and creative industries. I use Equation 3.2 above to test **H2** by examining the relative change in the raised amount of cultural and creative industries, differentiating between campaigns requiring and not requiring gathering given the pandemic, which reports the estimation of a DiD fixed effect model on the raised amount. The main parameter of interest is the triple interaction between the *Post* dummy, which takes the value of one from 29/1/2020 onwards, zero otherwise, the *Treatment* dummy variable, which takes the value of one for campaigns requiring gathering, zero otherwise, and the *cultural & creative* dummy, which takes the value of one if the campaigns are from the following industries: art, comics and graphic novels, dance, design, fashion, heritage, photography, publishing, radio and podcast, theatre, transmedia, video/web, and writing (based on section 3.2.3.2), zero otherwise.

The results are presented in Table 3.6. From Panel A columns (1) to (6), I find that cultural and creative industries that require gathering raised less money than campaigns that do not require gathering. The effect is strong in statistical significance and magnitude; precisely, the reduction of the raised amount was between 37% and 75%. Moreover, in column (6), the effect remains significant at a 1% level and strength in magnitude when I add control variables and multiple fixed effects. The interaction term between *Cultural* & *Creative* and *Post* coefficient reports a positive coefficient, indicating that cultural and creative industries that do not require gathering reported an increase in the raised amount.

In Panel B, I use success rate as the outcome variable; I get similar results when using the success rate as the dependent variable. Looking at the main parameter of interest $Treatment * Post * Cultural\ \&\ Creative$ from columns (1) to (6), I find that the chance for a campaign to be successfully funded has decreased; the reduction was between 1.7% and 9.3% for cultural and creative industries. When I add control variables and multiple fixed effects, the effect remains significant at a 1% level.

In Panel C, I used the number of backers as the outcome variable. I get similar results as the main results; although the coefficient is insignificant, it still shows a negative coefficient. Further, the interaction term between *Cultural & Creative* and *Post* shows negative coefficients, indicating that cultural and creative industries experienced a reduction in the success rate during the pandemic.

Lang et al. (2020) reported that the streamer's shares of Netflix went up by 12.5%; similarly Spangler (2021) reported that Disney's online streaming platform (Disney+) has dramatically expanded its membership base during the pandemic, while its theme park and resort divisions desperately suffer. Further, Ryu and Cho (2022) find that all theatres across the world have experienced a severe drop in demand due to the mandatory lockdowns. They add that the demand for concerts may experience a reduction as a result of insufficient supply and the imperative of maintaining social distance, where digital alternatives cannot replace live performances perfectly.

Although entrepreneurs can use crowdfunding platforms to collect money for financial relief, our results indicate a reduction in the raised amount, success rate, and the number of backers for cultural and creative industries that require gathering, and reported an increase in the raised amount, success rate, and the number of backers for campaigns that do not require gathering. The growing popularity of online streaming has expanded digital media, making it a substitute for physical places. Not only did dance and theatre have an online substitute, but a survey by McKinsey found that consumers in many countries, even those significantly impacted by the pandemic, demonstrated a greater inclination to continue engaging in in-person activities at public spaces, such as visiting malls, as opposed to opting for online shopping (Bhargava et al. 2020). I conclude that art, comics and graphic novels, dance, design, fashion, heritage, photography, publishing, radio and podcast, theatre, transmedia, video/web, and writing attracted fewer backers, raised less money, and therefore reflected on the success rate. Our results match the literature.

Given the discussion above, I support **H2**, as the pandemic had a negative impact on cultural and creative industries with campaigns requiring gathering.

Table 3.6: Cultural and Creative Industries

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post*Cultural and Creative	-0.372**	-0.747***	-0.627***	-0.563***	-0.628***	-0.573***
	(0.176)	(0.152)	(0.148)	(0.145)	(0.150)	(0.172)
Treatment*Post	-0.147	-0.0796	-0.0650	-0.113	0.00142	0.00698
	(0.114)	(0.0957)	(0.0824)	(0.0705)	(0.0652)	(0.0814)
Cultural and Creative*Post	-0.0304	0.0933	0.110	0.0712	0.149	0.193*
	(0.166)	(0.112)	(0.121)	(0.120)	(0.0997)	(0.113)
Cultural and Creative*Treatment	0.150	0.270	0.228	0.162	-0.469	-0.325
	(0.486)	(0.446)	(0.436)	(0.432)	(0.341)	(0.339)
Cultural and Creative	-0.0210	-0.100	-0.0812	-0.0536	-	-
	(0.480)	(0.432)	(0.423)	(0.420)		
Post	0.512***	0.319***	-	-	-	-
	(0.113)	(0.0658)				
Treatment	-0.126	0.102	0.109	0.103	0.360	0.312
	(0.377)	(0.252)	(0.251)	(0.245)	(0.229)	(0.267)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.007	0.154	0.218	0.261	0.294	0.362
Panel B: Success Rate						
Treatment*Post*Cultural and Creative	-0.0173	-0.0939***	-0.0717***	-0.0505**	-0.0760***	-0.0721**
	(0.0539)	(0.0250)	(0.0220)	(0.0200)	(0.0221)	(0.0276)
Treatment*Post	-0.0548	-0.0509***	-0.0340**	-0.0393***	-0.0184*	-0.0199
	(0.0481)	(0.0128)	(0.0127)	(0.0133)	(0.0101)	(0.0141)

	(1)	(2)	(3)	(4)	(5)	(6)
Cultural and Creative*Post	-0.0505	0.0271*	0.0294**	0.0249*	0.0242*	0.0269*
	(0.0404)	(0.0136)	(0.0135)	(0.0140)	(0.0136)	(0.0140)
Cultural and Creative*Treatment	-0.0211	0.0498	0.0395	0.0360	-0.0396	-0.0304
	(0.117)	(0.0537)	(0.0516)	(0.0521)	(0.0416)	(0.0510)
Cultural and Creative	0.130	-0.0218	-0.0183	-0.0154	-	-
	(0.0867)	(0.0474)	(0.0460)	(0.0453)		
Post	0.157***	0.0441***	-	-	-	-
	(0.0374)	(0.00855)				
Treatment	-0.0913	-7.21e-05	-0.00179	0.00262	0.0383	0.0398
	(0.0904)	(0.0309)	(0.0302)	(0.0304)	(0.0399)	(0.0476)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.049	0.248	0.309	0.334	0.351	0.399
Panel C: Log Number of Backers						
Treatment*Post*Cultural and Creative	0.0628	-0.109	-0.138	-0.0731	-0.0830	-0.0987
	(0.144)	(0.154)	(0.151)	(0.151)	(0.144)	(0.128)
Treatment*Post	-0.145	-0.164	-0.0914	-0.124	-0.0670	-0.0855
	(0.108)	(0.110)	(0.0988)	(0.0942)	(0.0799)	(0.104)
Cultural and Creative*Post	-0.0711	0.0729	0.0670	0.0485	0.0738	0.0737
	(0.120)	(0.0816)	(0.0750)	(0.0824)	(0.0738)	(0.0935)
Cultural and Creative*Treatment	-0.0464	0.0412	0.0221	-0.0244	-0.231	-0.179
	(0.240)	(0.183)	(0.178)	(0.168)	(0.153)	(0.125)
Cultural and Creative	0.149	-0.0320	-0.0201	0.00198	-	-
	(0.220)	(0.168)	(0.163)	(0.153)		
Post	0.441***	0.228***	-	-	-	-

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.110)	(0.0730)				
Treatment	-0.119	0.0311	0.0238	0.0282	0.143	0.123
	(0.212)	(0.113)	(0.113)	(0.109)	(0.0945)	(0.106)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.015	0.055	0.121	0.157	0.173	0.238
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table reports the DiD fixed effect model investigating the impact of COVID-19 on cultural and creative industries using Equation (2) above. The key dependent variables are log raised amount, success rate, and log number of backers. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, industry, and city*industry fixed effects, respectively. *Post* dummy takes the value of 1 from 29/1/2020 onwards and 0 otherwise. *Treatment* dummy takes the value of 1 if the campaign requires gathering and 0 otherwise. *Cultural & Creative* dummy takes the value of 1 if it is under the following industries: art, comics and graphic novels, dance, design, fashion, heritage, photography, publishing, radio and podcast, theatre, transmedia, video/web, and writing, 0 otherwise. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.8.3.3 Hypothesis 3: Impact of COVID-19 on Entertainment Industry

I now move to examine the impact of COVID-19 on the entertainment industry. I use Equation 3.2 above to test **H3** by examining the relative change in the raised amount of entertainment industries differentiating between campaigns required gathering given the pandemic, which reports the estimation of a DiD fixed effect model on the raised amount. The main parameter of interest is the triple interaction between the *Post* dummy, which takes the value of one from 29/1/2020 onwards, zero otherwise, the *Treatment* dummy variable, which takes the value of one for campaigns requiring gathering, zero otherwise, and the entertainment dummy, which takes the value of one if the campaign is from the following industries: film, gaming, music, sports, technology, and travel (based on section 3.2.3.3), zero otherwise.

The results of entertainment industries are shown in Table 3.7. From Panel A, columns (1) to (6), β_1 and β_2, indicate that during COVID-19 campaigns that require gathering did not experience changes in the raised amount compared to other industries. However, looking at differences between gathering and non-gathering campaigns within the entertainment industries, from β_1 and β_3 campaigns that require gathering raised more compared to non-gathering campaigns.

In Panel B, I use success rate as the outcome variable; I find a 2% reduction in the success rate of entertainment industries that require gathering compared to other industries. Further, I find no significant impact on entertainment campaigns that do not require gathering compared to campaigns that require gathering.

I used the number of backers in Panel C. I get similar results when using the number of backers as the dependent variable. Given all the restrictions and lockdowns during COVID-19, there was no significant impact on the entertainment industry, even with campaigns that require gathering. This is mainly due to the fact that entrepreneurs used crowdfunding for 3 main reasons: for a start up business, to provide financial relief, and as an exit strategy (Chandler et al. 2021).

Further, Ryu and Cho (2022) find that the entertainment industry has been increasingly affected by COVID-19, and most types of games have benefited from the pandemic; this form of entertainment is largely unaffected by physical restrictions and can be consumed asynchronously through various digital channels. They added the increase in the entertainment industry is likely to be temporary in this uncertain time. As some sectors in the entertainment industries had no substitute (i.e. travel, sports) it is common to seek financial support through crowdfunding to get financial relief. Further, researchers (i.e. Yang and Koh (2022)) find that backers are less concerned about the pandemic when a project is in the planning stage.

Given the discussion above and the result presented in Table 3.7, film, gaming, music, sports, technology, and travel have not been affected by the pandemic. Therefore, I do not support **H3**, as the pandemic did not have an impact on the entertainment industries with campaigns requiring gathering.

Table 3.7: Entertainment Industries

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post*Entertainment	0.375**	0.529***	0.437***	0.354**	0.401**	0.504***
	(0.148)	(0.156)	(0.159)	(0.132)	(0.150)	(0.141)
Treatment*Post	-0.370**	-0.562***	-0.467***	-0.432***	-0.394**	-0.460***
	(0.141)	(0.152)	(0.155)	(0.138)	(0.145)	(0.132)
Entertainment*Post	-0.192**	-0.170*	-0.183*	-0.153	-0.211**	-0.258**
	(0.0914)	(0.0936)	(0.0983)	(0.0977)	(0.0915)	(0.108)
Entertainment*Treatment	-0.576	-0.276	-0.247	-0.268	0.199	0.248
	(0.511)	(0.425)	(0.423)	(0.411)	(0.521)	(0.534)
Entertainment	0.520	0.395	0.373	0.357	-	-
	(0.491)	(0.419)	(0.412)	(0.402)		
Post	0.548***	0.425***	-	-	-	-
	(0.0880)	(0.0908)				
Treatment	0.110	0.247	0.230	0.218	0.169	0.142
	(0.242)	(0.201)	(0.192)	(0.190)	(0.107)	(0.114)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.011	0.156	0.220	0.263	0.294	0.362
Panel B: Success Rate						
Treatment*Post*Entertainment	-0.0325	0.0513	0.0349	0.0251	0.0344	0.0585*
	(0.0533)	(0.0316)	(0.0298)	(0.0287)	(0.0274)	(0.0317)
Treatment*Post	-0.0210	-0.0989***	-0.0686**	-0.0634**	-0.0610**	-0.0789***
	(0.0473)	(0.0300)	(0.0264)	(0.0254)	(0.0243)	(0.0233)

	(1)	(2)	(3)	(4)	(5)	(6)
Entertainment*Post	-0.0771**	-0.0251*	-0.0247*	-0.0197	-0.0191	-0.0247
	(0.0355)	(0.0127)	(0.0133)	(0.0140)	(0.0139)	(0.0150)
Entertainment*Treatment	0.0410	-0.0594	-0.0528	-0.0548	0.0343	0.0337
	(0.0960)	(0.0526)	(0.0520)	(0.0513)	(0.0868)	(0.0975)
Entertainment	0.0486	0.0515	0.0478	0.0460	-	-
	(0.0892)	(0.0451)	(0.0437)	(0.0422)		
Post	0.164***	0.0664***	-	-	-	-
	(0.0326)	(0.00919)				
Treatment	-0.159***	0.0354	0.0280	0.0328	0.0168*	0.0208**
	(0.0480)	(0.0266)	(0.0242)	(0.0249)	(0.00863)	(0.00796)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.040	0.249	0.310	0.335	0.351	0.399
Panel C: Log Number of Backers						
Treatment*Post*Entertainment	0.251	0.412**	0.440***	0.352**	0.319*	0.375**
	(0.180)	(0.159)	(0.159)	(0.165)	(0.158)	(0.182)
Treatment*Post	-0.260	-0.457***	-0.410***	-0.364**	-0.302**	-0.366**
	(0.161)	(0.142)	(0.142)	(0.144)	(0.137)	(0.144)
Entertainment*Post	-0.190*	-0.123	-0.124	-0.105	-0.111	-0.123
	(0.0982)	(0.0887)	(0.0739)	(0.0803)	(0.0808)	(0.106)
Entertainment*Treatment	-0.154	-0.207	-0.192	-0.193	-0.0616	-0.0642
	(0.246)	(0.170)	(0.168)	(0.154)	(0.224)	(0.224)
Entertainment	0.246	0.195	0.183	0.169	-	-
	(0.213)	(0.162)	(0.159)	(0.143)		
Post	0.473***	0.308***	-	-	-	-

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.0707)	(0.0503)				
Treatment	-0.133	0.115	0.0957	0.0898	0.107	0.104
	(0.117)	(0.0756)	(0.0765)	(0.0788)	(0.0661)	(0.0636)
N	23,933	23,933	23,927	23,266	23,266	21,097
R^2	0.016	0.056	0.123	0.158	0.173	0.238
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table reports the DiD fixed effect model investigating the impact of COVID-19 on the entertainment industry using Equation 3.2 above. The key dependent variables are the log raised amount, the success rate, and the log number of backers. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, industry, and city*industry fixed effects, respectively. *Post* dummy takes the value of 1 from 29/1/2020 onwards and 0 otherwise. *Treatment*, takes the value of 1 if the campaign requires gathering and 0 otherwise. *Entertainment* takes the value of 1 if it is under the following industries: film, gaming, music, sports, technology, and travel, 0 otherwise. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively. Standard errors are clustered at the industry level.

