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THÈSE

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Design des Campagnes de Crowdfunding

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Sommaire

Introduction Générale

Avec la crise financière de 2008, le financement des entrepreneurs, qui n'a jamais été une chose aisée, devient un réel challenge. Alors que les banques, elles-mêmes en danger, durcissent leurs conditions d'attribution de prêts aux petites et moyennes entreprises, et aux startups en particulier[1], afin de contenir leur exposition aux risques de défaut, un système alternatif desintermédié se développe sur Internet: le crowdfunding (parfois traduit par "financement participatif" en français, bien que le terme anglo-saxon "crowdfunding" soit largement utilisé dans les pays francophones[2]).

L'idée de base est simple: permettre aux entrepreneurs de présenter leurs projets directement au public ("crowd" en anglais) afin de récolter un nombre élevé de petites contributions pour permettre le financement ("funding" en anglais) de leur projet.

Depuis la mise en place des premières plateformes de crowdfunding au début des années 2000, c'est devenu aujourd'hui une industrie aussi importante que les sociétés de venture capital en terme de montants investis[3]. Quelques 6 milliards de dollars sont levés de par le monde en 2013, 16 milliards en 2014 et plus de 34 milliards en 2015[4] (presque 300 millions pour la France cette même année).

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1 *"The Impact of the Global Crisis on SME and Entrepreneurship Financing and Policy Responses" OECD-2009*

2 *voir les sites Kisskissbankbank, Wiseed ou encore Ulule pour les sites français les plus connus.*

3 *"Trends Show Crowdfunding To Surpass VC In 2016" Forbes-2015*

4 *"2015CF Crowdfunding Industry Report" Massolution-2015*

L'engouement est général et la recherche en finance n'est pas en reste. Au commencement de cette thèse en octobre 2013, le nombre de papiers publiés dans des revues académiques se comptaient sur les doigts de la main. A ce jour, SSRN renvoie 357 résultats pour le terme crowdfunding et Web of Science en retourne 252.

Dans ce chapitre introductif, après une première section descriptive, je vais m'attacher à passer en revue la littérature actuelle sur le sujet afin de mener la réflexion vers les questions de recherche qui seront traitées dans les trois chapitres qui constituent cette thèse. Enfin, comme la recherche empirique sur le crowdfunding est aujourd'hui fortement liée aux données disponibles pour les chercheurs, j'exposerai également les techniques utilisées et disponibles afin de collecter les données nécessaires à toute recherche empirique dans ce domaine.

1. Les Différentes Formes de Crowdfunding

Pour un entrepreneur, l'objectif d'une campagne de crowdfunding est d'attirer de nombreuses personnes vers son projet et de les inciter à y participer financièrement. Il peut alors présenter son projet de manière plus ou moins détaillée (texte, photos, vidéos, etc...) afin de collecter les fonds nécessaires à sa réalisation. L'entrepreneur effectue cette collecte via internet sur un site individuel (Belleflamme et al., 2013) ou, dans la majorité des cas, sur une plateforme de crowdfunding. La plateforme sert alors de vitrine pour le projet. Il sera présenté à côté d'autres projets qui

seront classés par domaine d'activité. La plateforme imposera à l'entrepreneur un canevas de présentation pour son projet et prélèvera des frais, sous la forme d'un pourcentage du montant collecté.

Le crowdfunding peut s'effectuer sous diverses formes (Belleflamme et al., 2014). Les formes les plus courantes sont : la donation, le don-récompensé (reward-based crowdfunding), l'investissement en capital (equity crowdfunding aussi appelé crowdinvesting) et le prêt de pairs à pairs (crowdlending aussi appellé P2P-lending ou encore loan-based crowdfunding).

Le crowdfunding par donation regroupe toutes les initiatives pour lesquels les entrepreneurs n'offrent aucune contre-partie en retour à la personne apportant de l'argent dans le projet. Cependant, on considère que le sentiment positif d'avoir participé à un projet ou d'avoir été charitable procure une utilité au donateur et n'est pas considéré comme un altruisme pur. Ce phénomène est appelé également "warm-glow giving" (Andreoni, 1990).

Dans le reward-based crowdfunding, en échange de sa participation, le supporter du projet peut choisir une récompense non-financière en échange de son don. Le plus souvent il s'agira de l'objet qui sera produit par l'entrepreneur. Je reviendrai plus en détails sur ce type de crowdfunding dans la troisième section de ce chapitre introductif car c'est ce type de crowdfunding qui sera l'objet central de cette thèse.

Les autres formes de crowdfunding (crowdinvesting et crowdlending) se rapprochent par contre assez fortement de sources de financement classiques

à savoir le financement en capital (actions) ou par la dette (prêts, obligations, etc...). En effet, en equity crowdfunding, l'investisseur reçoit des actions dans l'entreprise en échange de son investissement (Hornuf and Schwienbacher, 2016), avec tous les risques inhérents à ce type d'investissement en capital dans une start-up : un risque élevé sur la survie de l'entreprise, sur sa rentabilité et une liquidité quasiment inexistante. Il n'existe en effet à ce jour aucun marché secondaire officiel pour de tels investissements. En crowdlending, tout comme dans le cas classique d'un prêt, l'investisseur devient créancier de l'entreprise avec un prêt pouvant prendre toutes les formes classiques de crédits (Everett, 2014) (échéances constantes, in fine, avec ou sans coupons, etc...). Même si les horizons de placement sont souvent moins longs, le risque lié à l'investissement dans des start-ups reste un paramètre important.

D'autres formes de crowdfunding existent encore mais sont très marginales et ne concernent que certains types de projet bien particuliers. Pour n'en citer qu'un exemple, le logiciel libre se finance parfois par reverse-auction crowdfunding[5]. Dans ce cas, plusieurs personnes intéressées par un projet (ajout d'une fonctionnalité à un programme existant, création d'un add-on ou d'un plug-in, correction d'un bug, mise à jour, etc...) proposent d'offrir chacune une certaine somme d'argent à la personne qui effectuera le travail. Au fur et à mesure que plusieurs personnes sont intéressées par la même fonctionnalité, la cagnotte augmente. Plus le montant total est élevé, plus il y aura de programmeurs intéressés pour effectuer le travail de codage. Une fois que le programme informatique est réalisé (et que les conditions exigées

5 *Voir le site http://www.bountysource.com*

par les demandeurs sont remplies), le programmeur touche la totalité des sommes offertes par les demandeurs pour ce projet.

Il est à noter que si la plupart du temps un entrepreneur va préférer utiliser un seul type de crowdfunding, il existe des situations qui justifient d'utiliser différentes formes à différents moments. Une première campagne de reward-based crowdfunding réussie peut être un bon signal afin de se lancer dans une campagne d'equity crowdfunding (Ralcheva and Roosenboom, 2016). Un entrepreneur pourra également décider de lancer plusieurs campagnes en même temps, soit sur différentes plateformes, pour améliorer la visibilité du projet (mais il s'agit rarement d'un choix judicieux car cela a tendance à disperser les investisseurs), soit entre différents modèles, afin de structurer les ressources financières de l'entreprise (une partie en equity crowdfunding et une partie en crowdlending par exemple).

2. Le Crowdfunding comme Source de Financement

La source de financement des startups est une question centrale de la finance entrepreneuriale (Cumming, 2012). Lorsqu'un entrepreneur cherche à financer un projet, plusieurs solutions s'offrent à lui. L'autofinancement, bien entendu, mais aussi le financement par la dette (bancaire, inter-entreprise ou auprès d'investisseurs individuels) ou encore la prise de participation par des investisseurs directement dans le capital de l'entreprise. De nombreuses recherches montrent que l'investissement par l'entrepreneur lui-même directement dans son entreprise est la principale

source de financement pour les startups (Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2007). Cela s'explique par une asymétrie trop importante de l'information, qui empêche à l'entreprise de trouver des bailleurs de fonds externes (Leland and Pyle, 1977). Une fois cette première source de financement trouvée, le prêt bancaire devient possible et il constitue la principale source de dette des TPE-PME afin de permettre la croissance de l'entreprise (Cassar, 2004; Cosh et al., 2009). La prise de participation par des investisseurs externes se fait, quant à elle, principalement sous trois formes : les business angels (BA), les sociétés de capital risque (Venture Capital - VC) et l'introduction en bourse (IPO). Si les VC et les IPO constituent des moyens de financement pour les entreprises en très forte croissance, elles ne concernent toutefois pas les entreprises en tout début de vie.

Que reste-t-il alors comme solutions aux entrepreneurs pour financer leur projet en tout début de vie, quand leurs fonds personnels sont insuffisants, quand les banques se voient contraintes et forcées de rationner le crédit pour les entreprises considérées comme plus risquées ou dans les pays où le système bancaire ou le réseau de business angels sont peu développés? C'est justement ce déficit de financement que peut venir combler le crowdfunding.

2.1. Le Nouveau Cycle de Financement

Dans le modèle de financement des startups proposé par Berger et Udell (1998), à chaque stade de développement de l'entreprise correspond une

source de financement optimale. De ce fait, la source de financement est liée à la taille et à l'âge de l'entreprise. Les capacités de financement aux différents stades sont principalement liés à des problèmes d'asymétrie de l'information. Des entreprises en tout début de vie ne pourront la plupart du temps que s'autofinancer, par apport de capitaux directement de l'entrepreneur dans sa propre entreprise, par sa famille ou ses amis. Il est également possible d'être soutenu par un business angel, mais cela ne concerne que des secteurs spécifiques. Dans tous les cas, les montants financés sont relativement limités. Pour des montants plus conséquents, les entrepreneurs pourront se tourner vers les sociétés de capital risque (VC). Celles-ci proposent des financements par paliers (les paliers de financement étant conditionnels à des niveaux de croissance de l'entreprise) et permettent de financer jusqu'à plusieurs millions d'euros ou de dollars. Pour les plus grandes entreprises, également plus matures, il est en outre possible d'émettre des actions auprès du public via une introduction en bourse et d'être ainsi listé sur les marchés d'échanges.

En ce qui concerne le financement bancaire, bien que disponible à tous les stades de développement (Schwienbacher, 2015), il n'est possible que pour les entreprises très peu risquées ou moyennant des collatéraux importants.

Dans ce schéma, le crowdfunding ne peut trouver une place pérenne que s'il ne vient pas simplement en substitut d'un autre mode de financement existant. La recherche sur ce point tend à montrer que le crowdfunding a un rôle à jouer dans différents cas. D'abord, il est souvent la première source de financement lorsque les fonds de départ sont difficiles à trouver pour

l'entrepreneur (pas ou peu d'apport personnel ou venant de la famille et des amis ou un réseau faible, voire parfois inexistant, de business angels). Ensuite, une première campagne réussie semble être un bon signal pour attirer par la suite des investisseurs plus importants (comme les sociétés de venture capital) (Shafi and Colombo, 2016). Enfin, pour une campagne en reward-based crowdfunding, comme les investisseurs sont en même temps les consommateurs finaux, la campagne fournit à l'entrepreneur non seulement un capital de départ mais également un test du marché-cible à un coût très réduit.

2.2. La Foule comme Bailleurs de Fonds

Dans cette partie, je vais décrire plus en détail la foule comme bailleurs de fonds pour une campagne de crowdfunding. La foule peut être vue comme un ensemble de personnes, chacune avec son profil et ses attentes, mais ayant la volonté commune de participer financièrement à un projet. Cependant les motivations ne seront pas les mêmes qu'il s'agisse d'investir dans une campagne en reward-based crowdfunding ou en equity crowdfunding. De même, la foule ne va pas évaluer les risques de la même manière qu'un investisseur professionnel.

2.2.1. Profils et Motivations

Dans un système financier intermédié classique dans lequel les investisseurs doivent passer par leur banque ou par un general partner (dans le cas des VC) pour réaliser un investissement, une distinction claire est faite entre investisseurs professionnels et investisseurs non-professionnels. Par construction, l'objectif d'un entrepreneur qui passe par une campagne de crowdfunding pour financer son projet est de réunir un nombre important de petits investisseurs ("petits" en terme de montants investis par rapport au montant nécessaire pour réaliser le projet). Mais "petits investisseurs" est-il nécessairement synonyme d'"investisseurs non-professionnels"?

Une distinction importante entre investisseurs professionnels et non-professionnels réside dans le fait que l'objectif premier d'un investisseur non-professionnel peut être différent du rendement ou du profit généré par son investissement (par exemple : un acte de consommation, de reconnaissance, de soutien d'une cause, etc...) (Bretschneider et al., 2014). De son côté, et par définition, l'investisseur professionnel se doit de générer un bénéfice ou des revenus par son activité d'investissement. Cela ne l'empêche pas, bien entendu, de se fixer des objectifs secondaires de responsabilité sociale, d'écologie ou encore d'aide au développement.

Parallèlement à cette première distinction, il est également important de différencier donation/reward-based crowdfunding et crowdlending/ crowdinvesting. Lors d'une donation, par définition, le donateur ne recevra rien de matériel en échange de sa participation. Dans le reward-based

crowdfunding, le donateur ou le supporter (il est assez délicat de parler d'investisseur dans ce cas précis, car il ne réalise pas réellement un investissement à proprement parler), va mettre de l'argent dans le projet et pourra, en fonction du montant offert, être éligible pour recevoir une récompense si le projet se déroule comme prévu. A contrario, en crowdlending/crowdinvesting, l'entrepreneur offre à l'investisseur la possibilité de générer un profit (incertain) sur l'argent qu'il mettra dans le projet, sous forme d'intérêts (crowdlending) ou de gain en capital ou en dividendes (equity crowdfunding ou crowdinvesting). Cette opportunité de générer un retour financier va être en mesure d'attirer cette fois des investisseurs professionnels, contrairement au reward-based crowdfunding. Le tableau ci-dessous offre une vue synthétique des motivations en fonction du type d'investisseur (professionnel ou non) et du type de campagne de crowdfunding (donation/reward-based ou crowdlending/crowdinvesting).

	Crowdfunding par donation / don récompensé	Crowdlending/Crowdinvesting
Investisseurs professionnels	-	Profits financiers
Investisseurs non-professionnels	Récompense, «warm glow», altruisme, reconnaissance, réciprocité, identification	Profits financiers, plaisir d'investir (jeu), reconnaissance, réciprocité, identification

Dans un second temps, il est également possible de distinguer différents profils d'investisseurs/supporters en fonction de la manière dont ils agissent. Les investisseurs/supporters peuvent être classés en 4 groupes (Lin et al.,

2014): le supporter actif, le suiveur, l'altruiste et la foule. Le supporter actif est celui qui investit tôt, dans de nombreux projets et est moins sensible au nombre de personnes ayant déjà investi avant lui dans le projet. Le suiveur, au contraire, est très sensible au nombre d'investisseurs précédents et va de ce fait investir plus tard dans les projets. L'altruiste, pour sa part, va investir pour des raisons autres que celle de faire un bon investissement. C'est le cas typique du donateur dans les campagnes de crowdfunding par don, bien que cette notion soit nuancée (voir plus haut dans le texte). Quant à ce qui est dénommé "la foule", il s'agit de personnes n'ayant pas de comportement d'investissement particulier.

En plus de ces 4 profils d'investisseurs, il est également intéressant d'ajouter une cinquième catégorie : les pairs. En effet, il a été montré que de nombreux entrepreneurs en crowdfunding étaient également supporters d'autres projets (Zvilichovsky et al., 2013). En agissant de la sorte avant de commencer leur propre campagne, ils augmentent leurs chances de succès. Et, par réciprocité, les entrepreneurs ayant reçu un soutien lors de leur propre campagne seront plus facilement amenés à investir à leur tour dans une campagne menée par un de leurs investisseurs/supporters.

2.2.2. Evaluation des Opportunités d'Investissements

En crowdfunding, comme avant tout investissement traditionnel, l'investisseur a accès à toute une série d'informations fournie par l'entrepreneur directement sur la plateforme de crowdfunding (description

du projet et de la campagne de financement, business plan, informations légales, etc...). Selon la plateforme, les informations fournies seront plus ou moins imposées, parfois minutieusement auditées ou au contraire, très hétérogènes entre les différents projets en laissant libre l'entrepreneur de divulguer ou non certaines informations qu'il juge pertinentes ou trop sensibles pour être publiquement diffusées. Cependant, Mollick (2013) montre que la foule est sensible aux mêmes signaux de qualité que les VC, réduisant même les biais géographique et de genre. De plus, les supporters sont souvent capable d'évaluer une opportunité d'investissement de manière aussi précise que ne le ferait un investisseur professionnel, avec l'avantage de fournir une bonne évaluation du marché cible puisque, la plupart du temps, ils sont non seulement investisseurs mais également utilisateurs finaux (Mollick and Nanda, 2014).

En outre, les principes de fonctionnement du crowdfunding vont apporter des mécanismes complémentaires aux investisseurs pour leur permettre d'évaluer les opportunités d'investissement. Etant donné que les investissements réalisés par les autres participants sont visibles en temps réel sur la page du projet, au moment où un investisseur va décider de participer à un projet, il va être capable d'estimer le souhait des autres à faire de même. De là, deux effets peuvent être déterminants dans la décision d'investir : le nombre de personnes ayant déjà investi et la réputation de ces participants. Premièrement, le nombre d'investisseurs ayant déjà participé à un même projet est un bon signal de l'adhésion au projet par le public. Comme le montre Kuppuswamy et al. (2013), une personne sera plus vite

tentée d'investir si le nombre d'investisseurs ayant déjà participé est élevé. Deuxièmement, lorsqu'il participe, un investisseur peut décider de rester anonyme ou de divulguer son identité publiquement sur la plateforme. Si un participant est reconnu comme leader d'opinion ou comme investisseur bien informé, sa participation sera perçue comme une certification de qualité et attirera d'autres participants, augmentant de la sorte les probabilités de succès de la campagne (Parker, 2014; Ralcheva and Roosenboom, 2016).

De même, en agrégeant les informations quantitatives fournies par l'entrepreneur (business plan et informations chiffrées, information légales) avec les informations qualitatives ("soft information" en anglais, c'est-à-dire la description du projet, les photos ou vidéo d'accompagnement, etc...), les participants sont capables d'évaluer le risque d'un projet et de prédire son échec au moins aussi précisément que le système classique de scoring des banques (Iyer et al., 2016).

3. Design d'une Campagne de Reward-Based Crowdfunding

Les sections précédentes traitaient du crowdfunding en général et nous avons vu que le crowdfunding pouvait revêtir différentes formes. Cette thèse va se concentrer uniquement sur le reward-based crowdfunding (qui pourrait se traduire par "investissement participatif par don récompensé" s'il était nécessaire de le nommer dans un français correct. Je garderai le terme de reward-based crowdfunding afin de ne pas perdre le lecteur dans les

chapitres suivants rédigés en anglais). Dans cette section, je vais décrire la manière dont se présente et se déroule une campagne de reward-based crowdfunding avant de mener, dans la partie suivante, aux questions de recherche traitées dans cette thèse.

3.1. Objectifs de la Campagne

Lorsqu'un entrepreneur lance une campagne de reward-based crowdfunding, ses objectifs peuvent être multiples. A priori, l'objectif principal est de financer une étape de son développement. Cependant, pour certain projets, il est plus délicat de parler d'entreprise, notamment lorsque le financement concerne une association ou une cause caritative. De même, une entreprise peut utiliser une campagne de crowdfunding comme campagne marketing ou un test du marché-cible pour un nouveau produit sans que l'objectif premier ne soit le financement. Dans cet exposé, je resterai sur le cas le plus courant, celui de l'entrepreneur souhaitant financer une étape du développement de son entreprise.

Bien que, comme présenté plus tôt, le crowdfunding est utilisé principalement à des stades précoces de développement de l'entreprise, il existe des campagnes pour toutes les étapes de développement d'un produit. Les projets présentés sont à des stades allant de la conception, lorsque la seule chose présentée et une idée de départ mais où tout reste à faire, jusqu'à la production à grande échelle et la distribution, lorsque l'entrepreneur a déjà testé de nombreux prototypes, que le design final est

arrêté et qu'il ne reste plus qu'à fabriquer à grande échelle et à distribuer aux clients finaux.

L'entrepreneur va alors définir son objectif de financement, c'est-à-dire le montant qu'il estime nécessaire à cette étape de son projet. Il pourra, de la même manière, définir si son projet requiert l'intégralité de la somme pour démarrer (All-Or-Nothing) ou s'il peut se permettre de démarrer son projet avec un financement incomplet (Keep-It-All). Les deux modèles existent (la plupart des plateformes proposent l'une ou l'autre mais certaines offrent le choix entre les deux, comme sur Indiegogo ou sur Fundrazr) et présentent une répartition du risque différente sur lequel nous reviendrons lors de la définition des questions de recherche de cette thèse.

