

# How does Social Media Affect Contribution to Public versus Private Goods in Crowdfunding Campaigns?

*Completed Research Paper*

**Yili Hong**

Arizona State University  
Tempe, Arizona  
hong@asu.edu

**Yuheng Hu**

University of Illinois at Chicago  
Chicago, Illinois  
yuhenghu@uic.edu

**Gordon Burtch**

University of Minnesota  
Minneapolis, MN  
gburtch@umn.edu

## **Abstract**

*This paper examines the interplay among crowdfunding campaigns, social media activity and accumulated capital. We construct a panel dataset that incorporates information about crowdfunding campaigns hosted at one of the worlds largest reward-based crowdfunding platforms, IndieGoGo, as well as social media activities relating to the campaign, collected from Twitter and Facebook APIs. We demonstrate that, while social media activities matter in general, buzz on Twitter is more influential for campaigns that intend to produce private goods, because Twitter is more likely to be used for objective information gathering and is therefore a better source for information about product or service quality. In contrast, sharing activities on Facebook are more influential for campaigns that aim to supply a public good, because Facebook primarily supports connections, and thus provides the conditions necessary for the manifestation of social norms. We discuss the theoretical implications for the literatures on social media and crowdfunding.*

**Keywords:** Social media, crowdfunding, social sharing, public good, private good

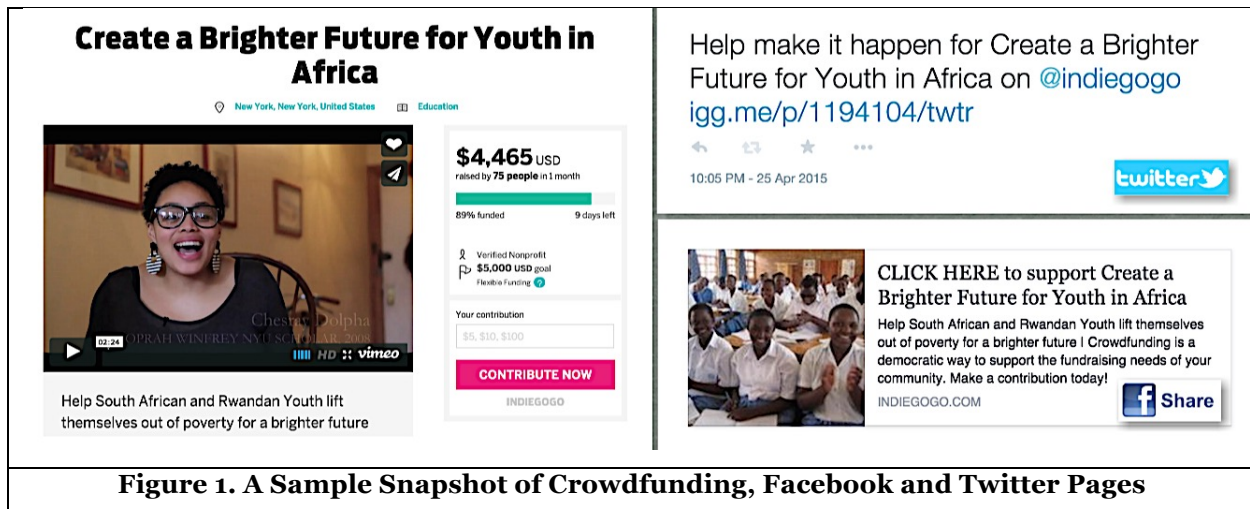
## Introduction

Crowdfunding enables entrepreneurs of all types - whether social, cultural, artistic or for-profit - to raise money from the crowd to pursue new ventures (Mollick 2014). The most successful campaigns engage the crowd early, establishing a large social media footprint before campaign launch, tapping into the social networks of the organizer and early campaign backers (Agrawal et al. 2015), and engaging throughout the course of fundraising (Lu et al. 2014). The resulting sustained buzz helps to ensure fundraising success and increased demand for project output (Burtch et al. 2013). Most crowdfunding platforms provide social media sharing features, such as integrations with Twitter and Facebook, to enable this process. Numerous industry best practices are available on the Internet that instruct campaign organizers on how best to leverage social media in fundraising.

Given the importance of social media in crowdfunding, there is a notable dearth of empirical evidence on the subject. A small body of work has explored the role of social media in crowdfunding campaign outcomes (Lu et al. 2014; Thies et al. 2014), but a number of important questions remain. Past work has tended to treat various forms of social media as direct substitutes, yet even the two most prominent platforms - Facebook and Twitter - have notably different characteristics, which may or may not lend themselves to a particular fundraising effort. Whereas Twitter is more likely to be used for information-gathering purposes, Facebook is more likely to be used to maintain personal social connections. These motivations for using social media can have important implications for the receptiveness of an audience to solicitations for campaign contributions. In particular, Twitter users may be more responsive to information about consumer goods and services (particularly if that information helps them to evaluate quality), whereas Facebook users may be more responsive to information about desirable behaviors in a social group - e.g., contributions in support of a charity or community project, a public good.

Private contribution to public goods has been a subject of interest to researchers in many fields of study, including information systems (Burtch et al. 2013; Xia et al. 2012), economics (Andreoni 1988; Bagnoli and Lipman 1989; Bergstrom et al. 1986) and public administration (Goodsell 1990). Numerous studies indicate the primary role of social image, social norms and conformity in individuals' decisions to contribute to a public good (Andreoni and Bernheim 2009; Becker 1974; Bernheim 1994; Rege 2004; Shang and Croson 2009). In contrast, the literature dealing with individual purchase and consumption has tended to focus on informational factors, namely the notion of search costs and information asymmetry; individuals desire to reduce product quality uncertainty (Akerlof 1970; Dimoka et al. 2012), fit uncertainty (Hong and Pavlou 2014) or valuation uncertainty (Hong et al. 2015) prior to purchasing or contracting. These differences in the characteristics of social media and various crowdfunding campaigns suggest an alignment argument, which we explore empirically, herein. In particular, we seek to answer the following research question: How do campaign objectives (the provision of a public versus private good) interact with social media characteristics to influence subsequent campaign contribution?