3.9 Heterogeneity

To enrich our understanding of the main findings, I further explore the heterogeneity across industries by examining the goal amount, duration, and flexibility of the campaigns; I look to determine whether there are differences between campaigns with high duration, campaigns with high goal amount, and campaigns following "keep-it-all" (flexible) or "all-or-nothing" (non-flexible). Given that the decision of whether to choose keep-it-all or all-or-nothing depends on the campaign's category (Cumming et al. 2020), I expect differences across campaigns. Further, I look at whether campaigns with higher duration periods and higher goal amounts have different impacts on the determinant of success (i.e. raised amount, success rate, and the number of backers) across industries. I look at the goal amount and the duration of the campaign as information asymmetries often associated with crowdfunding. Further, signalling theory states that entrepreneurs intentionally indicate positive qualities of themselves to investors. Effective signals are observable and represent a degree of cost. The receiver of the signal (i.e. investor) is more likely to offer financial benefits to the signal creator (i.e. entrepreneur). Signals may affect the success of a campaign positively or negatively in reward-based crowdfunding (Connelly et al. 2011; Spence 1973). Kunz et al. (2017) find that multiple rewards and presentations provide positive signals, whereas funding goal, duration, and delivery duration are negative signals. I further explore the differences across industries, given an exogenous shock.

3.9.1 By Campaign's Flexibility

There are two types of platform models: keep-it-all or all-or-nothing; the first type is where the fundraiser is allowed to keep the money raised even if the amount reached is less than the campaign's target; it is common in donation-based crowdfunding. The other type allows fundraisers to keep the money raised only if it equals or exceeds the funding goal. Some platforms follow both models. Whether to follow a keep-it-all or all-or-nothing approach impacts the success rate, as backers are more likely to back all-or-nothing campaigns because they are confident that they will have their money back in case of the campaign's failure. Although campaigns bear more risk when choosing all-or-nothing, backers are considered less risky and

more likely to back the campaign (Belleflamme et al. 2014; Cumming et al. 2019). Therefore, selecting the appropriate funding model is a critical strategic decision; the impact is not only on the entrepreneur's ability to secure pledges but also determines how the risk of underfunding is distributed between the entrepreneur and the crowd (Cumming et al. 2020). The two models have different indications; following all-or-nothing indicates that the fundraisers are committed to only undertaking the project and collecting the pledged money from backers if the raised amount is equal to or higher than their goal amount. Furthermore, the backers are less reluctant to pledge money under all-or-nothing. Therefore, all-or-nothing campaigns are expected to attract more backers (ibid.). I look to determine whether the "keep-it-all" and "all-or-nothing" strategies have different impacts on the raised amount, success rate, and the number of backers across industries given an exogenous shock. To do so, I estimate the following model:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Treatment_i * Flexibility_i * Post_t) + \beta_2(Treatment_i + Post_t) \\ &+ \beta_3(Flexibility_i * Post_t) + \beta_4(Flexibility_i * Treatment_i) + \beta_5 Treatment_i \\ &+ \beta_6 Post_t + \beta_7 Flexibility_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.3}$$

Where $Flexibility$ is a dummy variable taking one when a campaign follows "keep-it-all", zero otherwise.

Although the literature indicates that campaigns following all-or-nothing have higher chances of being successfully funded (ibid.), here I examine the impact across industries using the following equation:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Industry_j * Flexibility_i * Post_t) + \beta_2(Industry_j + Post_t) \\ &+ \beta_3(Flexibility_i * Post_t) + \beta_4(Flexibility_i * Industry_j) + \beta_5 Industry_j \\ &+ \beta_6 Post_t + \beta_7 Flexibility_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.4}$$

Table 3.8 below shows the impact of having flexible funding (keep-it-all) across campaigns compared to following non-flexible funding (all-or-nothing) during COVID-19. From Panel A, the results show that following keep-it-all has a positive impact on the raised amount for campaigns requiring gathering. Panel B reports an increase in the success rate of campaigns requiring gathering. Moving to the impact on the number of backers, Panel C reports an increase in the number of backers for campaigns requiring gathering. Although I find a positive coefficient of the triple interaction term, the results are insignificant.

Looking at the interaction term between *Flexible* and *Post*, the coefficient remains negative and significant after adding control variables and multiple fixed effects, indicating that during COVID-19 campaigns that do not require gathering following a keep-it-all strategy raised less money, had fewer backers, and lower success rate. The results also indicate that campaigns that require gathering following a keep-it-all strategy raised more money prior to the pandemic. I get matching results with the success rate and the number of backers.

I further look at the impact of having flexible funding across industries. Table 3.9 reports the result of Equation 3.4; the results indicate that the cultural and creative industry has been negatively affected prior to COVID-19 when choosing to follow the keep-it-all funding strategy and reporting no impact during the pandemic. This is not the case with the entertainment industries during COVID-19; as campaigns following keep-it-all raised more money, further backers were interested in backing campaigns following keep-it-all, therefore having higher chances of being successfully funded. Following all-or-nothing indicates that entrepreneurs are taking more risk, therefore, having a greater chance of being successfully funded (Cumming et al. 2020; Belleflamme et al. 2015).

Table 3.8: The Heterogeneous Impact of Flexibility on Campaigns

	(1)	(2)
Panel A: Log Raised Amount		
Treatment*Post*Flexible	0.222	0.482
	(0.412)	(0.438)
Treatment*Post	-0.0398	-0.0248
	(0.0863)	(0.125)
Flexible*Post	-1.015***	-0.779**
	(0.362)	(0.363)
Flexible*Treatment	1.492***	1.454***
	(0.419)	(0.472)
Flexible	-2.583***	-3.011***
	(0.436)	(0.444)
Post	0.321***	-
	(0.0676)	
Treatment	-0.231	-0.384
	(0.258)	(0.358)
N	23,933	21,097
R^2	0.139	0.373
Panel B: Success Rate		
Treatment*Post*Flexible	0.115***	0.109**
	(0.0353)	(0.0481)
Treatment*Post	-0.0812**	-0.0483**
	(0.0323)	(0.0188)
Flexible*Post	-0.105***	-0.129***
	(0.0247)	(0.0328)
Flexible*Treatment	0.115***	0.0495
	(0.0416)	(0.0477)
Flexible	-0.441***	-0.249***
	(0.0389)	(0.0472)
Post	0.0998***	-
	(0.0140)	
Treatment	-0.0958*	0.00843
	(0.0481)	(0.0502)
N	23,933	21,097
R^2	0.167	0.401
Panel C: Log Number of Backers		

	(1)	(2)
Treatment*Post*Flexible	0.000866	0.0969
	(0.137)	(0.227)
Treatment*Post	-0.0558	-0.0631
	(0.0634)	(0.0813)
Flexible*Post	-0.468***	-0.666***
	(0.134)	(0.139)
Flexible*Treatment	0.427**	0.218
	(0.160)	(0.178)
Flexible	-0.867***	-0.603***
	(0.135)	(0.101)
Post	0.370***	-
	(0.0491)	
Treatment	-0.186	-0.0312
	(0.140)	(0.148)
N	23,933	21,097
R^2	0.053	0.241
Time Fixed Effect	No	Yes
City Fixed Effect	No	Yes
Industry Fixed Effect	No	Yes
City*Industry Fixed Effect	No	Yes
Control Variables	No	Yes

Note: This table investigates the heterogeneous impact of having flexible funding (keep-it-all) across campaigns compared to following non-flexible funding (all-or-nothing) using Equation 3.3. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and $flexible$, which is a dummy variable and takes the value of 1 if the campaign follows keep-it-all and 0 otherwise. Column 1 contains neither control variables nor fixed effects. Column 2 contains a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

Table 3.9: The Heterogeneous Impact of Flexibility Across Industries

	(1)	(2)	(3)	(4)
	Cultural and Creative		Entertainment	
Panel A: Log Raised Amount				
Industry*Post*Flexible	0.293	0.133	1.360***	1.165**
	(0.680)	(0.655)	(0.436)	(0.495)
Industry*Post	-0.0664	-0.00388	-0.130	-0.335**
	(0.129)	(0.152)	(0.0907)	(0.133)
Flexible*Post	-1.146**	-0.751	-1.812***	-1.355***
	(0.487)	(0.581)	(0.364)	(0.458)
Flexible*Industry	-1.162	-1.361**	-0.568	-0.0718
	(0.722)	(0.602)	(0.701)	(0.641)
Flexible	-1.641***	-1.960***	-1.710***	-2.381***
	(0.428)	(0.399)	(0.411)	(0.527)
Post	0.369***	-	0.379***	-
	(0.0909)		(0.0847)	
Industry	-0.0418	-	0.372	-
	(0.366)		(0.375)	
N	23,933	21,097	23,933	21,097
R^2	0.133	0.369	0.129	0.364
Panel B: Success Rate				
Industry*Post*Flexible	-0.00959	-0.0163	0.124**	0.133**
	(0.0595)	(0.0661)	(0.0533)	(0.0573)
Industry*Post	-0.00986	0.0149	-0.0919**	-0.0406**
	(0.0460)	(0.0201)	(0.0404)	(0.0198)
Flexible*Post	-0.0829	-0.0908	-0.148***	-0.169***
	(0.0577)	(0.0646)	(0.0316)	(0.0398)
Flexible*Industry	-0.128*	-0.120**	-0.0161	-0.0230
	(0.0640)	(0.0529)	(0.0702)	(0.0497)
Flexible	-0.351***	-0.188***	-0.399***	-0.218***
	(0.0576)	(0.0342)	(0.0412)	(0.0465)
Post	0.0944**	-	0.132***	-
	(0.0438)		(0.0255)	
Industry	0.109*	-	0.0292	-
	(0.0642)		(0.0656)	
N	23,933	21,097	23,933	21,097
R^2	0.166	0.401	0.159	0.400

	(1)	(2)	(3)	(4)
	Cultural and Creative		Entertainment	
Panel C: Log Number of Backers				
Industry*Post*Flexible	-0.246	-0.287	0.474**	0.601**
	(0.270)	(0.277)	(0.198)	(0.232)
Industry*Post	0.0368	0.0787	-0.170*	-0.148
	(0.102)	(0.0948)	(0.0847)	(0.0908)
Flexible*Post	-0.429***	-0.545***	-0.760***	-0.962***
	(0.149)	(0.177)	(0.184)	(0.199)
Flexible*Industry	-0.108	-0.197	-0.156	-0.176
	(0.219)	(0.161)	(0.230)	(0.164)
Flexible	-0.661***	-0.446***	-0.640***	-0.437***
	(0.166)	(0.146)	(0.128)	(0.117)
Post	0.355***	-	0.443***	-
	(0.0820)		(0.0656)	
Industry	0.0699	-	0.176	-
	(0.171)		(0.167)	
N	23,933	21,097	23,933	21,097
R^2	0.051	0.241	0.051	0.241
Time Fixed Effect	No	Yes	No	Yes
City Fixed Effect	No	Yes	No	Yes
Industry Fixed Effect	No	Yes	No	Yes
City*Industry Fixed Effect	No	Yes	No	Yes
Control Variables	No	Yes	No	Yes

Note: This table investigates the heterogeneous impact of having flexible funding (keep-it-all) across industries in comparison to following non-flexible funding (all-or-nothing) using Equation 3.4. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and $flexible$, which is a dummy variable and takes the value of 1 if the campaign follows keep-it-all and 0 otherwise. Odd-numbered columns contain neither control variables nor fixed effects. Even-numbered columns contain a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.9.2 By Campaign's Duration

I look to determine whether a higher goal amount and higher duration have different impacts on the raised amount, the success rate, and the number of backers across campaigns. To do so, I estimate the following model:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Treatment_i * Duration_i * Post_t) + \beta_2(Treatment_i + Post_t) \\ &+ \beta_3(Duration_i * Post_t) + \beta_4(Duration_i * Treatment_i) + \beta_5 Treatment_i \\ &+ \beta_6 Post_t + \beta_7 Duration_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.5}$$

Where *duration* is a dummy variable taking one when a campaign has a high duration. In our sample, I identify campaigns with a high duration as those with a duration above the median.

I then examine the differences across industries using the following estimation:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Industry_j * Duration_i * Post_t) + \beta_2(Industry_j + Post_t) \\ &+ \beta_3(Duration_i * Post_t) + \beta_4(Duration_i * Industry_j) + \beta_5 Industry_j \\ &+ \beta_6 Post_t + \beta_7 Duration_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.6}$$

The impact of duration on the raised amount has been substantially inconsistent across studies; a systematic literature review by Shneor and Zhao (2020) indicates that 25 studies showed a positive impact, 19 negative and 7 insignificant. On the impact of campaign duration, Mollick (2014) suggest that longer duration may signal a lack of confidence in the project initiator, potentially hindering success. Kunz et al. (2017) argue that longer duration may reduce backers' confidence in the project initiator's ability to achieve their goal. However, Calic and Mosakowski (2016) find no significant impact of duration on the amount raised from backers.

In the context of donation-based crowdfunding, Burtch et al. (2013) suggest that longer campaign duration can increase project visibility, leading to higher success rates. Conversely, Hou et al. (2015) find that project goal and duration significantly negatively impact success rates in reward-based crowdfunding. Similarly, Gianfrate et al. (2015) find that higher funding goals are associated with lower success rates, while longer project duration correlates positively with success rates in reward-based crowdfunding. I take the literature a step ahead by examining the heterogeneous effect among different industries.

The results are presented in Table 3.10 below; the triple interaction term indicates a negative coefficient for the treatment group when having a high duration. Coefficient 3 reports that campaigns with no gathering requirement and high duration raised less money during the pandemic, significant at 1% after adding control variables and multiple fixed effects. I get the same conclusion with the success rate and the number of backers. I extend the result by looking at the industry level. The results of Equation 3.6 are reported in Table 3.11 below. I find no differences across industries, as setting campaigns with a high duration still has a negative relation with the raised amount, success rate, and the number of backers.

Table 3.10: The Heterogeneous Impact of Duration Across Campaigns

	(1)	(2)
Panel A: Log Raised Amount		
Treatment*Post*High Duration	-0.0123	0.0398
	(0.280)	(0.227)
Treatment*Post	-0.226	-0.223*
	(0.168)	(0.123)
High Duration*Post	-0.595***	-0.585***
	(0.191)	(0.110)
High Duration*Treatment	-0.0510	0.0524
	(0.224)	(0.198)
High Duration	0.144	-0.0597
	(0.205)	(0.168)
Post	0.879***	-
	(0.150)	
Treatment	-0.0492	0.186
	(0.352)	(0.243)
N	23,933	21,097
R^2	0.010	0.364
Panel B: Success Rate		
Treatment*Post*High Duration	0.0711	0.0726
	(0.0730)	(0.0550)
Treatment*Post	-0.104	-0.0905***
	(0.0735)	(0.0279)
High Duration*Post	-0.136***	-0.110***
	(0.0333)	(0.0251)
High Duration*Treatment	-0.0570	-0.0408
	(0.0601)	(0.0365)
High Duration	-0.0439	-0.00689
	(0.0342)	(0.0249)
Post	0.226***	-
	(0.0326)	
Treatment	-0.102	0.0555
	(0.0799)	(0.0457)
N	23,933	21,097
R^2	0.051	0.402
Panel C: Log Number of Backers		

	(1)	(2)
Treatment*Post*High Duration	0.000169	-0.0358
	(0.145)	(0.130)
Treatment*Post	-0.146	-0.130*
	(0.127)	(0.0761)
High Duration*Post	-0.302**	-0.273**
	(0.122)	(0.102)
High Duration*Treatment	-0.0729	-0.00549
	(0.0987)	(0.0886)
High Duration	0.0934	-0.0298
	(0.0870)	(0.0598)
Post	0.607***	-
	(0.107)	
Treatment	-0.122	0.0772
	(0.172)	(0.101)
N	23,933	21,097
R^2	0.015	0.239
Time Fixed Effect	No	Yes
City Fixed Effect	No	Yes
Industry Fixed Effect	No	Yes
City*Industry Fixed Effect	No	Yes
Control Variables	No	Yes

Note: This table investigates the heterogeneous impact of having a campaign with a high duration period compared to a lower duration period using Equation 3.5. The key dependent variables are the log raised amount, success rate, and the log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and *High Duration*, which is a dummy variable and takes the value of 1 for campaigns with high a duration period and 0 otherwise. Column 1 contains neither control variables nor fixed effect. Column 2 contains a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