3.2. Présentation du Projet et des Récompenses

Une fois son objectif défini, l'entrepreneur va présenter son projet au public pour lui donner l'envie de participer financièrement à l'entreprise. C'est lors de cette étape que l'entrepreneur est le plus libre dans le choix du design de sa campagne. Il a la possibilité de fournir des informations qualitatives sur son projet sous forme de texte, de photos ou de vidéos. Il peut par ailleurs fournir également des liens hypertextes vers un site propre au projet ou vers des pages relatives au projet sur les réseaux sociaux. Il a également la possibilité de se présenter, sur une page spécifique, de manière individuelle ou en équipe. En effet, une campagne de crowdfunding peut être menée par une personne seule mais la plupart du temps, un projet est réalisé et la

campagne en elle-même est menée par toute une équipe de plusieurs personnes. Dans la suite de cet exposé, nous continuerons de parler de "l'entrepreneur" au singulier mais ce terme recouvre également les équipes qui travaillent sur un projet.

Afin de motiver les gens à participer à la campagne de crowdfunding, l'entrepreneur met ensuite en place une échelle de récompense. En fonction du montant que le participant/supporter décide de donner à l'entrepreneur, il a la possibilité de choisir une récompenses. La récompense la plus courante proposée par l'entrepreneur est le produit qui sera fabriqué par l'entreprise : par exemples un CD (ou sa version numérique) pour un musicien, un DVD/BR pour une équipe réalisant un film ou le produit fabriqué pour une entreprise proposant un nouvel objet hi-tech. Outre cette récompense principale, l'entrepreneur peut également proposer toute récompense lui paraissant pertinente afin d'attirer une personne potentiellement intéressée par son projet; il peut s'agir d'un simple remerciement en échange d'une somme symbolique (quelques euros ou dollars), de divers produits dérivés tels que des t-shirts ou des stylos à l'effigie du projet ou encore des récompenses "premiums" comme une édition spéciale de l'objet, une visite des ateliers ou des studios, une rencontre avec l'entrepreneur ou encore une participation-clé dans le projet (un second rôle dans le film, le choix du nom d'un personnage d'une histoire, etc...). En variant les récompenses en terme de choix ou de montant, l'entrepreneur tentera d'attirer un maximum de participants et ainsi d'augmenter ses probabilités de succès.

3.3. Déroulement de la Campagne

Une fois la campagne prête, l'entrepreneur peut décider de la durée sur laquelle va s'étendre l'appel à contributions. La plupart du temps, les plateformes mettent une limite à 60, 90 ou 120 jours mais il est également possible d'avoir des campagnes 'on-demand', pour lesquelles les participations continueront au-delà de la durée prévue à condition que l'objectif initial ait été atteint dans les temps.

La campagne est alors lancée, pour la durée définie. Durant toute la durée de la campagne, le public a la possibilité de poser des questions à l'entrepreneur, de faire des commentaires sur le projet et de participer au projet. Tout cela est retranscrit en temps réel sur la plateforme de crowdfunding et chacun est capable de lire les commentaires, les questions/réponses et de voir combien de personnes ont déjà participé, pour quels montants et quelles sont les récompenses qui ont été choisies (ou qui restent disponibles, car certaines récompenses peuvent être présentes en quantité limitée). Le public peut également voir l'identité des participants pour ceux n'ayant pas fait de demande d'anonymisation de leur contribution. De plus, tout au long de la campagne, l'entrepreneur a la possibilité de mettre à jour la page de description, d'ajouter des photos ou des vidéos afin de rendre compte de l'évolution du projet. Il est également important de noter que l'argent n'est pas collecté par la plateforme durant la campagne et les carte de crédit des participants ne sont pas débitées.

3.4. Fin de la Campagne

Une fois la campagne terminée, et en fonction du type de campagne choisie, les sommes promises sont débitées des cartes de crédit des participants et l'entrepreneur est crédité de la totalité de l'argent moins les frais qui reviennent à la plateforme. Si le modèle de financement choisi par l'entrepreneur est de type "All-Or-Nothing", les participations ne sont prélevés que si l'objectif de la campagne est atteint. Si le total des participations est inférieur à l'objectif fixé par l'entrepreneur, personne n'est débité, l'entrepreneur ne reçoit aucune somme et le plateforme ne perçoit aucun frais. En revanche, si le modèle choisi est de type "Keep-It-All", l'entrepreneur pourra décider de recevoir l'argent proposé par les participants même si l'objectif de la campagne n'est pas atteint et les frais seront alors perçus par la plateforme.

Dans tous les cas, si l'entrepreneur perçoit les fonds, que la campagne soit un succès ou qu'elle soit un échec et qu'il décide de garder l'argent malgré tout, il prend l'engagement de délivrer les récompenses prévues aux participants ou de les rembourser s'il est incapable de délivrer. D'un point de vue légal, ce type de crowdfunding n'est, la plupart du temps, pas régulé par les autorités financières[6] et semblerait relever alors du code de la consommation (Gabison, 2014).

6 *voir https://www.the-fca.org.uk/consumers/crowdfunding*

4. Questions de Recherche

Dans cette section, je vais expliciter, en me basant sur ce qui a été décrit précédemment, comment les questions de recherche ont été construites et en quoi elles sont pertinentes dans l'analyse de ce nouveau mode de financement qu'est le crowdfunding.

4.1. Modèles de Financement et Répartition des Risques

Les plateformes de crowdfunding jouent un rôle de "market maker" dans la rencontre entre les entrepreneurs en demande de financement et la foule qui souhaite participer, pour les raisons évoquées plus haut, au financement de projets. Les plateformes mettent à la disposition des entrepreneurs divers services leur permettant de présenter leur projet et d'inciter un maximum de personnes à y participer. Si le rôle de la plateforme dans la promotion d'un projet (Haas et al., 2014), le réseau social de l'entrepreneur (Hekman and Brussee, 2013; Horvát et al., 2015; Vismara, 2016) ou encore les caractéristiques des projets (Agrawal et al., 2015; Belleflamme et al., 2014; Greenberg and Mollick, 2015; Mollick, 2014) ont déjà fait l'objet de recherches, à ma connaissance, le modèle de financement en lui-même et la répartition des risques qui en découle n'a fait l'objet d'aucune recherche à ce jour. Nous avons vu plus haut que, dans le reward-based crowdfunding, deux modèles de financement s'offraient à l'entrepreneur : le modèle "All-Or-Nothing", lorsque l'entrepreneur ne collecte les sommes des participants

que si l'objectif de la campagne est atteint, et le modèle "Keep-It-All", qui permet à l'entrepreneur de collecter toutes les sommes promises, même si le total est inférieur au montant visé par la campagne.

On se rend bien compte que le risque n'est pas le même pour lui s'il choisit l'un ou l'autre modèle. Dans un cas, avec le modèle "All-Or-Nothing", c'est l'entrepreneur lui-même qui supporte le risque de ne jamais pouvoir commencer son projet, tout en assurant à la foule que l'argent ne sera pas prélevé s'il n'y a pas suffisamment de personnes intéressées dans le projet et, par conséquent, d'argent pour le réaliser. Dans le second cas, lorsqu'il opte pour le modèle "Keep-It-All", l'entrepreneur s'assure de pouvoir disposer de tout l'argent proposé par les participants mais en leur faisant supporter le risque que le projet puisse commencer en ne disposant peut-être pas de suffisamment de fonds pour être mené à bien.

Comme ce choix de modèle de financement se fait au même moment où l'entrepreneur fixe l'objectif financier de la campagne, un équilibre va se créer entre ce goal et la possibilité de collecter les fonds si ce montant n'est pas atteint. C'est cet équilibre et cette répartition des risques entre le choix du modèle de financement et l'objectif de la campagne qui sera étudié dans le premier chapitre de cette thèse.

4.2. Personnalité de l'Entrepreneur

En dehors des spécificités liées à un projet, l'importance de l'entrepreneur en lui-même (et du dirigeant de n'importe quelle entreprise en général) dans

le bon déroulement d'un projet est un facteur-clé du succès de toute entreprise (Caliendo et al., 2016; Rauch and Frese, 2007). Plus particulièrement, la personnalité de l'entrepreneur peut avoir un impact sur son comportement entrepreneurial, à la base même de sa décision de devenir entrepreneur (Brandstätter, 1997; Frese, 2009), mais également sur les choix stratégiques au sein de son activité (Gudonavičius and Fayomi, 2014; Marcati et al., 2008). Un trait spécifique de la personnalité a principalement été étudié sur les CEO, il s'agit du narcissisme (Aktas et al., 2016; Chatterjee and Hambrick, 2007). Là où ces études sont basées sur des dirigeants de grandes entreprises avec des carrières remplies de succès renforçant encore leur perception d'eux-mêmes, dans le cas des entrepreneurs, une plus grande variabilité pourra être observée. De plus, dans le cadre du crowdfunding, nous pourrons étudier non seulement leurs choix stratégiques mais également la manière dont la foule perçoit le narcissisme des entrepreneurs et son impact sur le résultat des campagnes.

Afin d'étudier cet aspect, nous allons nous baser sur le fait qu'une fois l'objectif de la campagne de crowdfunding et le modèle de financement défini, les entrepreneurs vont rédiger le texte pour présenter leurs projets et leurs équipes. Cette partie de la campagne étant beaucoup moins formelle et beaucoup plus qualitative, elle sera très variable d'une campagne à l'autre est fortement influencée par la personnalité de l'entrepreneur. Si quelques recherches ont déjà été menées sur l'influence de la tonalité du texte de la campagne sur la capacité d'un entrepreneur à atteindre son objectif (Allison et al., 2015; Gao and Lin, 2015), en nous basant sur la mesure "I over We"

utilisée dans la littérature sur le narcissisme des CEO, le deuxième chapitre de cette thèse va pour la première fois analyser l'impact de ce trait particulier de la personnalité des entrepreneurs sur la manière dont ils vont designer leur campagne et sur la manière dont le public va réagir. Cette seconde analyse ne pourra être menée que sur les projets menés par des équipes car la mesure du narcissisme utilisée est basée sur le fait que le meneur de l'équipe, c'est-à-dire celui qui initie la campagne de crowdfunding, aura tendance à se ("I") mettre en avant par rapport à l'équipe ou au groupe ("We").

4.3. Renouveler le Succès ou Dépasser l'Echec

Enfin dans le troisième et dernier chapitre de cette thèse, nous allons nous intéresser au phénomène des entrepreneurs en série (Wright et al., 1997a) , c'est-à-dire les entrepreneurs qui vont se lancer dans une deuxième campagne. En effet, au-delà du projet en lui-même et de la personnalité de l'entrepreneur, plus encore dans le cadre d'appel au public comme dans le crowdfunding, l'expérience et, surtout, la réputation de l'entrepreneur auront une importance significative sur l'avenir du projet. La littérature en finance entrepreneuriale est assez partagée sur ce sujet. Si de nombreuses recherches montrent un effet positif des expériences passées, via la réputation ou le réseau acquis (Ebbers and Wijnberg, 2012; Mahto and Khanin, 2013; Starr and Bygrave, 1991), certaines montrent une stigmatisation de l'échec qui tend à démotiver et à rendre plus difficile tout

nouveau projet lorsque l'entrepreneur échoue dans un projet (Landier, 2005; Simmons et al., 2014). Une seconde campagne est pour chaque entrepreneur un défi, qu'ils aient réussi leur première campagne ou pas. Nous allons essayer de comprendre comment les entrepreneurs réagissent après un succès ou un échec, à savoir si, pour les entrepreneurs avec un premier succès, ils risquent de se relancer dans une nouvelle campagne pour trouver de nouveaux participants et si les entrepreneurs avec un premier échec trouvent la motivation de relancer une seconde campagne en essayant à nouveau de convaincre la foule de l'intérêt de leur projet. Ensuite nous nous intéresserons aux changements de design de la campagne entre leur premier et leur second essai. Quelles sont les adaptations stratégiques effectuées, tant en terme de caractéristiques de la nouvelle campagne (objectif et modèle de financement) qu'en terme de quantité d'informations fournies (texte, photos, vidéos) au public afin de réduire les asymétries ayant pu causer un premier échec? Enfin, nous regarderons si ces changements stratégiques ont un impact sur le comportement de la foule ou si la réputation acquise lors de la première tentative joue un rôle prépondérant dans le souhait du public de soutenir à nouveau, ou pas, l'entrepreneur.

5. Acquisition de Données

Le principal challenge de la recherche sur le crowdfunding est l'acquisition de données empiriques. Au début de cette thèse, la capacité à obtenir des données empiriques suffisantes et pertinentes était la principale barrière. Ce

problème était même suffisamment important pour justifier qu'il en soit question avant même de décider de commencer une thèse sur ce sujet. En effet, il n'existe à ce jour aucun fournisseur de base de données pour la recherche dans ce domaine et la plupart des travaux réalisés actuellement se basent sur des données privées. C'est d'ailleurs le cas de cette thèse.

Cette cinquième section est un peu particulière car son objectif est de fournir à tout nouveau chercheur intéressé par la recherche empirique sur le crowdfunding les sources existantes et quelques bases techniques utiles à la collecte de nouvelles données pour la création de nouvelles bases de données nécessaires à la recherche.

5.1. Méthodes

Dans les papiers de recherche actuels, trois méthodes sont principalement utilisées pour acquérir des données empiriques : la collecte manuelle, les accords avec les plateformes de crowdfunding pour obtenir leurs données et la collecte directe sur internet au moyen d'un programme informatique (bot), aussi appelé "web scraping".

La première méthode, la collecte manuelle, est la plus simple à utiliser car elle ne requiert aucune connaissance technique particulière, il suffit de passer en revue les pages web souhaitées (page des projets, présentation des leaders, des participants, etc...) et de collecter méthodiquement les données souhaitées dans un simple tableur par exemple. Le principal avantage de cette technique est la qualité des informations. Chaque page étant

soigneusement inspectée, la personne effectuant la collecte pourra facilement trouver les informations désirées et juger de la pertinence de l'observation. En contre partie, cette méthode minutieuse est chronophage et ne permet pas de collecte exhaustive, induisant des biais de sélections qui peuvent être compliqués à justifier. Les papiers utilisant ce type de données sont alors basés sur de petits échantillons, plus proche de l'étude de cas et assez difficilement généralisables.

La seconde méthode, de toute évidence celle ayant le meilleur rapport qualité des informations/temps de collecte/exhaustivité, est de passer un accord avec une plateforme de crowdfunding pour qu'elle fournisse sa base de données, et idéalement ses sauvegardes quotidiennes, ceci permettant d'obtenir de grandes séries temporelles permettant une analyse détaillée et des résultats robustes. Ici le principal problème est d'obtenir un accord pour ce genre de chose. Les plateformes connaissent la valeur de leurs données, ne souhaitent pas qu'elles puissent être diffusées (même accidentellement) à leurs concurrents et se doivent d'avoir une certaine politique de confidentialité, notamment envers leurs usagers (entrepreneurs et investisseurs). De même, il est assez difficile d'imaginer qu'un tel accord soit accessible pour de nombreux groupes de recherche, surtout en ce qui concerne les données de plateformes internationales.

Reste la dernière méthode, la collecte automatisée directement sur le site web de la plateforme des informations relatives aux campagnes de crowdfunding et/ou à leurs usagers. Cette technique nécessite cependant des connaissances en informatique, en réseau, en programmation et en langage

internet. C'est cette méthode qui a été utilisée pour constituer la base de données utilisée tout au long de cette thèse et il nous semblait utile d'en donner ici les bases afin que d'autres chercheurs puissent à leur tour se lancer dans la collecte de telles données, voire d'étendre ces techniques à d'autres domaines de recherche.

5.2. Web scraping

Le principe de fonctionnement du web scraping est assez simple. Il nécessite de créer un programme informatique qui va naviguer de lui-même sur le site web choisi, "lire" les pages et en copier les informations dans un fichier ou dans une base de données afin qu'elles puissent être ensuite utilisées dans un autre logiciel, comme un logiciel de traitement de données par exemple (un tableur ou un logiciel de type R ou Stata).

5.2.1. Structure des sites web de crowdfunding

Les sites web, pour être affichables dans un navigateur, utilisent un système de balises. Le texte est mis dans un fichier .html, facilement lisible, entre des balises qui vont permettre de savoir si c'est un titre, un texte qui va dans un cadre, s'il est en gras, etc... Le navigateur mettra la page en forme en se référant aux balises et à une feuille de style qui indique ce qu'il doit faire des éléments en fonction de la balise.

Par exemple, dans le code source d'une page kickstarter, on peut trouver ceci :

```
602 <div class="digits_5" id="stats">
603 <div class="row">
604 <div class="col col-12 mb2 stat-item">
605 <div class="num f1 bold" data-backers-count="254" id="backers_count"><data cla
606 <span class="type-14 bold navy-600 text">backers</span>
607 </div>
608 <div class="col col-12 mb2 stat-item">
609 <div class="num f1 bold nowrap" data-goal="75000.0" data-percent-raised="0.457
610 <data class="Project471688899" data-currency="USD" data-format="shorter_money"
611 <span class="money usd project_currency_code"></span>
612 </div>
613 <span class="type-14 bold navy-600">
614 pledged of <span class="money usd no-code">$75,000</span> <span class="mobile-
615 </span>
616 </div>
617 <span data-duration="30.0" data-end_time="2016-09-08T06:00:29-04:00" data-hour
618 <div class="col col-12 stat-item">
619 <div class="Project471688899" data-conditions="[{&quot;!state&quot;:[&quot;can
620 <div class="js-num f1 bold"> </div>
621 <span class="type-14 bold navy-600 js-text"> </span>
622 </div>
623 </div></div>
624 </div>
625 </div>
```

On observe que le nombre de participants ('backers', donc 254) est dans la balise de class nommée 'num f1 bold' et que le goal du projet est dans la class 'num f1 bold nowrap' (75000). Il en est de même pour toute les données de la campagne, y compris le texte.

De même, il est courant que les plateformes de crowdfunding indexent des projets présents sur le site, en cours ou terminés. Les urls[7] des pages de chaque projet sont alors accessibles directement dans le code source de la page d'index comme dans l'exemple ci-dessous (à nouveau pour kickstarter) :

```
4834 <a class="project-thumbnail-wrap" data-pid="1172892804" href="/projects/496246404/scubajet-worlds-first-flexible-water-sports-jet-en?ref=category" target="">

4893 <a class="project-thumbnail-wrap" data-pid="1251830695" href="/projects/1793003507/voices-of-humanity-the-worlds-space-time-capsule?ref=category" target="">

4946 <a class="project-thumbnail-wrap" data-pid="305050541" href="/projects/enblue/evolus-dock-power-up-your-apple-watch-iphone-and-i?ref=category" target="">
```

7 *de l'anglais "Uniform Ressource Locator", il s'agit de l'adresse de la page internet.*

L'adresse url des projets est alors simplement reconstituée en ajoutant "https://www.kickstarter.com" devant le texte référencé sous la balise 'href=' de la class 'project-thumbnail-wrap'.

5.2.2. Etapes pour la mise en pratique

La collecte d'informations sur des campagnes de crowdfunding doit donc se faire en deux étapes : il faut d'abord collecter les adresses (url) des pages des projets et ensuite extraire les données de chaque page.

Pour chaque étape, la méthode est la même : fournir au programme l'url de la page à visiter et lui indiquer à quel endroit aller chercher les informations. Il est à noter que les sites de crowdfunding sont incapable de référencer toutes les campagnes sur une seule page d'index. Il sera nécessaire de repérer la partie incrémentale de l'url afin de permettre au bot de naviguer dans toutes les pages d'index.

Dans le cadre de cette thèse, nous avons utilisé le langage opensource Java[8] pour la programmation ainsi que les librairies Jsoup[9] pour naviguer et extraire les données de fichiers html. Nous conseillons cependant, à quiconque souhaite créer un programme d'extraction, de s'orienter de préférence vers le langage Python[10] et les librairies BeautifulSoup [11] pour des raisons de simplicité et de flexibilité.

