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Mind Your Language Entrepreneur! Analysing Crowdfunding Success through the Lens of Effectuation Theory

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Mind Your Language Entrepreneur! Analysing Crowdfunding Success through the Lens of Effectuation Theory

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Abstract

This research examines whether the adoption of narratives consistent with effectuation and causation in crowdfunding campaigns, impacts the likelihood of funders committing funds. The theoretical lens of effectuation are employed to examine the text narrative in a ten-year data set from kickstarter.com. The results support that narratives consistent with pre-commitments and means-orientation can have positive impact on the likelihood of successfully funding a campaign. Causal orientation positively impacts funding success in commercial campaigns, and negatively impacts funding of non-commercial campaigns. Our work expands the knowledge about how the narratives used by entrepreneurs in crowdfunding impact the funders' decisions to invest.

Keywords: effectuation, crowdfunding, content analysis, entrepreneurship.

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1 Introduction

Sarasvathy's (Sarasvathy and Dew, 2008; Sarasvathy, 2001) is rooted in the necessity to understand how entrepreneurs make decisions in the presence of uncertainty and risk when launching and developing new ventures (Andersson, 2011; Kerr and Coviello, 2019). According to effectuation theory, entrepreneurs employ two distinct approaches when making decisions namely causation and effectuation (Sarasvathy and Dew, 2005). A strand of research has examined the impacts of effectuation and causation on the performance of the business (M Brettel et al., 2012; Cai et al., 2017; Shirokova et al., 2021), however, most of it has focused on the impact of the decisions made by entrepreneurs on the performance of their respective businesses measured in terms of sales, profits and innovation outcomes (Cai et al., 2017; Muleta et al., 2017; Szambelan et al., 2019). Few studies have analysed the extent to which the adoption of causation or effectuation by entrepreneurs as far as their decision making is concerned, impacts on decisions made by third parties with regards to their business. In this sense, Braun and Sieger (2020) suggested that when entrepreneurs try to secure funds from their families, the latter expect financial returns rather than being based on altruism only, thus, more consistent with a causal orientation. Similarly, venture capitalists' decisions to invest in technology businesses is based on the entrepreneurs' track record of causal rather than effectual decision-making (Arroteia and Hafeez, 2021; Woike et al., 2015). Also, Wiltbank et al. (2006) postulated that angel investors supporting entrepreneurs adopting effectuation encountered fewer investment failures.

Raising funds from investors is vital for entrepreneurs starting new ventures who have little track-record and therefore cannot rely entirely in conventional financial sources such as loans. Therefore, the way and extent to which entrepreneurs convey their plans and convince third parties to invest in their ventures is a crucial metric of performance for their business. However,

we know little about how the content of the narratives used by entrepreneurs influence the attractiveness of their projects to funders. Thus, building on prior research, the objective of this study is to examine whether the adoption of effectuation and causation decision-making by entrepreneurs impacts the likelihood of stakeholders committing funds to their businesses. To address this gap, the theoretical lens of effectuation will be employed using quantitative content analysis to examine the text narratives used by entrepreneurs in crowdfunding campaigns, in a ten-year data set of 185,000 from kickstarter.com (2009 to 2019). Kickstarter is a rewards-based crowdfunding platform that is widely used by entrepreneurs to raise funds in exchange for a reward, mostly when they are starting a new business or entering the market with a new offering. The impacts will be ascertained by measuring the extent to which the campaigns' goals have been met or exceeded.

This study contributes to the existing theory in several ways. First, our results contribute to effectuation theory in the sense that they expand knowledge about how effectuation and causation as expressed by entrepreneur's narratives in crowdfunding campaigns impacts the financial commitments of third parties towards their business venture. Second, our application of effectuation to the domain of crowdfunding enables us, as researchers, to see nuanced insights that had not yet been possible. Specifically, from a theory-based standpoint, we show that certain subconstructs within effectuation provide positive impetus towards the success of crowdfunding campaigns. More specifically, narratives consistent with higher effectuation exhibit higher chances of success in raising funds and this impact is more pronounced in commercial campaigns. Third, our work extends signalling theory in the context of crowdfunding research, by expanding our understanding on how the narratives in crowdfunding campaigns impact the funders' decisions to invest in a business (Allison et al., 2017; Anglin et al., 2018; Parhankangas and Renko, 2017; Pollack et al., 2019). Fourth, we build upon the existing strand of literature examining determinants of successful crowdfunding

campaigns by showing how entrepreneurs can effectively adopt narrative styles to diminish the information asymmetries and influence potential funders. Beyond academic implications, our study also has implications for practice. Examining the effects of narratives is important from an entrepreneurial finance standpoint because typically entrepreneurs have limited resources, and therefore it is critical for them to be focused on signaling the right information to investors, therefore better contributing towards achieving their financial goals. Moreover, the potential funders whom entrepreneurs seek to attract also have limited time and resources; and it is therefore vital for entrepreneurs to emphasize the right signals in their campaigns to convince them to invest in their businesses.

The remainder of the paper is structured as follows. Section 2 provides the theoretical framework leading to the development of hypotheses. Section 3 discusses the research methodology, method, and data collection. Section 4 presents the results and discussion, and Section 5 provides concluding remarks.

2 Theoretical framework and hypothesis development

2.1 Signalling and performance in crowdfunding

Crowdfunding involves seeking funding for a specific purpose through a campaign (Belleflamme et al., 2014). In return for their financial commitment to a campaign, funders receive incentives such as a pre-order of the product or service (Belleflamme et al., 2014; Short et al., 2017), partial ownership (Ahlers et al., 2015; Stemler, 2013), or accrue interest from loans (Allison et al., 2015; Short et al., 2017). Irrespective of the type of crowdfunding¹, the performance of a campaign is measured by the extent to which the goal was pledged (or exceeded) within each campaign's time frame (Ahlers et al., 2015).

¹ In this paper, we focus only on rewards-based crowdfunding campaigns.

In crowdfunding platforms, as campaigns are presented exclusively online, how the relevant information is disclosed is vital to motivate potential funders (Ahlers et al., 2015; Mollick, 2014; Plummer et al., 2016). A typical reward-based crowdfunding campaign webpage describes the project using multimedia (text, images, and videos), and presents a wide array of information about the funding goal, amount pledged, number of funders, duration of the project, regular updates posted by founders, and comments made by the community. In this research we examine the text narrative in the campaigns which is read by potential funders. Most campaigns fail, and more than 50% do not reach their goals (Mollick, 2014; Zhao et al., 2017). Hence, signalling information using the campaign's website presents a unique challenge for both entrepreneurs who attempt to convince funders of the benefits in supporting their projects, and for the potential funders who have to make a decision based on their interpretation of the information made available.

Previous crowdfunding studies have investigated the importance of signals on the performance of campaigns. Signals such as the qualities of entrepreneurs (Busenitz et al., 2005; Moss et al., 2015), their past successes (Lukkarinen et al., 2016), their teams (Baum and Silverman, 2004), or third-party endorsements (Courtney et al., 2017), have all been reported as significantly and positively correlated with performance. The signals such as the text narrative (non-costly signals) can convey, among other things, information about how entrepreneurs intend to implement their business projects once the funds are raised (i.e. the campaign ends). For example, in commercial campaigns this can be related to plans to make a working prototype of the product, how to produce a limited series or mass-scale, or how to market, distribute and sell it. Research about *equity-based crowdfunding* has demonstrated that providing information about risk (Ahlers et al., 2015) or financial projections (Lukkarinen et al., 2016) serves as effective signals to convince funders and is positively associated with the success of a campaign. In their study of *loan-based crowdfunding*, Galak et al., 2019 suggest that funders

make decisions incorporating aspects of both traditional investment decision making (i.e. explicit potential rewards) and intrinsic factors such as the desire to help others. Allison et al. (2015, 2013) identified that greater degrees of risk-taking language in the campaigns are associated with a decrease in the attractiveness among prosocial investors, whereas entrepreneurs were more successful raising funds when the narrative included language indicating accomplishment. Anglin et al. (2018) demonstrated that language and statements indicative of a positive expectancy regarding an idea (or cause) are significantly related to obtaining support. In *rewards-based crowdfunding* (which is the focus of this research), Allison et al. (2017) found that using a positive narrative tone has a significant and positive impact on performance. Anglin et al. (2018) found a positive impact based on the use of language indicative of positive psychological capital, and Ahlers et al. (2015) concerning sharing information about the projects' risks. Herrero et al. (2020) identified that the return on investment of a project does matter but it is not enough to drive support. In social campaigns in rewards-based crowdfunding (e.g. charity), altruism has been identified as the dominant motive for funders (Gorczyca and Hartman, 2017; Kuppuswamy and Bayus, 2017). Parhankangas and Renko (2017) found that concrete language facilitates fundraising for both social and commercial campaigns; on the other hand, linguistic styles such as concrete, precise, and interactive language, as well as using language low in psychological distancing is more important for the success of social compared to commercial campaigns.