Many crowdfunding platforms play host to a mix of campaign types. A prime example is IndieGoGo, one of the world's largest crowdfunding platforms, which juxtaposes campaigns seeking to support for-profit businesses with charitable fundraisers (private and public goods). Campaigns that intend to implement private goods typically raise funds via product pre-order. That is, campaign organizers solicit funds from consumers in exchange for early access to the product, often at a reduced price. In contrast, in the cases of public goods, campaign organizers typically operate on a donation-based model, soliciting contributions by tapping into sympathy, empathy or other social mechanisms. If the campaign is successful, contributors generally do not receive a tangible benefit; instead, the benefit is largely social in nature.



**Figure 1. A Sample Snapshot of Crowdfunding, Facebook and Twitter Pages**

Information exchange on Twitter is quite different than that on Facebook (Hughes et al. 2012). Facebook is a “closed and intimate” social platform where connections tend to follow offline relationships. Conversely, Twitter is a public forum that facilitates follower-following relationships, which is ideally suited to the spread of information (Kwak et al. 2010). Indeed, Twitter exhibits characteristics quite different from those of typical social networks, in that it lacks a power-law distribution in the pattern of connections between users, and there is little evidence of reciprocity. Thus, we would argue that there is a great potential for alignment (or misalignment) between the characteristics of a social media platform that plays host to buzz about a campaign, and the objectives of said campaign. In short, some campaigns are likely to benefit more greatly from social media buzz on Twitter, and others from buzz on Facebook.

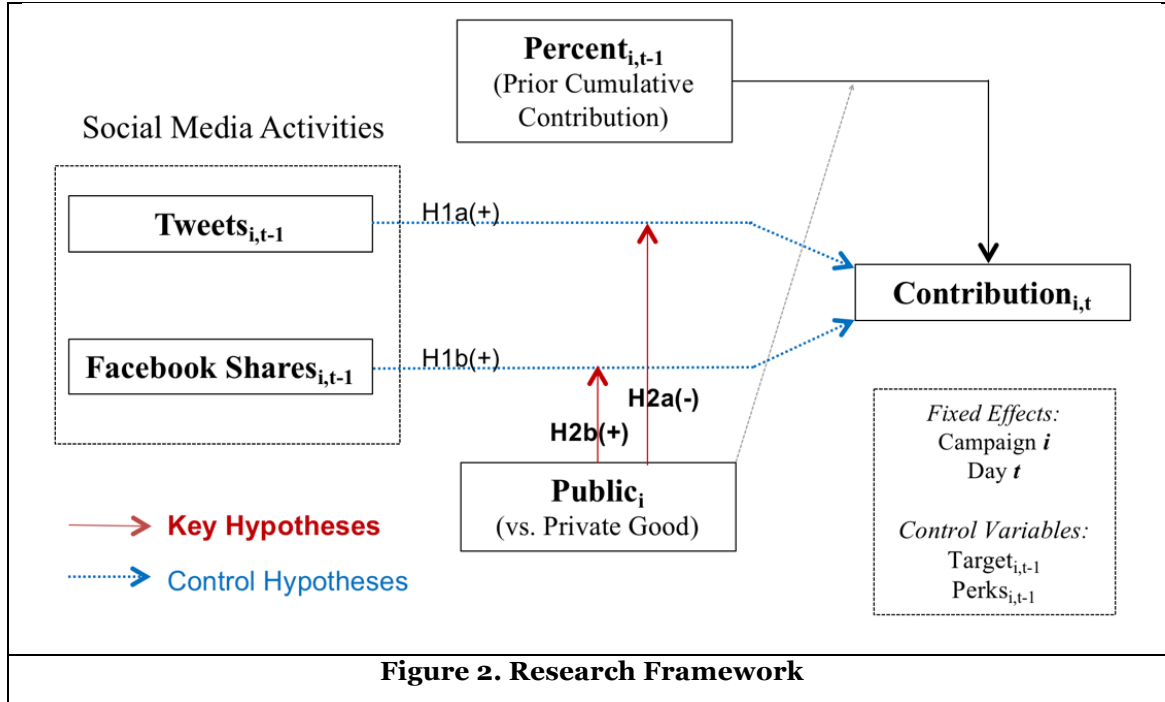
This work contributes to the emerging literature on social media and crowdfunding. Drawing on the theory of task-technology fit (TTF), we propose a number of hypotheses about the interaction between the aforementioned factors, highlighting the importance of alignment. We test our hypotheses using a panel dataset that combines daily observations of campaign fundraising activity on IndieGoGo, with the volume of social media chatter associated with each campaign on Twitter and Facebook. Consistent with our expectations, we demonstrate that social media activity on Facebook delivers a relatively greater benefit to campaigns that are pursuing public goods, whereas activity on Twitter delivers a greater benefit to campaigns pursuing private goods. More specifically, we observe the following marginal effects: on average, a 10% increase in number of tweets related to the campaign increases contribution by 1.75%, whereas a 10% increase in the number of Facebook shares increases contribution by 1.77%. For public good campaigns, a 10% increase in number of tweets related to the campaign increases contribution by only 0.35%, whereas a 10% increase in the number of Facebook shares increases contribution by as much as 5.98%. For private good campaigns, a 10% increase in number of tweets related to the campaign increases contribution by 3%, whereas Facebook shares has no significant effect.

This paper contributes to several streams of literature. First, we add to the emerging literature on the value of social media (Aral et al. 2013) in the context of crowdfunding. In addition to confirming the significant positive effect of social media activity on campaign contribution, we demonstrate the practical importance of alignment between the campaign objectives and social media platform characteristics. Second, we contribute to an emerging literature on crowdfunding (Agrawal et al. 2013; Schwenbacher and Larralde 2010). Our work considers a prominent context, IndieGoGo, which, unlike Kickstarter, allows submission of any and all campaign types. This enables us to compare and contrast the dynamics of both campaign types, to identify interesting differences.

The remainder of the paper proceeds as follows. Section 2 describes the related literature and develops the research hypotheses, which set the foundation for our empirical analysis. Section 3 presents the data, empirical specifications and results. Finally, Section 4 discusses the contributions and implications of our work for theory and practice.

## Literature Review and Hypothesis Development

In this section we review the related literature on social media, crowdfunding and public goods to develop a number of hypotheses. We first establish the simple effect of social media activity on campaign fundraising. We then consider the interactions between the type of social media and campaign characteristics. Our research framework is as shown in Figure 2.