8 *http://www.java.com/*
9 *https://jsoup.org/*
10 *https://www.python.org/*
11 *https://www.crummy.com/software/BeautifulSoup/*

A titre d'exemple, un 'scraper' de base programmé en Python pour le site de crowdfunding Kisskissbankbank[12] sous licence libre GNU-GPL est disponible à l'adresse suivante :

http://cloud.leboeuf.eu/index.php/s/YYGJzIAEuhNuZgR

ou sur simple demande à l'auteur de cette thèse.

Les captures d'écran ci-dessous présentent une extraction type réalisée avec ce logiciel.

```
glebelg@ordiglebelg:~/ownCloud/dev/cf001$ python scraper_kisskissbankbank.py
**********
This program helps you to extract data from Kisskissbankbank website
It is distributed under GPL 2.0
**********
Please choose a category to extract :
**********
(1)adventure-and-sport, (2)art, (3)book-and-publishing,
(4)design-and-innovation, (5)ecology, (6)education,
(7)film-and-video, (8)food, (9)games, (10)journalism,
(11)live-performance, (12)music, (13)photography, (14)social,
(15)style, (16)web-and-tech.
**********
Your choice : 5
**********
Extracting category : ecology
There are 114 pages of index in this category.
**********
How many pages index pages do you want to extract? : 2
**********
Extracting 2 pages of index.
Processing page 1/2
Processing page 2/2
**********
Done ! extraction-ecology-20160815-113856.csv created.
**********
Do you want to extract all projects in ecology (y/n) : y
Extracting project 1.
Pâturons
Extracting project 2.
Remise en état de la Saline de Truscat
Extracting project 3.
Potager Vertical
Extracting project 4.
ÄLVIS. PAPER PROJECT
Extracting project 5.
Participez à l'achat et à la rénovation d'un refuge pour animaux.
Extracting project 6.
Des ABEILLES au secours des ÉLÉPHANTS au Togo!
Extracting project 7.
TRENCH AA
Extracting project 8.
N'jill
Extracting project 9.
Potagers Solaires Urbains
Extracting project 10.
Les coffrets de variétés anciennes régionales
Extracting project 11.
Micro-crèche Montessori et éco-responsable
Extracting project 12.
Faire germer une fleur en coton
Extracting project 13.
Terres Solidaires 2016 Projet Haïti / Projet Madagascar
Extracting project 14.
Le Carrelet du Pertuis // Centre socio-culturel Le Pertuis
Extracting project 15.
Ma ruche en Morvan
Extracting project 16.
Construction d'un dôme
Extracting project 17.
Mission Prospective pour la Réserve de Comoé-Léraba
Extracting project 18.
La Faim du Monde 2017
**********
Done ! full_extractionecology-2_pages-20160815113856.csv created.
**********
```

12 *https://www.kisskissbankbank.com/*

Chapter 1: Crowdfunding Models: Keep-It-All vs. All-Or-Nothing[13]

1. Abstract

Reward-based crowdfunding campaigns are commonly offered in one of two models. The "Keep-It-All" (KIA) model involves the entrepreneurial firm setting a fundraising goal and keeping the entire amount raised, regardless of whether or not they meet their goal, thereby allocating the risk to the crowd when an underfunded project goes ahead. The "All-Or-Nothing" (AON) model involves the entrepreneurial firm setting a fundraising goal and keeping nothing unless the goal is achieved, thereby shifting the risk to the entrepreneur. We show that small, scalable projects are more likely to be funded through the KIA scheme, while large non-scalable projects are more likely to be funded through the AON scheme. Overall, KIA campaigns are less successful in meeting their fundraising goals, consistent with a risk-return tradeoff for entrepreneurs, where opting for the KIA scheme represents less risk and less return for the entrepreneur.

13. *This chapter is based on "Crowdfunding Models: Keep-It-All vs. All-Or-Nothing" co-authored with Douglas J. Cumming (York University–Schulich School of Business) and Armin Schwienbacher (supervisor of this thesis). We are grateful for helpful comments and suggestions from seminar and conference participants at Bentley University, Concordia University, SKEMA Business School, University of Poitiers, the 2014 Strategic Management Society Annual Conference, the 2014 EUROFIDAI Paris Conference, the 3L Finance Research Workshop in 2014, the Government of Canada Department of Foreign Affairs, Industry and Trade, the National Crowdfunding Association of Canada, and Politechnico di Milano.*

2. Introduction

The rise of crowdfunding has been facilitated by standardized Internet platforms that act as two-sided markets through the participation of a large crowd. They enable clear mechanisms through which individuals can provide money for or even invest in early-stage entrepreneurial firms (Belleflamme et al., 2014, 2013; Mollick, 2013). There is growing literature on the network effects that may result from the participation of a large crowd. While understanding how crowdfunding platforms work has attracted increasing interest from research scholars, recent research is inconclusive about network benefits arising from the crowd (Bayus, 2013; Boudreau and Jeppesen, 2015), partly because the incentives and motivations among different individuals is heterogeneous (Belenzon and Schankerman, 2015). In this paper, we provide new theory and evidence on how the design of the crowdfunding mechanism itself can influence the networked risks and benefits associated with participation in the crowd.

Kickstarter and Indiegogo are reward-based crowdfunding platforms whereby entrepreneurs state capital raising goals, and, in exchange, individuals are offered a reward for participating.[14] In most cases, the reward is the product that is eventually produced by the entrepreneur with the money raised during the campaign. In practice, two types of platforms have emerged: "All-Or-Nothing" (AON), and “Keep-It-All” (KIA). In the

14. *Other forms of crowdfunding platforms exist, such as equity-, loan- and donation-based platforms. These platforms attract different types of crowdfunders, since incentives to participate are not based on receiving a product.*

AON model, entrepreneurial firms set a capital-raising goal below which the entrepreneurial firm does not keep any of the pledged funds, and the crowd does not get any reward. In the KIA model, by contrast, the entrepreneurial firm can keep the entire pledged amount, albeit at higher fees, as explained further herein, regardless of whether or not the stated capital raising goal is reached. In this paper, we consider whether the differences in these two fundraising models give rise to differences in the types of firms that select a particular model, their eventual likelihood of success, and the sensitivity of investors to information released by the entrepreneurial firms. From a managerial perspective, these issues are crucial for understanding how networks such as crowdfunding platforms can contribute to obtaining necessary resources to transform innovative ideas into products.

We conjecture that entrepreneurs that self-select into the AON model do so in order to signal to the crowd that they are committed to only undertake the project if enough capital is raised, which reduces the crowd's risk that undercapitalized projects will be undertaken, as under the KIA model. As such, AON projects are expected to be larger and more successful. By contrast, KIA projects will be selected by entrepreneurs who can scale their project (i.e., a portion of the planned project is feasible) at a level that individuals still get utility from the reward under a scaled-down format (knowing that they will lose the entire utility if the project is canceled). This may occur if the degree of underfunding is not excessive so that the crowd avoids bearing too much risk of not receiving anything. Similarly, entrepreneurs with projects with few fixed costs of production are more

likely to use the KIA model, since the absence of fixed costs makes it easy to undertake the projects on a smaller scale than when fixed costs are important. These predictions are consistent with a risk-return tradeoff at the entrepreneurial level, in which selecting the KIA model represents less risk but also lower returns (lower chances of obtaining the needed funds) for the entrepreneur, while the AON model has more risk taken by the entrepreneur but higher chances of successful funding. Thus, the KIA model, while offering an overall lower chance of success, may be optimal for risk-averse entrepreneurs, particularly if the higher risk involved in AON is not compensated by sufficiently higher success chances.

To test these propositions, we extracted a sample of 22,850 fundraising campaigns from the Indiegogo platform (www.indiegogo.com) from the years 2011–2013. Unlike other major platforms, Indiegogo has offered entrepreneurs the option of picking either the AON or the KIA model since December 2011. Thus, Indiegogo offers a unique setting to investigate our research questions. The data indicate that 94.8% of fundraising campaigns used the KIA model, while only 5.2% used the AON model. Campaigns using the AON model on average sought to raise $31,397 (and median of $16,485), while campaign goals for KIA were on average $20,478 (median of $10,000). AON campaigns had an average completion ratio (i.e., the ratio of total pledges over goal, in a percentage) of 64%, while KIA campaigns had a completion ratio of 42%. Put differently, 34% of all AON campaigns were successfully completed (i.e., they had a completion ratio of 100% or higher), while only 17% of all KIA campaigns achieved their funding goals. AON

campaigns had on average 189 backers (median 43), while KIA campaigns on average attracted 76 backers (median 33).

The data further indicate that there is a negative relationship between the funding goal and usage of the KIA model, in line with the prediction that the AON model constitutes a commitment device and thus reduces risk to the crowd, as underfunded projects will not be undertaken under with AON. Consistent with existing studies on crowdfunding success (Belleflamme et al., 2014, 2013; Mollick, 2014; Mollick and Kuppuswamy, 2014), campaigns with larger fundraising goals are less successful. Controlling for size differences, our data indicate AON campaigns are more likely to achieve their goal, despite the fact that their goals are larger on average. Taken together, these results are consistent with the view that the usage of AON is a clear signal to the crowd that the entrepreneur commits not to undertake the project if not enough is raised, which represents a potential cost to the entrepreneur who may not be able to undertake the project. The AON model therefore reduces the risk to the crowd, thereby enabling the AON entrepreneurial firms to set higher goals, raise more money, and be more likely to reach their stated goals. Opting for the AON model allows entrepreneurs to alleviate constraints on their fundraising goals induced by the negative impact of funding goals on success. In contrast, KIA projects tend to be less successful in general, despite their lower goals, when compared to AON campaigns. Under a KIA campaign, the crowd bears the risk that an entrepreneurial firm undertakes a project that is underfunded and, hence, more likely to eventually fail, making the

crowd more reluctant to pledge. However, these conclusions do not imply that AON is systemically superior, since AON entails significantly higher risk for the entrepreneur. Thus, our findings support the view that entrepreneurs on Indiegogo are often willing to reduce their own risk by opting for a KIA model at the expense of achieving higher funding amounts. These findings are robust to a number of specification tests, including controls for the endogenous choice of the fundraising goal and propensity score matching.

The remainder of the paper is structured as follows: The next section provides information on the structure of the Indiegogo platform. Our theoretical predictions are thereafter explained and summarized. The subsequent sections introduce the data and provide empirical tests. A discussion and concluding remarks are provided in the last section.

3. The Structure of Indiegogo Platform

Launched in 2008, Indiegogo has become the second-largest crowdfunding platform worldwide (59,889 projects listed[15]), after Kickstarter (133,859 launched projects, among which 56,468 successfully funded for a total amount raised of $986 million[16]). Indiegogo offers entrepreneurs the possibility to launch their online reward-based crowdfunding campaign in three categories (Creative, Innovative, or Social). The website is available in

15 *Source: Indiegogo.com (last viewed on February 20, 2014)*
16 *Source: kickstarter.com (last viewed on February 20, 2014)*

English, French, German, and Spanish, but project leaders may be located in any country of the world. Entrepreneurs must have a fundraising goal of at least 500 units in any accepted currency (USD, EUR, GBP, CAD, or AUD). An individual, a group of persons, a registered business, a non-profit institution, a community, or even a religious or political organization can post projects. Campaigns can last up to 60 days for AON and up to 120 days for KIA. During the campaign, the platform collects pledges from the backers; once the campaign ends, the money is transferred to the entrepreneur via PayPal.

One of the main differences between Indiegogo and most other platforms is the possibility for the entrepreneur to choose between a KIA funding model and an AON model.[17] Other major platforms such as Kickstarter, FundedByMe, or PeopleFund.it, only offer the possibility to run AON campaigns. Other platforms such as RocketHub, GoFundMe, or Sponsume, only allow use of the KIA model. In an AON crowdfunding campaign, the entrepreneur sets a fixed fundraising goal. If the total money pledged is smaller than the goal at the end of the campaign period, all the pledges are cancelled, and the entrepreneur does not receive anything. On Indiegogo, this type of campaign is called "fixed funding," and the platform takes a 4% success fee on the money received by the entrepreneur in case of a successful campaign. In a KIA campaign, the entrepreneur also sets a fixed fundraising

17 *There are other platforms offering the choice between KIA and AON models, such as Community Funded and Crowdtilt. Indiegogo, however, is by far the larger and more widely known platform, according to the Google page rank (from 0 up to 10): a value of 7 for Indiegogo, 4 for Community Funded and 6 for Crowdtilt. By comparison, Kickstarter's Google page rank is 7 and Wikipedia 9. Compared to these others platforms that also offer the choice between KIA and AON models, Indiegogo is also larger in terms of number of projects posted and volume pledged.*

goal. However, whatever the outcome at the end of the campaign, the entrepreneur can choose to keep all the money pledged by backers, even if the goal is not reached. On Indiegogo, this type of campaign is called "flexible funding." There, the platform charges a 4% fee for successful campaigns (as in AON campaigns) but a 9% fee in an unsuccessful campaign if the entrepreneur chooses to call the pledged money. Thus, there is a cost for the entrepreneur to set the funding goal too high[18]. Of course, the costs of a too high goal are even larger for AON projects, since there the entrepreneur needs to abandon his/her project. While all the campaigns were based on the KIA model in the first years of the platform's existence, Indiegogo started offering the option to the entrepreneur to choose between KIA and AON from November 2011 onwards.

To sum up, two important decisions must be considered by the entrepreneur when setting up his/her campaign: the funding structure (AON versus KIA model) and the fundraising goal. These two variables are set simultaneously at the beginning of the campaign and are, therefore, potentially endogenous, as we discuss and control for in our empirical analyses below.

Each project also indicates a reward scale. The entrepreneur sets one or more pledge levels (based on amount to pledge) for which he or she will offer different rewards to the backers. The entrepreneur freely defines the reward amounts and steps, and the number of reward levels. Rewards offered can be as simple as a "thank you" on the project page or as important as a key decision in the project development. Usually, the main

18. *Next to these success fees, Indiegogo also charges 3% third-party fees for credit card processing for both models.*

reward offered is the project's main product combined with some extras (dedication, personalization, etc.). Moreover, some rewards can be available only in a limited quantity (limited editions of the product, a special discount for early backers, etc.). The entrepreneur also indicates a provisional date for the reward to be delivered. These rewards offer no legal obligation for the entrepreneur or guarantee for the backers, even in case of project success.

Beside this hard information, Indiegogo also permits an entrepreneur to provide 'soft' information about his or her project. Some information is needed for the index pages, where projects are listed as standardized "projects cards" (a small image, the campaign title, and a short description with a maximum of 160 characters, the category, and the origin country and city). Other project descriptions will only appear on the project main page: the full project description with no limit in length or form (and which can include text, pictures, animations, charts, graphics...), an optional video pitch introducing the project and the leading team, an extra pictures gallery, links to relevant external websites or social networks pages, and team description. Each team member also has a personal page, where he can introduce himself with pictures and text and where facts about his/her activity on Indiegogo are listed. This personal page shows links to other projects leaded, their own backer activities in other projects, referrals (the number of clicks on shared links from external social networks), and the number of comments he or she has made on an actual or previous campaigns.

Some of the information flow accrues only over time. While hard information is provided at the beginning of any campaign, the entrepreneur can update the project page with soft information during and after the campaign, notably by posting comments. However, visitors and backers are also allowed to post comments or questions, which facilitates interaction with the entrepreneur. Complementary data will also be provided all along the crowdfunding process by the platform and backers. The page will also be automatically updated to provide information about enrolled backers with pledges made for the different rewards offered, the campaign's remaining time, and the overall progress towards the goal.

4. Theory and Hypotheses

Prior empirical and theoretical work on crowdfunding has focused on the factors that affect success on crowdfunding platforms that only offer AON crowdfunding, including Kickstarter (Belleflamme et al., 2014; Colombo et al., 2015; Mollick, 2014; Mollick and Kuppuswamy, 2014). Related studies on crowdfunding have examined equity crowdfunding (Ahlers et al., 2015; Cumming and Johan, 2013; Hornuf and Schwienbacher, 2014, 2015a).

Our theoretical setting differs from prior work by examining the different types of reward-based crowdfunding models and the role of model choice as a signal in the crowdfunding campaign. While most of these prior studies focus on crowd and project characteristics, such as gender (Greenberg and Mollick, 2015) or geographical origin (Agrawal et al., 2015; Lin and

Viswanathan, 2016), our contribution lies in examining the choice of AON versus KIA relative to project characteristics such as size and scalability, the design of the crowdfunding campaign in respect of rewards levels and soft information, and its impact on the crowd's willingness to pledge money and, thus, the ultimate campaign outcome.

4.1. Project Characteristics: Size and Scalability

We assume entrepreneurs and the crowd are both risk averse. Expected utility is a function of the project, the reward, the cost of participation, the risks of the project not being undertaken, and the risks of the project not succeeding on the condition of being undertaken.

Using a theoretical framework of information aggregation (Hakenes and Schlegel, 2014), Hakenes and Schlegel show that the level of funding goals set in AON crowdfunding campaigns helps to attract a larger crowd. They consider equity- and loan-based crowdfunding where the crowd makes financial decisions. In the context of reward-based crowdfunding, by contrast, the crowd does not make investment decisions but rather consumption-based decisions. However, part of the intuition developed there is useful in our context. In Hakenes and Schlegel, the level of the funding goal serves as a tool to aggregate vague information that each investor has. By imposing an AON model, individual investors are more likely to invest, despite the availability of only vague information, since they know they will become a crowdfunder to the project if many other crowdfunders with

similarly vague information also contribute. In the case of reward-based crowdfunding, the level of the funding goal serves a costly mechanism that ensures that the entrepreneur will limit the risk faced by the crowd only by starting the project with sufficient financial resources. This maximizes the chances that the entrepreneur will be able to deliver the promised reward to the crowdfunders.

To sum up, by selecting the AON model, entrepreneurs have the ability to signal quality. If an entrepreneur leads a project with a high capital goal, he or she must attract more backers and/or try to convince each of them to pledge larger amounts. To do this, the entrepreneur must give some guarantees to the backers. Based on the notion that incompletely funded projects are more risky than projects starting fully financed, setting an AON campaign shows the potential backers that the project will start if and only if the funds are sufficient. The decision to seek AON financing imposes a larger risk on the entrepreneur of not being able to start the project at all, making the choice of AON a costly and thus credible signal for the entrepreneur (consistent with the Spence-Mirrlees condition that any signal must be costly to be credible (Spence, 2002)). Such campaigns may then be considered as less risky for the backers and, hence, may attract more backers and larger amounts.

> **H1 (Funding Goal):** Projects with high capital goals are more likely to opt for All-Or-Nothing crowdfunding campaigns.

Generally, entrepreneurs who are in the market for crowdfunding are capital constrained and unable to make up funding shortfalls, although some

already have some capital (Agrawal et al., 2015). At least, given the uncertainty with the possibility of a funding shortfall and the magnitude of the shortfall, there is no way for the entrepreneur to credibly signal to the crowd that he or she will make up the difference with other sources of funding. Entrepreneurs are not likely to be successful crowdfunders at all if they advertise that they have lots of money from other sources and do not need the pledges from the crowd.

The risk to the crowd of starting a project with insufficient resources is mitigated if the project is scalable. We expect that entrepreneurs involved in scalable projects are more likely to seek KIA funding since they are able to produce output even when they obtain only partial funding. A project can be considered as scalable in two ways, either because the output or costs are scalable. The first case is when the entrepreneur is able to reduce the costs by removing some features to the goods. Examples of projects that can be scaled back this way include books (one can generate a subset of the chapters or a comic book without color); music albums with fewer tracks than expected; video games with fewer levels and less options (less items, no digital voices, or less sophisticated graphics); and non-profit ventures (charity, whereby 'any amount is welcome'). In the second case, scalable projects are characterized by having little or no fixed, incompressible costs that need to be shared among a larger number of crowdfunders. Projects with absolutely no fixed costs can be started with any number of backers, as long as the required pledge covers the product's marginal cost of production.

Backers contribute capital if the utility associated with the funded project and reward outweighs the pledged contribution (Belleflamme et al., 2014), even in case of a scaled-back product. Projects based on material goods (like 3D-glasses, a health-monitoring watch, a new restaurant, etc.) without scalable output are less likely to opt for a KIA campaigns. Indeed, projects that are not scalable may face high risk of failure when pursued without enough funding. Such projects face significant fixed costs, leading to high operational leverage and, thus, higher risk (Lambrecht et al., 2014). The level of risk is then magnified when undertaken without sufficient initial funding. As such, the KIA model is relatively more attractive to backers that can still gain utility in a partially funded project in form of a qualitatively reduced product. Likewise, KIA models are more attractive if the project has little fixed costs to spread over backers, since such a project can remain profitable even with only a few backers.

