Can event studies be applied to non-stock listed organizations? – The impact of COVID-19 on social media p2p fundraising

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ABSTRACT

Event studies are a powerful tool to study the impact of a sudden, unexpected event on the stock market value of a company. Having stock market data is one essential prerequisite. However, this requirement prevents applying the method to non-stock listed organizations, such as the non-profit sector or specific divisions of a company. This paper justifies whether and how it is possible to adapt event studies to other contexts. We showcase this adaptation by studying the impact of the start of the COVID-19 crisis on a new digital fundraising channel, namely social media peer-to-peer fundraising. We show that in contrast to previous crisis literature, COVID-19 positively impacted this channel. Our research further indicates that a non-profit's public rating and its cause matters to fundraiser initiators on social media p2p fundraising during a crisis.

Key words: *event study, non-profit organizations, COVID-19*

Track: *Digital Marketing & Social Media*

1 INTRODUCTION

Without event studies, we would have little evidence of corporate finance's key issues (Kothari, Leone, & Wasley, 2005). With them, we have gained in-depth insights into the impact sudden events can have on organizations. Event studies are not only popular in finance but also at the intersection of marketing and finance.

Yet, event studies have only been used to analyze the impact of events on stock-listed organizations. A key aspect of stock market valuations is that the decisions to buy or sell are forward-looking. In contrast, other potential time-series observations, such as sales or profits, are backward-looking and thus exhibit different behavior. Further, under the assumption of a perfect market, stock markets react fast (nearly instantly) to external changes. Again, this is often not a given in non-stock-listed contexts, such that applications of event studies to non-stock listed organizations are sparse (one of the very few exceptions is Barber & Lyon, 1996).

Limiting event studies to stock-listed companies means missing many opportunities to analyze events outside this limited context. For example, studying the impact of an event on sub-divisions of companies isn't possible. Further, we cannot explore entire branches, which are not listed. Examples here include the non-profit sector or governmental structures. We think event studies may shed light on these areas if they are carefully adapted to fit these alternate contexts when critically reflecting on their theoretical assumptions.

A concrete example of an alternate context, which serves as the study context of this paper, is social media peer-to-peer (p2p) fundraising and the impact of the start of the COVID-19 crisis on this new digital fundraising channel. Social media p2p fundraising's importance is steadily rising. In March 2021, Facebook, the largest platform for this channel, reported continued exponential growth. The impact of the COVID-19 crisis on the channel is of particular interest because previous research emphasized how vulnerable non-profits are in times of crisis (Lin & Wang, 2016). Therefore, professional fundraisers working for non-profits need to know how this new tool withstands crises. For these reasons, we aim to answer the question: How did the start of the COVID-19 crisis impact social media p2p fundraising?

We aim to use event studies to answer our question and thus, use the event study method on non-stock listed organizations. Our work delivers significant methodological and managerial contributions. We showcase that event studies can be adapted to non-stock listed organizations and explain how to perform this adaptation. We further highlight what type of data is necessary and where adaptations are not realistic. We deliver managerial implications for non-profits about the new digital fundraising channel social media p2p fundraising.

2 EVENT STUDIES

The event study method stems from finance. Still, we use it in other areas of social sciences like marketing (Woodroof, Deitz, Howie, & Evans, 2019). Sorescu, Warren, and Ertekin (2017) explain that most of the knowledge on the effect of marketing on firm value comes from event studies as well. Marketers mostly use event studies to study corporate events issued by firms directly. One example is new product announcements (Bornemann, Hattula, & Hattula, 2019). Most event studies assess the extent to which an event that carries new information creates abnormal stock returns. Abnormal Returns (AR) are the difference between observed and expected returns in the absence of the event. In most cases, the mean (in cross-section or over time) AR around the event's occurrence is the focus of the analysis, but they use other measures like change in return variance and trading volume. Despite this, event studies generally follow the seven basic steps listed in Table 1.