## Social Media and Crowdfunding

Recent years have witnessed a rapidly growing interest in the dynamics of crowdfunding in the Information Systems literature (Burtch et al. 2013; Burtch et al. 2014). Crowdfunding, largely inspired by the success of the crowdsourcing paradigm, enables individuals to pool their money collectively, usually via the Internet, to invest in or support new projects and ventures (Schwienbacher and Larralde 2010). There are four primary types of crowdfunding: reward-based, loan-based, equity-based and donation-based (Burtch et al. 2014). The earliest work in this space considered loan-based crowdfunding, otherwise known as peer-to-peer lending or micro-lending (Lin et al. 2013; Zhang and Liu 2012), wherein a contributor expects repayment of their contribution with interest. Most recently, scholars have begun to focus on equity-based crowdfunding, in which contributors purchase a small ownership stake in the venture (Ahlers et al. 2012; Belleflamme et al. 2014). However, the largest body of work pertains to reward- and donation-based crowdfunding. In reward-based crowdfunding, contributors provide funds in exchange for tangible rewards – e.g., product pre-order (Agrawal et al. 2015; Hu et al. 2015; Mollick 2014). In contrast, in donation-based crowdfunding, contributors have no expectation of tangible compensation. In turn, much of their reasons for contribution derive from social motives (Burtch et al. 2013; Koning and Model 2013; Meer 2014).

Social media channels, such as Facebook and Twitter, are frequently used in crowdfunding, to enable organizers and backers to network and share campaign information with peers, broadcasting and marketing the campaign, soliciting support (Hui et al. 2014; Lawton and Marom 2010). The role of social media in crowdfunding has received considerable attention from various research communities, including information systems (Thies et al. 2014), human-computer interaction (Gerber and Hui 2013) and economics (Lehner 2013). The dominant effort in this line of research has been an examination of the influence of social media and social networks on crowdfunding campaign outcomes. It has been found, for

example, that the probability of campaign success is highly correlated with the size of an organizer's online social network (Giudici et al. 2012; Mollick 2014). Other work has reported that the number of Facebook "likes" a campaign receives positively impacts crowdfunding success (Mossiyev 2013), as does the number of Facebook shares (Thies et al. 2014).

Recent research has also begun to examine the manner in which social media is leveraged by crowdfunding campaigns. Ostensibly, best practice is to establish a social media footprint well in advance of a campaign, and to then leverage that footprint to spread information about the campaign after its launch, to acquire support and resources. Twitter and Facebook are the two most prominent social media platforms at present, enabling people to share, discuss, and communicate with others, they are ideal for use in crowdfunding.

In practice, Hui et al. (2014) report that creators use various forms of social media to ask for support, to activate network connections, to keep in contact with previous and current campaign supporters, and to expand network reach. Social media thus helps campaigns to establish social ties and to improve tie strength with current and potential backers. In turn, this tie strength ultimately enhances the social capital of the creators (Granovetter 1973) and results in a higher likelihood of success (Giudici et al. 2012).

Social media buzz enables the dissemination of campaign information. Given abundant evidence in the extant literature (Giudici et al. 2012; Mollick 2014; Thies et al. 2014) that social media activity positively associates with fundraising, we propose Hypotheses 1a and 1b, as control hypotheses:

*Hypothesis 1: Increases in social media activity on Twitter (H1a) and Facebook (H1b) around a campaign will positively affect contributions to that campaign.*

## **Public Goods and Social Media Alignment**

As noted above, we consider the distinction between two types of campaigns: those pursuing private goods, and those pursuing public goods. Private good campaigns aim to create or produce products or services, to be sold at a profit, where contributors receive a direct benefit from the campaign's success, in the form of a reward. Examples of this include campaigns that raise funds to support the manufacturing of smart phone accessories, video games, and so on. When it comes to the consumption of a public good, the primary factors underlying a purchase decision are product quality and fit. In short, consumers are concerned about the ultimate performance of the product, and the value they are likely to derive from it (Akerlof 1970; Dimoka et al. 2012; Hong and Pavlou 2014).

In contrast, examples of campaigns pursuing public goods might be a documentary about global warming, or a campaign to support individuals that have recently been subject to a natural disaster. Public goods, broadly speaking, benefit others (e.g., society at large), rather than the body of contributors. Research on the private provision of public goods has a long history of study in economics (Andreoni 1988; Andreoni and Bernheim 2009; Bagnoli and Lipman 1989; Becker 1974; Bergstrom et al. 1986; Bernheim 1994), where a variety of studies have noted that much of the decision to contribute to the public good is driven by social norms, conditional cooperation, social image and the like. Recent work in information systems has sought to examine public goods that manifest in online settings, considering, in particular, peer-to-peer file sharing (Adar and Huberman 2000; Gu et al. 2009; Xia et al. 2012) and donation-based crowdfunding (Burtch et al. 2013).

The alignment between social media and crowdfunding campaign type (i.e., a public versus a private good) is likely to play an important moderating role, with respect to our first hypothesis (stated above). The notion of alignment has been examined in various contexts in the information systems literature (Goodhue and Thompson 1995; Kane and Borgatti 2011; Venkatraman 1989). As contingency theory suggests, the alignment between a firm strategy and the business environment is what matters, not the strategy in isolation (Donaldson 2001; Weill and Olson 1989).

The theory of Task-Technology Fit (TTF) provides perhaps the clearest example. TTF holds that IT is more likely to have a positive impact on individual performance if the capabilities of the IT match the tasks that the user must perform (Goodhue and Thompson 1995). Although the original TTF is theorized to understand individual job performance, this theory is appropriate to examine the effectiveness of social media activities on the performance of crowdfunding campaigns with different objectives. The analog in

our context is that, although social media activity may matter in general, its benefits will be jointly determined by the characteristics or objectives of the crowdfunding campaign and the degree to which they align with the social media platform that hosts the social media buzz.

With this grand theoretical guidance, we begin exploring this alignment problem by investigating the nature of the platform characteristics and resulting social relationships that are likely to manifest on different social networking platforms -- Twitter and Facebook (Kane et al. 2014). By design, these two social media platforms are different in nature. Twitter allows a user to follow any number of other users without the followee's consent. As a result, the majority of Twitter users tend not to share sensitive, private, or identifiable information (Humphreys et al. 2010). Twitter is a medium uniquely suited to information broadcasting, rather than traditional social interaction (Kwak et al. 2010). Users generally do not see Twitter as a tool for developing personal relationships; instead, they employ Twitter to acquire objective information (Hughes et al. 2012). These features make Twitter ideally suited for gathering information on products and services, which in turn may help consumers to reduce information asymmetry with respect to products' quality and product fit with consumer preferences.