> **H2 (Scalable Projects):** Projects that are scalable and/or have lower fixed costs are more likely to use the Keep-It-All model.

4.2. Mechanisms to Reduce Risk: Rewards Levels and Soft Information

Entrepreneurs can affect the compensation of crowdfunders with more reward levels in order to make pledging more worthwhile. More reward levels increase the utility of crowdfunders when they have different preferences on how the final product should look (e.g., in terms of color or

design), since each crowdfunder can select the most appropriate reward type for him- or herself. This greater choice, in turn, increases the total amount of pledges, since more backers may want to participate. From the perspective of the entrepreneur, more reward levels reduce the risk of failure. Therefore, selecting the AON funding model becomes less costly, which then enables the entrepreneur to select the AON model more often.

> **H3 (Reward Levels):** All-Or-Nothing crowdfunding campaigns are more likely to have more reward levels.

The risks entrepreneurs face in terms of an underfunded AON project are much more pronounced than an underfunded KIA project. As such, we expect entrepreneurs to spend more effort and expense (in terms of money and time) on signals of quality to the crowd. These expenses are primarily in the form of soft information, such as longer catch phrases, photos, having a video pitch, and longer yet easier-to-read project descriptions. Furthermore, we would expect AON entrepreneurs to have invested more time in developing a social network presence in order to lower the probability of and expected cost associated with an underfunded project.

> **H4 (Soft Information):** Entrepreneurs pursuing riskier campaign strategies will make more use of soft information to mitigate the uncertainty faced by the crowd.

4.3. Likelihood of Success under AON versus KIA

Given these predictions on the choice of funding model, we further expect it to affect outcome in terms of achieving the campaign goal. Two assumptions imply the existence of a risk/reward tradeoff with AON versus KIA. First, there is some uncertainty about the true cost structure of the project (mainly the amount of fixed costs involved). Second, underfunded projects can be completed, but only at a lower probability of success relative to fully funded projects.

These two assumptions imply that under AON, there is more risk for the entrepreneur (the entrepreneur gets nothing if the funding goal is not met), but potentially more return for the entrepreneur since losses due to underfunding are minimized. At the same time, under KIA there is more risk for the funder (potentially the funder contributes to an underfunded project that will not be successfully completed), and hence funders are less willing to contribute, but not completely unwilling since underfunded projects can be undertaken albeit at a lower probability of success relative to fully funded projects.

Note that we are referring to different types of risks for the entrepreneur and the funders. For the funders, it is the risk of not being able to receive the product that s/he funded. For the entrepreneur, it is the financial risk leading to not being able to do the project. Therefore, crowdfunding in general transfers "financial risk" from the entrepreneur to "risk of product delivery, loss of utility, and frustration" to the funders.

In view of the risk transfers under the choice of funding models, risk-averse entrepreneurs will never pursue riskier AON campaign strategies unless the average success level associated with the riskier campaign strategy is higher. If success were, on average, higher under KIA campaigns, then entrepreneurs would never select AON campaigns, because there is no reward for the extra risk taken. In contrast, we expect KIA projects to be less successful, since the crowd bears the risk of an entrepreneurial firm undertaking a project that is underfunded and, hence, more likely to fail. Therefore, the crowd is less willing to participate. In equilibrium, if entrepreneurs are risk averse, they will use the riskier AON method only for projects where success is much more likely. In contrast, the crowd is less affected by these losses since individually they pledge only a very small amount.

In sum, in view of the risk/reward tradeoffs, we expect the following:

> **H5 (Success):** All-Or-Nothing campaigns are, on average, more likely to be successful than Keep-It-All campaigns.

In testing these hypotheses, we control for other factors that can affect crowdfunding success, including, but not limited to, the information provided by the entrepreneur and the level and structure of the rewards. The level of information provided prior to the fundraising campaign may, of course, likewise affect the probability of success. Where it is difficult or costly for the entrepreneur to provide information that is more than mere cheap talk, campaigns that offer more information (such as having a video

and not merely a textual description of the project) are more likely to be successful.

The level of the reward and the number of reward scales can further affect the probability of success. We expect that campaigns with more reward scales are more likely to succeed, since these campaigns are more likely to match preferences of the crowd, due to the broader variation in the amount that can be invested and the reward to be received.

5. Data and Summary Statistics

Our dataset was extracted directly from the Indiegogo website. Data were collected page by page in October 2013. On Indiegogo, all finished projects stay visible on the website, regardless of whether they are successful or not, as long as the total amount pledged is at least 500 USD/EUR/CAD/AUD/GBP. Our initial sample consisted of all of the 47,139 finished campaigns that took place from the very beginning of Indiegogo in 2008 until October 2013. Computer-automated data collection, however, led to a loss of less than 5% of data, due to missing or erroneous key values or inconsistency in data provided on the Indiegogo website. There is no evidence that these missing data were linked to specific project characteristics; therefore, it seems reasonable to assume that these missing projects were randomly distributed and that our sample is a good representation of the full population of projects launched on Indiegogo.

Since the database includes projects with five different currencies, we convert all monetary values (goal, pledge, rewards) in USD to make them comparable. The exchange rate is the yearly average exchange rate (for campaigns lasting between 2 years, the ending date was retained). We excluded 5,727 campaigns that took place between 2008 and November 2011, since the choice between the AON and KIA model was only introduced in December 2011 and, thus, our hypotheses could not be tested on these campaigns. Following previous empirical research on crowdfunding (Mollick, 2014; Qiu, 2013), we excluded projects with a fundraising goal under $5,000 (after conversion of all values into $). Such projects typically rely for the most part on money from family, friends, and relatives, and, thus, cannot be compared with projects relying on backers (i.e., the crowd) outside the close network of the entrepreneur. We also excluded projects with a goal higher than $200,000, which corresponds to the 99th percentile of our distribution. Indeed, some projects had very large fundraising goals (12 projects had a goal higher or equal to $10m). Consistent with the approach adopted by (Mollick, 2014) for Kickstarter data, we considered these few observations as outliers, distinct from the traditional type of projects proposed on the platform. Our final sample was composed of 22,850 campaigns. A full description of variables available in our dataset is provided in Appendix Table I. Variables are classified in 3 types: project characteristics, soft information provided at the beginning of the campaign, and campaign output.

The recorded project characteristics are mandatory information and prior to the campaign start, all entrepreneurs set them once and for all. While some variables are intrinsic to the project itself (the category/subcategory, the location), others are set freely by the entrepreneur: the goal, the funding model, the number of rewards, and the level of each reward (i.e., the amount a backer should give to choose the defined reward), the duration, etc. The additional "soft" information is a set of descriptive information provided to inform the crowd about the project. It consists of text, pictures, video pitches, possibly additional comments and updates, as well as any other information that the entrepreneur discloses to potential backers. As these pieces of information are mostly of qualitative nature, we limited ourselves to those that could be measured quantitatively. For instance, information such as the number of words/pictures/items and the presence or not of some items allowed us to observe the implication of the entrepreneur in his/her project and its degree of preparedness, as it is associated with success (Mollick, 2014).

Given that this information is intended to a wide audience reading, we also include a readability index as a control variable for evaluating crowd perception. Readability indexes are designed to gauge the understandability of a written text. We use the Automated Readability Index (ARI). This index uses the full text of project description, as described in Appendix Table 1. The ARI offers an index expressed in US grade levels, which makes it easy to interpret economically. For instance, grade 1 indicates text for

children who are 6/7 years old, and grade 12 for high school students who are 17/18 years old.1

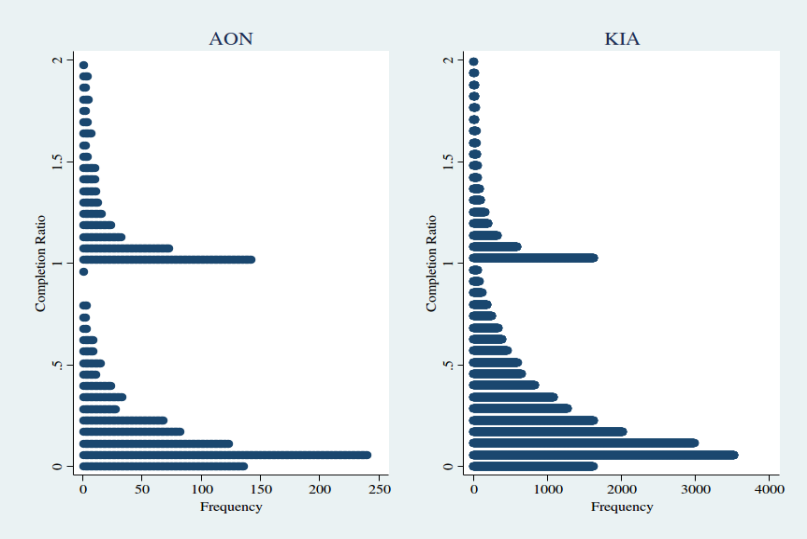
The Fixed Costs Dummy variable is equal to 1, if the project description mentions a term related to fixed costs and equal to 0 otherwise. This variable was constructed using a computer text analysis methodology based on a hand-made dictionary. Since this type of construction may be subject to researcher's bias, we checked the relevance of our methodology in accordance with three validity arguments developed in Short et al. (Short et al., 2010). The first validity check is about the degree to which a measure encapsulates the full domain of our construct of interest (Nunnally and Bernstein, 1993). We comply with this recommendation by the two-step method used to create the dictionary. We first created a randomly-selected subsample of 114 campaigns (0.5%) weighted by funding model and by category. Then, all co-authors read and analyzed the 114 campaigns independently, creating three dictionaries of words related to "fixed costs". Finally, we crossed our lists of words to keep only a restricted set of well-defined and highly-relevant words in the final dictionary. By creating lists of the first words from "in-situ" texts and by keeping only words for which we all agreed independently, we comply with this first validity argument. More details on the list of terms kept for coding fixed costs are provided in Appendix Table 1. A second validity argument is that the measure created must be predictive of other constructs to which they are theoretically linked (Cronbach and Meehl, 1955). Since this variable is a robustness check and since it gives exactly the theoretically expected results, we are able to

assume the compliance of our measure with that second validity check. A third validity check is the externality of the measure i.e. the ability of the measure to generate findings across multiple settings (Cook, 1979). In this paper the measure is used in various settings (see later) and results are in line with our predictions. Therefore, we can assume that our measure complies also with this argument. By combining these three validity arguments, we are confident that our measure is a good measure in the way defined by Short et al. (Short et al., 2010).

These output measures define the success of the campaign. We define the variable Completion Ratio as the ratio of the total amount pledged over the goal set by the entrepreneur. Our primary measure of success is a dummy variable called Success Dummy, which equals 1, if the Completion Ratio is equal or greater than 1, and 0 otherwise. Figure I shows the distribution of the Completion Ratio for AON and KIA (up to a value of 2) and highlights that the distribution is highly weighted on 0 and 1. The shape of this distribution lends support to our decision to use a dummy variable as our primary measure of campaign success. In unreported analysis, we considered the Completion Ratio as an alternative dependent variable to the Success Dummy, and our obtained conclusions are qualitatively similar. Thus, we do not report them below.

Figure I: Histogram of Completion Ratio, by funding model

This table shows the frequency (in number of campaigns) of the Completion Ratio for each funding model separately. Statistics are based on the final sample of projects, but the histogram shown is truncated at a completion ratio of 2 to enhance readability.



As shown in Table I Panel A, 56.2% of the projects in our final sample belong to the creative category, 13.3% to the innovative category and 30.5% to the social category. The AON model is becoming increasingly popular and now represents more than 5% of new campaigns (Panel A). Especially innovative projects are choosing the AON model more often. Table I Panel B shows that innovative projects are more likely to be AON projects (11.7% are AON versus 88.3% KIA), while social projects are more likely to be KIA projects (2.4% are AON versus 97.6% KIA), with creative projects falling in the middle (5.3% AON versus 94.7 KIA).

Table I: Sample distribution

Panel A of this table shows the distribution of projects in each category and funding model year by year for our final sample. Values are given in number of projects and in percentage of total projects. Panel B of this table shows the use of funding models (in percent) by category and in total.

Panel A: Number of projects by category and by model

	By Category			By Funding Model	
	Creative	Innovative	Social	All-Or-Nothing	Keep-It-All
2011	496	48	161	5	700
	70.4%	6.8%	22.8%	0.7%	99.3%
2012	5,787	1,156	3,281	503	9,721
	56.6%	9.4%	32.3%	4.9%	95.1%
2013	6,559	1,827	3,535	692	11,229
	55%	15.3%	29.7%	5.8%	94.2%
Total	12,842	3,031	6,977	1,200	21,650
	56.2%	13.3%	30.5%	5.2%	94.8%

Panel B: Financing model by category

	All-Or-Nothing	Keep-It-All
Creative	5.3%	94.7%
Innovative	11.7%	88.3%
Social	2.4%	97.6%
Total	5.2%	94.8%

Table II presents summary statistics for our final sample and for the two subsamples, All-Or-Nothing and Keep-It-All. T-tests of difference of mean and median between both subsamples are provided in the last two columns.

In line with our expectations (see Hypothesis H2), flexible projects account for a larger part in the KIA subsample: 44% of all the projects in the KIA subsample are projects with digital output, while such projects only account

for 37% of the projects in the AON subsample. Similarly, 78% of the KIA projects include fixed costs (our alternative measurement of scalability based on costs), compared to 89% of the AON projects. Moreover, KIA campaigns offer fewer reward levels, consistent with H3. The first reward level is, on average, 13% smaller for AON campaigns and is equal to $1 in 19% of the cases, while only 12% of the KIA campaigns have a first reward equal to $1 (not reported in Table I).

Table II: Summary statistics by funding model

*This table shows summary statistics for variables included in our database. All the variables are defined in Appendix Table I. We provide means, standard deviations, and median for the full sample of 22,850 campaigns and for the two subsamples based on funding models. The last two columns provide difference-in-mean tests and difference-in-median tests between the two subsamples. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	All Projects			All-Or-Nothing			Keep-It-All				
Variables	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean Diff. Test	Median Diff. Test
Project Characteristics											
Goal	21052	26601	10000	31397	36878	16485	20478	25792	10000	1.1e+04***	6500***
Digital Output Dummy	0.430	0.500	0	0.370	0.480	0	0.440	0.500	0	-0.066***	n.a.
Fixed Costs Dummy	0.790	0.410	1	0.890	0.310	1	0.780	0.410	1	0.109***	n.a.
Verified Non-Profit	0.100	0.300	0	0	0	0	0.110	0.310	0	-0.107***	n.a.
Reward Levels	7.440	3.940	8	8.740	3.720	9	7.370	3.940	8	1.374***	1***
Team Size	2.400	2.030	2	2.400	2.050	2	2.400	2.030	2	0.00300	0
Duration	48.32	22.61	45	40.27	13.22	40	48.77	22.94	45	-8.500***	-5***
Soft Information											
Catch Phrase Length	115.2	38.68	125.5	115.1	35.24	123	115.2	38.86	126	-0.117	-3**
Gallery Items	6.800	10.52	3	7.810	11.29	4	6.750	10.48	3	1.065***	1***
Video Pitch Dummy	0.790	0.410	1	0.850	0.360	1	0.780	0.410	1	0.066***	n.a.
Full Text Length	4658	3439	3809	6098	4474	5068	4579	3354	3763	1519.595***	1306***
Social Networks	3.290	31.53	3	3.280	1.910	3	3.290	32.39	3	-0.00900	0
A.R. Index	15.26	4.620	14.95	14.77	2.880	14.54	15.29	4.690	14.98	-0.518***	-0.431***
Campaign Outcome											
Completion Ratio	0.440	1.200	0.220	0.640	1.160	0.210	0.420	1.200	0.220	0.219***	-0.00951
Success Dummy	0.180	0.380	0	0.340	0.480	0	0.170	0.370	0	0.177***	n.a.
Total Backers	82.36	413.5	33	188.7	803.0	43	76.47	379.6	33	112.218***	10***
Total Pledge	6583	29851	2502	15323	56995	3903	6098	27497	2465	9224.594***	1451***
Observations		22850			1200			21650		22850	

All verified not-for-profit organizations (the variable Verified Non-profit) use the KIA model, suggesting that this form of fundraising constitutes a typical way non-profit organizations raise money on a regular basis (under the motto "any money is welcome"). Supporting Hypothesis H1, AON projects show, on average, 53% higher capital goals than KIA (and a 65% higher median). With an average of 2 team members, team size is not statistically different between the two subsamples.

As the risk of not collecting any funds is higher for an AON campaign, it seems that entrepreneurs provide more information to increase their chances to attract more backers, consistent with H5. Indeed, project descriptions are longer (the variable Full Text Length) and easier to read and more pictures and video pitches are provided. There is no difference in the number of external social network pages available for both types of project, suggesting that setting up a page on a social network requires little effort to generate extra information. This can also be explained by the fact that social networks are a base constituent of crowdfunding and, thus, considered by a majority of entrepreneurs as a must-do before even starting the crowdfunding campaign itself.

Outcomes also differ between subsamples. AON campaigns seem to be more successful (54% versus 32% for KIA campaigns) and attract almost 3 times more backers, providing support for the hypothesis H4. This difference in success will be confirmed in the multivariate analysis provided in the next section.

Table III offers summary statistics based on outcome (i.e., whether the campaign was successful or not). As expected, more information is provided in successful campaigns (longer text, more video pitches, and more pictures in galleries). Of course, successful projects imply, on average, more backers and a higher average of pledges by backers. Here, too, there is no difference in social network presence between the two groups (i.e., presence does not mean popularity). The readability of campaign descriptions does not seem to affect outcomes either. The two groups have approximately the same typology of texts; at best, unsuccessful projects are easier to read. However, readability may as well be driven by differences in project categories. It is worthwhile to note that the values obtained here are quite high, since they correspond to text designed at the undergraduate level. Recall that the ARI score corresponds to the US educational system level, with 12 being the last grade level of secondary education before college and 14 being a second-year undergraduate. Therefore,, an average level of 15 indicates text written (intentionally or not) at an undergraduate level.