2.2 *Effectuation, causation, and performance*

Through the lens of effectuation theory, entrepreneurs facing uncertainty make decisions based on two heuristics viz. effectuation and causation (Sarasvathy, 2001; Sarasvathy and Dew, 2005). Effectuation emphasizes experimentation of alternative paths with the means available, to see which one works better, adapting and leveraging the external contingencies (Sarasvathy

and Venkataraman, 2011). Conversely, a causal orientation is focused on specific goals and planned actions, where contingencies are undesired (Smolka et al., 2018). Conceptually, the main difference between effectual and causal orientation is the confidence space with which an entrepreneur makes decisions in presence of uncertainty and/or information asymmetry. As such, both are integral parts of decision-making that can overlap or occur with distinct strength; yet, they steer decision-making in different ways.

The literature has provided extensive evidence of effectual orientation and performance, particularly in uncertain environments. Mort et al. (2012) found that marketing approaches relying on effectual orientation led to superior performance within born global firms. Coviello and Joseph (2012), Guo (2018), and Szambelan et al. (2019) found that effectual orientation is positively associated with successful innovations. Blauth et al. (2014) indicated that it positively impacts on creativity. Guo (2018) found that effectual orientation leads to pioneering resource bundling, which in turn contributes to new internet venture growth. Kupper and Burkhart (2009) results suggest that non-predictive control approaches consistent with an effectual orientation determine success of highly innovative R&D projects. In the context of an emerging economy Cai et al. (2017) supported the positive effect of effectual orientation on new venture performance.

Entrepreneurs demonstrating an effectual orientation try to control what they know and make the best of the means available to them. In their decision making, entrepreneurs assess what effects can be achieved with the means available (means orientation) and chose the course of action to make the most of them without sacrificing more than what they can afford to lose (i.e. affordable loss). Read et al. (2009) reported a positive and significant overall relationship between effectuation and venture performance: means orientation lead to superior performance; however, no significant relationship was found for affordable loss (Deligianni et

al., 2017). Smolka et al. (2018) advocate that affordable loss is one of the effectual mechanisms driving performance. McKelvie et al. (2020) reported that affordable loss is a positive predictor of achieving a first sale and profitability. Brettel et al. (2012) advocate that R&D projects that are guided by affordable loss have a positive impact on R&D efficiency in projects with high innovativeness. A means-orientation by entrepreneurs may indicate to potential funders that the entrepreneurs would make more rational and better use of the means available as a risk-management strategy once the campaign, without putting at risk more than what he/she could afford to lose. Consequently, we hypothesize:

H1 - A means-only & affordable loss (EffMO) narrative has a positive impact on the likelihood of achieving the funding target.

Entrepreneurs leverage environmental contingencies in the short-term via experimentation and flexibility (Wiltbank et al., 2006). Experimentation is based on trial-and-error of different approaches to see which one works better (e.g. different pricing, promotion or distribution strategies), whereas flexibility is associated with adjusting or changing the business model to different possibilities (Chandler et al., 2011; Dew et al., 2009). Flexibility and experimentation come hand in hand in effectual decision making, and have found to be determinant of new venture performance (McKelvie et al., 2020). A narrative whereby entrepreneurs convey their approaches to decision-making based on flexibility, and experimenting different courses of action to see which one works best (Read et al., 2009a) may indicate potential funders that they are prepared to manage (and leverage from) the contingencies and to adapt the course of actions to learn from and respond to environmental challenges, especially in uncertain environments. However, in environments where regulatory and legal structures are already well-established, this aspect of effectuation could indeed be penalized by funders, rather than being rewarded (Shirokova et al., 2021). In this regard, a negative relationship between effectuation and performance is expected in stable conditions (Cai et al., 2017). As our study is focused in the

US market which can be considered well-established in terms of financial and legal structures, we expect a negative relationship between experimentation plus flexibility and campaign funding. Therefore, we hypothesize:

H2 – Experimentation & flexibility (EffEF) in the narrative has a negative impact on the likelihood of achieving the funding target.

Effectuators rely on strategic alliances and pre-commitments with external stakeholders and their networks are flexible to change and directed at leveraging contingencies (Engel et al., 2017). Pre-commitments allow resource-constrained firms to access vital resources, some of which they could not otherwise have accessed. Moreover, pre-commitments allow the diversification of risks among multiple stakeholders (Sarasvathy and Venkataraman, 2011). In the context of an effectual orientation, pre-commitments take the form of co-creation, mutual opportunity discovery and risk-sharing between the parties involved (Dew et al., 2009). Pre-commitments have been found to drive new venture performance (Deligianni et al., 2017; McKelvie et al., 2020; Read et al., 2009a; Smolka et al., 2018). Muleta et al. (2017) suggest that the use of pre-commitments is significantly associated with higher increases in sales and profits. Brettel et al. (2012) advocate that R&D projects with high innovativeness that are guided by pre-commitments have a positive impact on the outcomes. Mentioning third parties who will or have already pre-committed towards supporting the entrepreneurs and their projects is an indicator of trust and function as a sign of quality (Cholakova and Clarysse, 2015), thus, endorsing potential funders to support their campaigns (Courtney et al., 2017). Thus, we hypothesize:

H3 – A narrative evidencing pre-commitments (EffPC) has a positive impact on the likelihood of achieving the funding target.

A causal orientation is consistent with a predictable future, and the goals determine the resources to be acquired (Chandler et al., 2011). Causal orientation avoid contingencies by conducting a thorough market and competitor analysis and rely on business planning with a medium to long-term focus (Brinckmann et al., 2010; Delmar and Shane, 2004). As such, causal decision-making is more rigid compared to effectual (Brettel et al., 2012; Harms and Schiele, 2012). However, from the perspective of causal orientation, the motivations of funders to support crowdfunding campaigns are dependent on the type of campaign. In equity crowdfunding the funders have extrinsic motivations as in traditional investments (e.g. future rewards) (Ahlers et al., 2015; Lukkarinen et al., 2016), whereas in loan-based crowdfunding the funders have extrinsic but also intrinsic motivations such as the desire to help others (Galak et al., 2019). In rewards-based crowdfunding (which is the focus of our research), the motivations of the funders are diverse, and this is dependent of the type of projects. For example, in commercial rewards-based crowdfunding campaigns, funders receive perks such as advance versions of a product (usually a novelty on the market) (Belleflamme et al., 2014; Short et al., 2017), and, in this sense, they are in fact acting as early customers – the reward for them is a pre-order of a products at an earlier date, lower price or with some other advantage (Courtney et al., 2017; Gerber et al., n.d.). Therefore, as pre-buyers of a commercial product (Mollick, 2014), funders' decisions are based on the likelihood of getting a return for their investment - the product they paid for – and thus act with extrinsic motivations as if they had invested in equity or loan-based crowdfunding (Ahlers et al., 2015; Allison et al., 2013; Short et al., 2017). Therefore, we hypothesize:

H4 – The use of a narrative consistent with causal orientation (CauO) has positive impact on the likelihood of achieving the funding target in commercial campaigns.

The theoretical model based on the above discussion is illustrated in Figure 1 .

<Insert Figure 1 here>

3 Methodology and data

3.1 Elevating the level of the construct for computer-aided content analysis

In this research, we adopt a quantitative content analysis technique (Krippendorff, 2004; Neuendorf, 2020; White and Marsh, 2006) counting the occurrences of words in texts and measuring their frequency. The texts which will be investigated - the units of analysis - are the webpages of crowdfunding campaigns on Kickstarter. We use computer-aided content analysis tools to count the frequency of words present in the webpages of crowdfunding campaigns (Duriiau et al., 2007). Specifically applied in crowdfunding, content analysis has studied the social environment of the entrepreneur (Allison et al., 2015), narrative tone (Allison et al., 2017), or psychological capital (Anglin et al., 2018).

The texts in crowdfunding campaigns pitch a project to be implemented by an organisation (with a team and/or firm already in place) rather than a single individual (entrepreneur), therefore, in this sense, the projects are a separate entity from the entrepreneur(s) (Krippendorff, 2004; Neuendorf, 2020). Accordingly, investigating the narrative in the texts does not reflect how the decisions will be made by the entrepreneur alone but by the individual in a broader organisational context (as part of a team). To overcome the disconnection between the different units of analysis (entrepreneur and organization), we have adopted McKenny et al.'s (2013) conceptual and methodological considerations when applying constructs developed at the individual level to measures elevated at the organizational level. First, we have developed an organizational-level representation of the construct by adopting the names of the analytical constructs from effectuation theory (e.g. flexibility, experimentation, affordable loss, and pre-commitments) to be used at the organisational level. The organizational-level constructs of effectual and causal orientation were derived directly from those used in the individual-level

to preserve an alignment across levels of analysis (dimensionality of the construct), hence, the theoretical nature of the 'elevated' construct remains the same. The meaning of the constructs is the same at both the individual and organizational levels (isomorphic construct) even though the level of analysis is different.