In contrast, Facebook facilitates online interactions between individuals who typically form offline relationships, first (Hughes et al. 2012). Facebook provides complex privacy control settings (Boyd and Hargittai 2010), thus Facebook users tend to share more private and personal information and Facebook is a venue better suited to social interaction. This social venue provides conditions better suited to the manifestation of social norms, and may be more likely to result in conformity to those norms. This is notable, because peer pressure and social image have been shown to affect private contributions to public goods (Andreoni and Bernheim 2009; DellaVigna et al. 2012), and charitable fundraising in particular (Castillo et al. 2014).

Bearing the above in mind, we expect that campaigns intended to provide private goods will benefit more from activity on Twitter, whereas campaigns that support public goods will benefit more from activity on Facebook. More formally:

*Hypothesis 2a (H2a): Social media activity on Twitter will have a greater benefit for campaigns pertaining to private goods.*

*Hypothesis 2b (H2b): Social media activity on Facebook will have a greater benefit for campaigns pertaining to public goods.*

Besides these two main hypotheses, we also seek to empirically examine a moderating role of campaign objective on the effect of prior contribution on subsequent contribution. Notably, it has been reported that, for public goods, prior contribution crowds-out subsequent contribution (Burtch et al. 2013), because in the presence of greater prior contributions, backers may believe the campaign organizer is more likely reach their goal, and thus will benefit less from additional support. As such, backers respond by putting their funds toward other causes that lack attention. However, for campaigns pursuing private goods, prior contribution could be seen as a quality signal that reduces the uncertainty of backers, thus prior contribution may instead increase subsequent contribution. As this question has partially been addressed in the literature (Burtch et al. 2013), we do not pose a formal hypothesis, but seek to examine it as a supplementary analysis.

## Research Methods

### Data Collection

Our data comes from two sources. We collected daily campaign and contribution data from *IndieGoGo*, a leading online crowdfunding platform. Our data consists of 223 crowdfunding campaigns that span five different categories. We start tracking these campaigns on April 8, 2015. We collected daily snapshots of each campaign at 1:00am EST, each day. At the same time, we also collected social media activity from Facebook and Twitter, in parallel, reflecting the cumulative number of Facebook shares and Tweets

containing the campaign fundraiser URL. Our dataset spans 30 days and includes 5,980 campaign-day observations.

### Variable Definitions and Measures

In line with prior work on crowdfunding (Burtch et al. 2013), our dependent variable is the total dollars contributed to a campaign in a particular day (results are similar for total number of backers in a particular day, omitted for page limit). All non-categorical variables in our analyses are log transformed, which allows us to identify percentage changes in effect. This is appropriate because many of our variables are highly skewed, such as the number of social media shares. Below, we discuss our key measures and report descriptive statistics and pairwise correlations in Table 1.

**Table 1. Descriptive Statistics and Correlation Matrix of Key Variables**

Variable	Mean	St.d.	1	2	3	4	5	6	7	8
1. $\ln \text{funding}_t$	0.818	1.889	1							
2. $\text{public}$	0.548	0.498	0.059	1						
3. $\text{percent}_{t-1}$	17.654	58.300	0.334	0.047	1					
4. $\ln(\text{tweets})_{t-1}$	0.216	0.680	0.365	-0.064	0.147	1				
5. $\ln(\text{fb shares})_{t-1}$	0.184	0.633	0.327	-0.061	0.132	0.527	1			
6. $\text{public} * \text{percent}_{t-1}$	11.055	26.499	0.142	0.379	0.407	0.001	-0.002	1		
7. $\text{public} * \ln(\text{tweets})_{t-1}$	0.097	0.412	0.228	0.213	0.029	0.565	0.187	0.122	1	
8. $\text{public} * \ln(\text{fb shares})_{t-1}$	0.082	0.347	0.259	0.214	0.028	0.207	0.510	0.120	0.410	1

### Measure for Public and Private Campaigns

We categorized campaigns as pertaining to public goods or private goods using three general criteria. First, whether the campaign was non-profit in nature. Second, whether the campaign offered product rewards (small gifts such as, thank you cards, T-shirts and mugs with values much smaller than the contributed amount were excluded from consideration). Third, and last, whether the outcome of the campaign was of primary benefit to others (non-contributors). Based on these criteria, we identified and agreed upon three public goods categories and two private goods categories. Specifically, campaign categories that support the provision of public goods include: Animals, Education and Environment. Campaign categories that support the provision of private goods include: Technology and Gaming. We believe such an approach is appropriate for the following two reasons. First, these categories clearly and comprehensively meet our definition of public goods. Second, two of the authors manually examined the campaign descriptions of all campaigns in this subsample to ensure the non- and for-profit nature of each (126 public campaigns and 98 private campaigns). This was done to confirm the public or private good definition assigned to each campaign in the sample. One caveat of this measurement is that it might also capture altruistic versus non-altruistic nature of the projects.

### Measure for Social Media and Other Variables

We measure social media with two variables, total number of tweets for the campaign in the previous day ( $t-1$ ), and the total number of Facebook shares in the previous day ( $t-1$ ). Prior contribution is measured by

current progress of the campaign, i.e., percentage of the campaign goal achieved prior to the day ( $t-1$ ). This variable indicates the prior cumulative contribution normalized by the campaign target (goal). We also control for campaign target amount and number of perks offered by the campaign organizer, which also vary over time for some projects.

### Model and Estimation Method

Our data is constructed as a campaign-day panel, similar to Burtch et al. (2013). We estimate our model incorporating two-way fixed effects, as reflected in Equation (1). Campaign fixed effects are implemented via a within transformation, and day fixed effects are implemented as a vector of dummies. In this equation,  $i$  indexes campaigns, and  $t$  indexes days.  $X_{i,t-1}$  reflects dynamic campaign level variables, including social media activity and the interaction between social media activity and prior fundraising success, and  $\beta'$  represents the coefficients of interest.