Table 3.11: The Heterogeneous Impact of Duration Across Industries

	Cultural and Creative		Entertainment	
	(1)	(2)	(3)	(4)
Panel A: Log Raised Amount				
Industry*Post*High Duration	-0.287	-0.166	0.412	0.173
	(0.247)	(0.185)	(0.271)	(0.159)
Industryt*Post	0.214	0.348**	-0.427**	-0.390***
	(0.212)	(0.164)	(0.167)	(0.135)
High Duration*Post	-0.473***	-0.522***	-0.751***	-0.685***
	(0.165)	(0.0819)	(0.147)	(0.140)
High Duration*Industry	0.252	0.0790	-0.338	-0.0341
	(0.205)	(0.167)	(0.225)	(0.185)
High Duration	0.0335	-0.0817	0.285***	-0.0299
	(0.164)	(0.146)	(0.0991)	(0.110)
Post	0.751***	-	1.003***	-
	(0.130)		(0.121)	
Industry	-0.129	-	0.509	-
	(0.385)		(0.442)	
N	23,933	21,097	23,933	21,097
R^2	0.009	0.364	0.011	0.364
Panel B: Success Rate				
Industry*Post*High Duration	-0.0759	-0.0275	0.0996*	0.0392
	(0.0536)	(0.0469)	(0.0567)	(0.0458)
Industryt*Post	0.0331	0.0588*	-0.199***	-0.0625*
	(0.0754)	(0.0348)	(0.0605)	(0.0362)
High Duration*Post	-0.0896*	-0.0790*	-0.169***	-0.108***
	(0.0490)	(0.0409)	(0.0198)	(0.0274)
High Duration*Industry	0.0548	0.0203	-0.0894*	-0.0254
	(0.0463)	(0.0270)	(0.0498)	(0.0274)
High Duration	-0.0841*	-0.0307	-0.0167	-0.0107
	(0.0431)	(0.0248)	(0.0173)	(0.0175)
Post	0.198**	-	0.311***	-
	(0.0730)		(0.0343)	
Industry	0.118	-	0.0942	-
	(0.0753)		(0.0782)	
N	23,933	21,097	23,933	21,097
R^2	0.052	0.401	0.036	0.401

	Cultural and Creative		Entertainment	
	(1)	(2)	(3)	(4)
Panel C: Log Number of Backers				
Industry*Post*High Duration	-0.0694	-0.0389	0.228	0.124
	(0.164)	(0.150)	(0.176)	(0.157)
Industryt*Post	0.0539	0.163	-0.352**	-0.197**
	(0.149)	(0.0979)	(0.131)	(0.0868)
High Duration*Post	-0.272**	-0.266**	-0.397***	-0.344***
	(0.119)	(0.102)	(0.100)	(0.106)
High Duration*Industry	0.0565	-0.0218	-0.198*	-0.0275
	(0.0965)	(0.0705)	(0.103)	(0.0790)
High Duration	0.0481	-0.0267	0.168***	-0.0227
	(0.0857)	(0.0491)	(0.0579)	(0.0495)
Post	0.563***	-	0.744***	-
	(0.124)		(0.0975)	
Industry	0.132	-	0.288	-
	(0.189)		(0.196)	
N	23,933	21,097	23,933	21,097
R^2	0.014	0.239	0.014	0.239
Time Fixed Effect	No	Yes	No	Yes
City Fixed Effect	No	Yes	No	Yes
Industry Fixed Effect	No	Yes	No	Yes
City*Industry Fixed Effect	No	Yes	No	Yes
Control Variables	No	Yes	No	Yes

Note: This table investigates the heterogeneous impact of having a campaign with a high duration period compared to a lower duration period using Equation 3.5. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and *High Duration*, which is a dummy variable and takes the value of 1 for campaigns with a high duration period and 0 otherwise. Columns 1 and 3 contain neither control variables nor fixed effect. Columns 2 and 4 contain a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.9.3 By Campaign's Goal Amount

Theoretical models by Hornuf and Schwienbacher (2017b) and Strausz (2020b) predict that setting higher goal amounts makes campaigns less likely to reach their funding goal. While most studies support the negative relationship between goal amount and success, some researchers have found conflicting results. For instance, Koch and Siering (2015) suggest that campaigns with higher goals may be perceived as risky campaigns, leading to reduced support from backers. Vulkan et al. (2016) report similar findings on European equity crowdfunding platforms, noting that higher investment goals result in slower fundraising and fewer backers. I start by examining the goal amount of campaigns on the crowdfunding determinant of success, using the following equation:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Treatment_i * Goal_i * Post_t) + \beta_2(Treatment_i + Post_t) \\ &+ \beta_3(Goal_i * Post_t) + \beta_4(Goal_i * Treatment_i) + \beta_5 Treatment_i \\ &+ \beta_6 Post_t + \beta_7 Goal_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.7}$$

Where *Goal* is a dummy variable taking one when the campaign has a high goal amount. In our sample, I identify campaigns with a high goal amount as those with a goal amount above the median. I then explore the heterogeneous effects among various crowdfunding industries. To do so, I estimate the following model:

$$\begin{aligned} y_{ijt} =& \beta_0 + \beta_1(Industry_j * Goal_i * Post_t) + \beta_2(Industry_j + Post_t) \\ &+ \beta_3(Goal_i * Post_t) + \beta_4(Goal_i * Industry_j) + \beta_5 Industry_j \\ &+ \beta_6 Post_t + \beta_7 Goal_i + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{3.8}$$

The results are reported in Table 3.12 and Table 3.13; the coefficients are significant neither at the campaign level nor at the industry level, indicating that the goal amount has no impact on the raised amount, success rate, or the number of backers. Although literature shows that the goal amount has an impact on the crowdfunding determinant of success, it is mainly for investment-based crowdfunding (i.e. equity, P2P)

Table 3.12: The Heterogeneous Impact of Goal Amount Across Campaigns

	(1)	(2)
Panel A: Log Raised Amount		
Treatment*Post*High Goal Amount	-0.00448	0.0153
	(0.149)	(0.147)
Treatment*Post	-0.131	-0.117
	(0.104)	(0.157)
High Goal Amount*Post	-0.0451	-0.127
	(0.124)	(0.134)
High Goal Amount*Treatment	0.454**	0.232
	(0.181)	(0.172)
High Goal Amount	0.510***	0.223*
	(0.152)	(0.114)
Post	0.509***	-
	(0.0828)	
Treatment	-0.403**	0.0715
	(0.187)	(0.148)
N	23,933	21,097
R^2	0.021	0.362
Panel B: Success Rate		
Treatment*Post*High Goal Amount	0.0162	0.0136
	(0.0228)	(0.0250)
Treatment*Post	-0.0713*	-0.0452*
	(0.0398)	(0.0230)
High Goal Amount*Post	-0.00809	-0.0242
	(0.0210)	(0.0238)
High Goal Amount*Treatment	0.0986***	0.0202
	(0.0321)	(0.0185)
High Goal Amount	-0.218***	0.0145
	(0.0257)	(0.0147)
Post	0.145***	-
	(0.0253)	
Treatment	-0.170***	0.0181
	(0.0502)	(0.0320)
N	23,933	21,097
R^2	0.077	0.399
Panel C: Log Number of Backers		

	(1)	(2)
Treatment*Post*High Goal Amount	-0.162*	-0.0771
	(0.0895)	(0.0880)
Treatment*Post	-0.0190	-0.0701
	(0.0764)	(0.0893)
High Goal Amount*Post	-0.0747	-0.0874
	(0.0561)	(0.0648)
High Goal Amount*Treatment	0.266***	0.156*
	(0.0942)	(0.0874)
High Goal Amount	0.0448	0.0524
	(0.0832)	(0.0798)
Post	0.449***	-
	(0.0569)	
Treatment	-0.331***	-0.0224
	(0.104)	(0.101)
N	23,933	21,097
R^2	0.015	0.238
Time Fixed Effect	No	Yes
City Fixed Effect	No	Yes
Industry Fixed Effect	No	Yes
City*Industry Fixed Effect	No	Yes
Control Variables	No	Yes

Note: This table investigates the heterogeneous impact of having a campaign with a high goal amount compared to campaigns with a low goal amount using Equation 3.7. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and *High Goal* Amount, which is a dummy variable and takes the value of 1 for campaigns with high goal amount and 0 otherwise. Column 1 contains neither control variables nor fixed effects. Column 2 contains a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

Table 3.13: The Heterogeneous Impact of Goal Amount Across Industries

	(1)	(2)	(3)	(4)
	Cultural and Creative		Entertainment	
Panel A: Log Raised Amount				
Industry*Post*High Goal Amount	0.0878	0.0195	0.0501	-0.102
	(0.234)	(0.216)	(0.251)	(0.240)
Industry*Post	-0.0960	0.133	-0.115	-0.119
	(0.140)	(0.158)	(0.123)	(0.162)
High Goal Amount*Post	-0.114	-0.156	-0.124	-0.110
	(0.208)	(0.199)	(0.122)	(0.121)
High Goal Amount*Industry	-0.310	-0.131	0.231	0.236
	(0.254)	(0.215)	(0.222)	(0.200)
High Goal Amount	0.770***	0.357***	0.551***	0.201
	(0.121)	(0.129)	(0.163)	(0.139)
Post	0.554***	-	0.561***	-
	(0.0930)		(0.0865)	
Industry	0.220	-	0.158	-
	(0.293)		(0.390)	
N	23,933	21,097	23,933	21,097
R^2	0.019	0.362	0.021	0.362
Panel B: Success Rate				
Industry*Post*High Goal Amount	0.0481	-0.00798	0.00379	0.0128
	(0.0361)	(0.0360)	(0.0411)	(0.0381)
Industry*Post	-0.0490	0.0308	-0.123**	-0.0291
	(0.0600)	(0.0260)	(0.0502)	(0.0231)
High Goal Amount*Post	-0.0298	-0.0194	-0.0150	-0.0313
	(0.0240)	(0.0253)	(0.0271)	(0.0254)
High Goal Amount*Industry	-0.116**	-0.0414	0.0556	0.0330
	(0.0467)	(0.0290)	(0.0628)	(0.0358)
High Goal Amount	-0.145***	0.0397*	-0.218***	0.00906
	(0.0387)	(0.0212)	(0.0292)	(0.0162)
Post	0.158***	-	0.201***	-
	(0.0550)		(0.0409)	
Industry	0.204**	-	0.0174	-
	(0.0771)		(0.103)	
N	23,933	21,097	23,933	21,097
R^2	0.081	0.399	0.064	0.399

	(1)	(2)	(3)	(4)
	Cultural and Creative		Entertainment	
Panel C: Log Number of Backers				
Industry*Post*High Goal Amount	0.164	0.0742	0.0159	-0.0335
	(0.106)	(0.109)	(0.113)	(0.106)
Industry*Post	-0.108	0.0533	-0.182*	-0.0509
	(0.110)	(0.108)	(0.0960)	(0.101)
High Goal Amount*Post	-0.194**	-0.149*	-0.143	-0.110
	(0.0901)	(0.0779)	(0.0910)	(0.0870)
High Goal Amount*Industry	-0.268***	-0.197**	0.140	0.187**
	(0.0953)	(0.0894)	(0.104)	(0.0877)
High Goal Amount	0.228***	0.188***	0.0595	0.0300
	(0.0644)	(0.0577)	(0.0863)	(0.0695)
Post	0.509***	-	0.551***	-
	(0.0984)		(0.0735)	
Industry	0.315**	-	0.0853	-
	(0.139)		(0.170)	
N	23,933	21,097	23,933	21,097
R^2	0.014	0.238	0.013	0.238
Time Fixed Effect	No	Yes	No	Yes
City Fixed Effect	No	Yes	No	Yes
Industry Fixed Effect	No	Yes	No	Yes
City*Industry Fixed Effect	No	Yes	No	Yes
Control Variables	No	Yes	No	Yes

Note: This table investigates the heterogeneous impact of campaigns with high goal amount relative to campaigns with low goal amount across industries using Equation 3.8. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and *High Goal Amount*, which is a dummy variable and takes the value of 1 for campaigns with high goal amount and 0 otherwise. Odd-numbered columns contain neither control variables nor fixed effects. Even-numbered columns contain a vector of control variables and multiple fixed effects. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.10 Robustness Check

In the following section, I run several robustness tests to validate our hypotheses. For the first hypothesis, I use an alternative treatment group, and for the second and third hypotheses, I use alternative industry classifications.

3.10.1 Alternative Treatment Group

I use an alternative treatment group by restricting our sample; I eliminated charity campaigns, although it is common to use reward-based campaigns along with donations (see section 3.3). Backers tend to exhibit different behaviours, as the decline in wealth levels and uncertainty surrounding future economic prospects may influence donation behaviour differently. Researchers suggest that higher-income individuals tend to contribute more to charitable causes (Bennett 2012). However, during economic downturns, individuals often prioritise essential needs over charitable giving, potentially leading to decreased donations (Arsyianti and Kassim 2021). Table 3.14 reports the result of using an alternative treatment group. The result remains unaffected, as the campaigns requiring gathering reported a reduction of the raised amount, success rate, and the number of backers during the pandemic.

Table 3.14: Robustness Check: Gathering-Related Campaigns

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post	-0.169*	-0.219**	-0.195**	-0.222**	-0.161	-0.153
	(0.0864)	(0.0997)	(0.0859)	(0.0821)	(0.104)	(0.103)
Treatment	-0.110	0.176	0.168	0.145	0.213	0.213
	(0.254)	(0.167)	(0.163)	(0.163)	(0.181)	(0.206)
Post	0.481***	0.364***	-	-	-	-
	(0.0687)	(0.0674)				
N	23,468	23,468	23,460	22,815	22,815	20,694
R^2	0.007	0.157	0.222	0.265	0.298	0.364
Panel B: Success Rate						
Treatment*Post	-0.0488	-0.0738***	-0.0542***	-0.0550***	-0.0391***	-0.0404***
	(0.0344)	(0.0145)	(0.00982)	(0.0104)	(0.0113)	(0.0133)
Treatment	-0.137***	0.0140	0.00892	0.0122	0.0256	0.0305
	(0.0502)	(0.0239)	(0.0224)	(0.0232)	(0.0312)	(0.0364)
Post	0.128***	0.0580***	-	-	-	-
	(0.0201)	(0.00810)				
N	23,468	23,468	23,460	22,815	22,815	20,694
R^2	0.036	0.244	0.306	0.331	0.348	0.395
Panel C: Log Number of Backers						
Treatment*Post	-0.107	-0.199***	-0.127*	-0.144**	-0.107	-0.126
	(0.0690)	(0.0706)	(0.0705)	(0.0684)	(0.0677)	(0.0817)
Treatment	-0.188	0.0390	0.0230	0.0139	0.0660	0.0629

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.125)	(0.0745)	(0.0769)	(0.0764)	(0.0863)	(0.0934)
Post	0.396***	0.265***	-	-	-	-
	(0.0531)	(0.0447)				
N	23,468	23,468	23,460	22,815	22,815	20,694
R^2	0.013	0.054	0.122	0.157	0.173	0.236
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table reports the robustness check of H1; I used an alternative treatment group by eliminating charity campaigns. The key dependent variables are log raised amount, success rate, and log number of backers. The main parameter of interest is the interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, and *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, campaign, and city*industry fixed effects, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.10.2 Alternative Classification - Cultural & Creative Industry

Cultural and creative industries have multiple classifications (see section 3.2.3.2). Here, I use alternative grouping as a robustness test of H2; I added craft to the current group. Therefore, I identify cultural and creative industries as art, comics and graphic novels, crafts, dance, design, fashion, heritage, photography, publishing, radio and podcast, theatre, transmedia, video/web, and writing. The result of using alternative classification is presented in Table 3.15 below. Our results are unaffected; I continue to find that during COVID-19, cultural and creative industries that require gathering raised less money, as the triple interaction term is negative and significant. Similarly, the success rate and the number of backers report negative coefficients.