	Seven steps of an event study
1	Define the event of interest and identify the event date(s). Precise identification of the event date is important but not always feasible.
2	Define the event window and estimation window and define alternate windows for robustness checks.
3	Select the sample organizations, examine confounding effects, and define a strategy to address these.
4	Select an appropriate asset pricing model and calculate the normal returns and the abnormal returns (ARs) to the sample organizations. I.e., the market model: $E(R_{it}) = \alpha + \beta\ (R_{mt})$
5	Aggregate the ARs in cross section and/or over time to obtain cumulated abnormal returns (CARs): $CAR_i = \sum_{t=T_0}^{T1} AR_{i,t}$ and $CAR_t = \sum_{i=1}^{N} AR_{i,t}$ where $i = 1, \ldots N$ index of firm in sample. T_0: start of the event window, T_1: end
6	Determine the best tests of significance and their power and test for statistical significance of the aggregated ARs
7	Perform cross-sectional tests (e.g., regression) to explain the ARs or CARs by characteristics specific to the event observation and if necessary, control for sample selection bias

Table 1: Seven steps of event studies

We define the event in step 1. The event window defined in step 2 is when the researchers expect the event's repercussions to occur. In step 3, the researchers define the sample organizations and determine if confounding events exist. If there are confounding events, they need to decide on a strategy to handle these. In step 4, the researcher uses the estimation window (from step 2) to estimate the model behind the expected returns. Sorescu et al. (2017) the frequently used capital asset pricing models for this step. They derive the abnormal returns, e.g., the excess return of an organization i at time t, which indicates whether an organization develops better or worse than the market average at time *t*. We calculate the cumulative abnormal returns (CARs) from the abnormal returns (step 5: Table 1) before the significance of the event is determined (step 6). Finally, we use cross-sectional analyses to explain why the event had the impact it had. These seven steps are the suggested path for researchers to follow but are mostly seen as loose suggestions.

2.1 Theoretical Foundations

Event studies rely on the capital market efficiency assumption (Sorescu et al., 2017). Researchers frequently consider that stock market data fulfills this assumption: stock prices reflect all publicly available information, and they instantly change to reflect new information when it becomes available. It is assumed investors use new knowledge immediately to adjust their expectations of an organization's future cash flows.

It is possible to generalize this concept in the following way:

1. The dependent variable under consideration must be forward-looking and must rapidly absorb information.
2. The event under consideration must be unanticipated and its effect immediately.
3. No confounding events should occur around the event date.

These assumptions form the base layer to build event studies on, but how well they hold up in the areas that researchers study, varies. As Sorescu et al. (2017) highlight, there is a lack of consistency in the design of event studies.

2.2 Interpretation of Event Study Design and Assumptions

We observe some degrees of freedom in how researchers design event studies, as in Sorescu et al. (2017). The one constant is the dependent variable: abnormal stock returns.

The marketing literature studies a wide range of events. Most of them are corporate announcements directly issued by firms like product announcements (Sharma, Saboo, & Kumar, 2018) or external events, such as product design awards (Boyd & Kannan, 2018). Outside of the marketing domain, event studies are also used to study the impact of broader economic events, like the global financial crisis (Cayon, Sarmiento-Sabogal, & Shukla, 2016). As noted in, e.g., in Bhagwat, Warren, Beck, and Watson (2020), researchers sometimes must soften the assumption that an event was unanticipated. The authors state that corporate sociopolitical activism is often part of a company's brand image. Thus, investors may expect such events from certain types of brands and learn to anticipate them. Despite this, researchers use event studies to analyze such events.

These examples demonstrate that researchers have some flexibility when the underlying core assumptions are likely not 100% fulfilled in the studied specific context. It is a method where the scientific community tolerates non-adherence to the rules to a (latent) point. This variety in event studies shows how powerful this method is and indicates why extending it to other dependent variables other than stock returns could be interesting.