3.2 Development of word list

A crucial part of this research is to develop an initial list of deductive words for each of the elevated construct's dimensions, in this case effectual and causal orientation. To start with, we took into consideration the extant effectuation literature. Appendix I characterizes the different subconstructs derived from the literature, which were grouped into Means Orientation & Affordable Loss (EffMO), Experimentation & Flexibility (EffEF), Pre-commitments (EffPC) and Causation (CauO), used to deduct the initial word list. We started by identifying the words frequently referred to in relation to either of the subconstructs, by reading the effectuation literature. In that process we have adopted a partially grounded inductive approach to conduct the analysis (Sunduramurthy et al., 2016). The partially grounded approach differs from the purely grounded approach to data analysis in that the analysis of the data is guided by existing effectuation literature and a theoretical a priori insight of the theory (Glaser and Strauss, 2017), connecting and comparing the meaning emerging from the data with current constructs (Musteen et al., 2018). First the members of the team read the literature and took notes about the theoretically pre-identified subconstructs of effectual and causal orientation. After developing the initial word lists, each author individually verified the alignment of each word with the definition of the subconstruct which it represents. This verification ensured to minimize the subjectivity that is inherent in such process. The individual notes were discussed between the research team, and an initial set of agreed words was derived for each of the three subconstructs of effectual orientation and for the causal orientation (Sunduramurthy et al., 2016). In the third stage three researchers independently coded the textual data into the above

mentioned four different categories in RQDA, a software package that is widely used in qualitative research. The subconstructs were either appearing regularly in the literature, or were also coded and assigned a tag corresponding to the four subconstructs, based on the researcher's interpretations (Musteen et al., 2018). The list of coded words was subsequently revisited by the team members for comparison, discussion and debate to ensure consistency and consensus in the findings (Strauss and Corbin, 1990). For example, some words appear invariably as quotes and are mentioned in the literature as belonging to an effectual and causal orientation. The use of these words must be understood considering the context of the expression in which they appear. For example, both effectual and causal orientation implies that entrepreneurs avoid risk and uncertainty, even though they employ different approaches to manage both. In an effectual orientation, risks are minimised by a trial-and-error approach whereby entrepreneurs do not employ more means than those they can afford to lose, whereas in a causal orientation risks are avoided by conducting planning. Owing to this, we have not considered words such as 'risk' and 'uncertainty' as related to either of the sub-constructs, as using these words while performing content analysis would confuse the search and subsequent results. Hence, we removed them from the initial word lists. The full table of words derived from the literature has been compiled in what we consider as the main list of core words, of which 55 are related to a causal orientation and 178 are related to an effectual orientation (Appendix II). To finalize the word list, we generated a list of the most frequently used words from the sampled texts, by sorting the crowd funding campaigns that had been successful or failed and which had financial goals above \$5,000 (see Mollick, 2014). This was the basis for an inductive analysis of the words to be included (Short et al., 2010). At this stage, one external expert was also selected and invited to take part in the process, to ensure face validity of the final measure (Krippendorff, 2004). This verification ensured to minimize the element of subjectivity that is inherent in such a process. Moreover, this ensured the coded words could be operationalized

through automatic search processes to test the hypothesis, and are valid as these are the essential aspects of the constructs being measured (content validity) (Neuendorf, 2020).

Some adaptations had to be implemented to the final word list (Appendix II) to be used in the search, to avoid missing words that are differently spelled with and without the hyphen (e.g. non-predictable and non-predictable). Therefore, the use of the hyphen was not included in the query to avoid ruling out the words that might have been spelled with the hyphen. We have also used stemmed versions of words to avoid ruling out derivational affixes in the words (e.g. affiliation and affiliate were reduced to their word stem which is affiliate).

We will now discuss the research method and the three econometric models we use for the study. Then we go on to discuss the source of the data, the variables we use in the study, and the construction of such variables.

3.3 Econometric models

In examining the impact of effectual and causal narratives on the outcome of a crowdfunding campaign, one of the key issues is the measurement of the dependent variable (i.e. success or failure). Campaigns are either successful or unsuccessful and therefore, a simplistic indicator of success can be a dummy variable of 1 (0 if the campaign has been unsuccessful). This binary outcome can be estimated using the Maximum Likelihood (ML) estimation function of the following basic form:

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1(Eff) + \beta_2CauO + \beta_3(CauO * Commercial) \quad (1)$$

$$+ \beta_4Commercial + \delta'_iC_i + \varphi + \tau + \xi + \lambda + \varepsilon$$

where p is the *probability of success* of a campaign given two outcomes (success and failure); β (or specifically $\beta_0, \beta_1, \beta_2$) represents slope coefficients; Eff represents the three subconstructs within effectual orientation of campaigns; $CauO$ represents causal orientation $Commercial$ is a dummy variable to represent commercial campaigns. β_3 is the slope

coefficient for interaction term between *CauO* and *Commercial* and we expect β_3 to be positive based on hypothesis H4. δ and C are column vectors of coefficients and all control variables indexed by i . φ , τ , ξ and λ are fixed effects for campaign category, country, year and month respectively. ε is the error term which is expected to cluster around campaign categories; hence, for statistical inference purpose, the standard errors will be calculated by clustering the errors at the main category level.

However, there are situations where the degree of failure has vast variation among campaigns, but the outcomes of all failed campaigns would register as ‘0’ in the above ML function. To illustrate, consider two campaigns with a goal to raise \$50,000 each; one being able to attract a pledge of \$49,000, while the other attracting merely \$1,000. Although both have failed, the latter has attracted funds closer to the goal (target) than the former, and this is of interest. Therefore, we measure the dependent variable (success) by a multiple of money pledged in relation to the initial goal; this measure will be discussed in more detail later in section 3.4.1. As this second measure of success is a continuous variable, we use an ordinary least square estimation (OLS) regression approach of the following form:

$$\begin{aligned} Success = & \beta_0 + \beta_1(Eff) + \beta_2CauO + \beta_3(CauO * Commercial) \\ & + \beta_4Commercial + \delta'_iC_i + \varphi + \tau + \xi + \lambda + \varepsilon \end{aligned} \quad (2)$$

where *Success* is the extent of money pledged relative to the goal of a campaign; the construction of this variable is discussed in the next section. All other notations are as described in equation 1 above. The error term is again expected to cluster around campaign categories; hence, for statistical inference purpose, the standard errors will be calculated by clustering the errors at main category level. We use both specifications above to test our hypotheses H1, H2, H3, and H4.

3.4 Data

We sourced our data from www.kickstarter.com which is one of the most popular crowdfunding platforms in the USA (and the world). Using Python programming language, we developed code which downloaded texts from all the fund-raising campaigns launched between March 2009 and March 2019. This yielded a data set of text strings for 185,000 campaigns. Each of these campaigns normally have their description and risks explained in their web pages.² We downloaded text under both ‘description’ and ‘risk’ headings and amalgamate them for further analysis.

3.4.1 Dependent variables

Other important information for each of the campaigns such as launched date, number of backers, categories, goal amount, pledged amount, sector, etc. was sourced from the Web Robots website (<https://webrobots.io/projects/>). This allowed us to identify whether the campaigns succeeded or failed. For the purpose of the ML econometric approach mentioned earlier, we assigned a dummy variable of 1 to all successful campaigns (0 to failed campaigns). We discarded a small number of campaigns that were under other categories (e.g. still live, suspended, or cancelled). Further, we also discarded campaigns live for less than seven days’ duration and with less than 100 words to allow for a greater probability of more effectual or causal influenced words being present in the text string. We also dropped campaigns with goals less than \$5,000 in line with existing literature (Mollick, 2014). This resulted in a sample size of 76,341 observations.

For our second measure of success in relation to initial goal (for OLS estimation), we divided the pledged amount by the campaign goal amount, giving a measure of success as a multiple of the goal amount. However, the measure so derived is concentrated heavily towards zero or

² A sample web page can be seen at: <https://www.kickstarter.com/projects/holo/holo-magazine/description>

one. To make this measure more normally distributed, we take the natural log of the measure in our econometric specification.³ Hence, the second measure of success is given by the following formula:

$$Success = \ln\left(\frac{pledged\ amount}{goal\ amount}\right) \quad (3)$$

3.4.2 Key independent variables

Key dimensions of interest in our study are the demonstration of an effectual orientation (EffO) or causal orientation (CauO) in the campaign narratives. The three subconstructs within EffO namely pre-commitments, means orientation & affordable loss, and experimentation & flexibility are further distinguished as EffMO, EffEF, and EffPC respectively. To ascertain the level of these subconstruct in any given campaign, we first did a numerical count of each of the effectual and causal words; and then scaled the numerical count by the total number of words in the campaign pages to get percentage score (suffixed by % sign in each of the subconstructs), to proxy for the subconstructs of words in the campaigns (Grimmer and Stewart, 2013; Stone et al., 1966).⁴ We ignored the order in which words occur (Jurafsky and Martin, 2009) and discarded punctuation and capitalization (Grimmer and Stewart, 2013).