Table 3.15: Robustness Check: Cultural and Creative Industries

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post*Cultural and Creative	-0.269	-0.656***	-0.567***	-0.502***	-0.577***	-0.591***
	(0.189)	(0.168)	(0.157)	(0.140)	(0.159)	(0.156)
Treatment*Post	-0.179	-0.104	-0.0798	-0.132*	0.0154	0.0557
	(0.122)	(0.0992)	(0.0900)	(0.0750)	(0.0748)	(0.0779)
Cultural and Creative*Post	-0.0520	0.0844	0.114	0.0686	0.178*	0.251**
	(0.171)	(0.110)	(0.120)	(0.118)	(0.0981)	(0.112)
Cultural and Creative*Treatment	0.226	0.330	0.291	0.220	-0.461	-0.308
	(0.484)	(0.442)	(0.432)	(0.426)	(0.337)	(0.326)
Cultural and Creative	-0.116	-0.200	-0.180	-0.152	-	-
	(0.474)	(0.429)	(0.420)	(0.418)		
Post	0.534***	0.324***	-	-	-	-
	(0.125)	(0.0718)				
Treatment	-0.172	0.0663	0.0731	0.0680	0.363	0.308
	(0.380)	(0.251)	(0.250)	(0.243)	(0.232)	(0.259)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.008	0.155	0.219	0.261	0.294	0.354
Panel B: Success Rate						
Treatment*Post*Cultural and Creative	0.00362	-0.0733**	-0.0574**	-0.0384	-0.0636**	-0.0692**
	(0.0570)	(0.0336)	(0.0275)	(0.0229)	(0.0279)	(0.0300)
Treatment*Post	-0.0598	-0.0557***	-0.0379***	-0.0433***	-0.0176	-0.0153
	(0.0472)	(0.0134)	(0.0133)	(0.0136)	(0.0117)	(0.0146)

	(1)	(2)	(3)	(4)	(5)	(6)
Cultural and Creative*Post	-0.0530	0.0264*	0.0287**	0.0235*	0.0284*	0.0315**
	(0.0430)	(0.0132)	(0.0137)	(0.0136)	(0.0140)	(0.0146)
Cultural and Creative*Treatment	-0.0132	0.0674	0.0572	0.0534	-0.0289	-0.0186
	(0.119)	(0.0514)	(0.0492)	(0.0496)	(0.0414)	(0.0493)
Cultural and Creative	0.122	-0.0438	-0.0394	-0.0362	-	-
	(0.0896)	(0.0441)	(0.0427)	(0.0424)		
Post	0.159***	0.0444***	-	-	-	-
	(0.0404)	(0.00850)				
Treatment	-0.0925	-0.00905	-0.0105	-0.00597	0.0354	0.0373
	(0.0938)	(0.0284)	(0.0279)	(0.0281)	(0.0404)	(0.0467)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.047	0.248	0.309	0.334	0.351	0.391
Panel C: Log Number of Backers						
Treatment*Post*Cultural and Creative	0.0940	-0.0847	-0.127	-0.0429	-0.0594	-0.103
	(0.146)	(0.154)	(0.152)	(0.152)	(0.145)	(0.129)
Treatment*Post	-0.171	-0.184	-0.107	-0.145	-0.0742	-0.0830
	(0.114)	(0.112)	(0.102)	(0.0961)	(0.0817)	(0.104)
Cultural and Creative*Post	-0.112	0.0404	0.0415	0.0163	0.0571	0.0697
	(0.128)	(0.0829)	(0.0764)	(0.0806)	(0.0739)	(0.0953)
Cultural and Creative*Treatment	-0.0225	0.0708	0.0532	0.00270	-0.224	-0.166
	(0.245)	(0.180)	(0.176)	(0.166)	(0.149)	(0.119)
Cultural and Creative	0.127	-0.0700	-0.0572	-0.0330	-	-
	(0.225)	(0.167)	(0.161)	(0.152)		
Post	0.468***	0.246***	-	-	-	-

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.118)	(0.0754)				
Treatment	-0.127	0.0165	0.00925	0.0154	0.144	0.120
	(0.220)	(0.113)	(0.113)	(0.109)	(0.0963)	(0.104)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.014	0.055	0.121	0.157	0.173	0.228
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table reports the robustness check of H2; I used an alternative cultural and creative classification. The key dependent variables are the log raised amount, the success rate, and the log number of backers. The main parameter of interest is the triple interaction term between *Post* dummy, which takes the value of 1 from 29/1/2020 onwards and 0 otherwise, *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise, and *CulturalandCreative*, which takes the value of 1 if it is under the following industries: art, comics and graphic novels, crafts, dance, design, fashion, heritage, photography, publishing, radio and podcast, theatre, transmedia, video/web, and writing, and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, industry, and city*industry fixed effects, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

3.10.3 Alternative Classification - Entertainment Industry

Entertainment is a broad term that includes several sectors (see section 3.2.3.3). Here, I use alternative grouping as a robustness test of H3; I eliminate music as the music industry by itself, including artists, labels, and live sector companies (Gamble et al. 2017). Therefore, I identify entertainment industries as film, gaming, sports, technology, and travel. The result of using alternative entertainment classification is presented in Table 3.16 below. Our results are unaffected; I continue to find that during COVID-19, entertainment industries that required gathering did not experience changes in the raised amount. Similarly, the success rate and the number of backers had no significant change.

Table 3.16: Robustness Check: Entertainment Industries

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Raised Amount						
Treatment*Post*Entertainment	0.376**	0.505***	0.424**	0.321**	0.398**	0.405**
	(0.145)	(0.146)	(0.158)	(0.143)	(0.151)	(0.193)
Treatment*Post	-0.374***	-0.556***	-0.466***	-0.424***	-0.396***	-0.371**
	(0.127)	(0.138)	(0.144)	(0.136)	(0.133)	(0.159)
Entertainment*Post	-0.147	-0.116	-0.142	-0.107	-0.200**	-0.260**
	(0.0913)	(0.0787)	(0.0905)	(0.0963)	(0.0925)	(0.109)
Entertainment*Treatment	-0.549	-0.202	-0.174	-0.211	0.624	0.691*
	(0.609)	(0.503)	(0.504)	(0.481)	(0.412)	(0.357)
Entertainment	0.508	0.357	0.341	0.351	-	-
	(0.589)	(0.510)	(0.503)	(0.479)		
Post	0.519***	0.395***	-	-	-	-
	(0.0829)	(0.0848)				
Treatment	0.0585	0.195	0.178	0.166	0.0974	0.0557
	(0.224)	(0.195)	(0.188)	(0.185)	(0.127)	(0.139)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.011	0.156	0.220	0.263	0.295	0.355
Panel B: Success Rate						
Treatment*Post*Entertainment	-0.0535	0.0292	0.0181	0.00504	0.0223	0.0176
	(0.0475)	(0.0292)	(0.0287)	(0.0302)	(0.0286)	(0.0390)
Treatment*Post	-0.0124	-0.0891***	-0.0623**	-0.0558**	-0.0571**	-0.0521
	(0.0431)	(0.0287)	(0.0248)	(0.0262)	(0.0239)	(0.0324)

	(1)	(2)	(3)	(4)	(5)	(6)
Entertainment*Post	-0.0585*	-0.0112	-0.0131	-0.00703	-0.0151	-0.0191
	(0.0325)	(0.0100)	(0.0114)	(0.0125)	(0.0130)	(0.0139)
Entertainment*Treatment	0.0692	-0.0236	-0.0169	-0.0176	0.122**	0.132**
	(0.117)	(0.0625)	(0.0620)	(0.0602)	(0.0538)	(0.0538)
Entertainment	0.0173	0.0193	0.0167	0.0146	-	-
	(0.113)	(0.0575)	(0.0559)	(0.0536)		
Post	0.154***	0.0611***	-	-	-	-
	(0.0299)	(0.0101)				
Treatment	-0.166***	0.0218	0.0145	0.0185	0.000267	-0.000461
	(0.0432)	(0.0274)	(0.0251)	(0.0261)	(0.0162)	(0.0215)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.040	0.248	0.309	0.334	0.352	0.392
Panel C: Log Number of Backers						
Treatment*Post*Entertainment	0.182	0.340**	0.359**	0.233	0.223	0.208
	(0.169)	(0.155)	(0.161)	(0.176)	(0.173)	(0.195)
Treatment*Post	-0.219	-0.416***	-0.355**	-0.286*	-0.238	-0.266
	(0.149)	(0.136)	(0.141)	(0.156)	(0.145)	(0.160)
Entertainment*Post	-0.137	-0.0714	-0.0866	-0.0647	-0.0933	-0.0629
	(0.0945)	(0.0846)	(0.0756)	(0.0818)	(0.0955)	(0.105)
Entertainment*Treatment	-0.0989	-0.139	-0.120	-0.130	0.121	0.160
	(0.296)	(0.209)	(0.205)	(0.185)	(0.206)	(0.176)
Entertainment	0.195	0.139	0.129	0.125	-	-
	(0.268)	(0.206)	(0.203)	(0.179)		
Post	0.444***	0.285***	-	-	-	-

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.0670)	(0.0489)				
Treatment	-0.163	0.0806	0.0599	0.0546	0.0603	0.0403
	(0.110)	(0.0821)	(0.0843)	(0.0865)	(0.0813)	(0.0878)
N	23,933	23,933	23,927	23,266	23,266	20,675
R^2	0.015	0.056	0.122	0.157	0.173	0.228
Time Fixed Effect	No	No	Yes	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes	Yes
City*Industry Fixed Effect	No	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes

Note: This table investigates the same as Table 3.7 but using an alternative entertainment classification. Column (1) contains no control variables or fixed effects. From column (2) to column (6), I gradually added control variables, time, city, industry, and city*industry fixed effects, respectively. *Post* dummy takes the value of 1 from 29/1/2020 onwards and 0 otherwise. *Treatment*, which takes the value of 1 if the campaign requires gathering and 0 otherwise. *Entertainment* takes the value of 1 if it is under the following industries: film, gaming, sports, technology, and travel, and 0 otherwise. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively. Standard errors are clustered at the industry level.

3.11 Conclusion

The literature on crowdfunding has extensively studied the determinants of campaign success, leaving a gap in the impact of an exogenous shock on crowdfunding industries. This chapter examines the impact of COVID-19 on crowdfunding industries, focusing on non-investment campaigns.

I analysed 23,933 crowdfunding campaigns from four crowdfunding platforms across the UK, spanning from 2018 to 2021. I applied the DiD model; our findings indicate that the pandemic has negatively impacted crowdfunding campaigns requiring gathering. However, the severity of this impact varies across industries. I constructed the treatment group based on the campaign's gathering requirements. The findings suggest that COVID-19 has negatively affected campaigns that require gathering. Further, the negative impact hits the cultural and creative industries while showing a positive impact on the entertainment industries.

This chapter makes several significant contributions to the existing literature on alternative finance. Firstly, it enhances understanding of crowdfunding across diverse industries, given external shocks; it has been relatively understudied. Secondly, utilising crowdfunding data from multiple cities across the UK from four distinct crowdfunding platforms provides comprehensive and reliable results. Thirdly, using daily data spanning four years provides sufficient data, enabling us to compare pre- and post-pandemic periods. Lastly, the manual classification approach yields a unique dataset that contributes to crowdfunding literature from a novel perspective, offering the potential for further research utilisation. I have laid the foundation for such an analysis; future research may examine the differences between product and service campaigns given an exogenous shock. Further, future research could differentiate between campaigns with different goals, i.e. startup businesses, existing businesses raising funds for financial relief and businesses raising funds for an exit strategy.

Chapter 4

Does Sustainability Matter in Crowdfunding?

Abstract

As a relatively recent alternative to traditional financing, crowdfunding remains underexplored, particularly in relation to sustainability practices and gender dynamics. A deeper understanding is needed to assess how these factors influence campaign outcomes. This study examines how incorporating sustainable practices, rather than directly offering sustainable products or services, affects the success of crowdfunding campaigns. Additionally, it investigates whether these effects differ when campaigns are initiated by women. The analysis draws on data collected from four major crowdfunding platforms, Crowdfunder, FundRazr, Indiegogo, and Kickstarter, covering the period from 2018 to 2022. Unlike most previous studies, our dataset is notable for its broad industry coverage and extended timeline. Each campaign was manually reviewed and classified based on the presence of sustainability practices, resulting in a final sample of 27,582 crowdfunding campaigns across the UK. After accounting for control variables and multiple fixed effects, the results reveal that adopting sustainable practices does not significantly affect a campaign's success rate. Additionally, campaigns initiated by women are associated with a negative effect on the amount of funds raised. This research contributes to the growing literature on sustainable entrepreneurship and crowdfunding by providing new empirical evidence on the interplay between sustainability and gender in shaping campaign performance.

4.1 Introduction

Sustainable entrepreneurship has emerged in recent decades, aiming to develop products, services, or processes that help preserve the environment and support social communities (Shepherd and Patzelt 2011). Sustainable entrepreneurship has gained increasing attention as a critical strategy to develop products, services, and processes that promote environmental sustainability and social equity. Following global initiatives such as the Paris Climate Agreement, there has been heightened interest in promoting low-carbon economies and addressing climate change through sustainable business models. However, sustainable entrepreneurship often faces significant barriers when attempting to secure funding through traditional financial channels, as such ventures are frequently perceived as risky and less profitable by conventional investors. In response to these challenges, crowdfunding has emerged as an important tool for financing sustainable ventures, offering a platform for individuals and communities to support socially and environmentally responsible businesses. The 2015 Paris Climate Agreement, signed by 195 UNFCCC member countries, emphasised the need to limit global temperature rise to 2°C above pre-industrial levels, later adjusted to 1.5°C by the 2018 Intergovernmental Panel on Climate Change report (IPCC 2018) to avert catastrophic global warming. The COP22 Conference in Marrakesh highlighted strategies to combat climate change and decarbonise energy supplies through mitigation, adaptation, and financing mechanisms to reduce emissions and transition to a low-carbon economy. Financing the sustainable transition has since become a priority, particularly for developing countries that face limited access to capital for investments in critical infrastructure like water, energy, housing, and transportation, essential to support growing urban populations under the pressures of global warming (HLCCP 2017).

The crowdfunding market has expanded significantly since the 2007–08 banking crisis, as borrowers seek alternatives to traditional bank loans (Gray and Zhang 2017). Besides providing an alternative method of financing and greater chances to secure money, most crowdfunding models have a high speed of raising finance, which happened to be an essential factor offered by crowdfunding compared to traditional finance (ibid.). In general, the market introduction of entrepreneurial initiatives (Cassar 2004), and sustainable entrepreneurship specifically (Vismara 2019), frequently encounters challenges in securing capital from conventional financing mechan-

isms. In this context, the opportunity to invest in "sustainability" appears to be overshadowed by the achievements of "quick-win investment formats"s (Bocken 2015). Consequently, alternative financing models have arisen, such as ethical banking, social impact investment, and sustainable venture capital (Bocken 2015; Rizzi et al. 2018). These alternative financing models typically still encompass professional investors and standard financial intermediaries (such as banks). Another financing avenue to procure funding for sustainable entrepreneurship is crowdfunding, which provides individuals (i.e., private or restricted investors (Vismara 2019)) the opportunity to endorse the initiation of sustainable start ups without the necessity for standard financial intermediaries. Various investigations have indicated that funding from the crowd constitutes an effective instrument for financing sustainable entrepreneurship (e.g., Calic and Mosakowski (2016), Hörisch and Tenner (2020) and Lehner (2016)). Therefore, it holds substantial potential for facilitating sustainable development. Traditional investors often perceive sustainable entrepreneurship as unprofitable and risky, so crowdfunding is anticipated to function as a supplementary financing mechanism for such projects (Calic and Mosakowski 2016; Lehner 2016).