3 BACKGROUND ON SOCIAL MEDIA P2P FUNDRAISING

3.1 Social Media p2p Fundraising

Social media p2p fundraising is a recently launched fundraising channel for non-profit organizations on social media platforms. It allows non-profits to let any users on the platform fundraise in their name, targeted to the user's network that is typically not reachable for a non-profit. Common causes for the social media p2p fundraisers are birthday events.

P2p fundraisers are not a new idea, but outside of social media, their leverage is limited. They used to be limited to placing a shoebox for donations at a birthday party entrance or other social events in the offline world. The social ties created by social media may prove ideally suited for turning social media p2p fundraising into a powerful fundraising channel for non-profits.

3.2 Critical Reflection on the Suitability for the Event Study Method

We know event studies require a forward-looking dependent variable that absorbs new information or sudden changes fast. We believe the elements of our question fulfill these criteria. When social media users decide to start a fundraiser, they look into the future by reflecting on two decisions, first, whether to start a fundraiser or not, and second, which non-profit, respectively, which cause, is most worthy to support. The first decision impacts the overall number of started fundraisers and, thus, overall donations. The second decision implies that some non-profit organizations benefit more than others, when a crisis starts. Information spreads rapidly on social media, and decisions are changed as rapidly as new content arrives. Transferring this rapid adaptation to new information to the social media p2p fundraising world appears justified.

The events used in event studies need to be sudden and unanticipated. The first wave of the COVID-19 crisis took the entire world by surprise. In weeks, it spread across the globe and grew from being a concerning new illness to a pandemic without warnings. In the first days of March, lockdown announcements and restrictions on the freedom of movement spread worldwide. As such, we also see this criterion as fulfilled.

4 DATA AND SET-UP OF THE EVENT STUDY

We aim to show how to extend event studies to non-stock-market contexts. We also want to understand more about social media p2p fundraising. Specifically, what was the impact of the COVID-19 crisis on the non-profits? Did the start of COVID-19 impact non-profits in different countries equally? And what factors drove the differences in performance?

As two exemplary countries, we concentrate on the U.S.A as the largest donation market and Germany, as the largest European donation market. To disentangle the factors that drove the performance of social media p2p fundraisers across non-profits. We draw on cross-sectional tests based upon the CARs determined in the event study and compare these factors to a pre-COVID time. For U.S.A, we will focus on the 100 largest non-profits in the U.S.A according to Forbes and for Germany according to the DZI (Deutsches Institut für soziale Fragen).

4.1 Data

We collected data on social media p2p fundraising evolution from the largest platform for social media p2p fundraising today: Facebook. For each of the 200 non-profits in our sample, we tested whether the non-profit enabled fundraising via their Facebook page. If so, we manually extracted all publicly displayed fundraisers of the non-profit. Furthermore, we complement the data with publicly available information on the non-profits and the crisis itself.

In the U.S.A, we observe 1.31 more fundraisers than in Germany. The donations collected in the U.S.A exceed those collected in Germany by a factor of 7.84. It suggests the two markets may show very different behaviors. Further, in the U.S.A, the average number of donors is 2.82 times higher than in Germany, and the difference between the average amounts donated is even more considerable at 6.25.

4.2 Adaptation of the Event Study Method

We study the start of the COVID-19 crisis. We focus on the start of the crisis because it came as a surprise to the world. We define the beginning of the rise in public perception as the start date for the crisis, i.e., the 2nd March 2020 for the U.S.A and the 7th March 2020 for Germany. We run sensitivity tests by varying the event window in length from 2 to 30 days. Following Homburg, Vollmayr, and Hahn (2014), we select the window with the highest significance for the cross-sectional analysis. For the U.S.A, this is the event window [0,10], and for Germany, it is [0,5]. The estimation window is 200 days long, following Feng, Morgan, and Rego (2019). As all firms in the sample experience the event, our event study only shows how much more – or less – an organization is affected compared to the overall market.