3.4.3 Control variables

Following the existing literature⁵, we included several control variables to account for factors that can be expected to impact the success of a crowdfunding campaign. The value of the financial goal itself is expected to have an influence on the success of a campaign- the higher the goal amount, the lower the chances of success. We use the natural log of the goal amount [$\ln(\text{goal})$] to control for the campaign size. Similarly, the length of the text (see Larrimore et

³ In campaigns where the raised amount is 0, we replace 0 with USD 1 so as to avoid errors in calculation.

⁴ For example, if a campaign containing 500 words has 25 occurrences of effectual orientation words in the text, the effectual orientation measure for the campaign is 5% (=25/500).

⁵ See Allison et al. (2017); Anglin et al. (2018); Mollick (2014); Parhankangas and Renko (2017)

al., 2011) is also expected to impact the chances of success of a campaign and we controlled for the length of the text by taking the word count in its natural log form (*Word Count*). Similarly, we take the length of the campaign in days (*Duration*). We further controlled for aggregate macroeconomic conditions, country, and year, and category of the campaign (e.g. music, games, theatre, etc.) using dummy variables. We also controlled for ‘staff pick’ which is a situation where a campaign is highlighted by the platform itself as this is a selective process and enhances the chance of a campaign being successful.

We further controlled for projects that are more innovative and more inclined towards R&D in nature. Campaigns under the main category of Games, Tech, and Fashion along with sub-category of Product Design are considered ‘innovative’ for this purpose. In a similar vein, existing studies refer to these categories as ‘commercial’ campaigns (e.g Parhankangas and Renko, 2017). Even though this crowdfunding platform is reward-based (i.e. non-equity based), the distinction between commercial⁶ and non-commercial projects in our econometric models is helpful in at least two ways: it may help control for any impartiality shown towards either of these two broad categories of projects; and, allows us to test our fourth hypothesis (H4).

To account for cross-country differences, we included country fixed effect in our models. Additionally, we control for various main categories (e.g. music, games, theatre, etc) of campaigns to allow for possible differences across campaigns of different nature (i.e. sector specific). Further, various macroeconomic conditions, market volatility, seasonal influences, and specific events over the years might have impacted prospective contributor’s appetite to contribute to a given campaign; we control for these factors by using year fixed effects and months fixed effects.

⁶ Henceforth, we will use the term ‘innovative’ and ‘commercial’ interchangeably.

4 Results and analyses

4.1 Descriptive statistics and univariate analyses

This section provides the descriptive statistics of the data used in this study. To begin, Figure 2 below shows the number of successful and failed campaigns overall and by year.

<Insert Figure 2 here>

The number of campaigns over \$5,000 peaked in 2015 (c.17,000 campaigns) and declined to roughly 13,000 in each of the following three years. After enjoying higher levels of success than failure in the initial years, the success rate dropped dramatically in 2015 when only 5,948 (out of 17,000) campaigns succeeded. However, in 2018, the successful campaigns again outnumbered failed campaigns. Overall, Figure 2 (b) shows that the number of campaigns, along with the rate of success rate has fluctuated over the years.

<Insert Figure 3 here>

There are also a wide variety of campaigns having varying levels of success, as shown in Figure 3. The main categories with two highest number of campaigns are Technology (12,958) and Film & Video (12,313); though the numbers are comparable, the success rate for Technology (32%) is much lower than that of Film & Video (52%). In terms of success rate, Comics, Dance, Design, and Music, and Publishing exhibit higher than a 60% success rate over the years. It seems plausible that the success rate of campaigns is dependent on the campaign category.

When we created a graph comparing *LnSuccess* with each of the subconstructs (i.e. EffMO%, EffEF%, EffPC% and CauO%) for the sample, no discernible pattern is apparent as shown in Figure 4 where the least successful campaign is at the far left on the X axis and the most successful campaign is at the far right of the X axis. As *LnSuccess* increases, the key independent variables keep on fluctuating without any discernible pattern; as the curve for

LnSuccess reaches 0 (i.e. goal is achieved), it stays flat for a while indicating that the rate of additional fund contribution slows down once the campaign achieves its goal.

<Insert Figure 4 here>

We also provide below charts to visually assess the log odds of success with respect to causal orientation and (the three subconstructs within) effectual orientation in Figure 5. The charts, based on 76,447 observations, show tentatively positive relationship of *EffPC* and *EffMO* with *LnSuccess* while the association of *EffEF* and *CauO* with *LnSuccess* is negative.

<Insert Figure 5 here>

Summary statistics of the key variables are shown in Table 1. Average of *EffMO*, *EffEF* and *EffPC*, stand at 0.1%, 0.06%, 0.86% and 0.1% respectively, while that of *CauO* stands at 0.27%. Although the average use of the subconstructs is less than 1 % in all cases, they exhibit comparatively high variability as evidenced by the standard deviation of each. Among the word subconstructs, *EffEF* enjoys the highest level of usage among the campaigns. The measure of Success (*LnSuccess*) ranges from -18.42 to 5.2, with an average of -2.93. This indicates that on average the campaigns were able to get a pledge of roughly 5.3% ($=e^{-2.96}$) of the goal amount overall. The average goal of 9.94 equates to USD 20,744. Similarly, average word count and duration of the campaign (in days) are 847 and 35, respectively.

<Insert Table 1 here>

Correlation of the key variables is shown in Table 2. *EffMO* and *EffMO* exhibit positive correlation with *LnSuccess* whereas *EffEF* and *CauO* show negative correlation with *LnSuccess*. A relatively high correlation of *LnSuccess* can be observed with *Word_count* (0.37) and *Lngoal* (0.36). We consider all correlation measures to be of moderate levels to be of any concern for the purpose of econometric analysis.

<Insert Table 2 here>

4.2 Multivariate analysis

The results from ML estimation from specification (1) are presented in Table 3. Column I shows the results without any fixed effects or interaction term from the specification. In column I, where we do not allow for heterogeneity across campaign categories, countries, or seasonality dimension, all the three subconstructs of effectuation (*EffMO%*, *EffEF%*, and *EffPC%*,) are exhibiting statistically significant coefficients in the expected direction. The variables *EffMO%* and *EffPC%* impact *Success* positively while *EffEF%* has a negative impact, thus initially supporting our hypotheses H1, H2, and H3. *CauO%* exhibits statistically significant negative coefficient in Column I meaning causal orientation has a negative impact on likelihood of *Success* in general, however, our hypothesis H4 is specifically in relation to commercial campaigns; hence, we are more interested in the interaction term between *CauO%* and *Commercial* which is shown in Column II. The interaction term of interest (*CauO%* \times *Commercial*) in Column II exhibits a statistically significant positive coefficient thus supporting our hypothesis H4 that *CauO* is associated with higher likelihood of funding success in commercial campaigns.

In column III, we include various fixed effects - to control for various country-specific, category-specific, and time-specific issues - as discussed in specification (1) earlier. Our overall results remain mostly robust to this inclusion but *EffEF%* loses its statistical significance. In numerical terms, column III shows that theoretical increase of one percentage point in *EffPC* words is associated with approximately 58% ($= e^{0.457} - 1$) increased odds of the campaign success. A graphical representation of the impact of effectual and causal orientation on campaign success (in terms of probability rather than odds) based on column III, is shown in Figure 6. This shows that if all the other variables were held at their means, increasing the

EffPC% from 0.2 percent to 0.8 percent is associated with the probability of success improving from 49% to 56%. By the same token, increasing *EffMO%* from 0.2 percent to 0.8 percent is associated with the probability of success improving from 50% to 58% (Figure 6b). On the contrary *EffEF%* has a negative impact on *Success*, but the coefficient loses its statistical significance once additional controls are implemented. Hence, we do not find support for hypothesis H2.⁷ Other variables in the models also exhibit statistical significance. For example, *Goal* and *Duration* are negatively associated with probability of success whereas campaigns being chosen by staff (*Staff_pick*) increases the odds of success. Overall, results shown in Table 3 provides support for hypotheses H1, H3, and H4; but not for H2.

<Insert Figure 6 here>

< Insert Table 3 here>

The results from OLS estimation from specification (2) are presented in Table 4. Despite the change in econometric model and the dependent variable, overall results are largely similar to the ML results discussed above. In short, we find support for our hypotheses H1, H3, and H4 from the results shown in Table 4. The other control variables also exhibit impact on the expected direction consistent with the ML model.

<Insert Table 4 here>

For robustness, we use additional dependent variable in the form of inverse hyperbolic sine transformation (*IHSPledged*) of the pledged amount ⁸ (see Anglin et al., 2018). A key difference in this dependent variable (compared to *Success*) is that only the pledged amount is taken into consideration, ignoring the goal amount. We replace the dependent variable *Success*

⁷ As Column III includes the full sets of controls including category-specific and time-specific variables, we consider results of Column III to be closer to the ‘true model’ compared to the results of Column I and Column II. However, we tabulate results of all three columns in the interest of academic transparency and for ease of comparison.