The advantage of this two-way fixed effects model is that it addresses both unobserved campaign level heterogeneity, as well as any unobserved time trends, both important factors. This approach also controls for the unobserved features of the campaign organizer that can reasonably be viewed as time invariant, such as their prior experience in crowdfunding, the size of their offline social network, network position, social capital, and so forth.

$$\ln(\text{contribution}_{it}) = X_{i,t-1}\beta' + \alpha_i + \gamma_t + \varepsilon_{it} \quad (1)$$

### Results

We begin by reporting the main effects of accumulated capital (funds raised to date), and social media activity in Table 5. Based on the results, we observe that increases in the volume of tweets and Facebook shares in the prior period have a significant and positive effect on subsequent contribution. Specifically, on average, a 10% increase in number of tweets related to the campaign increases contribution by 1.75%, whereas a 10% increase in the number of Facebook shares increases contribution by 1.77%. In sum, the results of the main effects model provide strong support for Hypotheses 1a and 1b. Importantly, these results also replicate prior findings, in that they provide evidence positive average effects from social media activity (Thies et al. 2014).

**Table 2. Estimation of Main Effects**

	<i>coefficient</i>	<i>s.e.</i>	<i>t</i>	<i>p</i>
$\text{percent}_{t-1}$	-0.002	0.001	-1.543	0.124
$\ln(\text{tweets})_{t-1}$	<b>0.175**</b>	0.068	2.562	0.011
$\ln(\text{fb shares})_{t-1}$	<b>0.177**</b>	0.077	2.310	0.022
$\ln(\text{goal})_{t-1}$	<b>-0.141***</b>	0.035	-4.072	0.000
$\ln(\text{perks})_{t-1}$	0.005	0.032	0.162	0.871
Constant	<b>2.849***</b>	<b>0.505</b>	<b>5.646</b>	<b>0.000</b>
Observations		5,980		
Within R-squared		0.054		
Number of Campaigns		223		
Project Fixed Effect		Yes		
Day Fixed Effect		Yes		

Notes: 1. Cluster-robust standard errors in parentheses; 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$



**Table 3. Estimation of Interaction Effects**

	<i>coefficient</i>	<i>s.e.</i>	<i>t</i>	<i>p</i>
$percent_{t-1}$	-0.001	0.001	-1.269	0.206
$ln(tweets)_{t-1}$	<b>0.301***</b>	0.083	3.630	0.000
$ln(fb\ shares)_{t-1}$	-0.027	0.071	-0.382	0.703
$public*ln(tweets)_{t-1}$	<b>-0.266**</b>	0.125	-2.128	0.034
$public*ln(fb\ shares)_{t-1}$	<b>0.598***</b>	0.149	4.018	0.000
$public*percent_{t-1}$	<b>-0.011**</b>	0.005	-2.253	0.025
$ln(goal)_{t-1}$	<b>-0.119***</b>	0.030	-3.905	0.000
$ln(perks)_{t-1}$	0.007	0.031	0.236	0.814
Constant	<b>2.532***</b>	0.469	5.396	0.000
Observations		5,980		
Within R-squared		0.068		
Number of Campaigns		223		
Project Fixed Effect		Yes		
Day Fixed Effect		Yes		

Notes: 1. Cluster-robust standard errors in parentheses; 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The baseline main effects provide an indication that social media and prior contribution have the expected average effects on campaign contribution. Below, we report the estimation results for the interaction effects we proposed in the hypotheses section.

In the estimation models, we add our interaction terms, and report the results of this estimation in Table 6. We find differing effects for the interaction between campaign type and tweet volumes, versus that between campaign type and Facebook shares. These results indicate support for our hypotheses relating to the alignment between social media platforms and campaign objectives. Specifically, we observe a negative interaction between our indicator of a public good and tweet volumes, and we observe a positive interaction between our indicator of a public good and Facebook share volumes. These findings indicate that public good campaigns benefit less from Twitter activity than private good campaigns. In contrast, public good campaigns benefit more from Facebook activity than private good campaigns. This second set of results provides full support for hypotheses H2a and H2b. Based on estimates from Table 3, for public good campaigns, a 10% increase in number of tweets related to the campaign increases contribution by only 0.35%, whereas a 10% increase in the number of Facebook shares increases contribution by as much as 5.98%. For private good campaigns, a 10% increase in number of tweets related to the campaign increases contribution by 3%, whereas Facebook shares has no significant effect. Below, we provide marginal effects plots to visualize these interactions effects.

Further, as an extension to Burtch et al. (2014), which examined the “crowding out” effect for a single type of public goods campaign (journalism), we empirically examine how prior contribution affect subsequent contribution for different types of campaigns. Interestingly, we found that prior contribution has a negative effect on contribution in the current period, only for public good campaigns. This may be due to a “crowding out” effect as documented.

### ***Interaction Effects Plots***

Figure 3 presents plots of our two interaction effects, based on the interaction effects estimations.

Figure 3a depicts the interaction between public good status and the number of tweets issued in the prior day in relation to the target campaign. We calculate and plot the predictive margins of public versus private good status over the range of tweet volumes. From this plot, we again observe that both private and public goods benefit from an increase in tweets; however, the effect is much stronger for private good campaigns. Figure 3b depicts the interaction between public good status and the number of Facebook shares of the campaign URL in the prior period. We calculate and plot the predictive margins of public versus private good status over the range of Facebook share volumes. Here, we observe that private good campaigns do

not benefit from Facebook shares, because the slope is almost horizontal); however, we observe a clear positive effect for public good campaigns, because the slope is clearly positive.