I used non-investment crowdfunding data from 2018 to 2022 across the UK. After adding control variables and controlling for multiple fixed effects, our results indicate that initiating a campaign with sustainable practice has no impact on the success of campaigns; further, campaigns initiated by women negatively impact the raised amount.

The remainder of this chapter is organised as follows. The next section introduces the relevant literature. Sections 4.3 and 4.4 state the objectives of the chapter and develop hypotheses, respectively. Section 4.5 shows the data collection. Section 4.6 reports the methodology, and section 4.7 reports the research findings and discussion. The conclusion is shown in the last section of this chapter.

4.2 Literature Review

4.2.1 Sustainability

4.2.1.1 Sustainability in Finance

The concept of sustainable finance is compared to traditional and behavioural finance; initially, the idea was launched in the environmental interpretation during the United Nations conferences in the 1970s (Soppe 2004). Ronaldo and Suryanto (2022) defined sustainability as utilising natural resources to benefit societies without side effects. Further, Lehner (2016) states that sustainable entrepreneurship can broadly be defined as all ventures with social or environmental missions as their primary goal, aiming to be financially and legally independent. Soppe (2004) states that sustainability is mainly the explicit connection between present and future generations. They added that the sustainable finance concept emphasises the importance of the behavioural premises of modern economic agents and explicitly extends the company's goals. Sustainable finance, environmental finance, climate finance, and green investment are all used interchangeably with the term green finance (Akomea-Frimpong et al. 2022). Although there is no universally agreed-upon definition of green finance in academic literature, there is a general consensus that it promotes a balance between ecological sustainability and economic development (Zhou and Li 2019). Green finance requires the allocation of financial resources to be extended to protect the environment, clean energy, green building, climate change, social inclusion, and corporate governance in all sectors of the economy (Urban and Wójcik 2019; Yuan and Gallagher 2019).

Sustainability-oriented companies have traditionally found it difficult to raise money using external capital (Ortas et al. 2013). The emergence of alternative finance, such as crowdfunding, might foster sustainability by facilitating the financial challenge such ventures face and may overcome the difficulties of communicating with conventional financiers (Block et al. 2018; Vismara 2019). Additionally, researchers find that crowdfunding holds great potential for promoting sustainable development (Hörisch and Tenner 2020; Testa et al. 2020; Wehnert et al.

2019). Unlike traditional entrepreneurs, who primarily focus on economic aspects, sustainable entrepreneurs must balance economic, social, and environmental goals, known as the triple bottom line (Belz and Binder 2017). Although these goals can sometimes be mutually reinforcing, they often require trade-off, adding ambiguity and complexity to projects and heightening risk perceptions among conventional investors (Petruzzelli et al. 2019).

A number of studies investigate gender diversity; Liu (2018) investigates the relationship between board gender diversity and corporate environmental violations, drawing on gender socialisation and diversity theories. They suggest that increased female representation on boards and female CEOs can reduce the frequency of environmental violations. The empirical evidence shows that firms with higher board gender diversity are less frequently sued for environmental infringements. Interestingly, the link between having a female CEO and reduced environmental litigation is only significant in companies with low female board representation.

4.2.1.2 Sustainability and Crowdfunding

Crowdfunding was first used to fund small projects in the music and movie industries; later, its popularity grew, and ventures from other domains (i.e. gaming, culture) started to be funded through crowdfunding (Hörisch 2015), beginning with the entertainment industries and moving to various industries. The potential of crowdfunding to finance sustainable businesses has attracted researchers' attention and has been examined from various perspectives. One of the most successful campaigns in sustainability is the American project Solar Roadways, which aimed to make solar panels for road and path construction. The project funded US $2.2 million from over 48,000 backers using the online crowdfunding platform Indiegogo (ibid.). According to Böckel et al. (2021), the first paper that considers the interaction between sustainability and crowdfunding was published in 2011; two years later, a second paper was published. They added that most studies published before 2017 were qualitative, and researchers started applying quantitative methods in 2018; however, qualitative methods and conceptual approaches are dominant.

Previous research shows that a lack of financial resources is a significant barrier to launching sustainable projects. Crowdfunding can help overcome this challenge by providing an alternative financing option for sustainable initiatives (Testa et al. 2020). Sustainable crowdfunding (financing sustainable ventures through crowdfunding (Hörisch 2015)) has emerged as a distinct phenomenon, attracting growing research interest (Petruzzelli et al. 2019; Maehle 2020; Testa et al. 2020; Wehnert et al. 2019). However, this field is still in its early stages, and further research is needed. The literature uses different ways to study crowdfunding and sustainability; further, it provides mixed results regarding the effect of sustainability on crowdfunding (Siebeneicher and Bock 2022). Earlier studies have shown that sustainability-oriented campaigns, particularly security-based crowdfunding, attracted more investors. Cumming et al. (2024) and Vismara (2019) studied sustainability in equity crowdfunding. They find that sustainability increases the number of backers but does not increase the chances of success. Researchers indicate that crowdfunding has great potential for promoting sustainable development (Hörisch and Tenner 2020; Testa et al. 2020; Wehnert et al. 2019).

Focusing on the alternative energy sector, Cumming et al. (2017) examined different campaigns initiated on Indiegogo; they find that clean-tech entrepreneurs who use soft mechanisms to mitigate information problems are more likely to raise funds successfully. Calic and Mosakowski (2016) studied campaigns initiated on Kickstarter, focusing on two industries. They find a positive effect from the sustainability orientation of crowdfunding campaigns, especially technology and film campaigns; on the other hand, Hörisch (2015) and Tenner and Hörisch (2021) find mixed results regarding the effect of environmental orientation on crowdfunding success. Testa et al. (2020) studied sustainable-oriented campaigns focusing on food-related projects; they find that emphasis on self-centred product attributes (i.e. personal taste) rather than on society-centred ones (i.e. sustainability) is more crucial to the campaigns' success. Tenner and Hörisch (2021) studied the characteristics of crowdfunding investors, and they find that a typical supporter of sustainability-oriented projects is young, is well-educated, has lower levels of self-enhancement, and has conservative values.

Researchers have explored the impact of the sustainability orientation of traditional seed financing providers, such as venture capitalists (VCs) and business angels. For example, Bürer and Wüstenhagen (2009) examined the policy preferences of clean-tech VCs using qualitative interviews, identifying policies perceived as most effective in boosting investment in innovative clean energy technologies. Additionally, Cumming et al. (2016) find that oil prices significantly drive clean-tech venture capital deals, often outweighing the influence of other economic, legal, or institutional factors.

Although several papers have been published concerning crowdfunding and sustainability, the research on sustainability and crowdfunding is still in its early stages, and more is needed to know about sustainability in the area.

4.2.2 Gender Diversity

4.2.2.1 Gender Diversity and Finance

A significant body of academic research explores the "business case" for board and executive gender diversity (e.g., Adams and Funk (2012), Rose (2007), Adams and Ferreira (2009) and Cumming et al. (2015)). Empirical evidence indicates that firms with more gender-diverse boards often exhibit better financial performance (Erhardt et al. 2003; Joecks et al. 2013; Liu et al. 2014), higher market valuation (Campbell and Mínguez-Vera 2008), and superior governance quality (Adams and Ferreira 2009). From a sociological and psychological framework, gender socialisation theory, diversity theory, and social role theory explain why females perform better than males. The first theory suggests that women, due to their greater concern for stakeholder welfare, are more likely to address environmental risks that could impact communities proactively (Adams et al. 2011; Carlson 1972; Gilligan 1977). According to diversity theory, female directors contribute diverse perspectives and a broader range of eco-friendly solutions, enhancing board decision-making on environmental matters (Cumming et al. 2015; Erhardt et al. 2003; Estélyi and Nisar 2016; Westphal and Milton 2000). Finally, the social role theory of leadership suggests that female leaders display greater concern for people, while male leaders

are more inclined to exhibit traits that emphasise competition. In practice, women are often recognised as better listeners, and as a result, they seek financial partners who also prioritise attentive listening and understanding in financial matters (Eagly et al. 1995). Females are known to be good financial managers; Karavitis et al. (2021) find that firms with female directors secure lower loan spreads, with female independent directors having a greater influence on reducing spreads compared to other attributes of female directors.

Gender diversity has been a topic of interest for researchers looking at the different risks associated with the banking industry; Bayazitova and Shivdasani (2012) find that female directors tend to exhibit greater risk aversion compared to their male counterparts, leading to a decrease in the financial distress costs and systemic risk, leading to a reduction of public bailout. Studying the relationship between gender diversity and bank performance, Cardillo et al. (2021) indicate that banks with more gender-diverse boards are less likely to require a public bailout and, when they do, receive a smaller amount of bailout funds relative to their total assets compared to banks with less gender-diverse boards; precisely they find that an increase in the percentage of female directors leads to a reduction bailout. Another way gender diversity might lower the likelihood of a public bailout is through improved performance, as bank profitability is crucial in determining the need for such bailouts (Dam and Koetter 2012). Female directors often exhibit stronger monitoring abilities than their male counterparts; gender diversity generally enhances how executive compensation and CEO turnover are linked to firm performance (Cardillo et al. 2021). Furthermore, Chen et al. (2017a) find that gender diversity reduces agency costs; this is mainly due to female directors' tendency to be more effective (higher probability and lower agency costs) at monitoring than their male counterparts (Adams and Ferreira 2009; Chen et al. 2017b; Evgeniou and Vermaelen 2017).

Increasing the percentage of female board members had an impact on the firm. Bertrand et al. (2019) evaluate whether Norway's 2003 law requiring 40% female representation on corporate boards improved board diversity and broader labour market outcomes for women, such as reducing the gender pay gap and advancing women's careers. They find that the quota successfully increased female board representation and reduced the gender pay gap among board members. However, it had little impact on broader female labour market outcomes, such as improving career progression or wages for women not on boards.

Further, Sila et al. (2016) investigate the impact of gender diversity in corporate boardrooms on firm risk; they find that greater representation of women on boards is associated with lower firm risk, suggesting that female directors contribute to more effective decision-making and enhanced risk management practices. This effect is particularly pronounced in high-risk industries, highlighting the value of diverse perspectives in corporate governance.

The debate on providing finance to female business owners started a while ago (e.g., Calcagnini (1992), Fletcher (1994) and Storey (1994)). Researchers studied the differences in finance, differentiating between males and females; Riquelme and Rios (2010) studied the factors that can influence the adoption of mobile banking, specifically investigating the role of gender as a moderating variable. They find that female mobile phone users who have used their phones for electronic banking believe that the mobile phone is easy to use; they also see it as more helpful in conducting banking services. Further, Adams et al. (2016) find that males were somewhat more likely to view mobile phones as practical for banking. Gender influenced how social norms, ease of use, and usefulness were perceived, but it didn't affect risk perception. Studies suggest that female borrowers are more successful than men in terms of loans (e.g., Chen et al. (2017a) and Pope and Sydnor (2011)); they argue that this is mainly related to asking for relatively smaller loans. The studies above show that males and females differ in finance.

Access to financial capital remains a significant challenge for small businesses, with studies identifying it as a key barrier to success. Research on over 1,000 Canadian firms found that women prioritised access to capital over other business issues (Orser and Foster 1994). Coleman (2000) observed that women were less likely to apply for loans than men, despite having equal approval rates, suggesting a heightened expectation of denial discouraging them from seeking debt financing to grow their businesses. Similarly, Fabowale et al. (1995) reported that women were less satisfied with banking relationships but were no less likely to secure loans. Additionally, Walker and Joyner (1999) noted that while women often perceive discrimination in accessing funding, empirical evidence does not support this belief. Gicheva and Link (2013), using data from the US Small Business Innovation Research program, found that female-owned firms are up to 16 percentage points less likely to secure private investment than male-owned firms. Crowdfunding could be a promising and inclusive alternative for financing startups, mainly by providing access to funding for investors who are typically under-represented in traditional

financing. Further, Bapna and Ganco (2021) used a randomised field experiment. They reveal that inexperienced female investors are 138% more likely to show interest in ventures led by female founders than those led by male founders. However, no such gender preference is observed among experienced female investors.

Prior research on performance found that women-owned firms were more likely to fail and have lower levels of sales, profit, and employment compared to their male counterparts (Watson 2002; Robb 2002; Rosa et al. 1996). Further, women reported continued difficulties in securing sources of capital (Coleman 2007). Although the literature summary above indicates that females are better at leading, decision-making, and using technology, substantial evidence suggests gender disparities in capital markets. Women face greater restrictions on access to personal savings compared to men (Boden Jr and Nucci 2000). Female-led businesses also struggle more with obtaining debt capital than their male-led counterparts (Buttner and Rosen 1992; Coleman 2002; Orser and Foster 1994). While there is no significant evidence of discrimination in loan approval rates, fewer women apply for debt financing (Cavalluzzo et al. 2002; Fielden et al. 2003). Moreover, those who do often face higher interest rates or stricter collateral requirements (Coleman 2000; Fabowale et al. 1995; Riding and Swift 1990).

4.2.2.2 Gender diversity and crowdfunding

Researchers studied gender diversity in crowdfunding; Marom et al. (2014) found that women constitute approximately 35% of project leaders and 44% of investors on Kickstarter. Despite women having higher success rates in funding their projects, only 23% of projects backed by men were led by women, whereas over 40% of projects supported by women were led by female founders. Later on, in 2018, the fifth UK Alternative Finance Industry Report revealed that in terms of female participation, in the UK, 56% of all the reward-based crowdfunding fundraisers were female and female backers accounted for 38% of total backers (Zhang et al. 2018). The investigations that have been done about both reward-based crowdfunding (e.g., Cecere et al. (2017)) and investment-based crowdfunding (debt and equity) (e.g., Bretschneider and Leimeister (2017), Hervé et al. (2019) and Mohammadi and Shafi (2018)) have revealed that they predominantly attracted male investors. According to Hervé et al. (2019) and Mohammadi

and Shafi (2018), the rationale for this disparity is that males exhibit greater tolerance for financial risks compared to females. Considering that sustainability-oriented initiatives are laden with risks and uncertainties in contrast to traditional projects (Dickel et al. 2018; Hart 1995), it can be anticipated that risk-averse individuals would eschew such investments. Consequently, although women typically manifest a heightened degree of environmental concern (Jones and Dunlap 1992; Schahn and Holzer 1990), the quantity of male proponents of sustainability-oriented crowdfunding initiatives is presumed to be greater. This assertion is further corroborated by the observation that levels of environmental behaviour do not diverge between men and women, notwithstanding differing levels of environmental concern (Tindall et al. 2003). Greenberg and Mollick (2015) find that women are more likely to succeed in reward-based crowdfunding campaigns, particularly in technology sectors, with female backers tending to disproportionately support women-led projects in fields where women are traditionally underrepresented.

According to Kaartemo (2017), when a fund seeker is an individual, gender might influence crowdfunding success. However, Barasinska and Schäfer (2014) find that gender does not impact whether a project is successfully crowdfunded. On the other hand, Ewens and Townsend (2020) find that female-led startups face significantly greater challenges in attracting interest and raising capital especially from male investors compared to similarly situated male-led startups. Specifically, women are less successful with male investors, even after accounting for various startup and founder characteristics available to investors during decision-making. They added that male-led companies outperform female-led ones in generating interest. Specifically, male-led companies are more likely to be shared, receive introduction requests, or secure funding. Further, they are slightly more likely to have experienced an IPO or acquisition and are marginally less likely to have failed.

Interestingly, Vismara et al. (2017) studied equity crowdfunding campaigns in Seedrs; they reveal that firms led by a female CEO have higher success rates in crowdfunding campaigns, with 18.2% of successful campaigns having a female CEO compared to 16.7% of unsuccessful ones. However, a higher percentage of female members in top management teams is negatively correlated with the likelihood of success. Additionally, successful offerings tend to attract more male investors than female ones. They added that although male investors slightly outnumber female investors in campaigns launched by male-led firms (46.8 male investors in firms with a

male CEO versus 43.6 in those with a female CEO), female investors strongly prefer female-led firms. On average, female-led businesses attract 20 bids from female investors, while male-led businesses receive just 11.2 bids from female investors. On the other hand, Geiger and Oranburg (2018) studied US equity crowdfunding, and they find significant evidence that crowdfunding campaigns led by a female received less funding.