⁸ $IHSPledged = \ln(\text{pledged\$} + (\text{pledged\$}^2 + 1)^{0.5})$. Correlation of *IHSPledged* with *Success* is 0.9616.

in OLS model (specification 2) with *IHSPledged* and present the results in Table 5. The results shown in Table 5 are qualitatively similar to our earlier results and supportive of hypotheses H1, H3, and H4.

Concerns could be raised about the campaigns that can be considered outliers. As shown in Figure 4, we treat the campaigns with extreme level of *Success* at both ends of the figure as outliers and discard the 5% least successful and 5% most successful campaigns from our sample to ensure that outliers are not unduly impacting the results. We run all our econometric models with this pared sample and present the results in Table 6. Column I shows results from the ML estimation; column II shows results from OLS estimation and *Success* as the dependent variable, while column III shows results from OLS estimation using *IHSPledged* as the dependent variable. The results are qualitatively similar to our earlier findings and this mitigates to some extent concerns related to impact of outliers.

5 Concluding comments

The results in this research expand knowledge about how effectuation and causation expressed by the narratives of crowdfunding campaigns impact on the financial commitments of third parties towards funding a project. Our results show that effectuation and causation can have an impact on performance of crowdfunding campaigns, specifically because the narratives used in said campaigns signal to potential funders how the entrepreneurs plan to manage a project upon completion. We provide consistent evidence that two subconstructs within effectuation orientation, namely pre-commitments and means-orientation can have positive impact on likelihood of successfully funding a potential campaign, whereas we do not find evidence that the third subconstruct (experiment and flexibility) influences the chances of funding success for a potential campaign. In doing so, we show that all the subconstructs within effectuation may not impact campaigns equally and some may indeed have no influence on funding success.

We also find consistent support for the notion that causal orientation positively impacts the likelihood of funding success in commercial crowdfunding campaigns. However, our results show that causal orientation is associated with negative impact on likelihood of success for non-commercial crowdfunding campaigns. We note that this could be an interesting avenue for further research in this area.

Our work also extends signalling theory in the context of crowdfunding research, expanding the knowledge about how the narratives in crowdfunding impact the funders' decisions to invest. Beyond academic implications, our study also has implications for practice. From the standpoint of entrepreneurs looking at raising funds via crowdfunding, it is vital to adopt the narrative signals that may allow them to perform better considering the differences between non-commercial and commercial campaigns, for example. The results are not negligible in the sense that the use of certain words can have a significant impact on achieving the goals. For academics and other practitioners in international entrepreneurship and entrepreneurial finance, the results can help to better prepare entrepreneurs to convey their messages to stakeholders, because the language and narrative matters and impacts on third parties' perceptions towards the entrepreneurs and their projects.

However, the findings we present in this paper should be observed in conjunction with some limitations. One obvious limitation relates to the limited scope of data and language i.e. English language. Though we use the universe of data from a very popular crowdfunding platform mostly used by entrepreneurs and funders based in USA, it remains to be seen how a campaign in a different language or different cultural setting might influence the funders. It would be interesting to examine if the costless signals within the context of causal and effectual orientation are at play in similar fashion in other regional settings. Additionally, we only examine reward-based campaigns. Equity-based crowdfunding is different as various

regulatory issues must be addressed before a company is allowed to raise equity. As such, it is not surprising that such data tends to be outside of public domain. In this paper, we have classified some campaigns as commercial in a broad sense; but it would be more appropriate to access equity-based data to examine the differential impact of effectual and causal orientation on commercial campaigns. Perhaps, equity investors are motivated by different sets of factors and future research could examine the impact of effectual orientation and causal orientation on equity-based campaigns also. At a broader level, the decision on whether or not to contribute to a campaign could be dependent on numerous campaign-specific, funder-specific, and other societal factors. In this paper, we merely look into campaign-specific factors and that too within the limited scope of effectuation theory. Although we present new findings to this strand of literature, much remains to be understood. This warrants a broader analysis incorporating campaign-specific, funder-specific, institutional and societal factors so that a more unified framework could be presented. The work presented here, we hope, provides a useful first step in this regard.