Table III: Summary statistics by outcome

*This table shows summary statistics for variables included in our database. All the variables are defined in Appendix Table I. We provide means, standard deviations, and median for the subsamples of successful (Success Dummy = 1) and unsuccessful (Success Dummy = 0) campaigns. The last two columns provide difference-in-mean tests and difference-in-median tests between the two subsamples. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	Successful (Success = 1)			Unsuccessful (Success = 0)				
Variables	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean Diff. Test	Median Diff. Test
Project Characteristics								
Keep-It-All Dummy	0.900	0.300	1	0.960	0.200	1	0.060***	n.a.
Goal	13477	16702	8500	22678	28012	11667	9200.725***	3167***
Digital Output Dummy	0.450	0.500	0	0.430	0.500	0	-0.019**	n.a.
Fixed Costs Dummy	0.800	0.400	1	0.790	0.410	1	-0.0100	n.a.
Verified Non-profit	0.130	0.330	0	0.100	0.290	0	-0.030***	n.a.
Reward Levels	7.990	4.000	8	7.320	3.920	7	-0.672***	-1***
Team Size	2.740	2.270	2	2.330	1.960	2	-0.408***	0
Duration	44.62	20.71	42	49.12	22.92	45	4.496***	3***
Soft Information								
Catch Phrase Length	114.0	37.96	123	115.5	38.83	126	1.450**	3***
Gallery Items	8.630	12.38	5	6.410	10.04	3	-2.221***	-2***
Video Pitch Dummy	0.820	0.380	1	0.780	0.420	1	-0.047***	n.a.
Full Text Length	4990	3704	4083	4587	3375	3757	-402.697***	-326***
Social Networks	3.330	15.68	3	3.280	33.98	3	-0.0540	0
A.R. Index	15.37	5.010	14.94	15.24	4.530	14.95	-0.127	0.0152
Campaign Outcome								
Completion Ratio	1.400	2.600	1.070	0.230	0.200	0.160	-1.170***	-0.910***
Total Backers	267.2	953.5	107	42.67	59.75	26	-224.559***	-81***
Total Pledge	21787	68243	10103	3318	4728	1885	-1.8e+04***	-8218***
Observations		4039			18811			22850

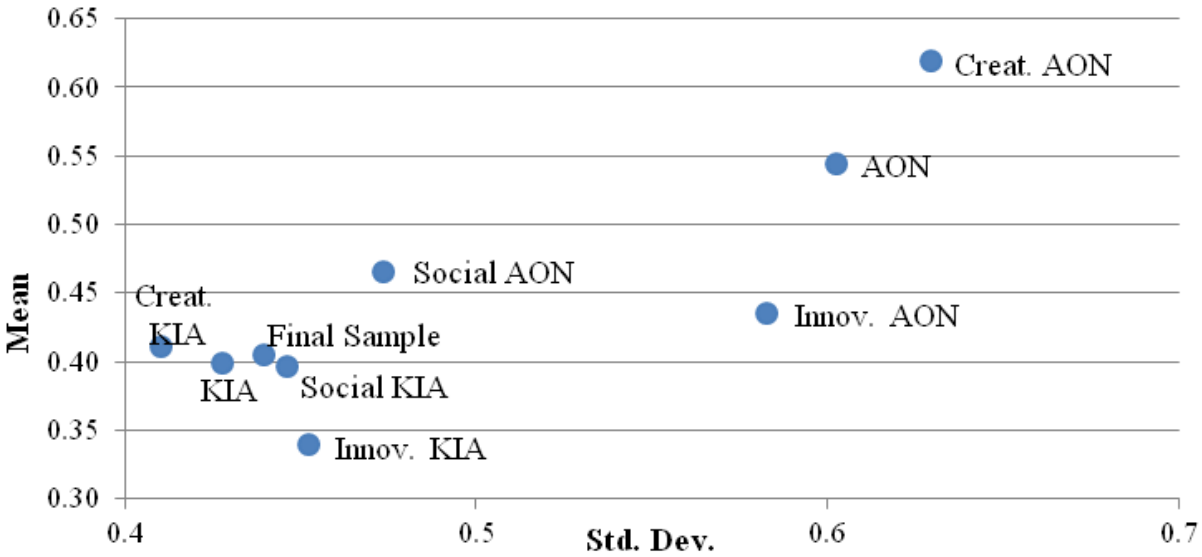
Table IV provides further insights into hypothesis H4 on funding outcomes. Panel A of Table IV shows the mean of the Completion Ratio and the standard deviation of the Completion Ratio for the full sample, the KIA subsample, and the AON subsample, as well as for innovative, creative, and social KIA and AON campaigns. Panel B of Table IV shows the same information for the amount pledged (the variable Total Pledge). We present winsorized variables at the 99th percentile to make the different amounts comparable (the same range for each variable) and to avoid excessive outliers at the higher end. The data and figures in Panels A and B in Table IV show a clear, positive relationship between standard deviation and average success. Thus, more risk for the entrepreneur is associated with a higher average success level, consistent with H4.1

Table IV: Risk and return analysis

This table shows additional statistics on risk (standard deviation) and return (mean) of campaign outcomes for various subsamples. Panel A is based on the output variable Completion Ratio and Panel B on Total Pledge. The sample employed here differs from the rest of the analysis, as the full sample used here is winsorized at the 99th percentile to eliminate excessive outliers.

Panel A-Completion Ratio

	Obs	Mean	Std. Dev	Min	Max
Final Sample	22850	0.403	0.441	0.00	2.22
KIA	21650	0.396	0.429	0.00	2.22
AON	1200	0.541	0.603	0.00	2.22
Innov. KIA	2677	0.337	0.454	0.00	2.22
Innov. AON	354	0.432	0.584	0.00	2.22
Creat. KIA	12161	0.409	0.411	0.00	2.22
Creat. AON	681	0.617	0.630	0.00	2.22
Social KIA	6812	0.394	0.447	0.00	2.22
Social AON	165	0.464	0.475	0.00	1.58



Panel B-Total Pledge

	Obs	Mean	Std. Dev	Min	Max
Final Sample	22850	5402	8370	0	56461
KIA	21650	5165	7867	0	56461
AON	1200	9674	14086	500	56461
Innov. KIA	2677	5990	10209	0	56461
Innov. AON	354	10234	15699	500	56461
Creat. KIA	12161	5046	7252	0	56461
Creat. AON	681	9827	13805	503	56461
Social KIA	6812	5055	7846	0	56461
Social AON	165	7845	11218	500	56461

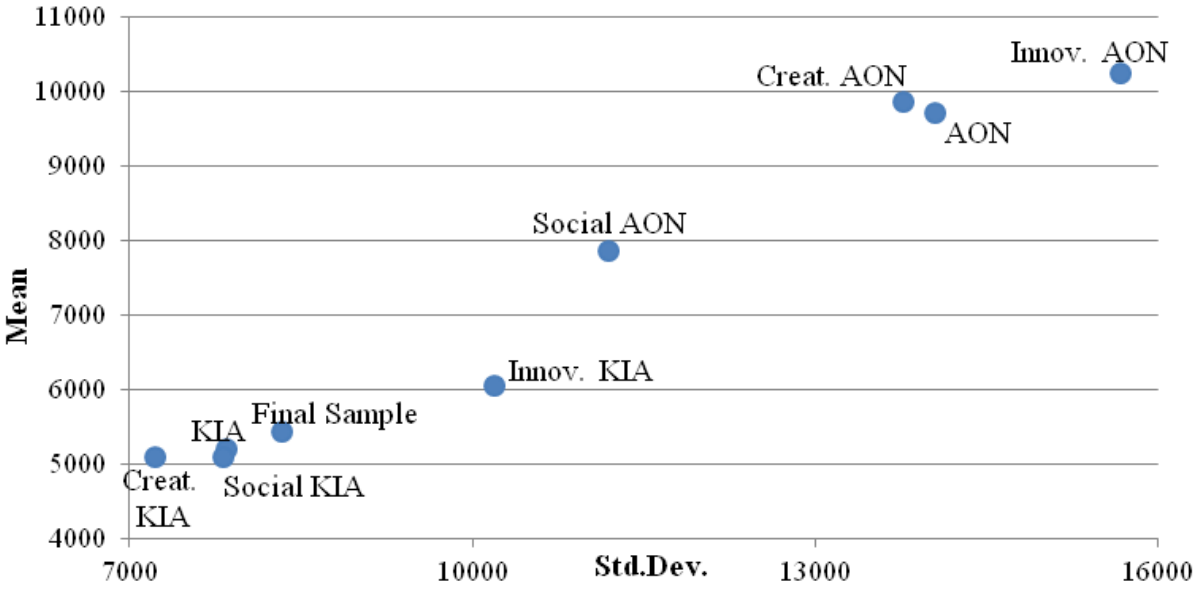


Table V provides a comprehensive correlation matrix that includes the most relevant variables. In particular, the reported correlations offer preliminary support for our hypotheses H2 on scalability and H1 on the funding goal. Indeed, the correlation between the Digital Output Dummy (for scalable projects, as defined in Appendix Table I) and the Keep-It-All Dummy (Hypothesis H2) is 0.0299 and statistically significant at 1%. Similarly, the correlation between the Fixed Costs Dummy and the Keep-It-All Dummy also has the excepted sign (i.e., it is negative, since it is defined in the opposite way from the Digital Output Dummy) and is statistically significant at 1%. The correlation of the Goal and the Keep-It-All Dummy (Hypothesis 2) is -0.0916 and also significant at 1%. As for our hypothesis H4, we find a correlation of -0.1033 between the Success Dummy and the Keep-It-All Dummy, which supports the hypothesis that AON projects are more successful on average in achieving their goal. The next section tests and confirms these findings in a multivariate setting.

Table V: Correlation matrix of main variables

This table presents pair-wise correlations between the main variables. All the variables are defined in Appendix Table I. A star indicates a significance level of 1%.

	Goal	Keep-It-All Dummy	Digital Output Dummy	Fixed Costs Dummy	Verified Non-profit	Reward Levels	Team Size	Duration	Catch Phrase Length	Gallery Items
Goal	1									
Keep-It-All Dummy	-0.0916*	1								
Digital Output Dummy	-0.0532*	0.0299*	1							
Fixed Costs Dummy	0.0696*	-0.0593*	0.0803*	1						
Verified Non-profit	0.0021	0.0791*	-0.0865*	0.0480*	1					
Reward Levels	0.1274*	-0.0777*	0.2968*	0.2521*	0.0079	1				
Team Size	0.0927*	-0.0004	0.0277*	0.1277*	0.0973*	0.1944*	1			
Duration	0.1000*	0.0839*	-0.0162	-0.015	-0.009	-0.0965*	0.0102	1		
Catch Phrase Length	0.0430*	0.0007	-0.0642*	0.0636*	0.0511*	0.0548*	0.0234*	-0.0813*	1	
Gallery Items	0.0727*	-0.0226*	0.0475*	0.1043*	-0.0017	0.1874*	0.2217*	0.0477*	0.0444*	1
Video Pitch Dummy	0.0588*	-0.0361*	0.2003*	0.1932*	0.0441*	0.3457*	0.1385*	-0.0542*	0.0512*	0.1214*
Full Text Length	0.1778*	-0.0986*	0.0559*	0.3021*	-0.0116	0.3141*	0.1817*	-0.0007	0.1142*	0.2333*
Social Networks	0.0034	0.0001	0.0044	-0.0071	0.0047	0.0259*	0.007	0.0034	0.0136	0.0190*
A.R. Index	0.0270*	0.0250*	-0.0311*	0.0720*	0.1040*	0.0365*	0.0685*	0.0108	0.0412*	0.0161
Completion Ratio	-0.0829*	-0.0408*	-0.0106	-0.0115	0.0114	0.0119	0.0321*	-0.0491*	-0.008	0.0616*
Success Dummy	-0.1319*	-0.1033*	0.0149	0.0098	0.0375*	0.0650*	0.0768*	-0.0758*	-0.0143	0.0805*
Total Backers	0.0982*	-0.0605*	-0.0058	0.0003	-0.0027	0.0632*	0.0473*	-0.0304*	0.0082	0.0616*
Total Pledge	0.1491*	-0.0689*	-0.0235*	0.0232*	0.0093	0.0728*	0.0669*	-0.015	0.0182*	0.0931*

	Video Pitch Dummy	Full Text Length	Social Networks	A.R. Index	Completion Ratio	Success Dummy	Total Backers	Total Pledge
Video Pitch Dummy	1							
Full Text Length	0.1639*	1						
Social Networks	0.0214*	0.0012	1					
A.R. Index	0.0523*	0.1246*	0.0478*	1				
Completion Ratio	0.0104	0.0397*	-0.0003	-0.0046	1			
Success Dummy	0.0438*	0.0447*	0.0007	0.0105	0.3731*	1		
Total Backers	0.0301*	0.0886*	0.0015	-0.0125	0.7102*	0.2072*	1	
Total Pledge	0.0389*	0.1213*	0.0019	0.0002	0.4880*	0.2360*	0.6922*	1

6. Results

6.1. Choice of AON versus KIA Crowdfunding Models

Table VI addresses the issue of what drives entrepreneurs to opt for KIA. To test our hypotheses H2 and H1, we consider that the decision between KIA and AON will depend on some characteristics intrinsic to the project that exist before the campaign launch, including the category of the project and the goal amount of the funding campaign. We also expect some other pre-existing variables to have an impact on this choice such as the number of different rewards the entrepreneur is able to offer, the size of the team leading the project, and the profit purpose of the project. The first method used is a probit regression, since our dependent variable is binary.

Most likely, the goal of the campaign is set at the same time as the one for the funding model and is, therefore, linked. This causes a problem of endogeneity between our goal variable and the Keep-It-All dummy, as these decisions are simultaneous. Indeed, the campaign goal is primarily determined by real needs, though most likely adjusted for strategic purposes that are based on the desire to signal commitment and also based on expectations of the entrepreneur about his/her capability to attract the crowd's interest. To control for the endogeneity of the goal amount, we chose to use two-step (IV-probit) regressions to solve this problem, which is our second method of analysis. We use a two-step estimation methodology, in which the first equation estimates the ln(Goal) and the second equation

the choice of funding model (Keep-It-All Dummy). Since our dependent variable in the second step is binary, we estimate our equations using IV-probit regressions.

Moreover, all our models control for fixed effects due to the country of origin of the project initiator, the project category, and the semester of campaign launch. Table VI shows results for our regressions under various specifications.

Our explanatory variables of interest are the scalability measures (H2) and the logarithm of goal (H1). As discussed, we use two different measures of scalability: the Digital Output Dummy that proxies for output scalability and the Fixed Costs Dummy that proxies for costs scalability. Given the definition of these variables, we expect from H2 a positive impact for the first measure but a negative impact for the second one. As shown in Table VI, the digital output variable is positive and statistically significant at the 1% level, indicating that digital projects are 37.9% more likely to use KIA in Model 1, which is strongly consistent with H2. In Model 2, the presence of fixed costs reduces the probability of KIA by 23.2%, which is again significant at the 1% level and consistent with H2. Further, as expected (H1), the data indicate that the impact of the ln(Goal) is negative and statistically significant, such that a 1-standard deviation increase in the ln(Goal) gives rise to a 13.5% increase in the probability of the use of AON. Similarly, the coefficient on Reward Levels is negative and statistically significant at the 1% level, whereby a 1-standard deviation increase in Reward Levels gives rise to an 11.3% increase in the probability of the use

of AON, consistent with H3. Note that we have carried out several robustness checks that are not reported in the tables for succinctness (but available on request from the authors) but that control for rewards in different, other ways, including the size of the smallest reward. These alternative measures do not alter our conclusions.

Table VI: Choice of funding model for crowdfunding campaigns

*This table shows factors influencing the decision on the funding model. The dependent variable in Regressions (1), (2), (4), and (6) is the "Keep-It-All Dummy," a dummy variable equal to 1 if the model used is "Keep-It-All" and 0 if the "All-Or-Nothing" model is used. All the variables are defined in Appendix Table I. Regressions (4) and (6) control for the endogeneity of the variable "Goal" using a 2-stage IV probit regression model. The instrumented variable for the first-step (see Regressions (3) and (5)) is the ln(Goal), and the two instrumental variables used are as follows: the first is the median goal of successful projects in the same subcategory for the semester previous to the campaign launch, and the second is the median Completion Ratio for projects in the same subcategory during the semester prior of the campaign launch. All regressions include country, subcategory, and semester fixed effects. Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1) Probit	(2) Probit	(3) First stage (Dep.Var.=ln(Goal))	(4) IV Probit (Second stage)	(5) First Stage (Dep.Var.=ln(Goal))	(6) IV Probit (Second stage)
ln(Goal)	-0.157***	-0.150***		-0.483***		-0.346***
Digital Output Dummy	0.379***		-0.0111	0.391***		
Fixed Costs Dummy		-0.232***			0.0837***	-0.209***
Reward Levels	-0.0288***	-0.0226***	0.0429***	-0.0151**	0.0411***	-0.0148**
Team Size	0.0256***	0.0275***	0.0384***	0.0394***	0.0371***	0.0355***
Instrumental Variables						
Med. Goal by Subcat. of Succ. Proj. in s-1 (log)			0.0971***		0.0988***	
Med. Completion Ratio by Subcat. in s-1			-1.128***		-1.100***	
Cat./Sem./Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22850	22850	22850	22850	22850	22850
R^2 / Pseudo R^2	0.108	0.103	0.111		0.112	
			Tests for weak instruments, over-identification, and exogeneity			
Over Id. test				0.073		0.309
Over Identif. p-val				0.787		0.578
First stage F-stat				38.4		38.95
Wald chi2 test of exog.				9.886		3.348
Wald chi2 p-val				0.002		0.067

The data further indicate that team size is positively associated with using KIA, such that a 1-standard deviation increase in team size increases the probability of using KIA by 5.2%. One possible reason could be that team size proxies for firm size and larger firms may be more able to start an underfunded project.

We now turn to the two-step IV-probit regressions (Models 3 to 6 in Table VI). The first-stage regression in Model 3 used to estimate the goal is based on two instrumental variables (IVs) that are linked to the goal of the project but are independent of the decision of the funding model. The first IV is the median goal of successful projects in the same subcategory in the semester prior to the campaign launch, and the second is the median completion ratio for projects within the same subcategory for the semester prior to the campaign launch. We present statistics in Table VI that show these are statistically valid instruments. In terms of the intuition, these variables for the median previous period's goal size of the same subcategory and the median previous period's completion ratio of the same subcategory are likely to affect the goal levels selected by current entrepreneurs seeking crowdfunding. It would be unusual for an entrepreneur to have a vastly different goal amount than a similar, successful entrepreneur in a prior period, unless a similar entrepreneur in the prior period was unsuccessful in achieving that goal. We obtain that higher goals set by previously successful projects (Med. Goal by Subcat. of Succ. Proj. in s-1 (log)) positively impact current goals, consistent with recent success stories driving follow-up entrepreneurs to undertake more ambitious projects. In contrast, high

completion ratios of previous projects (Med. Completion Ratio by Subcat. in s-1) negatively impact current goals, which can be explained by entrepreneurs taking less risk by setting lower goals (consistent with H1, since signaling becomes less important). We use the estimated goal of the first regressions (Models 3 and 5) for the estimation of the second regressions (Models 4 and 6). The results observed in Table VI confirm what we saw in the first probit specification, in terms of the statistical significance, and show similar economic significance. In short, even if we only partly deal with endogeneity in these tests, the findings are very stable under different specifications and, hence, we do not have reason to believe that the results are being significantly affected by endogeneity.

In addition to these regressions, we created some tests to address concerns about the validity of our IV probit methodology. The first test of endogeneity follows the specification of Durbin-Wu-Haussmann testing the difference between the two estimates. The null hypothesis tests if the regressor of interest (the variable ln(Goal)) is exogenous. As the null hypothesis is rejected in our tests, the variable ln(Goal) is indeed endogenous, and, thus, ordinary probit estimates are inconsistent. The IV-probit estimates are, therefore, appropriate. The second test checks whether or not the instruments are weakly correlated with our endogenous variable. Based on F-statistics values of our first stage, we can assume that our instruments are not weak. We can compare the values with the minimal recommended value of 11.59 for two IVs in Stocket al. (Stock and Yogo, 2002). The third test computes the Amemiya-Lee-Newey score test of over-

identifying restrictions. This test performs for over-identification (exogeneity of IVs) following the procedure described by Lung-Fei (Lung-Fei, 1992). Our results show that the null hypothesis cannot be rejected and, thus, our instruments are valid.

6.2. Outcome of Crowdfunding Campaigns

Tables VII-VIII examine factors that affect the outcome of crowdfunding campaigns in terms of the probability of success for the campaign. The baseline specifications are presented in Table VII. The data indicate that KIA campaigns are significantly less successful on average (17.5% less successful in the full sample in Model 1 and 16.3% in Model 2), and this effect is statistically significant at the 1% level. But this effect varies in the different subsamples in the data. For the subsample of digital output projects (Model 3), KIA is 20.3% less successful, while for non-digital output projects (Model 4), KIA projects are 13.6% less likely (significant at the 1% level) to be successful, consistent with H4. These findings are consistent with the use of fixed costs as alternative proxy for scalability (Models 5 and 6), as well as subsamples of projects with and without fixed costs (Models 7 and 8), and subsamples of projects with digital and non-digital output (Models 9 and 10).