Gafni et al. (2021) examine the impact of gender on crowdfunding success on the Kickstarter platform, focusing on the behaviours of both entrepreneurs and backers. The study finds that female entrepreneurs are underrepresented in specific project categories, particularly technology and gaming. However, they often achieve higher success rates in areas like fashion and arts, where they are more prevalent. It reveals that female backers support female-led campaigns, demonstrating a form of positive bias that helps these projects succeed. However, evidence of taste-based discrimination is also present, as some backers exhibit preferences for male entrepreneurs, which could hinder female entrepreneurs despite their overall success. The findings highlight the complexities of gender dynamics in crowdfunding, suggesting that while women benefit from supportive networks, challenges related to discrimination persist in the crowdfunding landscape.

A recent literature review by Shneor and Vik (2020) identified seven key variables that consistently impact the success of crowdfunding donations across multiple studies. One notable finding is that female campaign creators tend to achieve higher success rates than their male counterparts. This success may be attributed to women typically setting lower funding goals and possessing stronger social mobilisation abilities driven by empathy and a focus on building relationships.

4.3 Objective and Motivation

From the literature survey above, all previous papers on crowdfunding and sustainability have been done on sustainable-related campaigns, where the main activity of the campaign is providing a sustainable product/service (i.e., environmental and social-oriented crowdfunding projects) with some limitations, such as using a small data set (e.g., Hörisch (2015), Ma et al. (2022), Vismara (2019) and Zhao and Vinig (2017)), using a short period (e.g., Vismara (2019)), and focusing on one/few sectors (e.g., Calic and Mosakowski (2016) and Cumming et al. (2017)).

Sustainability can be achieved by integrating sustainable practices into the products/service value (e.g., Siebeneicher and Bock (2022)) or by introducing creative and novel business practices that support sustainability (e.g., Bornstein (2007) and Laurell et al. (2019)). Given the fact that very few existing environmentally sustainable crowdfunding campaigns seem to make use of crowdfunding platforms to fund their project (Hörisch 2015), in this chapter, I examine campaigns that apply sustainability across different industries (e.g. using sustainable fashion materials or using recycled paper to produce a book). I aim to find out whether sustainability makes entrepreneurs more successful and examine whether such campaigns will enhance their fundraising capability; further, I want to find out whether factors affecting campaigns' success fulness are the same for campaigns that practice sustainability in any form. I want to understand whether entrepreneurs can increase the likelihood of a campaign's success in any way when practising sustainability. While the literature finds that women are risk-averse compared to men (Barber and Odean 2001; Byrnes et al. 1999; Hinz et al. 1997), it is unclear whether a sustainable crowdfunding campaign initiated by a female will have a higher success rate. Although researchers investigated the impact of gender on crowdfunding success, they focused on a single industry (e.g. Kleinert and Mochkabadi (2021)); therefore, their findings cannot be generalised. This paper includes all industries and takes into consideration sustainable campaigns.

For several reasons, non-investment crowdfunding is particularly interesting when studying how to finance sustainability and crowdfunding success. Starting with reward-based crowdfunding, the first reason is that entrepreneurs act as sellers (Zhao and Vinig 2017). A second reason is that reward-based campaigns are considered pre-order products (Ma et al. 2022). Finally,

reward-based platforms relate to e-commerce businesses (Myoung-Ho and Lee 2020). I extend the data by analysing donation-based crowdfunding, which is considered the most traditional form of crowdfunding (Lehner 2016; Mollick 2014); furthermore, both types are regarded as non-investment crowdfunding. As the United Kingdom's crowdfunding market is the most developed (Coakley et al. 2022), it provides the best opportunity to investigate investors' reactions to the sustainability of the campaigns.

Siebeneicher and Bock (2022) examined crowdfunding and sustainability; however, they considered only four industries (design, fashion, food, and technology) from Kickstarter; therefore, their findings are not generalisable for Kickstarter or at the crowdfunding level. Our main objective is to analyse whether sustainability-oriented campaigns lead to raising more money. Sustainability orientation is proxied by the campaign's signals (i.e., the information provided by the campaign on their website). This study contributes to the literature by providing evidence on the impact of having environmentally friendly campaigns on crowdfunding success. As some investors believe that sustainability is costly, and the primary goal is to maximise profit (Hartzmark and Sussman 2019), I want to study the impact of sustainability on the success of the crowdfunding campaign. In 2018, Kickstarter introduced an Environmental Commitments section on project pages; by 2019, almost 20% of creators in the Design and Tech categories were utilising this field, which was later expanded to include Fashion and Games creators. Among these projects, 135 were identified as exemplary for incorporating post-consumer recycled materials, emphasising durable design, collaborating with sustainable factories, opting for eco-friendly shipping, and other sustainable practices (Kickstarter 2020).

Given that some campaigns use environmentally friendly materials to produce their products or services, it is essential to know whether such practices contribute to the campaign's success rate. Our motivation is to promote entrepreneurs to initiate more successful campaigns. Since sustainable entrepreneurship has historically faced limited financing options, crowdfunding is anticipated to expand these opportunities. This expectation is based on the belief that the motivations of crowdfunding participants differ from those of traditional financial investors. However, crowdfunding provides funding to diverse industries of various types. Further, I want to investigate whether social inequalities present in traditional finance capital markets also

transfer to alternative finance markets. Since the supply side of this market is not dominated by a single gender, it is worth exploring the differences in contribution patterns between genders. This chapter focuses on non-investment crowdfunding, precisely reward and donation-based models, highlighting the perspectives of reward and donation backers in entrepreneurial finance.

4.4 Hypothesis Development

Our central thesis is that campaigns with sustainable practices have a higher success rate. I further expect that crowdfunding campaigns initiated by women with sustainable practices have a lower success rate.

4.4.1 Sustainability and Crowdfunding

I study the impact of having sustainable campaigns on the success, the raised amount, and the number of backers of crowdfunding campaigns. Crowdfunding backers consider financial returns and societal effects, aligning their preferences with socially responsible investing (SRI) (Vismara 2019). These preferences are essential for the development and survival of sustainable businesses, especially in entrepreneurial finance, where investors increasingly demand that companies adhere to a triple-bottom-line approach, balancing economic, environmental, and social value creation. Given the differing goals of traditional and crowdfunding investors, their investment selection processes and screening criteria are likely to differ as well (e.g., Hartzmark and Sussman (2019)). Crowdfunding platforms offer unique opportunities to convey non-financial, or "soft", information to investors through various mediums such as text descriptions, videos, pictures, and testimonials (Johan and Zhang 2022).

Calic and Mosakowski (2016) examine technology and film/video initiatives on Kickstarter, wherein backers receive incentives or pre-purchase a product that remains in the developmental phase, and ascertain that the sustainability orientation of a campaign exerts a positive influence on funding success. A potential explanation of the observed phenomenon that sustainability-

oriented campaigns in reward-based crowdfunding exhibit greater success may include either backers pledging more substantial amounts or these campaigns simply attracting more backers. Although they do not expound upon these inquiries, they demonstrate that the efficacy of sustainability-oriented campaigns on Kickstarter is at least partially mediated by the innovation and third-party endorsements associated with the campaign. On the other hand, some investors believe sustainability is costly, and the primary goal is to maximise profit (Hartzmark and Sussman 2019).

Given that awareness of sustainability and environmentally friendly products and services has increased over time, I expect an increase in the success rate, the raised amount, and the number of backers of campaigns with sustainability practices. Based on the observations, I present Hypothesis 1:

Hypothesis 1: Crowdfunding campaigns with sustainable practices have a higher success rate.

4.4.2 Gender and Crowdfunding

I study whether female campaign initiators have higher chances of being funded. Prior research on gender dynamics in crowdfunding presents mixed findings. On one hand, studies suggest that female campaign initiators may benefit from gender homophily—women's tendency to support other women (Greenberg and Mollick 2015). Similarly, Gorbatai and Nelson (2015) argue that differences in linguistic style could advantage female founders on crowdfunding platforms like Indiegogo. However, their study did not account for fundamental characteristics that could influence funding success, limiting the generalisability of their conclusions. Additionally, some research suggests that women are often perceived as more trustworthy and ethical, which could, in some cases, enhance their chances of securing funding (Chaudhuri et al. 2013; Golesorkhi 2006; Ullah and Zhou 2020).

Despite these findings, significant challenges persist for female-led campaigns. Research by Ewens and Townsend (2020) indicates that female campaign initiators, particularly in startup crowdfunding, face greater difficulties in attracting investor interest. Similarly, Geiger and Oranburg (2018) found that female entrepreneurs struggle more than their male counterparts when raising funds through equity crowdfunding. These barriers stem from structural biases and investor preferences, as male-led campaigns tend to generate higher engagement, receive more funding introductions, and experience greater long-term success. Additionally, the underrepresentation of women among funders exacerbates these disparities, reducing the likelihood that female-led campaigns will secure sufficient backing.

Beyond funding challenges, female-led campaigns may suffer from broader negative outcomes. Women often face scepticism regarding their leadership and decision-making capabilities, leading to lower confidence from investors and backers. Male-led campaigns, on the other hand, are more likely to be shared, attract interest, and ultimately secure higher amounts of funding. Furthermore, gender biases may limit women's opportunities in traditionally male-dominated industries, restricting their ability to expand their ventures and sustain long-term success.

Taken together, these factors suggest that while female leadership is associated with strong risk management and firm performance in corporate settings, gender-based disadvantages in crowdfunding create additional hurdles. Thus, I expect that female-led crowdfunding campaigns will experience a lower success rate, attract fewer backers, and raise less capital compared to their male-led counterparts. These considerations lead to our second hypothesis:

Hypothesis 2: Crowdfunding campaigns initiated by a female have a lower success rate.

4.4.3 Gender, Sustainability, and Crowdfunding

Along similar lines, I then investigate how sustainable campaigns initiated by females impact the success of crowdfunding campaigns. The presence of women on the board was found to be positively correlated with the firm performance (Greene et al. 2020), as females are found to be risk-averse (Bayazitova and Shivdasani 2012), improve companies' performance (Dam and Koetter 2012), have stronger monitoring abilities (Cardillo et al. 2021), and be able to find eco-friendly solutions (Cumming et al. 2015; Erhardt et al. 2003; Estélyi and Nisar 2016; Westphal and Milton 2000). Further, having female independent directors—those not closely tied to the company or its management—on the board has an even stronger effect on reducing loan costs compared to other characteristics or attributes of female directors (Karavitis et al. 2021). Companies with more women on their boards are also less likely to face lawsuits for environmental issues, indicating that gender-diverse leadership enhances sustainability policies (Liu 2018).

However, despite these positive aspects, female entrepreneurs face substantial challenges in raising funds, particularly in male-dominated investment landscapes. Greenberg and Mollick (2015) found that female-led campaigns struggle to secure funding due to the under-representation of female investors, which limits their ability to benefit from gender homophily. Additionally, Ewens and Townsend (2020) showed that female-led startups receive significantly less interest from male investors, even when controlling for startup characteristics, making fundraising more difficult.

Sustainability-oriented crowdfunding campaigns introduce additional complexities. Prior research has shown that sustainability-based campaigns, particularly in equity crowdfunding, attract more backers but do not necessarily increase the likelihood of success (Cumming et al. 2024; Vismara 2019). Given that sustainability initiatives involve higher levels of uncertainty and risk (Dickel et al. 2018; Hart 1995), investors may be hesitant to support these ventures,

particularly when led by women, who are often perceived as more risk-averse (Mohammadi and Shafi 2018). Furthermore, research indicates that male investors are more willing to take financial risks than females, contributing to the gender disparity in crowdfunding investment patterns (Hervé et al. 2019).

Studies also highlight the role of discrimination in crowdfunding, where some backers exhibit preferences for male-led campaigns, limiting female entrepreneurs' success despite their overall capabilities (Gafni et al. 2021). Geiger and Oranburg (2018) found that female-led campaigns received significantly less funding in US equity crowdfunding markets. Given that women already face challenges in raising capital, adding the uncertainty of sustainable ventures may further reduce their crowdfunding success rates.

The above evidence suggests that while female board representation improves sustainability outcomes, the combination of gender-based fundraising challenges and the inherent risk in sustainable ventures makes it more difficult for female-led sustainable campaigns to succeed. These considerations lead to our third hypothesis:

Hypothesis 3: Crowdfunding campaigns with sustainable practices initiated by females have a lower success rate.

4.5 Women, Sustainability, and Access to Traditional Finance

Traditional financial systems have historically provided uneven access to capital, particularly for women entrepreneurs and sustainability-oriented ventures. Studies show that female-led firms often face greater challenges in securing external finance due to perceived risk, smaller collateral, and persistent structural biases (Coleman 2000; Cavalluzzo et al. 2002; Fabowale et al. 1995). Although loan approval rates may not differ substantially between men and women, female entrepreneurs are generally less likely to apply for credit, partly due to lower expectations of approval and less favourable borrowing conditions (Coleman 2002; Fielden et al. 2003). Even when funding is obtained, women frequently encounter higher interest rates and stricter collateral requirements (Riding and Swift 1990; Fabowale et al. 1995). These barriers have contributed to persistent gender gaps in business growth and profitability (Watson 2002; Robb 2002; Rosa et al. 1996).

Similarly, sustainability-oriented ventures face funding constraints within conventional finance. Lenders often perceive environmentally and socially focused businesses as riskier or less profitable, given their longer investment horizons and non-financial objectives (Ortas et al. 2013; Petruzzelli et al. 2019). Sustainable entrepreneurs must balance economic, environmental, and social goals, which can introduce additional uncertainty and complexity (Belz and Binder 2017). Consequently, traditional investors frequently view sustainable ventures as unattractive or speculative (Calic and Mosakowski 2016; Lehner 2016).

Within this context, crowdfunding has emerged as a more inclusive financing mechanism. It enables direct engagement between entrepreneurs and a diverse pool of backers motivated by social impact, environmental goals, or gender solidarity rather than collateral and financial history (Block et al. 2018; Vismara 2019; Hörisch and Tenner 2020). Empirical evidence sug-

gests that female-led and sustainability-oriented campaigns attract broad support and perform well relative to their traditional finance counterparts, underscoring crowdfunding's potential to reduce structural inequalities in access to capital (Bapna and Ganco 2021; Greenberg and Mollick 2015).

Understanding these disparities in access to traditional finance provides important context for the analysis that follows, which investigates whether crowdfunding markets offer a more inclusive and effective funding channel for women and sustainability-oriented projects.

4.6 Data

This chapter's empirical analysis is based on data from four crowdfunding platforms: Crowdfunder, FundRazr, Indiegogo, and Kickstarter. It contains the entire population of 28,049, focusing on non-investment campaigns (reward-based and donation-based) initiated in the UK between January 2018 and December 2022. This large sample allows us to fully exploit the differences of backers and investigate different predictions about crowdfunding campaigns. To specify sustainable-related campaigns, I perform a text analysis by manually going through the 28,049 campaigns to identify whether the campaign practices a sustainable activity when producing its main product/service. According to signalling theory, signal effectiveness depends on signal visibility, clarity, and frequency (Courtney et al. 2017); our study focuses on "signalled value", which refers to the value entrepreneurs communicate through textual signals in campaign teasers and descriptions. To analyse this, I draw upon signalling theory (Spence 1973), which provides a well-established theoretical foundation for understanding how these signals influence potential backers' perceptions and decisions (Courtney et al. 2017; Ahlers et al. 2015; Anglin et al. 2018; Kim et al. 2016). Therefore, I identified a campaign as sustainable when it explicitly mentions that they are practising sustainability in any form.