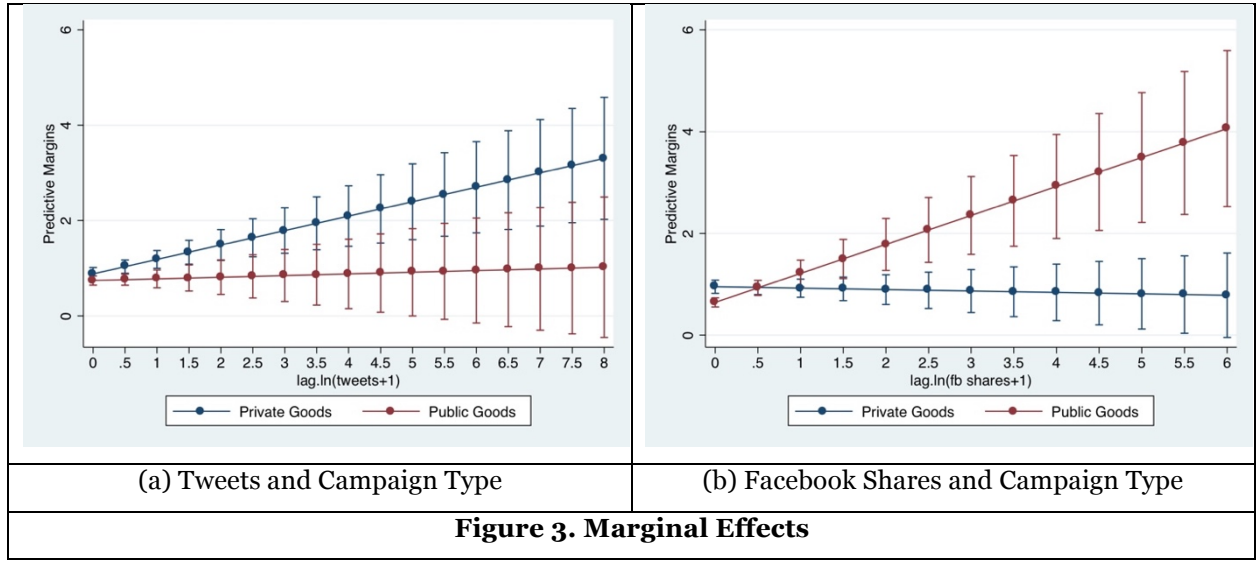


Figure 3. Marginal Effects

### Sub-sample Analysis

We break down the sample to campaigns that public goods and private goods, and conduct sub-sample analyses. The results first show the different effects of tweets and Facebook shares for crowdfunding campaigns that support different types of goods. Second, as a falsification test for the observed effects for public versus private goods, we also observe the moderating role of campaign objective on the effect of prior contribution on subsequent contribution. Notably, it is found that for public goods, prior contribution will crowd-out subsequent contribution (Burtch et al. 2013), because the backers may believe the campaign organizer will likely reach their goal, and thus put their funding to support other causes that lack funding, leading to the “crowding out” in the contribution process (Burtch et al. 2013). However, for private goods, prior contribution could be seen as a quality signal that reduces the uncertainty of backers, thus does not reduce subsequent contribution.

Table 4. Sub-sample Analysis

	Public Goods	Private Goods
$percent_{t-1}$	<b>-0.012**</b> (0.005)	-0.001 (0.001)
$ln(tweets)_{t-1}$	0.026 (0.097)	<b>0.309***</b> (0.084)
$ln(fb\ shares)_{t-1}$	<b>0.573***</b> (0.132)	-0.030 (0.071)
$ln(goal)_{t-1}$	-0.128*** (0.031)	-0.022 (0.123)
$ln(perks)_{t-1}$	-0.036 (0.092)	0.017 (0.036)
Constant	<b>2.786***</b> (0.573)	<b>1.564</b> (1.509)
Observations	3,279	2,701
Within R-squared	0.073	0.070
Number of Campaigns	126	98
Project Fixed Effect	Yes	Yes
Day Fixed Effect	Yes	Yes

Notes: 1. Cluster-robust standard errors in parentheses; 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Discussion

Leveraging a unique data set that combines crowdfunding data from IndieGoGo and social media sharing activities data from Twitter and Facebook, we performed a panel data analysis to explore the interplay between social media activity and crowdfunding campaign objectives, in terms of the intent to produce a public or a private good. We build on prior work, in that we have identified a clear benefit to alignment between campaign objectives and the forum for social media activity around a campaign (Twitter or Facebook). We next discuss the implications for each of these findings for theory and practice.

## Implications

This study builds on and contributes to several streams of recent information systems literature on social media and crowdfunding, and more broadly, the literature on private contribution to public goods.

First, this work deepens our understanding of private contribution to public goods, and the role of the medium in solicitations for contribution. Our study focuses on the alignment between the characteristics of a medium (the technology) and the type of solicitation – contribution to a public good, or private consumption (i.e., the task). Our study thus provides additional empirical evidence of important theories in the Information Systems discipline, namely task-technology fit (Goodhue 1995; Goodhue and Thompson 1995) and contingency theory (Donaldson 2001; Weill and Olson 1989) in an increasingly important context; crowdfunding. Our study builds on and differs from the extant literature that has looked at social media and crowdfunding, most notably Thies et al. (2014), who report differing effects of social media activity on the number of backers in different crowdfunding campaign categories (creative, social and entrepreneurial). For example, those authors report that tweets have a negative effect on the arrival of contributors at creative projects, while they find that Facebook activity has a positive effect on entrepreneurial projects. Our work presents a possible rationalization for those results, as it suggests that other aspects of campaigns (i.e., their private or public nature) may play an important role.

Prior research has found evidence of a “crowding out” effect in the case of campaigns supporting public goods (Burtch et al. 2013), and a positive, reinforcing effect between prior backer arrival and subsequent backer arrival for creative, social and entrepreneurial campaigns (Thies et al. 2014). Our study helps to reconcile and clarify these disparate results by theorizing and empirically examining variation in campaign objectives within a single platform. In general, we find a negative effect of prior contribution on present period contribution across all campaigns in our sample. This result could be due to the fact that the marketplace is subject to a budget constraint.

Finally, the results of this study also provide practical implications for crowdfunding marketplaces, campaign organizers, and more broadly social commerce. Recently, there has been a great deal of hype around social media campaigns. Many prominent companies are pouring a great deal of money into establishing a presence on different social media platforms. Our findings imply that the resources one allocates to managing activities across social media platforms should be apportioned with the characteristics of the medium in mind, and more importantly with the degree to which a particular medium aligns with the purpose and objectives of the firm.

For example, when organizing fundraising for public goods (e.g., as in the case of a charity, or a community development project), more attention should be geared towards highly social platforms, such as Facebook. In contrast, when organizing campaigns around a product or service (e.g., new gadgets, games), more resources should likely be dedicated toward information sharing platforms, such as Twitter. Cautiously, we might also generalize our findings to other aspects of social commerce, such as referral-based marketing. Our results would suggest that referrals pertaining to product purchase might be more effective when issued via an information-sharing platform, such as Twitter. If our alignment effect holds, Twitter will be a more effective platform to broadcast social referrals.