Table VII: Outcome of crowdfunding campaigns

*This table shows results on the impact of the success of a crowdfunding campaign. The dependent variable is the Success Dummy. All the variables are defined in Appendix Table I. We use probit regressions. For Regressions (3), (4), (9), and (10), we use subsamples based on project output (i.e., whether Digital Output Dummy equals 1 or 0). For Regressions (7) and (8), we use subsamples based on the presence of fixed costs (i.e., whether the Fixed Costs Dummy equals 1 or 0). For Regressions (5) and (6), we replicate previous models but with the "Fixed Costs Dummy" as an alternative measure of scalability. In Regressions (9) and (10), we use an alternative measure of success, considering Keep-It-All projects as successful above 80% of completion (for All-Or-Nothing, we leave the threshold at 100%). All regressions include country, subcategory, and semester fixed effects. Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1) All Projects	(2) All Projects	(3) Digital Output	(4) Non-Digital Output	(5) All Projects	(6) All Projects	(7) No Fixed Costs	(8) Fixed Costs	(9) Digital Output	(10) Non-Digital Output
					Robust to Scalability Measure				Robust to Success Measure	
Project Characteristics										
ln(Goal)	-0.091***	-0.112***	-0.113***	-0.112***	-0.092***	-0.112***	-0.100***	-0.115***	-0.121***	-0.119***
Keep-It-All Dummy	-0.175***	-0.163***	-0.203***	-0.136***	-0.173***	-0.163***	-0.167***	-0.165***	-0.201***	-0.129***
Digital Output Dummy	0.006	0.010								
Fixed Costs Dummy					0.020***	-0.009				
Verified Non-profit		0.052***	0.055***	0.044***		0.052***	0.028	0.055***	0.081***	0.051***
Reward Levels		0.007***	0.009***	0.006***		0.007***	0.007***	0.007***	0.009***	0.006***
Team Size		0.014***	0.010***	0.016***		0.014***	0.018***	0.013***	0.010***	0.018***
Duration		-0.001***	-0.001***	-0.001***		-0.001***	-0.001**	-0.001***	-0.001***	-0.001***
Soft Information										
Catch Phrase Length		-0.000254***	-0.000353***	-0.000175*		-0.000253***	-0.000131	-0.000276***	-0.000364***	-0.000135
Gallery Items		0.002***	0.002***	0.003***		0.002***	0.003***	0.002***	0.002***	0.003***
Video Pitch Dummy		0.029***	0.010	0.037***		0.029***	0.015	0.037***	0.013	0.036***
Full Text Length		0.0000059***	0.0000059***	0.0000058***		0.0000060***	0.0000071*	0.0000061***	0.0000059***	0.0000061***
Social Networks		-0.003*	-0.002	-0.004**		-0.002*	-0.003	-0.002*	-0.001	-0.005***
A.R. Index		0.001	0.000	0.002**		0.001	0.001	0.001	0.000	0.002**
Sub-Cat./Sem/ Country F.E.	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Observations	22850	22439	9639	12637	22850	22439	4476	17771	9664	12650
Pseudo R^2	0.050	0.098	0.094	0.108	0.050	0.098	0.087	0.106	0.094	0.108

According to Table II, there is, on average, a significant difference in project size between KIA and AON. Since the goal is a key variable of our hypotheses by impacting the decision for the funding model, and since the goal is also a determinant of the completion ratio--and by extension, the success dummy, which is our dependent variable--we wanted to be sure that the difference in the goals between subsamples was not affecting our results. Using a propensity score matching methodology (Rosenbaum and Rubin, 1983), we are able to weight projects in the AON subsample to match more closely with the average size of projects between both subsamples. This methodology links all the KIA projects one by one with the closest AON project (we match projects based on goal, category, and campaign start date). In the process, since there are more KIA projects, all AON projects must have at least one KIA equivalent but can be matched with more than one KIA project. At the end of the matching process, we found a number of observations equivalent in both subsamples (with duplicated AON projects that matched more than one a KIA project).

Table VIII: Outcome of crowdfunding campaigns for matched samples on goal, start date, and subcategory

*This table shows results on the impact of the success of a crowdfunding campaign. This table is similar to Table VII, but with the KIA and AON subgroups matched with propensity score based on goal, subcategory, and starting date (i.e., every KIA project is matched with one AON project; AON projects can be matched with more than one KIA project). All the variables are defined in Appendix Table I. All regressions include country, subcategory, and semester fixed effects. Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1) All Projects	(2) Digital Output	(3) No Digital Output	(4) All Projects	(5) No Fixed Costs	(6) Fixed Costs	(7) All Projects	(8) Digital Output	(9) No Digital Output
				Robust to Scalability Measure			Robust to Success Measure		
Project Characteristics									
ln(Goal)	-0.153***	-0.137***	-0.162***	-0.153***	-0.122***	-0.160***	-0.157***	-0.141***	-0.165***
Keep-It-All Dummy	-0.246***	-0.301***	-0.201***	-0.245***	-0.200***	-0.258***	-0.233***	-0.290***	-0.187***
Digital Output Dummy	0.008						0.006		
Fixed Costs Dummy				0.012*					
Verified Non-profit	0.067***	0.067***	0.049***	0.065***	0.055*	0.068***	0.081***	0.096***	0.057***
Reward Levels	0.010***	0.009***	0.011***	0.010***	0.007***	0.012***	0.010***	0.009***	0.011***
Team Size	0.015***	0.007***	0.023***	0.015***	0.004	0.015***	0.015***	0.007***	0.024***
Duration	-0.001***	-0.000**	-0.001***	-0.001***	-0.000	-0.001***	-0.001***	-0.001**	-0.001***
Soft Information									
Catch Phrase Length	-0.000476***	-0.001015***	-0.000028	-0.000478***	-0.000323**	-0.000522***	-0.000468***	-0.001026***	-0.000004
Gallery Items	0.006***	0.006***	0.006***	0.006***	0.004***	0.006***	0.006***	0.006***	0.006***
Video Pitch Dummy	0.001	-0.018	0.022***	0.000	0.019	0.002	0.000	-0.017	0.021**
Full Text Length	-0.0000005	-0.0000003	-0.0000007	-0.0000007	0.0000223***	-0.0000030***	-0.0000004	-0.0000003	-0.0000006
Social Networks	-0.011***	0.002	-0.024***	-0.011***	-0.020***	-0.007***	-0.011***	0.002	-0.025***
A.R. Index	0.003**	0.002	0.004***	0.003**	0.000	0.008***	0.003**	0.003	0.004***
Country/Cat/Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42776	18839	23937	42776	7214	35562	42776	18839	23937

After running the same regression models presented in Table VII on the new matched samples, we were able to confirm that the sign and statistical significance of our results are very robust.[19] The findings with matched samples are reported in Table VIII. In the economic significance of the results between Tables VII and VIII, there are some differences, which are as follows. The marginal effects for the *ln(Goal)*, the *Keep-It-All Dummy*, the *Verified Non-profit*, and the *Reward Levels* are approximately 30% larger, relative to those for Table VII. The marginal effects for the *Team Size*, the *Duration*, and the *Catch Phrase Length* are approximately the same for Tables VII and VIII. The *Fixed Costs Dummy* marginal effect in Model 5 in Table VIII is roughly half the magnitude relative to Table VIII. The marginal effect for the *Video Pitch Dummy* and the *Full Text Length* is approximately two-thirds larger in Table VII, relative to Table VIII, and the statistical significance is more robust in Table VII than in Table VIII. The marginal effects for *Gallery Items* and *Social Networks* are approximately three and four times larger, respectively, in Table VIII relative to Table VII.

19To further test for robustness, we performed the analysis on subsamples based on goal levels (instead of the matched sample approach in Table VIII). The findings are similar and available on request.

Table IX: Soft information disclosure in crowdfunding campaigns

*This table shows results on the impact of the quantity of information provided by the entrepreneur in the crowdfunding campaign. The main variable of interest is the "Risk for the entrepreneur," which is computed as "(1 - Keep-It-All Dummy) x Goal." Thus, the risk for the entrepreneur is 0 if he/she opts for a Keep-It-All funding model and is proportional to the goal set if he/she opts for an All-Or-Nothing funding model. All the variables are defined in Appendix Table I. All regressions include country, subcategory, and semester fixed effects. Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1) Full Text Length (OLS)	(2) Full Text Length goal<median	(3) Full Text Length goal>=median	(4) Full Text Length Innovative	(5) Full Text Length Creative	(6) ARI (OLS)	(7) ARI goal<median	(8) ARI goal>=median	(9) ARI Innovative	(10) ARI Creative
Risk for the Entrepreneur	60.94***	30.76	58.60***	87.44***	65.41***	-0.0368***	-0.0635***	-0.0274*	-0.0354*	-0.0502***
Project Characteristics										
Digital Output Dummy	1092.9***	985.7***	1459.7***		1688.8***	0.676**	0.936**	0.538		-0.874***
Verified Non-profit	-7.773	41.13	-121.6	-167.2	245.2**	1.315***	1.459***	1.209***	1.068***	1.333***
Reward Levels	255.0***	205.8***	263.8***	296.1***	244.4***	0.0371***	0.0288	0.0336**	0.00688	-0.00995
Team Size	184.8***	139.6***	188.0***	226.0***	177.0***	0.0871***	0.0496	0.102***	0.109***	0.0763***
Duration	4.957***	3.702**	2.829*	7.293*	3.814**	0.00285*	0.00290	0.00164	0.00693*	0.00230
Constant	3286.4***	4136.5**	3052.1***	1941.1	2740.1***	13.94***	13.14***	14.56***	7.799***	16.82***
Semester F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subcategory F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22850	10711	12139	3031	12842	22656	10640	12016	2996	12725
R^2	0.188	0.182	0.195	0.268	0.161	0.050	0.045	0.070	0.075	0.039
Adjusted R^2	0.180	0.168	0.182	0.242	0.151	0.041	0.029	0.055	0.042	0.027

6.3. Soft Information Disclosure and Entrepreneurial Risk

In Table IX, we examine the impact of risk taken by the entrepreneur on the amount of soft information provided. We consider that the entrepreneur incurs a higher risk of not getting any funding in the AON model and that this risk is proportional to the goal: the higher the goal, the higher the risk of not receiving any funding (thus, the variable *Risk for the Entrepreneur*, which corresponds to the interaction between AON and Goal, as defined in Appendix Table I). Table IX Models 1-5 show that entrepreneurial risk increases the amount of soft information provided to the crowd: text length becomes longer. In the full sample (Model 1), a 1-standard deviation increase in risk for the entrepreneur increases the amount of text provided by 134 characters. Compared to the average length observed (4,658 characters; Table II), this represents an increase of 2.9%. This effect is significant at the 1% level in Model 1 and in Model 3 for the subsample, where the goal size is larger than the median, but not significant in Model 2, where the goal size is less than the median, hence, there is less risk for the entrepreneur. In Models 4 and 5 for innovative and creative projects, respectively, the effect is likewise significant at the 1% level, and the economic significance is more pronounced relative to that for the average project in Model 1. Overall, the data to text length and the risk for the entrepreneur are strongly consistent with H5.

Table IX Models 6-10 provide analogous regressions to Models 1-5 with the difference in terms of the dependent variable being the ARI score in Models 6-10. A higher ARI score means that the text is more complicated (more characters per word and more words per sentence; see Appendix Table I for the formula). Table IX shows that the higher the risk for the entrepreneur, the lower the readability score (the text is easier to read for a greater number of people), as expected (H5). This effect is significant at the 1% level in Models 6, 7, and 10 for the full sample, the subset of projects where the goal is less than the median, and the creative subsample, respectively. This effect is significant at the 10% level in Models 8 and 9 for the subset of projects where the goal is greater than the median and the subset of innovative projects, respectively. The economic significance is such that a 1-standard deviation increase in the risk for the entrepreneur is associated with a 0.5% reduction in the readability index for the average project in Model 6. This effect is approximately twice as large for the subset of projects, where the goal is less than the median in Model 7 and 25% lower for the subset of projects, where the goal is greater than the median in Model 8. This effect is similar to the average for the subset of innovative projects in Model 9 and 36% more pronounced for the subset of creative projects in Model 10.

7. Discussion: Limitations, Future Research and Concluding Remarks

Thanks to the emergence of Internet platforms, crowdfunding has become accessible to a large number of entrepreneurs as an alternative form of funding. While the standardization in crowdfunding platforms offers clear benefits in terms of comparability across projects and readability, it also reduces the extent to which entrepreneurs can tailor their offer according to their specific needs. One important dimension of standardization has been the adoption of AON and KIA models by the major reward-based platforms. The choice of model clearly affects the fee structure paid by the entrepreneurs (since the platforms charge different fees) and how pledges are transformed into funding for the entrepreneur.

In this paper, we compared the AON versus the KIA models in terms of the types of companies that used these methods of raising capital, their disclosures, and their success. An analysis of the Indiegogo platform offers a unique opportunity to examine the choice between the two forms of crowdfunding models, as the platform offers entrepreneurs the option to choose between the two models along with the fundraising goal of their project. Our findings offer support to the prediction that AON models offer a guarantee to the crowd that the entrepreneur does not start a project with unrealistically low funding. In contrast, the KIA model is a useful model for entrepreneurs who can scale their business. Overall, AON fundraising campaigns involved substantially larger capital goals and were

much more likely to be successful at achieving their goals. Further, we showed that the marginal effects associated with information related by AON fundraisers were much more pronounced than that for KIA fundraisers. These findings are robust to controls for self-selection and endogeneity and robust to propensity score matching.

In terms of implications for platforms, these findings offer support that providing flexibility to entrepreneurs, in terms of having a choice of funding model, may be an interesting selling point for platforms and a way to differentiate themselves in this rapidly growing market. This may also explain the success of Indiegogo (the major platform that offers this choice), since many entrepreneurs may prefer to raise funds on Indiegogo precisely because of the possibility to opt for the KIA model. The fact that this platform offers this choice magnifies the signaling effect of AON, compared to other platforms such as Kickstarter, where this choice is not possible (and thus cannot be a 'signal' mechanism).

Our study offers avenues for future research, such as determining the chances for the success of projects themselves, beyond the campaign success. Our analysis examined success during the fundraising campaign but is silent about what happens afterwards. For instance, Mollick and Kuppuswamy report that 75% of projects successfully funded on Kickstarter deliver late (Mollick and Kuppuswamy, 2014). However, based on conclusions offered in our study, one might expect that this percentage varies according to the fundraising model (KIA versus AON) used during the campaign, since the latter is related to the amount raised. Indeed, projects that are started with

sufficient funds are more likely to produce the promised product and eventually deliver on time, something that is worth investigating in future research. A related issue in future work might involve an examination of the publicity surrounding crowdfunding under different funding models, and an assessment of different ways to measure project quality.

Further research may focus on other mechanisms than the risk-return tradeoff if more data becomes available in the future. One mechanism relates to information asymmetry. There will always be asymmetric information between the potential funders and the entrepreneur. The entrepreneur knows more about himself or herself and his/her project than the crowd. One type of information pertains to the capital needs and expected expenditures for the project. An entrepreneur under AON will be more likely to reveal the true capital needs and expenditures for the project. There are many other tools that an entrepreneur can use to convey information to the market, including the "soft" information examined in this study such as a written project description, the length and quality of the project description, pictures, and videos. The credibility of the information conveyed in these soft tools is enhanced by an entrepreneur that uses the AON mechanism due to the credible revelation of capital needs and required expenditures. In other words, there are significant complementarities across the AON choice and the other soft mechanisms, which increases the likelihood of success with AON.

A second possible mechanism is related to difficulties that arise when managing a large number of funders. Since KIA is riskier for the crowd,

there will be a price discount compared to AON. This price discount is meant to compensate funders for the risk taken. This further implies that the entrepreneur needs to attract even more funders for a given amount needed, because a lower price means each funder provides less. So, on an equally matched funding amount basis for AON and KIA, for each dollar raised through KIA we would expect more funders. Managing a greater number of funders implies greater costs on the firm in terms of delivering rewards, product and firm level communication, and coordination of the stakeholders for the future direction of the enterprise. These issues in turn mean that the KIA mechanism makes it more difficult for the enterprise to be successful in the future.

Another worthwhile research question is whether certain models are more prone to fraud. Indeed, concerns have recently been raised by regulators and academics (Griffin, 2012; Hildebrand et al., 2010; Hornuf and Schwienbacher, 2014) that crowdfunding simply shifts risk to the crowd, and that some entrepreneurs may exploit an unsophisticated crowd. In the context studied here, one can extend the analysis by seeing whether projects funded with a KIA model are more prone to lead to fraud. Under KIA, the funding goal can be arbitrarily set since it does not matter either way whether or not the project is fully funded or not in terms of whether or not the entrepreneur can keep the money and the project can go ahead. If the entrepreneur does not get what s/he needs to do a proper job on the project, then the entrepreneur is more likely to abscond with the funds. Another possible outcome with a KIA entrepreneur funded at the wrong

level (either too high or too low) is that s/he may simply hoard the cash received, which could be viewed as a form of fraud insofar as the entrepreneur does not do what s/he promised (during the campaign) what s/he would do with the funds.

8. Appendix

Project Characteristics Variables	*Definition*
Keep-It-All Dummy	Dummy variable equal to one if the entrepreneur chooses a "keep-it-all" funding model and zero for the "all-or-nothing" funding model.
Verified Non-Profit	Dummy variable indicating if the entrepreneur is a US registered non-profit organization.
Goal	The crowdfunding campaign goal in USD set by the entrepreneur. For campaigns based on a currency other than USD, we converted the amount into USD at the annual average exchange rate.
Reward Levels	Number of reward levels offered by the entrepreneur for his campaign.
Risk for the Entrepreneur	Interaction term of (1-"Keep-It-All Dummy") and "Goal."
Digital Output Dummy	Dummy variable indicating if the project output is a digital good. Digital outputs typically follow a cost structure with significant fixed costs but scalable output, due to nearly zero marginal costs. It includes the following subcategories: comic, film, gaming, music, photo, trans-media, video/web, and writing.
Fixed Costs Dummy	Dummy variable indicating if the text on the crowdfunding campaign's webpage mentions one or more words related to fixed costs. Words included in the list are: build-, legal fees, production, produced, prototype, manufactur-, buy-, purchas-, building, acquire, develop-, equipment, construct-, permit, tool. Words finishing with a dash are truncated to include all words using the same base but with different endings as for manufactur**e**, manufactur**ed,** manufactur**ing**.
Team Size	Number of members in the team leading the project
Duration	Duration of the funding campaign in days and set by the entrepreneur prior to starting the campaign.
Innovative Dummy	Dummy variable indicating if the project belongs to the "Innovative" category (as defined by Indiegogo), which includes the following sub-categories: Technology, Small Business, Food, and Sports
Creative Dummy	Dummy variable indicating if the project belongs to the "Creative" category (as defined by Indiegogo), which includes the following sub-categories: Art, Dance, Film, Gaming, Music, Photography, Theatre, Transmedia, Writing, Comic, Design, Fashion, and Video/Web.
Social Dummy	Dummy variable indicating if the project belongs to the "Social" category (as defined by Indiegogo), which includes the following sub-categories: Animals, Community, Education, Environment, Health, Politics, and Religion.
Soft Information Variables	
Catch Phrase Length	Length (in number of characters) of the project catch phrase. Indiegogo allows a maximum of 120 characters. This sentence is found in the index description of the project and in the heading of the project page.
Gallery Items	Number of pictures or videos presented in the media gallery.

Video Pitch Dummy	Dummy variable indicating if a video pitch of the project is provided.
Full Text Length	Length (in characters) of the full text of the project description on the project's main page.
Social Networks	Number of external links to social networks (like Facebook, Twitter, or any other community website).
A.R. Index	The "Automated Readability Index" score, based on the full text of project description. This value is expressed in US grade levels. For instance, grade 1 indicates text for children of 6/7 years old, and grade 12 for high school students of 17/18 years old. This index is based on the following formula: [4.71*(characters/words)+ 0.5*(words/sentences)-21.43].
Campaign Outcome Variables	
Total Pledge	Sum of all pledges made by backers.
Completion Ratio	Ratio between total pledge and campaign goal; i.e., the ratio of the variables Total Pledge over Goal.
Success Dummy	Dummy variable equal to one if the completion ratio is at least equal to 1, and zero otherwise. The project is thus considered as fully financed. This variable exists also in an "extended" version ("Success ext."), including all KIA projects with a completion ratio at least equal to 0.8.
Total Backers	Number of backers having pledged money to the project.
Success Ratio	Ratio between the number of successful projects and the total number of projects. This ratio can be computed for the full sample or on various subsamples.
Instrumental Variables	
Med. Goal by Subcat. of Succ. Proj. in s-1	For each project, this is the median goal of successful projects in the same subcategory during the semester previous to the campaign start date.
Med. Completion Ratio by Subcat. in s-1	For each project, this is the median completion ratio of projects in the same subcategory during the semester previous to the campaign start date.

Chapitre 2: The Narcissism of Crowdfunding Entrepreneurs[20]

1. Abstract

The narcissism of established CEOs is known to affect corporate decisions and outcomes. We study the impact of crowdfunding entrepreneurs' narcissism on campaign design and campaign outcome, formulating hypotheses for both aspects. We distinguish between ego-defensive narcissism and grandiose/arrogant narcissism in the hypotheses for campaign design. We find that more narcissistic crowdfunding entrepreneurs set less ambitious goals, consistent with ego-defensive narcissism. We further document that more narcissistic entrepreneurs are less successful than other entrepreneurs, suggesting that crowdfunders recognize the narcissistic tendencies of entrepreneurs and are more reluctant to support them. Our results are consistent with recent conceptual research, suggesting that there are specific effects of narcissism in the early-stage entrepreneurial context.