Following previous literature, I searched for the following words in the project description: Sustainable, Ecological, Eco-innovation, Eco-efficient, Eco-effective, Eco-design, Ecology (Adams et al. 2016; Pujari et al. 2003), Environmental, Green, Renewable, and Dematerialization (Maxwell and Vorst 2003). To reduce the influence of extreme values, I have excluded campaigns with funding goals smaller than £100 or more than £1,000,000 (Mollick 2014). Based on the campaigns' duration window specified by each platform, I eliminated all campaigns with a duration period of zero days, more than 60 days duration for campaigns initiated on Kickstarter and Indiegogo, and a duration of more than 56 days for campaigns initiated on Crowdfunder. Furthermore, I have eliminated campaigns where the website was not working. As a result of the conditions mentioned above, I ended up with 27,582 crowdfunding campaigns from four crowdfunding platforms across the UK.

Data transformation using the natural logarithm is needed as the number of backers, raised amount, and goal amount are skewed. Since the continuous variables number of backers and the raised amount contained zero, I added one (log (1+x)) to avoid missing values, as it is a simple and convenient way to eliminate the problem of log zero (Bellégo et al. 2022). I further dropped campaigns with missing gender before running Equations 4.2 and 4.3 to test the second and third hypotheses; I ended up with 13,824 campaigns, with 4,869 initiated by females and 8,955 initiated by males. Our study is not confined to examining startups that successfully raised capital. Instead, I analyse a broad set of startups attempting to raise funds, including both successful and unsuccessful campaigns. This approach enables us to more directly assess whether gender plays a significant role in determining fundraising success.

Dependent variable: Success: binary variable =1 if the raised amount is at least the intended funding goal during the designated campaign duration. Raised amount: the natural logarithm of the amount raised by the campaign. Number of backers: the natural logarithm of the number of backers. I take this approach as I am following previous crowdfunding literature and to have our results comparable to the literature (Siebeneicher and Bock 2022).

Independent variables: The independent variables are derived from our classification of the campaigns (sustainable) and the characteristics of the campaigns (i.e., gender, duration, target goal). Multiple control variables were included because earlier studies demonstrate their influence on the success of crowdfunding.

4.7 Methodology

I begin our analysis by testing whether having a sustainable campaign has a higher success rate, raises more funds, and attracts more backers; I used the LPM and OLS. The LPM is easy to estimate and allows for interpretations similar to those in OLS, with the primary difference being that the outcome represents a probability. Although LPM is often a suitable starting point for analysing limited dependent variables because it utilises OLS, it can predict probabilities outside the [0,1] range (Baltagi 2021). For this reason, logit or probit models are generally preferred (Zhao et al. 2022b). However, LPM remains appropriate when controlling for multiple fixed effects since applying fixed effects in discrete choice models can yield biased results (Greene et al. 2002). Additionally, employing robust or clustered standard errors can address the issue of heteroscedasticity in LPM (Belleflamme et al. 2015). I used LPM when the dependent variable is a success (binary variable) and OLS when the dependent variable is the raised amount and the number of backers (continuous variables).

To test Hypothesis 1, I used the equation below to investigate the impact of sustainability on the success rate, raised amount, and the number of backers.

$$y_{ijt} = \beta_0 + \beta_1 Sustainable_{it} + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \tag{4.1}$$

Where y_{ijt} is the success rate, log raised amount, or log number of backers (I investigate three different dependent variables) of a specific campaign i, of industry j, at time t; sustainable is a binary variable equal to one if a campaign practices sustainability and zero otherwise. As control variables, I used platform, flexibility, duration, size of the city, and goal amount of campaigns. δ_t, γ_c, and η_j represent time, city, and industry fixed effects, respectively. The standard error

ε_{ijt} is clustered at the industry level. I incorporate time fixed effects to capture time-specific factors that affect all units equally over time. Additionally, city fixed effects are included to account for unobserved heterogeneity across different cities. Further, I include industry-fixed effect to account for unobserved heterogeneity.

To investigate H2, I run the equation below

$$y_{ijt} = \beta_0 + \beta_1 Female_{it} + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \tag{4.2}$$

Where $Female_i$ is a binary variable equal to one if a campaign is initiated by a female and zero otherwise.

I then added an interaction term between *Sustainable* and *Female* to test H3 and see whether the results hold when a female initiates a sustainable crowdfunding campaign.

$$\begin{aligned} y_{ijt} = & \beta_0 + \beta_1 Sustainable_{it} * Female_{it} + \beta_2 Sustainable_{it} + \beta_3 Female_{it} \\ & + controls_{ijt} + \delta_t + \gamma_c + \eta_j + \varepsilon_{ijt} \end{aligned} \tag{4.3}$$

4.8 Results

4.8.1 Descriptive Statistics

Table 4.1 below shows the number of campaigns over the years and the number (percentage) of sustainable campaigns. Although the total number of campaigns decreased over time, there was a noticeable increase in the number of campaigns with sustainable practices, which increased from 2.8% in 2018 to 19.6% in 2022. Table 4.2 shows the number (percentage) of campaigns with sustainable practices across the industries. In total, the percentage of sustainable-related campaigns presents 10% (2,694 campaigns), with the highest rate in design (36%). Table 4.3

below shows the descriptive statistics of sustainable and non-sustainable campaigns; overall, sustainable campaigns consistently outperform non-sustainable campaigns in terms of goals set, amounts raised, number of backers, progress towards goal, and raised amount per backer. The only exception is the duration, where no significant difference was found. The descriptive statistics underscore the potential advantages of sustainability in fundraising campaigns, suggesting that such campaigns may resonate more positively with the number of backers and the raised amount, possibly achieving greater financial success. Table 4.4 shows the descriptive statistics by gender. Male campaign founders significantly outperform female founders across most metrics (goal, amount raised, number of backers, progress towards goals, and amount raised per backer). The only exception is in the duration of campaigns, where no statistically significant difference was found. Males outperform females in sustainable and non-sustainable campaigns. Overall, the univariate results reveal the differences between sustainable and non-sustainable campaigns and among genders, where sustainable campaigns outperform non-sustainable campaigns and campaigns initiated by males outperform those initiated by females.

Table 4.1: Total Number (Percentage) of Sustainable-Related Campaigns from 2018 to 2022

Sustainable	**2018**	**2019**	**2020**	**2021**	**2022**
Yes	253	386	662	734	659
	(2.8%)	(6%)	(14.9%)	(16.9%)	(19.6%)
No	8,812	6,020	3,765	3,591	2,700
	(97.2%)	(94%)	(85.1)	(83.1%)	(80.4%)
Total	9,065	6,406	4,427	4,325	3,359

Table 4.2: Total Number of Sustainable Related Campaigns across Industries

Sustainable	**Yes**	**(%)**	**No**	**(%)**	**Total**
Animals	3	21	11	79	14
Art	86	3	2,815	97	2,901
Business	32	9	312	91	344
Charity	7	2	458	98	465
Comics and Graphic Novels	20	2	1,166	98	1,186
Community	20	2	1,090	98	1,110
Crafts	88	16	477	84	565
Dance	1	2	46	98	47
Design	616	36	1,109	64	1,725
Education	1	1	69	99	70
Environment	35	22	122	78	157
Events	1	7	14	93	15
Experimental	2	3	60	97	62
Family	1	5	18	95	19
Fantasy	2	6	32	94	34
Fashion	490	24	1,561	76	2,051
Film	18	0	4,633	100	4,651
Food	103	11	825	89	928
Gaming	645	19	2,684	81	3,329

Continued on next page

Table 4.2: Total Number of Sustainable Related Campaigns across Industries (Continued)

Sustainable	Yes	(%)	No	(%)	Total
Health	22	14	138	86	160
Heritage	0	0	48	100	48
Music	7	0	1,738	100	1,745
Other	13	6	190	94	203
Personal	0	0	4	100	4
Photography	7	2	440	98	447
Politics	1	1	107	99	108
Publishing	93	4	2,236	96	2,329
Radio and Podcast	0	0	53	100	53
Religion	0	0	29	100	29
Small Business	7	9	67	91	74
Social Enterprise	11	9	115	91	126
Sports	0	0	236	100	236
Technology	312	24	1,009	76	1,321
Theatre	1	0	524	100	525
Transmedia	0	0	29	100	29
Travel	8	11	68	89	76
Video / Web	0	0	73	100	73
Video Games	31	30	73	70	104
Writing	10	5	209	95	219
Total	2,694		24,888		27,582

Table 4.3: Descriptive Statistics

	Sustainable					Non-sustainable					
	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max	Obs	t-test
Goal (£)	18,400	60,491	100	1,000,000	2,694	11,586	48,336	100	1,000,000	24,888	-6,814***
Raised (£)	13,841	61,268	0	1,847,107	2,694	6,183	46,159	0	3,448,262	24,888	-7,658***
Number of Backers	177	731	0	20,398	2,694	107	624	0	58,730	24,888	-70***
Duration (days)	32	13	1	61	2,694	32	14	1	155	24,888	-0.44
Progress towards Goal (% of goal raised)	348	1,438	0	52,649	2,694	183	1,118	0	79,361	24,888	-164***
Raised Amount per Backer	1,384	11,486	0	262,329	2,583	577	10,864	0	1,094,446	23,230	-807***

Table 4.4: Descriptive Statistics by Gender

	Female					Male					
	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max	Obs	t-test
Panel A: All campaigns											
Goal (£)	9,160	40,264	100	1,000,000	4,869	12,321	50,360	100	1,000,000	8,955	3,161***
Raised (£)	4,087	17,664	0	562,339	4,869	7,921	57,049	0	3,448,262	8,955	3,833***
Number of Backers	64	172	0	4,827	4,869	127	590	0	15,790	8,955	63***
Duration (days)	31	13	1	155	4,869	31	13	1	93	8,955	-0.09
Progress towards Goal (% of goal raised)	155	394	0	9,427	4,869	236	1,593	0	79,361	8,955	81***
Raised Amount per Backer	356	3,623	0	201,131	4,696	917	13,966	0	1,094,446	8,445	561***
Panel B: Sustainable											
Goal (£)	13,934	38,650	100	500,000	478	19,767	69,284	100	1,000,000	868	5,834**
Raised (£)	6,643	20,396	0	210,270	478	15,559	75,850	0	1,847,107	868	8,916**
Number of Backers	78	224	0	3,510	478	186	703	0	9,059	868	107**
Duration (days)	33	12	3	60	478	31	13	1	61	868	-1.40**
Progress towards Goal (% of goal raised)	186	514	0	6,664	478	350	924	0	15,371	868	164**
Raised Amount per Backer	308	1,222	0	17,944	459	2,234	15,374	0	262,329	844	1,926**
Panel C: Non-sustainable											
Goal (£)	8,640	40,406	100	1,000,000	4,391	11,521	47,823	100	1,000,000	8,087	2,881***
Raised (£)	3,809	17,321	0	562,339	4,391	7,101	54,591	0	3,448,262	8,087	3,292***
Number of Backers	63	166	0	4,827	4,391	121	576	0	15,790	8,087	58***
Duration (days)	31	13	1	155	4,391	31	13	1	93	8,087	0.05
Progress towards Goal (% of goal raised)	151	379	0	9,427	4,391	224	1,649	0	79,361	8,087	72***
Raised Amount per Backer	361	3,793	0	201,131	4,237	771	13,794	0	1,094,446	7,601	410*

4.8.2 Baseline Regressions

In the following section, I run the baseline regression, examining the impact of sustainability on the success rate, the raised amount, and the number of backers. Further I test whether the results hold with campaigns initiated by females. Finally, I examine whether sustainable campaigns initiated by females have a higher chance of being successfully funded.

4.8.2.1 Hypothesis 1: Sustainability and Success

I start by presenting the results of Equation 4.1. Table 4.5 shows the effect of sustainability on three dependent variables: success rate, log raised amount, and log number of backers. Each panel presents five models, adding control variables and fixed effects progressively from column (1) to column (5).

Panel A shows that the *Sustainable* coefficient is positive, suggesting a slight positive association with success, but is statistically insignificant. Although there is an increase in the raised amount of campaigns with sustainable practices (Panel B), there is no impact on the success rate; this is mainly due to having a higher goal amount (shown in Table 4.3), which indicates that sustainable entrepreneurs may face higher costs (therefore setting higher goal amounts) in crowdfunding due to the intangible nature of their sustainability claims and outputs, meaning extra effort is required to effectively communicate their value proposition and persuade backers to support their projects (Hörisch 2015; Petruzzelli et al. 2019).

Panel B indicates that sustainability positively affects the raised amount in all models, and it is significant in column (1) at the 5% level and in column (5) at the 1% level. In column (1), which includes no controls, sustainable campaigns raise significantly more funds. However, the coefficient's size decreases as time, city, and industry fixed effects are introduced. By column

(5), where all fixed effects and controls are added, the coefficient for *Sustainable* reports an increase of almost 20% and is statistically significant, indicating that sustainable campaigns still tend to raise almost 20% more than non-sustainable campaigns even after accounting for time, city, and industry effects.

In Panel C, *Sustainable* has a positive but statistically insignificant effect on the number of backers across all models. The coefficient size decreases from 25% in the base model (column 1) to 2.3% in column (5), indicating that part of the initial effect observed is likely explained by time, city, and industry controls. This indicates that while sustainable campaigns may appeal to certain backers, the appeal does not necessarily translate into a larger number of supporters. Backers are unwilling to support sustainable campaigns as some investors believe sustainability is costly, and the primary goal is to maximise profit (Hartzmark and Sussman 2019).

The results indicate that sustainability has a positive and statistically significant effect on the amount raised. After adding control variables and accounting for multiple fixed effects, sustainable campaigns tend to raise more funds overall. However, sustainability does not show a statistically significant effect on the success rate or the number of backers, suggesting that while sustainable campaigns might raise more funds, they do not necessarily attract more backers or improve the likelihood of success.

Given the discussion above, I do not support **H1**, as crowdfunding campaigns with sustainable practices have no impact on the success rate and the number of backers.

Table 4.5: Success and Sustainability

	(1)	(2)	(3)	(4)	(5)
Panel A: Success Rate					
Sustainable	0.0380	0.00769	-0.00963	-0.00874	0.00287
	(0.0572)	(0.0322)	(0.0275)	(0.0274)	(0.0142)
N	27,582	27,582	27,549	26,815	26,815
R^2	0.001	0.238	0.301	0.326	0.345
Panel B: Raised Amount					
Sustainable	0.659**	0.344	0.230	0.257	0.197***
	(0.277)	(0.213)	(0.192)	(0.187)	(0.0609)
N	27,582	27,582	27,549	26,815	26,815
R^2	0.005	0.142	0.213	0.252	0.287
Panel C: Number of Backers					
Sustainable	0.250	0.104	0.0125	0.0217	0.0234
	(0.176)	(0.141)	(0.113)	(0.107)	(0.0746)
N	27,582	27,582	27,549	26,815	26,815
R^2	0.002	0.060	0.132	0.167	0.188
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: This table reports the result of Equation 4.1 investigating the impact of having a sustainable campaign on the success rate, log raised amount, and log number of backers. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

4.8.2.2 Hypothesis 2: Gender and Success

Table 4.6 below shows the results of running Equation 4.2, where I want to investigate the impact of having a campaign initiated by a female on the raised amount, success rate, and number of backers.

I examine the impact of a female initiating a campaign on the success rate, raised amount, and the number of backers. I used Equation 4.2 to test the second hypothesis. I excluded those campaigns with unknown gender before running the equation. Table 4.6 examines the effects of female campaign initiators on three dependent variables: success rate (Panel A), log raised amount (Panel B), and log number of backers (Panel C). Each panel presents five models, progressively adding control variables and fixed effects from column (1) to column (5).