Step 4 of the traditional event study method requires modifications, as we observe a high number of zeros for the dependent variable, i.e., the nonprofits' number of fundraisers. To calculate daily returns, financial metrics suggest dividing the difference in the dependent variable between two days by the observed number on a day to obtain the relative difference (Sorescu et al., 2017). However, we cannot follow this suggestion because of the number of zeros in the data, which analysis. Thus, our "fundraiser returns" $F_{i,t}$ are calculated like this:

(2) $$F_{i,t} = Fundraisers\ created_{i,t} - Fundraisers\ created_{i,t-1}\ ,$$

Where i represents the i^{th} non-profit of the sample and t a day in the observation period. The next question is what model to use to calculate the expected returns of the dependent variable. We propose to adapt the market model. We believe that because the data is forward-looking, we can calculate a β and α coefficient just like for stock market data. We regress $F_{i,t}$ for each non-profit against $F_{m,t}$ which represents the "fundraiser" returns for the entire market. β is the slope of the linear regression line, and α the intercept of the line with the y-axis. For all the next steps we refer to the standard event study method. In step 6, for the tests of statistical significance, we must choose a test. We selected the cross-sectional test presented by Gong (2009).

One set of potential drivers relate directly to a non-profit's characteristics. As Morreale (2011) suggests, the cause can shape a non-profit's performance stability during a financial crisis. We use the categorization defined by the International Classification of Nonprofit Organization (ICNPO). Two independent coders judged the most suitable cause for a non-profit based on its mission statement. Besides the cause, we also characterize non-profits according to their size, which can indicate trustworthiness. We tracked this information using yearly total donation volume as recorded by the DZI in Germany and Forbes in the U.S.A. In addition, we collected the non-profits' age, which allows us to evaluate how established a non-profit is.

The second set of drivers relates to how non-profits engage on social media and Facebook specifically. We collect data on the number of fans on social media because it indicates the likelihood that another user will join the community (Dhaoui & Webster, 2021) and the number of potential fundraisers a non-profit can directly reach. As a measure of the non-profits posting activity, we collect the number of photos posted (de Vries, Gensler, & Leeflang, 2012). Further, the age of the Facebook profile of a non-profit may indicate how stable its position is on Facebook. As the final indicator, the non-profit's publicly available rating on social media may underline a non-profit's trustworthiness. Facebook reports a non-profit's user rating on a scale of 1 to 5, with 5 being the best score. We call this measure the Facebook rating of a non-profit.

5 RESULTS

5.1 Performance Comparison of Non-Profits During the Crisis: Event Study

We turn to the results of the event study method. Through the significance tests we can determine whether each non-profit performed significantly better than the market. Overall,

25.71% of U.S.A non-profits exhibit a significant CAR in the event period and 16.00% of German non-profits. More non-profits in Germany perform as suggested by the market model than in the U.S.A. The distribution of the CARs is also different in the U.S.A and Germany. There are only two non-profits with significantly positive CARs in the U.S.A, but these have an average CAR of 12.06. This indicates that the positive impact of the crisis concentrates on two non-profits. On the other hand, there are 16 non-profits with a significantly negative CAR with an average of -1.51. In Germany, the image is more balanced. Five non-profits have a significantly positive CAR, with an average CAR of 1.09. Three non-profits have a significantly negative CAR with an average CAR of -1.70.

Further, we observe that overall, the social media p2p fundraising performance outperforms the expectations during the COVID-19 crisis. In Germany this effect is not as sudden and more gradual, but in the U.S.A we observe a sharp rise right at the start of the COVID-19 crisis of 210%.

5.2 Characteristics Related to a Good Performance: Cross-sectional Tests

We aim to understand why certain non-profits overperformed the market. We return to the CARs and use an OLS regression to examine which external drivers drive the changes. As independent variables we use the non-profit's characteristics and non-profit's Facebook presence. The results are visible in Table 2.