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Figure 1: Conceptual model

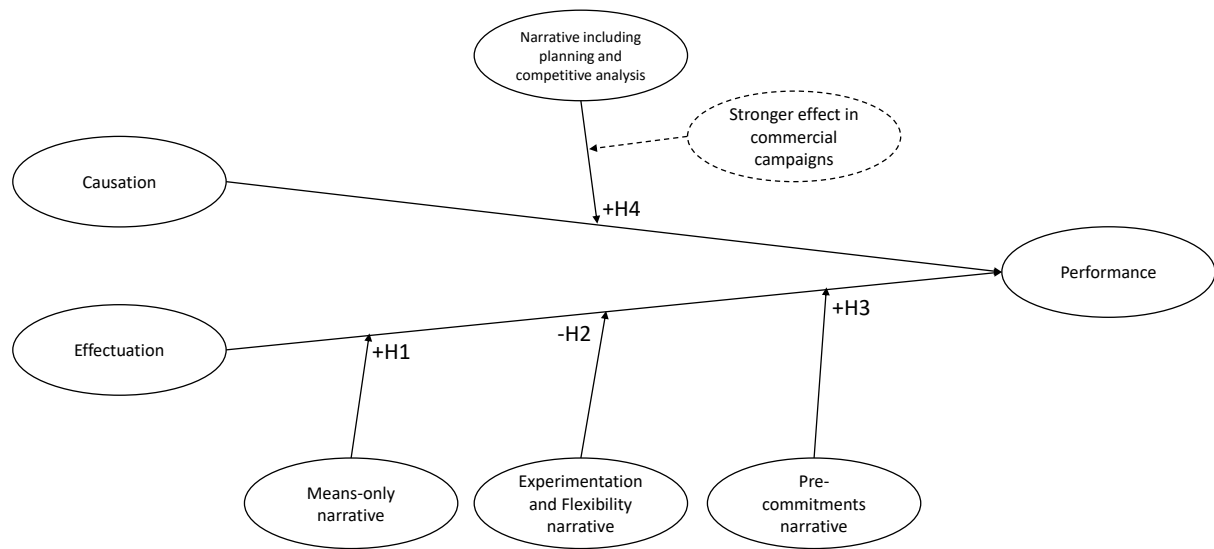


Figure 2: Successful and failed campaigns

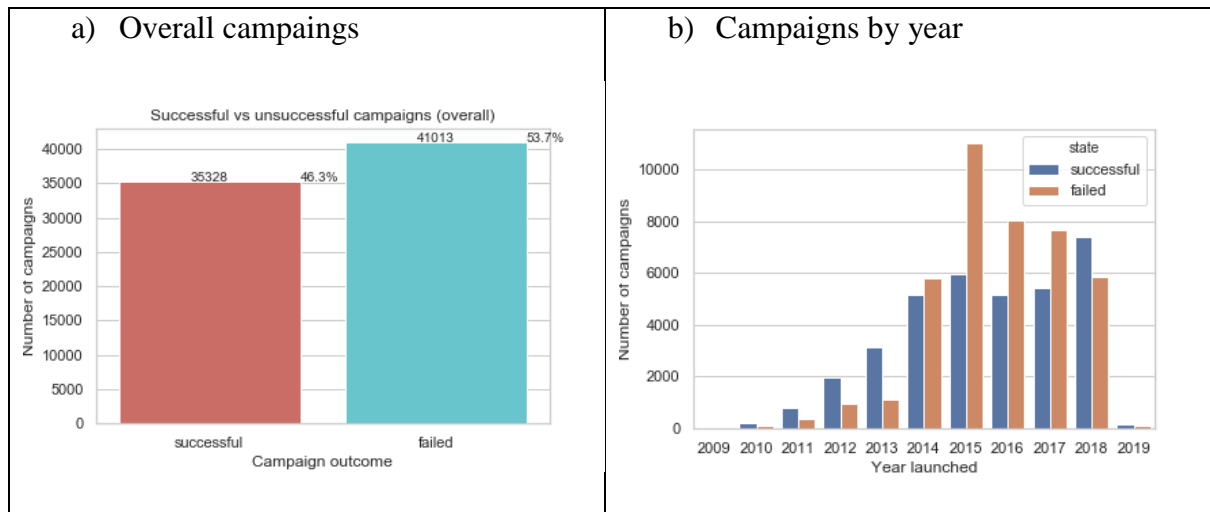


Figure 3: Successful and failed campaigns by main category

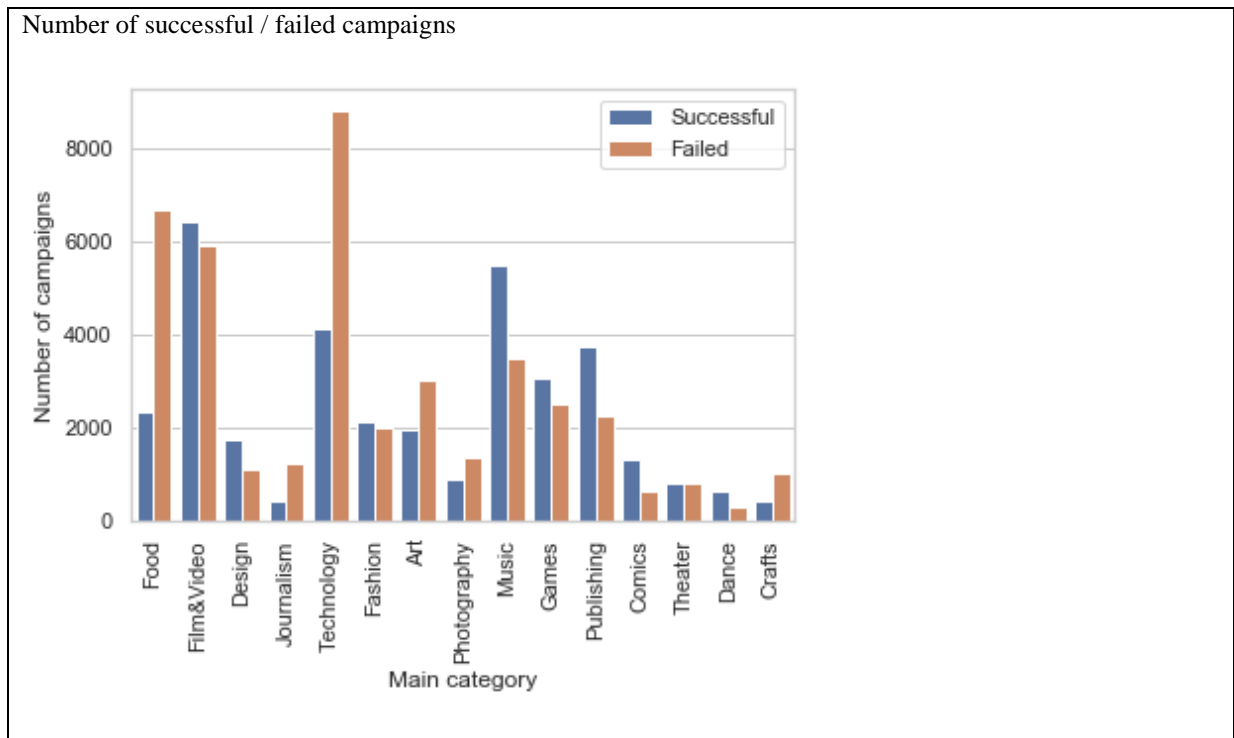


Figure 4: Chart comparing LnSuccess with various subconstructs (i.e. EffMO%, CauO% (entire sample))

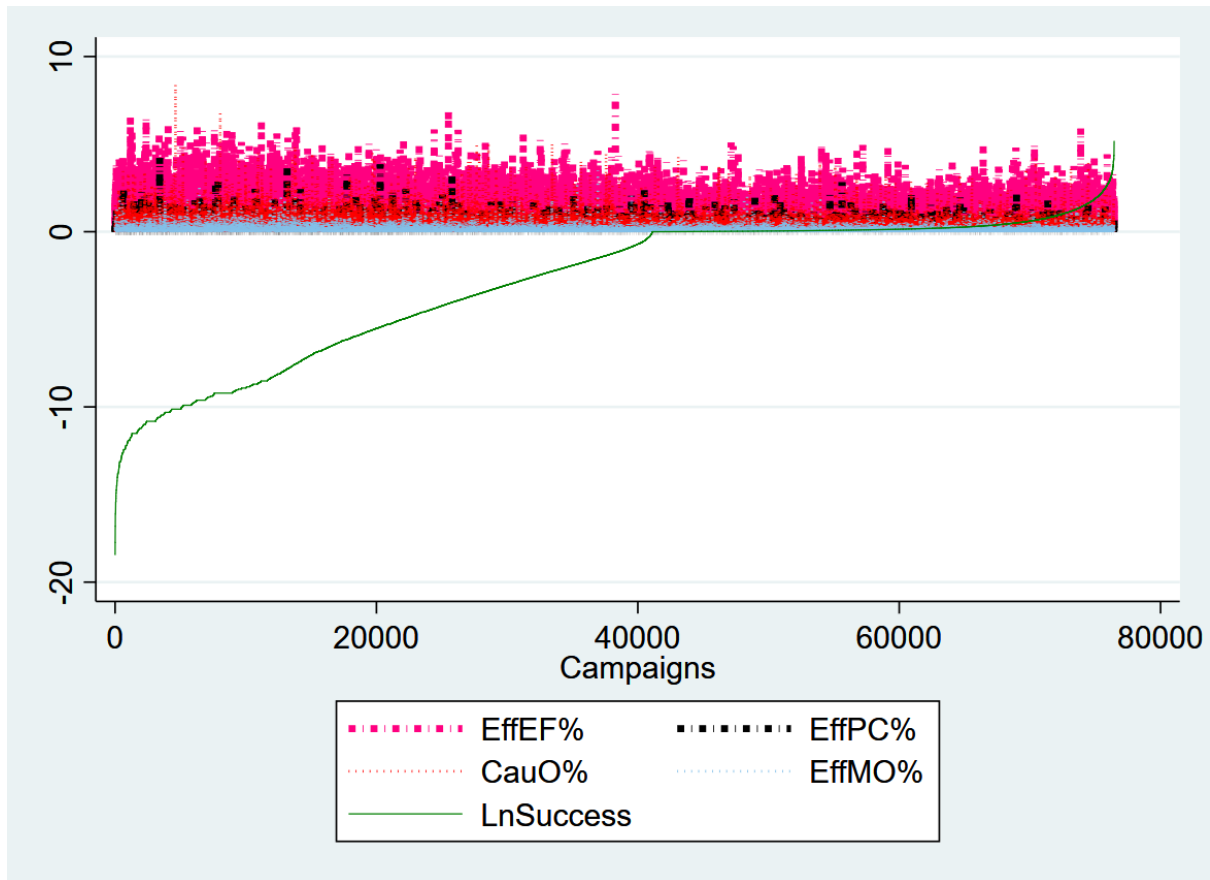


Figure 5: Graphs plotting log odds of success with respect to causal and effectual orientation