## Limitations and Future Research

As with all observational research, this study is not without limitations. First, although we have taken great pains to ensure the accuracy of our classification of campaigns as public goods, such as using a subsample of “clean” campaign categories, as well as manually screening campaigns based on descriptions, we nonetheless acknowledge that measurement error may remain. However, this error constitutes noise that

should only impede our ability to identify significant effects. As such, because we are able to identify significant effects in the hypothesized directions, it is likely that our estimates are in fact conservative as a result of any such measurement error. Nevertheless, future research could pursue a more nuanced classification via a text mining approach, leveraging the text of the campaign description, or via human coding over Amazon Mechanical Turk. There are of course other categories that have a mixture of private goods and public goods. For those categories campaign level manual coding is likely a better approach to categorize public versus private goods. Second, for the social media activity, we have focused on the number of tweets and number of Facebook shares in the prior period. These measures provide an accurate representation of the volume of social media activities, but they do not enable us to account for the source of the activity. Future research might build on this work, incorporating characteristics of the individuals initiating Tweets or Facebook shares, to draw additional insights. Third, and last, this paper on considers contribution dollars and the number of backers arriving on a given day. Future research might utilize alternative measures, such as a campaign level analysis of whether a campaign meets its fundraising target. Although this specification would necessitate a cross-sectional analysis, and would therefore pose challenges for identification, it might yield additional insights if appropriate instruments could be identified, or matched sampling techniques were applied.

### **Concluding Remark**

Social media are now a regular element of our everyday lives, thus it is important to consider the role they play in various contexts. Given the highly social nature of crowdfunding, it is only appropriate that social media would play a prominent role in campaign fundraising. This study provides a pioneering effort aimed at understanding the social aspects of crowdfunding and, in particular, the benefits of maintaining an alignment between the characteristics of social media platforms and the objectives of a crowdfunding campaign. While social media is often treated as a marketing elixir, our work shows that realizing value from social media depends a great deal on the implementation of an appropriate campaign strategy. It is our hope that this work provides merely the first step, as a basis for subsequent research in this space that can provide useful managerial insights for crowdfunding practitioners and related stakeholders.

### **References**

- Adar, E., B.A. Huberman. 2000. Free Riding on Gnutella. *First Monday* 5(10).
- Agrawal, A., C. Catalini, A. Goldfarb. 2013. Some Simple Economics of Crowdfunding *Innovation Policy and the Economy*. University of Chicago Press, 63-97.
- Agrawal, A., C. Catalini, A. Goldfarb. 2015. Crowdfunding: Geography, Social Networks, and the Timing of Investment Decisions. *Journal of Economics and Management Strategy* 24(2) 253-274.
- Ahlers, G.K.C., D. Cumming, C. Gunther, D. Schweizer. 2012. Signaling in Equity Crowdfunding. *SSRN Working Paper*.
- Akerlof, G. 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics* 84(3) 488-500.
- Andreoni, J. 1988. Privately Provided Public Goods in a Large Economy: The Limits of Altruism. *Journal of Public Economics* 35(1) 55-73.
- Andreoni, J., B.D. Bernheim. 2009. Social Image and the 50-50 Norm: A Theoretical and Experimental Analysis of Audience Effects. *Econometrica* 77(5) 1607-1636.
- Aral, S., C. Dellarocas, D. Godes. 2013. Introduction to the Special Issue-Social Media and Business Transformation: A Framework for Research. *Information Systems Research* 24(1) 3-13.
- Bagnoli, M., B.L. Lipman. 1989. Provision of Public Goods: Fully Implementing the Core Through Private Contributions. *The Review of Economic Studies* 56(4) 583-601.

- Becker, G. 1974. A Theory of Social Interactions. *Journal of Political Economy* **82**(6) 1063-1093.
- Belleflamme, P., T. Lambert, A. Schwienbacher. 2014. Crowdfunding: Tapping the Right Crowd. *Journal of Business Venturing* **29**(5) 585-609.
- Bergstrom, T., L. Blume, H. Varian. 1986. On the Private Provision of Public Goods. *Journal of Public Economics* **29**(1) 25-49.
- Bernheim, B.D. 1994. A Theory of Conformity. *Journal of Political Economy* **104**(5) 841-877.
- Boyd, D., E. Hargittai. 2010. Facebook Privacy Settings: Who Cares? *First Monday* **15**(8).
- Burtch, G., C.A. Di Benedetto, S. Mudambi. 2014. Leveraging Information Systems for Enhanced Product Innovation. F. Martinez-Lopez, ed. *Handbook of Strategic e-Business Management*. Springer, 211-216.
- Burtch, G., A. Ghose, S. Wattal. 2013. An Empirical Examination of the Antecedents and Consequences of Contribution Patterns in Crowd-funded Markets. *Information Systems Research* **24**(3) 499-519.
- Burtch, G., A. Ghose, S. Wattal. 2014. An Empirical Examination of Peer Referrals in Online Crowdfunding. Proceedings of the 2014 International Conference on Information Systems, Auckland, New Zealand
- Burtch, G., A. Ghose, S. Wattal. 2015. The Hidden Cost of Accommodating Crowdfunder Privacy Preferences: A Randomized Field Experiment. *Management Science* **61**(5) 949-962.
- Castillo, M., R. Petrie, C. Wardell. 2014. Fundraising Through Online Social Networks: A Field Experiment in Peer-to-Peer Solicitation. *Journal of Public Economics* **114** 29-35.
- DellaVigna, S., J.A. List, U. Malmendier. 2012. Testing for Altruism and Social Pressure in Charitable Giving. *The Quarterly Journal of Economics* **127**(1) 1-56.
- Dimoka, A., Y. Hong, P. Pavlou. 2012. On Product Uncertainty in Online Markets: Theory and Evidence. *MIS Quarterly* **36**(2) 395-426.
- Donaldson, L. 2001. *The Contingency Theory of Organizations*. SAGE.
- Duan, W., B. Gu, A. Whinston. 2009. Information Cascades and Software Adoption on the Internet: An Empirical Investigation. *MIS Quarterly* **33**(1) 23-48.
- Gerber, E.M., J. Hui. 2013. Crowdfunding: Motivations and Deterrents for Participation. *ACM Transactions on Computer-Human Interaction* **20**(6).
- Giudici, G., R. Nava, C. Rossi Lamastra, C. Verecondo. 2012. Crowdfunding: The New Frontier for Financing Entrepreneurship? *SSRN Working Paper*.
- Goodhue, D.L. 1995. Understanding User Evaluations of Information Systems. *Management Science* **41**(12) 1827-1844.
- Goodhue, D.L., R.L. Thompson. 1995. Task-Technology Fit and Individual Performance. *MIS Quarterly* **19**(2) 213-236.
- Goodsell, C.T. 1990. Public Administration and the Public Interest. G.L. Wamsley, ed. *Refounding Public Administration*. SAGE, 96-113.
- Granovetter, M. 1973. The Strength of Weak Ties. *American Journal of Sociology* **78**(6) 1360-1380.
- Gu, B., Y. Huang, W. Duan, A. Whinston. 2009. Indirect Reciprocity in Online Social Networks - A Longitudinal Analysis of Individual Contributions and Peer Enforcement in a Peer-to-Peer Music Sharing Network. *McCombs Research Paper Series*.