Variables	Model 2: CAR for U.S.A non-profits	Model 1: CAR for German non-profits
Constant	3.55 (1.73) *	-0.41 (1.04)
Non-profit's characteristics		
Donation amount in 1,000,000	-0.85 (0.11)	0.02 (0.01)
Causes	Only social services significant: 3.43 (1.79) *	No cause significant
Non-profit's Facebook presence		
Facebook likes in 1,000,000	2.98 (0.92) **	-2.60 (6.67)
Facebook: Photos posted in 1,000	-0.18 (0.31)	-0.01 (0.02)
Facebook: visits to non-profit in 1,000	-0.02 (0.02)	-0.23 (0.75)
Facebook: rating	0.59 (0.27) *	0.10 (0.17)
Dependent variables	CAR per non-profit	CAR per on-profit
R-squared	0.38	0.19
Observations	70	50
Note: Significance level $\alpha = 0.01$ → ***, $\alpha = 0.05$ → **, $\alpha = 0.1$ → *		

Table 2: Regressions of the CARs for each country against the social media p2p fundraiser drivers

We can immediately see some differences between Germany and the U.S.A. First, the R-squared of the model in Germany is half that of the U.S.A model. Second, none of the independent variables in the model have a significant impact on the CARs in Germany. Consequently, none of these are the reasons why German non-profits out- or underperform the market at the start of the COVID-19 crisis.

In the U.S.A, we do observe certain drivers with a significant impact. "Social services" non-profits have a weakly significant ($p<0.1$) higher likelihood of outperforming the market

than “international development aid” non-profits. We classified two non-profits with a positive and significant CAR as “social services” non-profits. Furthermore, the number of likes a non-profit has significantly ($p<0.05$) increases its CAR. Finally, the rating of a non-profit also increases its CAR. This effect is only weakly significant ($p<0.1$).

We see how the COVID-19 crisis impacted the social media p2p fundraising on Facebook. The COVID-19 crisis changed how certain drivers impact social media p2p fundraising. It is clear how vital a non-profits social media presence was in leading it to outperform the market during the COVID-19 crisis. The results of this section also confirm what we saw in previous sections. The impact of the crisis is less evident in Germany than in the U.S.A.

6 SUMMARY

Our first contribution is to showcase that it is possible to adapt the event study method to other, non-stock-market dependent variables. Thereby, we reflect on the core assumptions and summarize previously accepted approaches if some of the assumptions are unfulfilled. Thus, we provide guidelines on adapting the method to completely new settings – apart from the studied social media p2p fundraising and COVID-19 context, as studied in our paper.

We show how we can estimate a “Market model” even when there are many consecutive zeros in the data. In this case the model does not reflect relative, but absolute changes. This also involves differences in the interpretation of the results but does not create problems with their reliability. We believe replacing our research question on social media p2p fundraising with other suitable data would also deliver plausible results. It may be a possibility for extending our research: For example, to answer the question: how does a new medical imaging device improve patient satisfaction with a hospital?

The dependent variable must fulfill two essential criteria to be suitable for event studies: 1. It should be forward-looking, i.e., the decision-makers are interested in the development of the organization/situation. 2. The data must reflect changes instantly or within one period.

Regarding fundraising in times of a crisis, past research found crises have a negative impact on donations (Morreale, 2011) and a negative business impact (Johansson, Dimofte, & Mazvancheryl, 2012). For the COVID-19 crisis, we show the image is much more nuanced: namely, that the crisis has a considerable positive impact on social media p2p fundraising.

The positive spike may reflect a shift in fundraising from traditional offline channels to digital channels. In this case, we would expect a negative impact on overall donation volume (online + offline), despite increases in social media p2p fundraiser numbers. Public donation reports for 2020 point in the opposite direction: In general, the willingness to donate increased across all channels, and non-profits experienced higher donation volumes consistent with the observations in the studied new digital fundraising channel. Hence, we find it rather unlikely that cannibalization effects occurred.