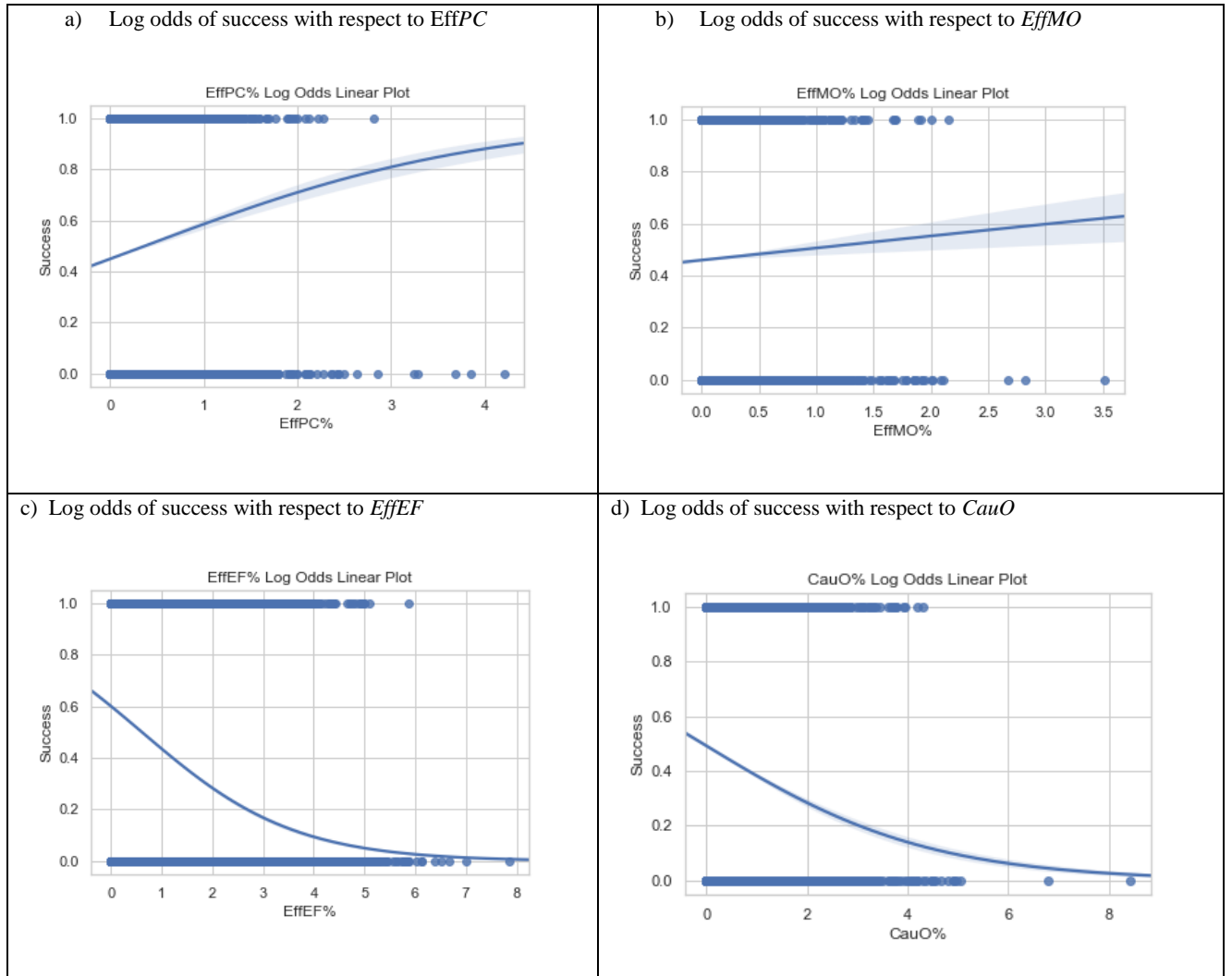


Figure 6: Impact of *EffPC* and *EffMO* on campaign success

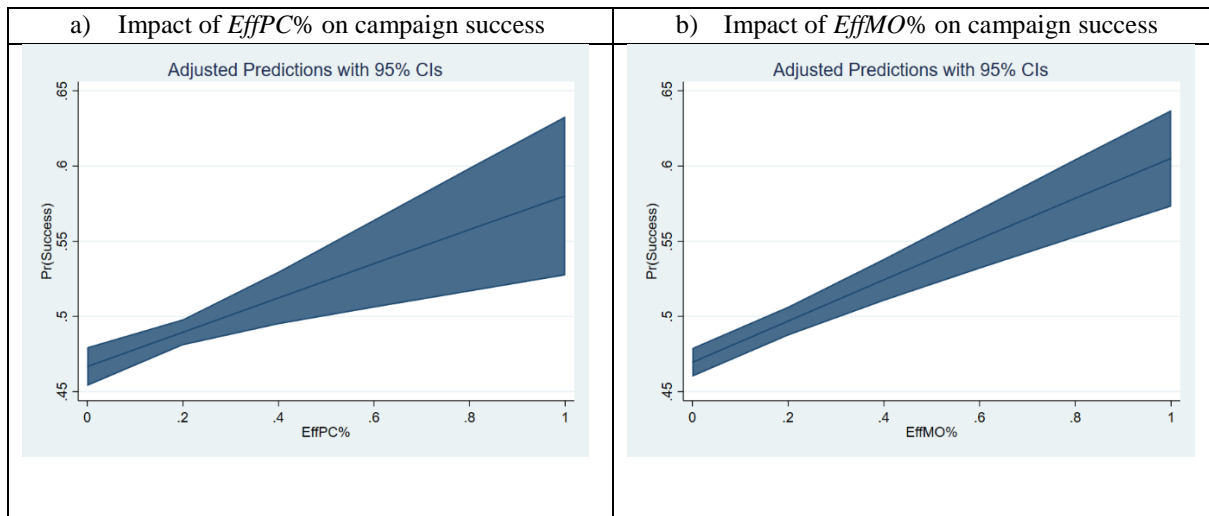


Table 1: Summary statistics of key variables

This table shows the summary statistics of the key variables. All variables are as described in the data section of text.

Variable	No. of obs.	Mean	Std. Dev.	Min.	25th percentile	50th percentile	75th percentile	Max.
EffMO%	76447	0.06	0.13	0.00	0.00	0.00	0.09	3.51
EffEF%	76447	0.86	0.60	0.00	0.45	0.71	1.10	7.84
EffPC%	76447	0.10	0.18	0.00	0.00	0.00	0.14	4.20
CauO%	76447	0.27	0.34	0.00	0.00	0.19	0.38	8.41
LnSuccess	76447	-2.93	3.96	-18.42	-5.78	-1.21	0.10	5.20
Lngoal	76447	9.94	1.10	8.52	9.21	9.62	10.46	18.42
Word_count	76447	84675	695.77	50.00	355.00	655.00	1126.00	8890.00
Duration	76447	34.79	11.17	7.00	30.00	30.00	38.06	93.11
Commercial	76447	0.31	0.46	0.00	0.00	0.00	1.00	1.00

Table 2: Correlation matrix of key variables

This table shows the Pearson's correlation coefficient for the key variables. All variables are as described in the data section of text. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

	EffPC %	EffMO %	EffEF %	CauO%	Ln Success	Ln Goal	Word_c ount	Duration	Commer cial	VIX
EffPC%	1.00									
EffMO%	0.01*	1.00								
EffEF%	0.04***	0.04***	1.00							
CauO%	0.03***	0.04***	0.09***	1.00						
LnSuccess	0.04***	0.02***	-0.19***	-0.06***	1.00					
Lngoal	-0.02***	0.00	0.09***	0.04***	-0.36***	1.00				
Word_count	-0.01	-0.01*	-0.18***	-0.03***	0.37***	0.08***	1.00			
Duration	-0.01**	0.00	0.03***	0.02***	-0.15***	0.15***	-0.07***	1.00		
Commercial	-0.04***	0.06***	0.22***	0.04***	0.01***	0.16***	0.15***	0.00	1.00	

Table 3: Logit model

This table shows the results from maximum likelihood estimation. Dependent variable is $\ln(P) - \ln(1-P)$ where P is the probability of success of a campaign. EffMO%, EffEF%, and EffPC% are the three subconstructs within Effectuation words and represent percentage of Pre-commitment, Means Orientation, and Experimentation & Flexibility words respectively. *CauO* % represents the percent of words with Causation orientation. All other variables are as described in the text. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels with t -statistics shown in brackets, after clustering the error terms around campaign categories.

	I	II	III
EffMO%	0.429*** (4.13)	0.430*** (4.21)	0.549*** (7.49)
EffEF%	-0.266** (-2.46)	-0.268** (-2.49)	-0.0974 (-1.12)
EffPC%	0.540*** (3.65)	0.537*** (3.66)	0.457*** (3.52)
CauO%	-0.348*** (-3.16)	-0.518*** (-4.75)	-0.273*** (-4.48)
CauO% x Commercial		0.527*** (3.38)	0.250* (1.76)
(ln) Goal	-0.729*** (-11.65)	-0.730*** (-11.66)	-0.806*** (-15.18)
(ln) Word Count	0.998*** (14.39)	1.000*** (14.64)	1.137*** (24.70)
Duration	-0.0149*** (-5.36)	-0.0150*** (-5.37)	-0.0172*** (-5.02)
Staff_pick	2.273*** (22.69)	2.271*** (22.76)	2.404*** (35.22)
Commercial	-0.0561 (-0.18)	-0.199 (-0.69)	18.89*** (19.51)
Category fixed	No	No	Yes
Country fixed	No	No	Yes
Month fixed	No	No	Yes
Year fixed	No	No	Yes
Constant	-1.269 (-1.07)	-1.229 (-1.05)	-1.198 (-1.19)
Pseudo R-sq.	0.263	0.264	0.340
Log-likelihood	-38876.4	-38838.8	-34851.3
Observations	76447	76447	76447

Table 4: OLS Model

This table shows the results from OLS regression. Dependent variable is *Success* which is amount pledged scaled by goal, taken in natural log form. EffMO%, EffEF%, and EffPC%, are the three subconstructs within Effectuation words and represent percentage of Pre-commitment, Means Orientation, and Experimentation & Flexibility words respectively. *CauO* % represents the percent of words with Causation orientation. All other variables are as described in the text. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels with *t*-statistics shown in brackets, after clustering the error terms around campaign categories.

	I	II	III
EffMO%	0.693*** (5.37)	0.694*** (5.42)	0.774*** (6.63)
EffEF%	-0.215 (-1.39)	-0.218 (-1.41)	-0.0385 (-0.33)
EffPC%	0.508* (2.07)	0.504* (2.06)	0.441* (2.03)
CauO%	-0.268** (-2.49)	-0.458*** (-4.47)	-0.237*** (-3.71)
CauO% * Commercial		0.592*** (3.03)	0.355** (2.27)
(ln) Goal	-1.339*** (-17.17)	-1.339*** (-17.23)	-1.388*** (-24.61)
(ln) Word Count	1.912*** (20.81)	1.912*** (21.01)	1.928*** (23.15)
Duration	-0.0126*** (-3.83)	-0.0126*** (-3.83)	-0.0123*** (-3.64)
Staff_pick	2.533*** (12.37)	2.528*** (12.34)	2.493*** (14.68)
Commercial	0.346 (1.19)	0.180 (0.67)	2.238*** (17.61)
Category fixed	No	No	Yes
Country fixed	No	No	Yes
Month fixed	No	No	Yes
Year fixed	No	No	Yes
Constant	-4.398** (-2.70)	-4.348** (-2.70)	-4.330*** (-3.32)
R-squared	0.427	0.428	0.489
Observations	76447	76447	76447

Table 5: OLS Model with alternative dependent variable

This table shows the results from OLS regression. Dependent variable is *IHSPledged* which is the inverse hyperbolic sine transformation of the pledged amount ($= \ln(\text{pledged\$} + (\text{pledged\$}^2 + 1)^{0.5})$). EffMO%, EffEF%, and EffPC% are the three subconstructs within Effectuation words and represent percentage of Pre-commitment, Means Orientation, and Experimentation & Flexibility words respectively. *CauO* % represents the percent of words with Causation orientation. All other variables are as described in the text. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels with *t*-statistics shown in brackets, after clustering the error terms around campaign categories.