20 *This chapter is based on "The Narcissism of Crowdfunding Entrepreneurs" co-authored with Helen Bollaert (Université Côte d'Azur – SKEMA Business School) and Armin Schwienbacher (supervisor of this thesis).*

2. Introduction

Narcissism is known to affect managerial decisions and firm outcomes. A series of studies has demonstrated the impact of CEO narcissism on various characteristics of large firms (Aktas et al., 2016; Chatterjee and Hambrick, 2007; Petrenko et al., 2016). One difficulty in studying the effects of narcissism in the large-firm context is that top managers typically have reputations built over the many years of their career. In contrast, crowdfunding entrepreneurs are largely an unknown quantity – they are typically novices and do not have a strong track record. It follows that investors base their decision to support projects on observable characteristics of newcomers, rather than on their previous performance or reputation. Crowdfunding therefore provides us with a relatively uncluttered context in which to examine the effects of narcissism on managerial decisions and project success.

Rewards-based crowdfunding in particular provides an ideal setting in which to examine the effects of narcissism. First, crowdfunded projects are typically small and under the direct control of the crowdfunding entrepreneur. That the success of the project hinges on the entrepreneur is therefore beyond dispute. This leaves him or her more exposed to the risk of being stigmatized by a failure (Burchell and Hughes, 2006; Landier, 2005; Simmons et al., 2014) and thus more concerned by how he/she is perceived by others. Second, perceptions of investors are likely to be more important in rewards-based crowdfunding projects, because campaign supporters are

not interested in a monetary return on investment (at best, they may receive the product resulting from the project) but on the warm glow that comes with helping the underdog (McGinnis and Gentry, 2009). Finally, the entire campaign is conducted on the internet, affording opportunities for potential backers to assess the characteristics of the founder.

We define narcissism in the personality psychology tradition, which considers it to be a normal part of an individual's psychological makeup. Consistent with the prevailing view, we assume narcissism is a continuously-distributed personality trait (Campbell and Foster, 2007). Narcissism is usually associated with grandiose behaviors (American Psychiatric Association, 2013; Emmons, 1987). However, narcissists may also suffer from fragile self-esteem which causes them to engage in ego-defensive behaviors, consistent with approach-avoidance motivations (Foster and Brennan, 2012). We formulate alternative hypotheses for the effect of narcissism on campaign design. If grandiose narcissism is on average more prevalent among crowdfunding entrepreneurs, we expect higher goals and a greater probability of choosing the all-or-nothing (AON) funding model. If ego-defensive narcissism is prevalent on average, we would predict lower goals and a greater probability of keep-it-all (KIA) funding model. Previous research suggests that more narcissistic entrepreneurs are less successful (Klotz and Neubaum, 2016; Navis and Ozbek, 2016). Crowdfunding campaigns can be assimilated with early-stage entrepreneurial projects, in which narcissism has been described as particularly damaging (Tucker et al.,

2016). We therefore posit that higher levels of narcissism are associated with less successful crowdfunding campaigns.

To test our hypotheses, we collect data on crowdfunding campaigns set up on Indiegogo, an internationally active rewards-based platform. We capture narcissism using patterns in first person pronoun usage. Prior research in psychology shows a positive (negative) correlation between first person singular (plural) pronouns and narcissistic personality inventory (NPI) scores. Following Chatterjee and Hambrick (2007) and Aktas et al. (2106), we estimate a narcissism score as the ratio of first person singular pronouns to total first person pronouns. We are able to estimate the score for crowdfunding entrepreneurs using the descriptive texts provided on Indiegogo. We restrict the sample to projects with at least two team members to ensure that the entrepreneur has a real choice between singular and plural pronouns. This leaves us with a final sample of 14,125 unique campaigns from the very beginning of the platform launch until November 2013 covering a range of project categories and countries.

Our empirical analysis supports the ego-defensive narcissism hypothesis. Narcissistic entrepreneurs set lower funding goals. This reduces the exposure of the entrepreneur. A lower goal helps the entrepreneur to reach the stated objective and obtain funds, minimizing his/her risk of damaging his/her ego. More narcissistic entrepreneurs are also less successful in their campaign, despite the fact that they set lower funding goals. They are less likely to collect sufficient funds to achieve their set goal, attract fewer backers, and raise less funds in dollars. This finding supports the idea that

more narcissistic entrepreneurs tend to be less successful than less narcissistic entrepreneurs and therefore that narcissism is a negative characteristic for nascent entrepreneurs.

Our paper makes several contributions to the existing literature. First, we contribute to the burgeoning literature on crowdfunding by examining how the personality traits of crowdfunding entrepreneurs affect campaign design and outcome. Some studies investigate other aspects such as gender, geographical distance and social capital (Agrawal et al., 2015; Colombo et al., 2015; Hervé et al., 2016; Marom et al., 2014; Mohammadi and Shafi, 2015; Mollick, 2014). Others examine the impact of signals and certification as well as funding dynamics (Ahlers et al., 2015; Hornuf and Schwienbacher, 2015b; Kuppuswamy and Bayus, 2013; Mollick, 2014; Ralcheva and Roosenboom, 2016; Vismara, 2015). To the best of our knowledge, our study is the first to investigate the narcissism of crowdfunding entrepreneurs. Second, we provide novel evidence for the effects of narcissism in very early stage ventures, lending support for the theoretical conclusions of Hayes et al. (Haynes et al., 2015) and Navis (Navis and Ozbek, 2016). Finally, we implement a novel methodology enabling us to capture the salient psychological trait of narcissism in a large sample of crowdfunding projects, obviating the need for a survey-based measure.

The remainder of this paper is structured as follows. The next section presents relevant literature and sets out our hypotheses. Section 4 describes the data and provides the main summary statistics of our sample of

crowdfunding campaigns. Section 5 presents results. Finally, Section 6 concludes.

3. Literature and Hypotheses

3.1. Narcissism

In the psychology and psychiatry literature, there are two main approaches to narcissism. First, in its most extreme manifestations, it is a pathology described in the fifth edition of the Diagnostic and statistical manual of mental disorders (DSM V) (American Psychiatric Association, 2013). Individuals suffering from Narcissistic Personality Disorder (NPD) display impaired self and interpersonal functioning – they rely on others to maintain their self-esteem, yet lack empathy towards others. This manifests in emotional instability, difficulty in setting realistic goals and a superficial attitude towards others. In addition, NPD individuals display grandiose behaviors, with a strong sense of entitlement and attention-seeking behaviors. Second, narcissism can be considered as a personality trait. In this approach, narcissism is a normal aspect of the personality and can be captured in the general population using questionnaires such as the Narcissistic Personality Inventory or NPI (Emmons, 1987). The trait approach is typified by the work of Raskin and Hall (Raskin and Hall, 1979) and Emmons (1987), among others. If we consider narcissism to be a normal personality trait, "narcissism should be thought of as neither entirely

healthy nor unhealthy" (Campbell and Foster, 2007). Narcissism may be beneficial to the individual but becomes problematic at higher levels because it has a negative effect on social relationships and because a lack of self-awareness affects decision-making (Campbell and Foster, 2007). In our study, we follow the second approach to narcissism and define it as a continuously-distributed normal personality trait, consistent with Campbell and Foster (2007).

3.2. Crowdfunding and Social Networks

Different forms of crowdfunding coexist (Mollick, 2014; Schwienbacher and Larralde, 2012). However, they are generally studied separately, since the way they operate affects the type of compensation obtained by participants and thereby the type of crowd participating in the campaigns. In rewards-based crowdfunding, backers donate a small amount of money in exchange for a pre-determined reward. The latter is often either a t-shirt (or any other type of goody) or the product resulting from the project. The crowd does not therefore base its decision on whether the entrepreneurial project is profitable per se, but rather whether they wish to sponsor the entrepreneur's project and "pre-purchase" the product. For instance, McGinnis and Gentry (2009) argue that warm glow crowdfunders may support a project out of empathy for the entrepreneur, as a way to help an underdog against market-dominant firms. Since the sponsoring component is

important in any crowdfunding campaign, the crowd's perception of the entrepreneur, including his or her personality traits, is important.

Social networks are extensively used in crowdfunding campaigns (Agrawal et al., 2015; Colombo et al., 2015; Mollick, 2014) - entrepreneurs need to interact with the crowd to attract backers and the entire campaign is run on the Internet. Colombo, Franzoni, and Rossi-Lamastra (2014) find that entrepreneurs' social capital (i.e., the extent of the social network on Facebook and LinkedIn) is crucial to attract the first backers, who affect the behavior of follow-up individuals during the campaign. Social networks further help alleviate geographical distance between backers and entrepreneurs (Agrawal et al., 2015) and help reduce information asymmetries (Lin et al., 2013). Vismara (2016) finds that entrepreneurs with higher levels of social capital are more successful at raising the required funds, because those with a more extensive initial social network are more widely known, creating rapid hype for the campaign and generating more early contributions.

Studies in psychology support the idea that the communication used by entrepreneurs during the crowdfunding campaign is likely to be affected by the extent to which they are narcissistic and to provide the crowd with clues as to how narcissistic the entrepreneur is. Clifton (Clifton, 2012) cites research showing that some characteristics of social network communication are associated with narcissism, and that other users are able to detect narcissism based on these characteristics.

3.3. Narcissism in the early-stage entrepreneurial context

In this section, we discuss characteristics of the narcissism personality trait which are salient for the crowdfunding context and review relevant papers from the entrepreneurship literature, to develop hypotheses about the effect of narcissism on crowdfunding campaign design and success. Hypotheses are summarized in Table 1.

Narcissism implies some behaviors which may appear inconsistent or even contradictory. The grandiose and arrogant side of narcissistic behavior is well-known and appears in both the DSM V (American Psychiatric Association, 2013) and the trait definitions underlying the NPI (Emmons, 1987). It leads highly narcissistic individuals to engage in seemingly risky behaviors and impulsive decision making (Foster et al., 2009; Vazire and Funder, 2006). Such actions are required to enhance their ego. On the other hand, narcissists may suffer from fragile self-esteem – "...individuals with fragile high self-esteem are defensive and highly reactive to events that threaten their positive attitudes towards themselves" (Zeigler-Hill and Jordan, 2012). They may take pre-emptive action and lower their sights if they detect a potential threat to their ego. This forms part of a self-regulatory strategy to protect their fragile self-esteem – "... narcissists seem to defuse potential harms to the self even when these are only potential and before they have had a chance to materialize" (Morf et al., 2012). In the psychology literature, these opposing forces of narcissism are characterized

as "approach-avoidance motivation" (Foster and Brennan, 2012), with a growing body of empirical evidence for both effects (Foster and Brennan, 2012; Morf et al., 2012).

Campaign design choices by crowdfunding entrepreneurs are likely to be affected differently depending on whether we observe, on average, grandiose/arrogant or ego-defensive narcissistic behaviors. In the former case, we would expect a higher goal to be set and an all-or-nothing campaign type – the arrogant narcissist would enhance his or her ego by taking more risk in the campaign, thereby showing off his/her higher expectations of success. In the latter case, we would expect a lower goal and a keep-it-all campaign type. This would protect the individual from a damaging shock to the ego, by increasing the probability of reaching the stated goal and enabling him/her to keep the funds raised, thereby providing something to show for his/her crowdfunding efforts, even if the project needs to be scaled down.

The hypothesized effects of narcissism on campaign design are consistent with the small number of studies in the entrepreneurship literature which refer to narcissism or related concepts. Baron (Baron, 1998) references cognitive mechanisms rather than personality traits, but he suggests that some cognitive biases could cause entrepreneurs to make more overconfident predictions about future outcomes. This echoes the risk-taking among narcissists identified by Foster et al. (2009) and is consistent with our hypotheses 1A and 2A. Likewise, Mathieu and St-Jean (Mathieu and St-Jean, 2013) find that narcissism and risk-taking are positively correlated

(consistent with Campbell et al., 2004), and that both are positively associated with the intention to start an entrepreneurial project. Haynes et al. (2015) discuss the effects of hubris in the entrepreneurial context. While hubris and narcissism are different concepts, there is some overlap, at least in the pathological dimensions (Owen and Davidson, 2009). Haynes et al. (2015) suggest that hubris translates into an underestimation of the resources required for the project, which would be consistent with our hypotheses 1B and 2B.

There are three requirements for credibly predicting the effect of narcissism on crowdfunding success. First, we need to provide evidence that narcissism is a determinant of the success of crowdfunding ventures. Second, internet users must credibly be able to recognize narcissism from online content. Finally, we need to show that entrepreneur personality is an investment criteria for campaign supporters.

The entrepreneurship literature mainly focuses on the five-factor model of personality, providing fairly consistent results for entrepreneurial propensity (for a review, see the meta-analysis by Zhao and Siebert (Zhao and Seibert, 2006)), and somewhat mixed findings for entrepreneurial outcomes (Omorede et al., 2015). The few studies focusing on narcissism are less equivocal and suggest that more narcissistic entrepreneurs are less successful in their entrepreneurial projects, especially in the early stages which concern us in the crowdfunding context. Tucker et al. (2016) discuss dark triad traits and entrepreneurship. They break down the dark triad into its component concepts (Machiavellianism, narcissism and psychopathy) and

theoretically model the effect of each component on the different stages of the entrepreneurial process. The authors suggest that in the early stages of the project, narcissism has a negative influence on outcomes because the self-aggrandizing tendencies of highly narcissistic individuals tend to distort their recognition of the project's potential and their attempts to protect their ego potentially alter their assessment of the project. Navis and Ozbek (2016) theoretically examine the links between psychological characteristics and entrepreneurial entry and success. They posit that more narcissistic entrepreneurs are less able to learn and are therefore less likely to successfully realize their projects. Other papers do not discuss narcissism directly, but consider related concepts. Klotz and Neubaum (2015) consider more generally the dark side of individuals' personality and the relationship with entrepreneurship. They state that "entrepreneurs driven by more negative personality traits would likely drop out or give up quickly if they did not find immediate rewards" (p. 9). The work of Haynes et al. (2015) on hubris and entrepreneurship suggests that hubristic individuals are less able to accurately assess the project or the resources required to bring it to fruition. This would potentially jeopardize the success of the project. Overall, the existing literature provides a strong case for the negative impact of narcissism on entrepreneurial success, which is even more pronounced in the early stages of the project.

Recent research in social psychology examines narcissism in the context of online social networks and, more broadly, the internet. More narcissistic individuals tend to post more online material and their social network

content enables observers to identify them as more narcissistic (Clifton, 2012). They use the internet as a self-promotion tool and use online communities to explicitly and implicitly regulate their inflated self-concept (Buffardi, 2012). These findings are important to our study because they show that real world narcissistic behaviors, such as those documented in Buss and Chiodo (Buss and Chiodo, 1991), transfer readily to the virtual world. In addition, Buffardi (2012) cites evidence that web users are able to accurately identify narcissism on the internet from the online content posted by individuals. It therefore seems reasonable to assume that crowdfunding sites provide strong clues about the narcissism of crowdfunding entrepreneursCrowdfunders are likely to be able to assess whether an entrepreneur is narcissistic, based on the online interaction and information content he/she discloses.

We have been unable to find any papers on investor perceptions of the narcissism of crowdfunding entrepreneurs or even traditional entrepreneurs. However, related research on angel investing provides some clues as to how investors may perceive narcissists. In an empirical study, Murnieks et al. (Murnieks et al., 2015) find that angel investors prefer emotional stability and perseverance – characteristics which are certainly not consistent with higher levels of narcissism. The scant evidence available suggests that narcissists are likely to be negatively perceived by potential investors, thereby reducing the likelihood of a successful crowdfunding campaign. We hypothesize that higher levels of narcissism are associated with less successful campaigns and the participation of fewer backers, because

narcissists perform less well on entrepreneurial projects and because potential investors are likely to view narcissists with caution as they make their investment decision.

Table I: Summary of hypotheses

	Campaign design		**Campaign success**
	Goal	**Keep-it-all v. All-or-nothing**	
Grandiose/ arrogant narcissism	*Hypothesis 1A: More narcissistic entrepreneurs set a higher funding goal*	*Hypothesis 2A: More narcissistic entrepreneurs are more likely to choose AON*	*Hypothesis 3: More narcissistic entrepreneurs' campaigns are less successful*
Ego-defensive narcissism	*Hypothesis 1B: More narcissistic entrepreneurs set a lower funding goal*	*Hypothesis 2B: More narcissistic entrepreneurs are more likely to choose KIA*	

4. Data and Summary Statistics

4.1. Narcissism measure

We choose to measure narcissism using first person pronoun usage, estimated as the ratio of first person singular pronouns (I, me, my, mine,

myself) to total first person pronouns (first person singular pronouns plus we, us, our, ours, ourselves). This measure is based on a study by Raskin and Shaw (Raskin and Shaw, 1988), demonstrating a positive correlation between first person singular pronouns and narcissism, and a negative correlation between first person plural pronouns and narcissism.

The first person pronoun measure has four main advantages, both theoretical and empirical. First, its ancestry can be mapped back to founding works in psychology. Freud (Freud, 1914) defined narcissism following his observations in clinical practice. Over the following decades, a full clinical pattern emerged, now formalized in its latest incarnation in the DSM V (American Psychiatric Association, 2013). In the 1970s and 1980s, researchers developed a survey instrument, the NPI, to capture narcissism in the general population (Emmons, 1987; Raskin and Hall, 1979). Finally, NPI scores were found to be correlated with observable characteristics such as speech patterns (Raskin and Shaw, 1988). Second, the measure relies on patterns in first person pronoun usage, which can be readily obtained from the texts that crowdfunding entrepreneurs post on their project webpage. Third, the first person pronoun measure is continuous, consistent with the prevailing view in psychology (Campbell and Foster, 2007). Finally, it is possible to estimate the first person pronoun measure using secondary data from the crowdfunding website, which obviates the need to administer questionnaires with the attendant advantages – mainly our ability to estimate the measure for a large number of crowdfunding projects (more than 14,000 observations). While the number of observations does not

ensure empirical quality per se, we can reasonably assume that our findings are fully representative of crowdfunding entrepreneurs on our source website, and are not an artefact of a small sample size or a low response rate.

The first person pronoun indicator has already been used in samples of CEOs in the finance and strategic management literatures (Aktas et al., 2016; Chatterjee and Hambrick, 2007). It has, however, recently been cast into doubt by Carey et al. (Carey et al., 2015) who claim they fail to replicate the original Raskin and Shaw (1988) study. However, closer reading of the Carey et al. (2015) study reveals that they focus only on first person singular pronouns: "The focus of this paper is on first-person singular only given the strong lay perceptions about I-talk (but not we-talk) indicating narcissism and given that researchers have used I-talk (but not we-talk) as an operationalization of narcissism" (p. e8). In research on narcissism and internet usage, Buffardi (2011) cites a study which is consistent with Raskin and Shaw (1988). This evidence is particularly relevant to our study because we use texts from a crowdfunding platform to estimate our measure of narcissism.

4.2. Sample

The initial dataset used in this study is composed of 51,996 crowdfunding campaigns collected from Indiegogo, covering the period from June 2008 to November 2013. We apply some data screens to remain consistent with the

existing literature and to avoid extreme values which may bias our analysis. We first drop all unfinished campaigns (4,857 projects) for which the final outcome is unknown. Since we use English language textual analysis, we next drop the 7,419 observations outside the US, Canada and Australia and 996 projects with either a very short descriptive text (less than 400 characters at the 1st percentile) or very large quantity of text (more than 14,270 characters, at the 99th percentile). We further exclude all social- and community-centered campaigns (8,511 projects), which include the following categories on Indiegogo: Health, Community, Animals, Politics and Religion. These types of projects are not centered on a product but on a person or on a group. The project description will therefore likely use pronouns in a specific way which could bias our measure of narcissism. For instance, in campaign centered on the illness of a person, which is a typical campaign in the "health" category, the individual describes his/her illness or his/her life experience in a highly personal way.

Following previous papers on rewards-based crowdfunding (Cumming et al., 2015; Mollick, 2014), we also exclude campaigns with a funding goal higher than $200,000 (which corresponds to the 99th percentile in our sample, or 310 projects), since they are generally atypical. Our narcissism measure implies that crowdfunding entrepreneurs must effectively be able to choose whether to speak in the first person singular or plural. For solo campaigns, it seems difficult to imagine that the entrepreneur would choose to speak in the first person plural. We therefore limit our sample to team projects, which we define as including at least two entrepreneurs (reducing the

sample by 15,594 projects). After removing the projects for which no first person pronouns were used at all (184 projects), this leaves us with a final sample of 14,125 observations. All currency amounts (the variables Goal and Total Pledge) not initially set in US dollars are converted using the semester average currency exchange rate. Variable descriptions are provided in Appendix Table I and further discussed in the next subsection.