- Hanh, J., G. Lee. 2014. Archetypes of Crowdfunders' Backing Behaviors and the Outcome of Crowdfunding Efforts: An Exploratory Analysis of Kickstarter *INFORMS Conference on Information Systems and Technology (CIST)*, Minneapolis, MN.
- Hong, Y., P. Pavlou. 2014. Product Fit Uncertainty in Online Markets: Nature, Effects, and Antecedents. *Information Systems Research* **25**(2) 328-344.
- Hong, Y., C. Wang, C., P. Pavlou. 2015. Comparing Open and Sealed Bid Auctions: Evidence from Online Labor Markets. *Information Systems Research*, Forthcoming.
- Hu, M., X. Li, M. Shi. 2015. Product and Pricing Decisions in Crowdfunding. *Marketing Science*.
- Hughes, D., M. Rowe, M. Batey, A. Lee. 2012. A Tale of Two Sites: Twitter vs. Facebook and the Personality Predictors of Social Media Usage. *Computers in Human Behavior* **28**(2) 561-569.
- Hui, J., M.D. Greenberg, E.M. Gerber. 2014. Understanding the Role of Community in Crowdfunding Work. *Proceedings of the 17th Conference on Computer Supported Cooperative Work (CSCW)* 62-74.
- Humphreys, L., P. Gill, B. Krishnamurthy. 2010. How Much is Too Much? Privacy Issues on Twitter *Conference of International Communication Association*, Singapore.
- Kane, G.C., S. Borgatti. 2011. Centrality-IS Proficiency Alignment and Workgroup Performance. *MIS Quarterly* **35**(4) 1063-1078.
- Kane, G. C., Alavi, M., Labianca, G., Borgatti, S. P. 2014. What's different about social media networks? a framework and research agenda. *MIS Quarterly*, **38**(1) 275-304.
- Koning, R., J. Model. 2013. Experimental Study of Crowdfunding Cascades. *SSRN Working Paper*.
- Kwak, H., C. Lee, H. Park, S. Moon. 2010. What is Twitter, A Social Network or a News Media? *Proceedings of the 19th International Conference on World Wide Web (WWW)*.
- Lawton, K., D. Marom. 2010. *The Crowdfunding Revolution: Social Networking Meets Venture Financing*.
- Lehner, O.M. 2013. Crowdfunding Social Ventures: A Model and Research Agenda. *Venture Capital* **15**(4) 289-311.
- Lin, M., N. Prabhala, S. Viswanathan. 2013. Judging Borrowers by the Company they Keep: Friendship Networks and Information Asymmetry in Online Peer-to-Peer Lending. *Management Science* **59**(1) 17-35.
- Lin, Y., W.F. Boh, K.H. Goh. 2014. How Different are Crowdfunders? Examining Archetypes of Crowdfunders and Their Choice of Projects. *SSRN Working Paper*.
- Lu, C., S. Xie, X. Kong, P. Yu. 2014. Inferring the Impacts of Social Media on Crowdfunding *7th ACM International Conference on Web Search and Data Mining (WSDM)*. ACM Press, 573-582.
- Meer, J. 2014. Effects of the Price of Charitable Giving: Evidence from an Online Crowdfunding Platform. *Journal of Economic Behavior and Organization* **103** 113-124.
- Mollick, E. 2014. The Dynamics of Crowdfunding: An Exploratory Study. *Journal of Business Venturing* **29**(1) 1-16.
- Mossiyev, A. 2013. Effect of Social Media on Crowdfunding Project Results. *Unpublished Dissertation*.
- Parker, G., M. Van Alstyne. 2005. Two-Sided Network Effects: A Theory of Information Product Design. *Management Science* **51**(10) 1494-1504.
- Rege, M. 2004. Social Norms and Private Provision of Public Goods. *Journal of Public Economic Theory* **6**(1) 65-77.

- Schwienbacher, A., B. Larralde. 2010. Crowdfunding of Small Entrepreneurial Ventures *Handbook of Entrepreneurial Finance*. Oxford University Press.
- Shang, J., R. Croson. 2009. A Field Experiment in Charitable Contribution: The Impact of Social Information on the Voluntary Provision of Public Goods. *The Economic Journal* **119**(540) 1422-1439.
- Thies, F., M. Wessel, A. Benlian. 2014. Understanding the Dynamic Interplay of Social Buzz and Contribution Behavior Within and Between Online Platforms-Evidence from Crowdfunding *International Conference on Information Systems (ICIS)*, Auckland, New Zealand.
- Venkatraman, N. 1989. Strategic Orientation of Business Enterprises: The Construct, Dimensionality, and Measurement. *Management Science* **35**(8) 942-962.
- Vesterlund, L. 2003. The Informational Value of Sequential Fundraising. *Journal of Public Economics* **87**(3-4) 627-657.
- Weill, P., M.H. Olson. 1989. An Assessment of the Contingency Theory of Management Information Systems. *Journal of Management Information Systems* **6**(1) 59-85.
- Wessel, M., F. Thies, A. Benlian. 2015. A Lie Never Lives to Be Old: The Effect of Fake Social Information on Consumer Decision-Making in Crowdfunding *European Conference on Information Systems (ECIS)*, Muenster, Germany.
- Woiciechowski, A. 2009. Models of Charity Donations and Project Funding in Social Networks *On the Move to Meaningful Information Systems: OTM 2009 Workshops*. Springer.
- Xia, M., Y. Huang, W. Duan, A.B. Whinston. 2012. To Continue Sharing or Not to Continue Sharing? An Empirical Analysis of User Decision in Peer-to-Peer Sharing Networks. *Information Systems Research* **23**(1) 247-259.
- Zhang, J., P. Liu. 2012. Rational Herding in Microloan Markets. *Management Science* **58**(5) 892-912.