Another goal was to investigate what differences exist between our two focal markets: Germany and the U.S.A. Overall the U.S.A is the more profitable market. While each fundraiser raises more money than in Germany, the market in Germany is growing rapidly and approaching the size of the U.S.A market (by fundraisers created if not by donation volume). In the U.S.A, the COVID-19 crisis led to a sharp rise in fundraising, creating the type of effect ideally suited for event studies. In Germany, the development was much more gradual and spread over a more extended period.

BIBLIOGRAPHY

Barber, B. M., & Lyon, J. D. (1996). Detecting Abnormal Operating Performance: The Empirical Power and Specification of Test Statistics. *Journal of Financial Economics, 41*(1), 359-399.

Bhagwat, Y., Warren, N. L., Beck, J. T., & Watson, G. F. (2020). Corporate Sociopolitical Activism and Firm Value. *Journal of Marketing, 84*(5), 1-21.

Bornemann, T., Hattula, C., & Hattula, S. (2019). Successive product generations: financial implications of industry release rhythm alignment. *Journal of the Academy of Marketing Science, 48*(6), 1174-1191.

Boyd, D. E., & Kannan, P. K. (2018). (When) Does Third-Party Recognition for Design Excellence Affect Financial Performance in Business-to-Business Markets? *Journal of Marketing, 82*(3), 108-123.

Cayon, E., Sarmiento-Sabogal, J., & Shukla, R. (2016). The effects of the global financial crisis on the Colombian local currency bonds prices. *Journal of Economic Studies, 43*(4), 624-645.

de Vries, L., Gensler, S., & Leeflang, P. S. H. (2012). Popularity of Brand Posts on Brand Fan Pages: An Investigation of the Effects of Social Media Marketing. *Journal of Interactive Marketing, 26*(2), 83-91.

Dhaoui, C., & Webster, C. M. (2021). Brand and Consumer Engagement Behaviors on Facebook Brand Pages: Let's have a (Positive) Conversation *International Journal of Research in Marketing, 38*(1), 155-175.

Feng, H., Morgan, N. A., & Rego, L. L. (2019). The impact of unprofitable customer management strategies on shareholder value. *Journal of the Academy of Marketing Science, 48*(2), 246-269.

Gong, S. X. H. (2009). Event Study in Transport Research: Methodology and Applications. *Transport Reviews, 29*(2), 207-222.

Homburg, C., Vollmayr, J., & Hahn, A. (2014). Firm Value Creation through Major Channel Expansions: Evidence from an Event Study in the United States, Germany, and China. *Journal of Marketing, 78*(3), 38-61.

Johansson, J. K., Dimofte, C. V., & Mazvancheryl, S. K. (2012). The Performance of Global Brands in the 2008 Financial Crisis: A Test of Two Brand Value Measures. *International Journal of Research in Marketing, 29*(3), 235-245.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics, 39*(1), 163-197.

Lin, W., & Wang, Q. (2016). What Helped Nonprofits Weather the Great Recession? *Nonprofit Management and Leadership, 26*(3), 257-276.

Morreale, J. C. (2011). The Impact of the “Great Recession” on the Financial Resources of Nonprofit Organizations. *Wilson Center for Social Entrepreneurship, 5*.

Sharma, A., Saboo, A. R., & Kumar, V. (2018). Investigating the Influence of Characteristics of the New Product Introduction Process on Firm Value: The Case of the Pharmaceutical Industry. *Journal of Marketing, 82*(5), 66-85.

Sorescu, A., Warren, N. L., & Ertekin, L. (2017). Event study methodology in the marketing literature: an overview. *Journal of the Academy of Marketing Science, 45*(2), 186-207.

Woodroof, P. J., Deitz, G. D., Howie, K. M., & Evans, R. D. (2019). The effect of cause-related marketing on firm value: a look at Fortune’s most admired all-stars. *Journal of the Academy of Marketing Science, 47*(5), 899-918.