	I	II	III
EffMO%	0.727*** (5.42)	0.729*** (5.47)	0.812*** (6.73)
EffEF%	-0.224 (-1.39)	-0.226 (-1.41)	-0.0416 (-0.35)
EffPC%	0.526* (2.05)	0.521* (2.05)	0.458* (2.01)
CauO%	-0.270** (-2.42)	-0.468*** (-4.37)	-0.242*** (-3.56)
CauO% * Commercial		0.618*** (3.04)	0.375** (2.30)
(ln) Goal	-0.369*** (-4.50)	-0.368*** (-4.51)	-0.419*** (-6.96)
(ln) Word Count	2.001*** (21.50)	2.001*** (21.71)	2.016*** (23.90)
Duration	-0.0125*** (-3.68)	-0.0124*** (-3.68)	-0.0121*** (-3.50)
Staff_pick	2.595*** (12.53)	2.590*** (12.49)	2.554*** (14.90)
Commercial	0.358 (1.20)	0.184 (0.67)	2.255*** (17.52)
Category fixed	No	No	Yes
Country fixed	No	No	Yes
Month fixed	No	No	Yes
Year fixed	No	No	Yes
Constant	-4.160** (-2.48)	-4.107** (-2.48)	-4.099*** (-3.01)
R-squared	0.308	0.310	0.374
Observations	76447	76447	76447

Table 6: Addressing the possible impact of outliers

This table shows the results from a subsample where least successful 5% and most successful 5% campaigns are discarded from the main sample. Column I shows results from maximum likelihood estimation and dependent variable is $\ln(P) - \ln(1-P)$ where P is the probability of success of a campaign. Column II shows results from OLS regression and dependent variable is *Success* which is the amount pledged scaled by goal, taken in natural log form. Column III shows results from OLS regression and dependent variable is *IHSPledged* which is the inverse hyperbolic sine transformation of the pledged amount ($= \ln(\text{pledged\$} + (\text{pledged\$}^2 + 1)^{0.5})$). EffMO%, EffEF%, and EffPC% are the three subconstructs within Effectuation words and represent percentage of Pre-commitment, Means Orientation, and Experimentation & Flexibility words respectively. *CauO* % represents the percent of words with Causation orientation. All other variables are as described in the text. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels with t -statistics shown in brackets, after clustering the error terms around campaign categories.

	I	II	III
	ML	OLS- <i>Success</i>	OLS- <i>IHSPledged</i>
EffMO%	0.477*** (5.40)	0.665*** (6.60)	0.695*** (6.70)
EffEF%	-0.0961 (-1.16)	-0.0798 (-0.73)	-0.0859 (-0.75)
EffPC%	0.517*** (4.68)	0.580*** (3.36)	0.600*** (3.34)
CauO%	-0.265*** (-4.45)	-0.257*** (-4.11)	-0.264*** (-3.97)
CauO% * Commercial	0.258* (1.89)	0.364** (2.33)	0.382** (2.34)
(ln) Goal	-0.742*** (-13.97)	-0.900*** (-13.37)	0.114 (1.61)
(ln) Word Count	1.086*** (26.77)	1.727*** (34.23)	1.796*** (35.49)
Duration	-0.0186*** (-8.02)	-0.0156*** (-6.44)	-0.0156*** (-6.15)
Staff_pick	2.259*** (35.90)	2.145*** (16.27)	2.185*** (16.40)
Commercial	19.02*** (19.55)	2.162*** (16.13)	2.184*** (15.85)
Category fixed	Yes	Yes	Yes
Country fixed	Yes	Yes	Yes
Month fixed	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes
Constant	-1.184 (-1.38)	-6.867*** (-6.47)	-6.882*** (-6.09)
R-squared		0.402	0.374
Pseudo R-sq.	0.308		
Log-likelihood	-32689.5		
Observations	68467	68467	68467

Effectual orientation	
Means orientation & Affordable Loss (EffMO)	Effectual logic starts with one goal and different alternatives to achieve it, however, it is not clear which is the best choice to follow (Sarasvathy and Dew, 2008; S D Sarasvathy, 2001). To decide, entrepreneurs start by assessing a set of characteristics (who I am), cognition (what I know) and networks (who I know) and choose between the possible effects that can be created with them. The choice is made between possible effects that can be created with their available means and not sacrificing more than what they can afford to lose (Alsos et al., 2016; Wiltbank et al., 2006).
Experimentation & Flexibility (EffEF)	Flexibility is associated with adapting the business model to the contingencies (Chandler et al., 2011) as opportunities emerge (Sarasvathy, 2001, 2008; Wiltbank et al., 2006; Chandler et al., 2011). Experimentation is associated with short-term tests of available capability configurations (Dew et al., 2009; Wiltbank et al., 2006). Trial-and-error is pursued along various dimensions of strategy (e.g. different products and business models) until they found one that worked (Alsos et al., 2016; Wiltbank et al., 2006; Brettel et al., 2012).
Pre-commitments (EffPC)	Entrepreneurs reduce uncertainty by exploring opportunities that emerge through pre-commitments and strategic alliances with customers, suppliers, and other strategic partners (Chandler et al., 2011; Galkina and Chetty, 2015; Sarasvathy and Venkataraman, 2011). Pre-commitments are important because they allow firms to diversify risks among multiple stakeholders, and/or to test markets without owning all the resources they would otherwise require (Sarasvathy and Dew 2005; Read et al. 2009; Sarasvathy, 2011), hence, minimising the costs of experimentation (Chandler et al., 2011).
Causal orientation	
CauO	Causal logic puts the goals determine actions and resources to be acquired and/or mobilized, and the focus is on planning business strategies to achieve the desired goals (Sarasvathy, 2001; Sarasvathy and Dew, 2008, Dew et al., 2009; Chandler et al., 2011). The selection criteria are based on the maximisation of expected returns (Dew et al., 2009). Contingencies are avoided (Wiltbank et al., 2006) by conducting competitive market analysis and business planning (Brettel et al., 2012; Welter and Kim, 2018). Focus on the long term, clear and consistent vision about objectives and how to achieve them (Sarasvathy, 2001; Chandler et al., 2011).

Appendix II – List of Core Words and Synonyms

	Core words
Means orientation & Affordable Loss (EffMO)	accept the loss, accessible mean, accessible resource, advantage of, afford to lose, affordable loss, available means, available resource, given means, given resource, means only, means orientation, possible, possibility, resource orientation, resources only, worst case
Word count	17
Experimentation and Flexibility (EffEF)	adapt, adaptation, adjust, adjustment, change, changing, construct, construction, contingent, contingency, creative, creativity, develop, developing, development, dynamic, evolve, evolving, experiment, experimenting, experimentation, experimental, exploit, exploitation, flexible, flexibility, invent, learn, learning, leverage, leveraging, non-predictable, non-linear, not predict, opportunity, potential, practice, problem solving, react, reaction, reactive, serendipitous, shape, shaping, short term, solve, solving, step by step, test, testing, transform, transforming, trial, tried, try, trying
Word count	56
Pre-commitments (EffPC)	affiliate, affiliation, agree, collaborate, collaboration, collaborative, commit, committing, commitment, committing, deal, dealing, endorse, endorsing, endorsement, joint, jointly, negotiate, negotiation, negotiating, negotiated, negotiable, partnership, partnering, partners, pre commit, pre commitment, relationship, relation, stakeholder, strategic alliance
Word count	31
Causal orientation (CauO)	acquire mean, acquire resource, acquire the mean, acquire the resource, allocate, allocating, allocation, analyse competition, analyse market, analyse the competition, analyse the market, analytical, analytic, calculate, calculation, causal, competition analysis, competitive advantage, competitive analysis, competitor analysis, defined, define, determine, determined, ensure, ensuring, expect, expecting, focused, focus, forecast, forecasting, goal driven, goal oriented, known, knowing, knowingly, long run, long term, market analysis, market survey, plan, planed, planning, pre determine, precise, precision, predetermine, predict, prediction, research, researching, return, systematic, yield
Word count	55