Panel A showed a negative and statistically significant effect in columns (2) through (5), suggesting that female-led campaigns are less likely to succeed than male-led campaigns. This consistent negative effect indicates a potential disadvantage for female-led campaigns in achieving success, even after adding control variables and accounting for multiple fixed effects. The negative impact on the success rate aligns with previous research that highlights challenges faced by female entrepreneurs in securing funding, potentially due to biases or perceptions of competence (Carter et al. 1997; Rosa et al. 1996). These biases could be amplified in crowdfunding, where backers might hold preconceived notions about women's capabilities in leading successful ventures.

From Panel B, the Female coefficient becomes statistically insignificant. This suggests that campaigns led by females did not have any impact on the raised amount after adding control variables and accounting for multiple fixed effects.

Finally, the results of Panel C show that the Female coefficient is positive in column (5). This suggests that female-led campaigns attracted a higher number of backers. The number of backers may be a reflection of growing support for women entrepreneurs, even if that support is not enough to secure the necessary funds.

Our results indicate that women are less likely to secure funds through crowdfunding, aligning with the prior research, which presents mixed findings regarding performance differences between women-owned and men-owned firms. Some studies suggest that women-owned firms underperform compared to men-owned firms in specific areas (Carter et al. 1997; Rosa et al. 1996; Cooper et al. 1994; Loscocco et al. 1991). In contrast, others find that the relationship between women and funding is insignificant (e.g. Prokop and Wang (2022)). Further, the results aligned with the initial glimpse of the descriptive statistics results.

From the discussion above, crowdfunding campaigns initiated by females have a negative effect on success; therefore, I support **H2**.

Table 4.6: Female, Raised Amount, Success and Number of Backers

	(1)	(2)	(3)	(4)	(5)
Panel A: Success Rate					
Female	-0.0343	-0.0540***	-0.0576***	-0.0601***	-0.0450***
	(0.0263)	(0.0152)	(0.0136)	(0.0139)	(0.00989)
N	13,824	13,824	13,778	13,308	13,307
R^2	0.001	0.199	0.318	0.353	0.373
Panel B: Raised Amount					
Female	-0.132	-0.0793	-0.101	-0.0999	-0.00901
	(0.131)	(0.0994)	(0.0944)	(0.0935)	(0.0629)
N	13,824	13,824	13,778	13,308	13,307
R^2	0.001	0.181	0.305	0.353	0.386
Panel C: Number of Backers					
Female	0.0366	0.0374	0.0363	0.0416	0.0960**
	(0.0981)	(0.0821)	(0.0629)	(0.0588)	(0.0455)
N	13,824	13,824	13,778	13,308	13,307
R^2	0.000	0.045	0.176	0.217	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: This table investigates the impact of having a female campaign initiator on the success rate, raised amount, and the number of backers. The main parameter of interest is the $female$ dummy, which takes the value of 1 if a campaign is initiated by a female and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effect, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

4.8.2.3 Hypothesis 3: Sustainability, Gender, and Success

Finally, I examine the impact of a female initiating a sustainable campaign on the success rate, raised amount, and the number of backers. I used Equation 4.3 to test the third hypothesis; I excluded those campaigns with unknown gender before running the equation. Table 4.7 examines the effects of sustainability, gender, and their interaction on three dependent variables: success rate (Panel A), log raised amount (Panel B), and log number of backers (Panel C). Each panel presents five models, progressively adding control variables and fixed effects from column (1) to column (5).

The interaction term of $\textit{Sustainable} * \textit{Female}$ in Panel A is negative and statistically significant in columns (1), (3), (4), and (5); this suggests that female-led sustainable campaigns are less likely to succeed compared to other campaigns. This consistent negative effect indicates a potential disadvantage for female-led sustainable campaigns in achieving success, even after adding control variables and accounting for multiple fixed effects. While sustainability has been shown to attract more backers (as indicated by the positive effects in H1), female entrepreneurs may still encounter greater barriers to securing funds. Studies like Ewens and Townsend (2020) have demonstrated that female-led startups face significant challenges in attracting attention and capital, particularly from male investors. This suggests that, despite the growing appeal of sustainable business models, the gender of the entrepreneur plays a crucial role in crowdfunding outcomes. The sustainable coefficient is statistically insignificant across models, suggesting that sustainability alone does not significantly impact success rates. The *Female* coefficient is consistently negative and statistically significant, implying that female-led campaigns, in general, are less likely to succeed, regardless of sustainability. Finally, the summation of the interaction term and *Female* indicates a significant negative impact on the success rate of sustainable campaigns initiated by females compared to sustainable campaigns initiated by males.

From Panel B, the coefficient of $\textit{Sustainable} * \textit{Female}$ becomes statistically significant in columns (4) and (5) at 10%, with a reduction of 26% and 25%, respectively. This suggests that sustainable campaigns led by females tend to raise less money compared to others after adding control variables and accounting for multiple fixed effects. This could be attributed to the combination

of gender biases and the higher perceived risk associated with sustainability-oriented projects (Dickel et al. 2018; Hart 1995). The *Sustainable* coefficient is positive and significant only in the baseline model (without control variables and fixed effects). This initially suggests a potential positive effect of sustainability on the raised amount, but the lack of significance in later models indicates that this effect diminishes with additional controls and multiple fixed effects. The *Female* coefficient is statistically insignificant, implying that gender alone does not significantly impact the amount raised when sustainability is not a factor. The summation of the interaction term and *Female* indicates no significant effect on the raised amount of sustainable campaigns initiated by females compared to sustainable campaigns initiated by males. The lack of significant support for the interaction term further reinforces the notion that female-led sustainable campaigns face additional obstacles that reduce their ability to raise substantial funds, even though sustainability itself may attract interest.

Finally, the results of Panel C show that the interaction term of the $Sustainable * Female$ coefficient is negative across all models but statistically insignificant. This suggests that the interaction between female-led and sustainable does not significantly impact the number of backers. Similarly, the *Sustainable* coefficient is statistically insignificant in any model, indicating that sustainability alone does not significantly impact the number of backers. The *Female* coefficient is positive and becomes statistically significant in column (5), suggesting that female-led campaigns may attract more backers when adding control variables and accounting for multiple fixed effects. Further, the summation of the interaction term and *Female* indicates no significant impact on the number of backers of sustainable campaigns initiated by females compared to sustainable campaigns initiated by males.

Although Greenberg and Mollick (2015) find that women are more likely to succeed in reward-based crowdfunding campaigns, this success is often sector-dependent, and campaigns led by women may still be at a disadvantage in fields where male leaders are more prevalent. This under-representation of women in leadership roles may contribute to the negative effect observed in female-led sustainable campaigns. The results highlight some challenges for female-

led sustainable campaigns, particularly regarding raising funds and achieving campaign success. Sustainability alone does not appear to offer a significant advantage across outcome measures, and female-led campaigns encounter distinct obstacles, especially regarding success rates. However, additional backers may be attracted to female-led campaigns.

Given the discussion above, I support **H3**, as sustainable crowdfunding campaigns initiated by females have a negative impact on the success rate.

Table 4.7: Success, Sustainability, and Gender

	(1)	(2)	(3)	(4)	(5)
Panel A: Success Rate					
Sustainable*Female	-0.0553*	-0.0308	-0.0488*	-0.0577**	-0.0589**
	(0.0278)	(0.0235)	(0.0283)	(0.0276)	(0.0269)
Sustainable	0.00531	0.00608	-0.0134	-0.00763	0.00732
	(0.0686)	(0.0392)	(0.0300)	(0.0285)	(0.0196)
Female	-0.0289	-0.0510***	-0.0529***	-0.0547***	-0.0394***
	(0.0255)	(0.0147)	(0.0128)	(0.0129)	(0.00960)
Sustainable*Female + Female	-0.084	-0.082	-0.102	-0.112	-0.098
P-Value	0.044	0.005	0.002	0.001	0.000
N	13,824	13,824	13,778	13,308	13,307
R^2	0.001	0.199	0.318	0.354	0.374
Panel B: Raised Amount					
Sustainable*Female	-0.116	-0.0484	-0.189	-0.262*	-0.246*
	(0.107)	(0.157)	(0.163)	(0.146)	(0.132)
Sustainable	0.512*	0.231	0.118	0.177	0.145
	(0.299)	(0.263)	(0.234)	(0.210)	(0.0878)
Female	-0.121	-0.0763	-0.0830	-0.0750	0.0142
	(0.125)	(0.0933)	(0.0840)	(0.0848)	(0.0575)
Sustainable*Female + Female	-0.237	-0.125	-0.272	-0.337	-0.232
P-Value	0.204	0.547	0.211	0.081	0.136
N	13,824	13,824	13,778	13,308	13,307
R^2	0.003	0.182	0.305	0.354	0.386
Panel C: Number of Backers					
Sustainable*Female	-0.0693	-0.0414	-0.0252	-0.0612	-0.0742
	(0.168)	(0.174)	(0.148)	(0.142)	(0.117)
Sustainable	0.154	0.0823	-0.0467	-0.0203	0.0236
	(0.233)	(0.211)	(0.155)	(0.145)	(0.123)
Female	0.0432	0.0409	0.0388	0.0474	0.103**

Continued on next page

Table 4.7: Success, Sustainability, and Gender (Continued)

	(1)	(2)	(3)	(4)	(5)
	(0.0925)	(0.0769)	(0.0602)	(0.0568)	(0.0465)
Sustainable*Female + Female	-0.026	-0.001	0.014	-0.014	0.029
P-Value	0.902	0.998	0.935	0.930	0.810
N	13,824	13,824	13,778	13,308	13,307
R^2	0.001	0.045	0.176	0.217	0.235
Time Fixed Effect	No	No	Yes	Yes	Yes
City Fixed Effect	No	No	No	Yes	Yes
Industry Fixed Effect	No	No	No	No	Yes
Control Variables	No	Yes	Yes	Yes	Yes

Note: This table reports the result of Equation 4.3 investigating the impact of having a sustainable campaign initiated by a female on the success rate, raised amount, and number of backers. The key dependent variables are the log raised amount, the success rate, and the log number of backers. The main parameter of interest is the interaction term between *Sustainable* dummy, which takes the value of 1 if a campaign uses sustainability when producing its service/product and 0 otherwise, and *Female*, which takes the value of 1 if the campaign was initiated by a female and 0 otherwise. Column (1) contains no control variables or fixed effects. From column (2) to column (5), I gradually added control variables, time, city, and industry fixed effects, respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively. Standard errors are clustered at the industry level.

4.9 Conclusion

This chapter focuses on examining the impact of initiating a sustainable campaign on three key crowdfunding outcomes: the success rate, the raised amount, and the number of backers. Additionally, it explores whether female-led sustainable campaigns perform differently across these dimensions. Using a dataset of non-investment crowdfunding campaigns initiated in the UK between 2018 and 2022, the analysis provides new insights into the role of sustainability and gender in crowdfunding performance.

The findings indicate that while sustainable campaigns tend to raise more funds compared to non-sustainable ones, they do not significantly improve the likelihood of campaign success or attract a higher number of backers. This suggests that although backers may value sustainability and contribute larger amounts to such projects, sustainability alone does not guarantee broader campaign success or wider backer engagement.

Furthermore, results show that campaigns led by women face notable disadvantages. Female-led campaigns are found to be less likely to succeed and, in contrast to expectations, do not raise significantly more funds than male-led campaigns. Even though female entrepreneurs often attract a supportive network of backers, as highlighted in previous studies, this support does not seem sufficient to overcome the systemic challenges they encounter in crowdfunding environments.

This study makes several contributions to the existing literature; first, it extends research on sustainable entrepreneurship by providing empirical evidence from the non-investment crowdfunding context, showing that while sustainability can enhance the amount raised, it does not necessarily translate into higher success rates or broader backer engagement. Second, it contributes to the literature on gender dynamics in crowdfunding by confirming that female-led campaigns continue to face structural barriers, even within newer financing models like crowdfunding. Finally, by examining the intersection of sustainability and gender, this study highlights the complexity of crowdfunding outcomes and offers a nuanced understanding of how different campaign characteristics influence performance.

Overall, these results highlight the persistent barriers that female entrepreneurs face when seeking crowdfunding, despite the potential appeal of sustainability-focused initiatives. They also underscore the complexity of crowdfunding dynamics, suggesting that sustainability, while positively influencing the amount raised, does not act as a universal driver of campaign success. Further research is needed to better understand how gender and sustainability interact to shape crowdfunding outcomes, and how structural biases within the crowdfunding market might be addressed to create a more equitable funding environment.

Chapter 5

Conclusion

This thesis investigates the dynamics of crowdfunding in the context of external shocks, industry-specific responses, and the role of sustainable entrepreneurship. Chapters 1 and 2 provide a comprehensive analysis of how crowdfunding campaigns in the UK were influenced by the COVID-19 pandemic, with a particular focus on campaign characteristics and industry variations, while Chapter 3 investigates the role of sustainability in crowdfunding success.

The first chapter examines the effects of COVID-19 on the success rate, number of backers, and the amount raised by crowdfunding campaigns. By analysing data from 24,243 campaigns between 2018 and 2021, the study reveals that while the pandemic did not significantly affect the number of backers or funds raised, it did impact other campaign characteristics. Shorter-duration campaigns and those with lower funding goals experienced higher success rates, suggesting that backers favoured campaigns perceived as more achievable during uncertain times. This finding underscores the importance of campaign characteristics in determining crowdfunding success during global crises. The insights from this chapter offer practical recommendations for entrepreneurs seeking funding during times of economic uncertainty, particularly emphasising the value of shorter campaigns and lower goal amounts. The impact of COVID-19 on crowdfunding outcomes is not straightforward and depends on other factors like campaign duration and goal size. It explains that COVID-19 had a positive effect in certain campaign settings but did not necessarily lead to an overall increase in raised amounts or backers when considered alone.

In the second chapter, the focus shifts to understanding how COVID-19 affected different crowdfunding industries in the UK. Using a DiD model to analyse data from four major platforms, the study finds that campaigns requiring physical gatherings were significantly impacted by the pandemic. However, the effects varied across industries: while the cultural and creative sectors faced declines in funds raised, the entertainment industry experienced an increase in campaign success. This chapter contributes to the literature by addressing a gap in research regarding how external shocks influence crowdfunding across different sectors.

The third chapter examines the role of crowdfunding in supporting sustainable entrepreneurship, a rapidly growing sector in light of global initiatives such as the Paris Climate Agreement. This chapter explores whether campaigns focused on sustainability perform better in crowdfunding markets compared to others. Despite growing interest in sustainable entrepreneurship, the study finds that sustainable campaigns did not necessarily outperform non-sustainable ones in terms of success rates or raised amounts. Additionally, campaigns initiated by women faced additional challenges in securing funds. This chapter contributes to the literature by shedding light on the challenges and opportunities of financing sustainable ventures through crowdfunding, providing insights into the potential and limitations of crowdfunding as a tool for supporting environmentally and socially responsible businesses.

Overall, this thesis contributes to the growing body of literature on crowdfunding by exploring its role in times of crisis, its varying effects across industries, and its potential for supporting sustainable entrepreneurship. The findings highlight the resilience of crowdfunding as a financing model during external shocks like the COVID-19 pandemic, as well as the need for tailored strategies to maximise campaign success. Policymakers and crowdfunding platform managers should consider encouraging shorter campaign durations and lower funding goals during times of uncertainty to increase success rates. Additionally, the study suggests that promoting digital financial inclusion could help democratise access to crowdfunding, particularly for entrepreneurs in smaller regions.

Future research could explore the long-term effects of COVID-19 on crowdfunding as markets recover, as well as comparing the impacts of different crowdfunding models. Further, examining the role of government interventions or technological innovations on crowdfunding platforms during crises would provide valuable insights. Moreover, future studies could investigate how crowdfunding campaigns targeting sustainable projects can be optimised to achieve better outcomes, with a focus on overcoming barriers such as gender disparities in funding. These areas of research will help deepen our understanding of the evolving landscape of crowdfunding and its potential to address both economic and social challenges in the future.

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