4.3. Variables

For each entrepreneurial project, we extract a number of details about campaign design and outcomes. These include the goal, the campaign type (keep-it-all or KIA versus all-or-nothing or AON), the number of team members, the nature of the rewards, non-profit status, the length of the campaign, funds pledged and the number of backers. We are also able to extract soft information, such as texts describing the project, the number of photos, the presence of a video pitch and links to social networks.

Dependent variables:

We test hypotheses 1A/1B and 2A/2B on campaign design by focusing on two important decisions the entrepreneur makes on the Indiegogo platform: the funding goal, measured by ln(Goal); and the funding model, captured by the dummy variable AON Dummy. Both of these decisions affect the extent to which the entrepreneur bears risk in the campaign (Cumming et al., 2015). A high funding goal makes success more difficult to achieve, as the entrepreneur needs to attract more backers. Predictions for the impact

of narcissism on the funding goal are provided in Hypotheses H1A and H1B. The AON funding model shifts the risk to the entrepreneur, away from the crowd. In an AON campaign, the crowd does not bear the risk of pledging money to a potentially underfunded project, which could be an outcome under the alternative KIA funding model. Predictions for the impact of narcissism on the funding model are provided in Hypotheses H2A and H2B.

We test Hypothesis H3 on campaign outcomes in three different ways: achievement of the funding goal (the binary variable Success Dummy), the total number of backers (the variable Total Backers) and the total amount of money pledged by backers (Total Pledge) at the end of the campaign.

Variable of interest:

We use texts to estimate a continuous measure of narcissism for team projects. We count the number of first person singular and plural pronouns in texts describing each project and estimate the crowdfunding entrepreneur's narcissism score as the ratio between first person singular pronouns and total first person pronouns in the text.

We create a dummy variable High Narcissism, which is equal to one if the narcissism score is greater than 0.5, and zero otherwise. The chosen cutoff of 0.5 has an intuitive interpretation. A value higher (lower) than 0.5 means that, on average, the entrepreneur uses first person singular pronouns more often (less often) than first person plural pronouns.

Control variables:

We add a series of control variables which are known to impact crowd behavior and project outcome. These control variables are classified into three categories: project characteristics, soft information and fixed effects.

The first category includes all measurable project characteristics available. We control for the size of the campaign team as the size of the group may impact the way the leader puts him- or herself forward in the project description. Projects by non-profit organizations tend to influence the behavior of backers, due to the associated tax deductions and an enhanced warm glow effect (Andreoni, 1990). Previous research shows that campaign duration and the number of reward levels offered to backers affect the funding process (Mollick, 2014), leading us to include control variables to capture these campaign characteristics.

The second category consists in measures related to the quantity of soft information provided by the entrepreneur to describe his or her campaign. Soft information reflects the effort that the entrepreneur makes to encourage the participation of potential backers and reduces information asymmetry with the participants. The information can be in the form of a video (videopitch), pictures (gallery) and a textual description of the project (full text length). We also capture the readability of the text using the Automated Readability Index (Senter and Smith, 1967), as a proxy for the ability of a larger crowd to understand the text. A higher A.R.I. value means that a higher level of education is needed to fully comprehend the text. Details of the estimation are provided in Appendix Table I.

For the third category, we include country, semester and category fixed effects. As the crowdfunding market evolves rapidly, the inclusion of semester fixed-effects is more appropriate than year fixed-effects.

To test our hypotheses, we use either OLS regressions or probit models depending on whether the left-hand side variable is a continuous or a binary variable. Robust standard errors are used throughout the analyses.

Descriptive statistics:

Summary statistics are presented in Table II for the full sample and for the subsamples of high and low values of narcissism, based on the cut-off value of a score of 0.5 in our High Narc. variable. The final column shows the result of a difference-in-means test between the two subsamples and provides some initial clues about differences between the campaigns of more and less narcissistic entrepreneurs. The mean narcissism score in the full sample is 0.202, meaning that on average there is about one first person singular pronoun used in the project description for five first person plural pronouns. This figure is close to the average narcissism score estimated using the same method in Chatterjee and Hambrick (2007) and Aktas et al. (2016). The range of values is also very broad, with a maximum of 1 and a minimum of 0. At the minimum value, the team leader only uses first person plural pronouns and does not self-reference. On the other hand, the maximum value of 1 means that the team leader only self-references and does not reference the team.

The average funding goal in the full sample is $13,658, with a median of $6,000. Consistent with our Hypothesis H1A, more narcissistic entrepreneurs set lower goals than less narcissistic ones ($11,292 versus $14,142), and the difference is statistically significant. Consistent with hypothesis H1B, more narcissistic entrepreneurs are more likely to select the AON funding model (4.33% of the campaigns as opposed to 3.58% for less narcissistic entrepreneurs), although the difference is only significant at the 10% level. More narcissistic entrepreneurs' campaigns are less likely to be non-profit oriented and project teams are smaller on average.

The last three rows in Table II show statistics for campaign outcome. The average success rate for meeting the funding goal is 32.6% in the full sample. There is no statistically nor economically meaningful difference between more and less narcissistic entrepreneurs (32.5% as opposed to 32.6%). However, more narcissistic entrepreneurs raise less money ($3,817 as opposed to $5,472) and attract fewer backers (49.8 as opposed to 66.8). Both of these differences are statistically significant and economically meaningful, lending preliminary support for Hypothesis H3

Table II: Summary statistics

*This table shows summary statistics for variables included in our database. All the variables are defined in Appendix Table I. We provide means, standard deviations, minimum, median and maximum for the full sample of 14,125 campaigns and for the two subsamples based on the level of narcissism. The last column provides a difference-in-mean tests between the two subsamples. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	Full Sample (14,125 obs.)					High Narcissism (>0.5) (2,402 obs.)					Low Narcissism (<=0.5) (11,723 obs.)					
	Mean	Std.Dev.	Min.	Median	Max.	Mean	Std.Dev.	Min.	Median	Max.	Mean	Std.Dev.	Min.	Median	Max.	Mean Diff. Test
Narcissism	0.202	0.303	0	0	1	0.798	0.157	0.507	0.822	1	0.0795	0.133	0	0	0.5	-0.72***
Project Characteristics																
Goal	13,658	21,135	500	6,000	197,000	11,292	16,484	500	5,136	150,000	14,142	21,937	500	6,000	197,000	2,850***
AON Dummy	0.0371	0.189	0	0	1	0.0433	0.204	0	0	1	0.0358	0.186	0	0	1	-0.007*
Team Size	3.52	1.98	2	3	10	3.08	1.67	2	2	10	3.61	2.03	2	3	10	0.53***
Verified Non-Profit	0.12	0.325	0	0	1	0.067	0.25	0	0	1	0.131	0.337	0	0	1	0.06***
Rewards Offered	7.75	3.22	0	8	30	7.57	3.2	0	7	24	7.79	3.23	0	8	30	0.22***
Duration	45.6	22.8	1	42	120	45.8	22.4	1	43	120	45.5	22.8	1	42	120	-0.23
Soft Information																
Desc. Length	107	41.9	0	116	172	110	41.2	0	119	172	107	42	0	115	167	-2.43***
Full Text Length	4,184	2,433	411	3,586	14,206	4,301	2,486	454	3,673	14,128	4,160	2,421	411	3,568	14,206	-141***
Gallery	6.83	10.5	0	4	350	6.69	10.2	0	3	166	6.86	10.6	0	4	350	0.17
Video Pitch	0.809	0.393	0	1	1	0.789	0.408	0	1	1	0.813	0.39	0	1	1	0.02***
Social Networks	3.01	2.02	0	3	27	3.02	2.09	0	3	19	3.01	2.01	0	3	27	-0.004
A.R.I.	15.2	3.07	4.92	14.9	98.9	14.3	3.16	6.36	14	67	15.4	3.02	4.92	15.1	98.9	1.05***
Outcome																
Success Dummy	0.326	0.469	0	0	1	0.325	0.469	0	0	1	0.326	0.469	0	0	1	0.0009
Backers	63.9	298	0	31	15,310	49.8	110	1	29	4,340	66.8	323	0	32	15,310	17.1**
Pledged	5,190	22,234	0	2,160	1,140,975	3,817	9,165	500	1,968	352,288	5,472	24,041	0	2,205	1,140,975	1,655***

Correlations between the variables used in our analysis are presented in Table III. In line with Hypothesis H1B on ego-defensive narcissism, there is a negative and statistically significant correlation between our narcissism measures and the size of the crowdfunding campaign (Goal). While we observe a positive correlation between our continuous measure of narcissism and the AON funding model, it is not significant for our high narcissism dummy. There is no significant correlation between Success Dummy and Narcissism, but a negative and significant correlation exists when we look at the number of backers (Backers) and at the total money pledged in the project (Pledged), providing support for Hypothesis H3.

Table III: Correlation matrix of main variables

This table shows pair-wise correlations between the main variables. All the variables are defined in Appendix Table I. A star indicates a significance level of 5%.

	Narcissism	High Narc. (>0.5)	Goal	AON Dummy	Team Size	Verified Non-Profit	Rewards Offered	Duration
Narcissism	1.00							
High Narc. (>0.5)	0.89*	1.00						
Goal	-0.03*	-0.05*	1.00					
AON Dummy	0.02*	0.01	0.12*	1.00				
Team Size	-0.1*	-0.1*	0.1*	-0.01	1.00			
Verified Non-Profit	-0.08*	-0.07*	0.03*	-0.07*	0.06*	1.00		
Rewards Offered	-0.01	-0.03*	0.25*	0.06*	0.13*	-0.01	1.00	
Duration	0.00	0.00	0.15*	-0.07*	0.05*	0.05*	0.01	1.00
Desc. Length	0.03*	0.02*	0.09*	0.04*	-0.01	0.02	0.1*	-0.14*
Full Text Length	0.07*	0.02*	0.28*	0.09*	0.12*	0.01	0.32*	0.04*
Gallery	0.01	-0.01	0.12*	0.02*	0.17*	-0.00	0.18*	0.09*
Video Pitch	-0.02*	-0.02*	0.12*	0.03*	0.07*	0.04*	0.23*	0.02*
Social Networks	0.02	0.00	0.17*	0.03*	0.11*	0.07*	0.26*	0.06*
A.R.I.	-0.6*	-0.13*	0.04*	-0.02*	0.05*	0.15*	-0.05*	0.04*
Success Dummy	-0.01	-0.00	-0.24*	0.08*	0.02	-0.02*	-0.09*	-0.17*
Backers	-0.02*	-0.02*	0.16*	0.07*	0.06*	0.00	0.1*	-0.01
Pledged	-0.02*	-0.03*	0.22*	0.09*	0.07*	0.01	0.1*	0.01

	Desc. Length	Full Text Length	Gallery	Video Pitch	Social Networks	A.R.I.	Success Dummy	Backers
Desc. Length	1.00							
Full Text Length	0.13*	1.00						
Gallery	0.05*	0.2*	1.00					
Video Pitch	0.06*	0.13*	0.12*	1.00				
Social Networks	0.13*	0.2*	0.21*	0.19*	1.00			
A.R.I.	0.06*	0.13*	-0.00	-0.00	0.00	1.00		
Success Dummy	-0.02*	-0.08*	-0.02*	-0.05*	-0.09*	-0.03*	1.00	
Backers	0.03*	0.1*	0.08*	0.05*	0.04*	-0.01	0.12*	1.00
Pledged	0.04*	0.13*	0.12*	0.05*	0.05*	0.01	0.14*	0.78*

5. Results

In this section, we formally test our hypotheses. Table IV shows the results for Hypotheses 1 and 2 on campaign design. Odd-numbered columns show results when the continuous measure Narcissism is included in the analysis, with even-numbered columns showing results for the dummy variable High Narc.

Consistent with Hypothesis H1B, more narcissistic entrepreneurs set a lower goal, estimated as the natural log of the dollar goal, than less narcissistic ones (Models (1) and (3)). Unreported results for the dollar value of the funding goal give similar results. Our findings suggest that, on average, narcissistic crowdfunding entrepreneurs are more concerned with defending their egos. A lower goal preemptively reduces the risk of campaign failure, thereby protecting self-esteem, consistent with Morf et al. (2011). Based on Model (3), the difference between high and low levels of narcissism translates, ceteris paribus, into a difference in funding goals of $420.

Models (2) and (4) show results for the effect of narcissism on the choice of funding model. Narcissism is not a significant predictor of the choice between AON and KIA. While Model (6) shows a significant result for the continuous measure of narcissism when soft information controls are excluded, this is not confirmed in Model (8) for the high narcissism dummy. We are therefore unable to distinguish between Hypotheses 2A and 2B. One reason for this could be the simultaneous nature of the choice between campaign goal and funding model.

Table IV: Crowdfunding Campaign Design

*This table shows the impact of narcissism of the entrepreneur on the design of the crowdfunding campaign. The dependent variable is the natural log of the dollar goal in odd-numbered models and a binary variable equal to one if the funding model is All-Or Nothing (AON) in even-numbered models. Models 1,2,5 and 6 use the continuous measure of narcissism as variable of interest and model 3,4,7 and 8 use a dummy variable equal to 1 if the narcissism measure is higher than 0.5 and 0 otherwise (high narcissism). Models 1 to 4 include control variables for soft information. All models include sub-category, semester and country fixed effects. Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		AON		AON		AON		AON
	ln(Goal)	Dummy	ln(Goal)	Dummy	ln(Goal)	Dummy	ln(Goal)	Dummy
Narcissism	-0.093***	0.008			-0.049*	0.012**		
High Narc. (>0.5)			-0.066***	0.005			-0.054**	0.007
Project Characteristics								
Team Size	0.031***	0.0004	0.031***	0.0003	0.049***	0.001	0.049***	0.001
Verified Non-profit	0.336***		0.337***		0.406***		0.405***	
Rewards Offered	0.088***	0.002***	0.089***	0.002***	0.122***	0.003***	0.122***	0.003***
Duration	0.011***	-0.001***	0.011***	-0.001***	0.013***	-0.001***	0.013***	-0.001***
Soft Information								
Catch Phrase Length	0.001***	-0.00002	0.001***	-0.00002				
Full Text Length	0.00008***	0.000003***	0.00008***	0.000003***				
Gallery's items	0.004***	-0.00005	0.004***	-0.00005				
Video Pitch Dummy	0.282***	0.011**	0.282***	0.011**				
Social Networks	0.051***	-0.002**	0.051***	-0.002**				
A.R. Index	0.013***	-0.001	0.013***	-0.001*				
Subcat./Semester/ Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14125	11449	14125	11449	14125	11449	14125	11449
Adj./Pseudo R^2	0.349	0.163	0.349	0.163	0.299	0.158	0.299	0.157

Regarding our control variables, the soft information variables all have a positive and highly significant impact on funding goal, which is consistent with expectations (Michels, 2012). Entrepreneurs with more advanced projects, for which it is possible to disclose more information and to show more pictures, request higher funds to pursue their project. Backers are reassured by the effort made by the entrepreneur, who can therefore reasonably expect to attain a higher goal. The more reward levels the entrepreneur is able to offer, the higher the possible funding goal. The number of reward levels can be interpreted as a signal of a more advanced project and/or the willingness to broaden the targeted crowd by offering multiple support levels (Gerber et al., 2012). Finally, consistent with Giudici et al.'s (Giudici et al., 2013) finding that bigger teams have larger network opportunities, the impact of team size on funding goal is positive and significant.

Table V provides results for Hypothesis 3 on the campaign outcome. Consistent with Hypothesis 3, campaigns of narcissistic crowdfunding entrepreneurs are less successful. First, they are less likely to achieve their desired goal (Models (1)-(2) and (5)-(6)). Consistent with our findings in Table IV for the effect of narcissism on campaign design, the result is only significant when we control for ln(Goal) and the funding model (Models (2) and (6)). Second, our results are confirmed when we refine our analysis to more specific performance variables. We find that more narcissistic entrepreneurs attract fewer backers and less funds. Our results for campaign outcome are consistent with prior studies on entrepreneurship and

personality traits, which predict lower levels of success for narcissistic entrepreneurs, especially in the early stages of a project (Navis and Ozbek, 2016; Tucker et al., 2016). Our findings also echo those of Murnieks et al. (2015) – it appears that the crowd, like angel investors, avoids entrepreneurs with narcissistic tendencies. In terms of economic significance, an entrepreneur classified as highly narcissistic attracts 13.8 fewer backers and $1,111.84 less funds than a low-level narcissist. These values are economically meaningful, given that the average campaign seeks to attract $13,658 (mean Goal in the full sample; see Table II).

Table V: Crowdfunding Campaign Outcome

*This table shows the impact of the narcissism of the entrepreneur on the outcome of the crowdfunding campaign. The dependent variable is a dummy equal to one if the goal is reached (models 1, 2, 5 and 6), the number of backers (models 3 and 7) and the total pledge in dollars (models 4 and 8 Models 1 to 4 use the continuous measure of narcissism as variable of interest and models 5 to 8 use a dummy variable equal to 1 if the narcissism measure is higher than 0.5 and 0 otherwise (high narcissism level). Standard errors are robust to heteroscedasticity. Significance levels (p-value): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Success Dummy	Success Dummy	Total Backers	Total Pledge	Success Dummy	Success Dummy	Total Backers	Total Pledge
Narcissism	-0.010	-0.029**	-20.407***	-1617.008***				
High Narc. (>0.5)					-0.007	-0.019**	-13.809***	-1111.840***
Project Characteristics								
ln(Goal)		-0.187***	25.658***	2667.642***		-0.186***	25.700***	2670.814***
AON Dummy		0.256***	47.901	5441.823**		0.256***	47.756	5430.714**
Team Size	0.010***	0.016***	4.876***	395.152***	0.010***	0.017***	4.949***	400.698***
Verified Non-Profit	-0.041***	0.032***	1.55	682.331**	-0.041***	0.032***	1.659	690.084**
Rewards Offered	-0.009***	0.008***	2.415	28.448	-0.009***	0.008***	2.436	30.008
Duration	-0.004***	-0.001***	-0.404**	-24.970***	-0.004***	-0.001***	-0.405**	-25.029***
Soft Information								
Desc. Length	-0.0003***	-0.0001	0.048	2.589	-0.0003***	-0.0001	0.047	2.472
Full Text Length	-0.000005***	0.00001***	0.004**	0.415***	-0.000005***	0.00001***	0.004*	0.403***
Gallery	0.001***	0.002***	1.220***	159.492**	0.001***	0.002***	1.218***	159.357**
Video Pitch	-0.015	0.039***	3.971	-46.621	-0.015	0.039***	4.034	-41.817
Social Networks	-0.014***	-0.005**	-3.122**	-253.256***	-0.014***	-0.005**	-3.150**	-255.532***
A.R.I.	-0.003**	-0.0004	-1.678*	-67.237	-0.003*	-0.0003	-1.568*	-58.769
Subcat/Semester/ Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14125	14125	14125	14125	14125	14125	14125	14125
Adj/Pseudo R^2	0.052	0.191	0.038	0.069	0.052	0.191	0.037	0.068

6. Discussion and Concluding Remarks

This study sheds light on how the entrepreneur's personality affects the design and outcome of crowdfunding initiatives. It extends the literature on managerial narcissism from studies which mostly focus on large firms to consider early stage ventures which are typically set up by novice entrepreneurs. The crowdfunding context has a number of attributes which enable us to test the effect of narcissism on campaign design and outcomes. Most notably, projects are small and under the full control of the project leader and perceptions of backers are highly important in the rewards-based crowdfunding under study. We can therefore reasonably attribute effects of narcissism on the crowdfunding project to the personality of the lead entrepreneur. Unlike for CEOs of large firms, prior reputation is not a confounding factor. In addition, the rewards-based project draws potential backers for whom the feel-good factor is important, leading them to focus on the entrepreneur's personality.

We find that more narcissistic entrepreneurs who launch a rewards-based crowdfunding campaign set lower funding goals. This result is consistent with the hypothesis that more narcissistic entrepreneurs seek to defend their ego, rather than engaging in grandiose actions one might more frequently associate with narcissism, consistent with an avoidance motivation as described in Foster and Brennan (2011). Although more narcissistic crowdfunding entrepreneurs set more modest targets, they are less likely to

achieve their goals. The lower performance generated by more narcissistic project leaders is consistent with work in the entrepreneurship literature documenting the negative effects of narcissism in early-stage entrepreneurial projects (Tucker et al., 2016).

Recent conceptual papers show that the effect of narcissism or other negative personality traits may be context dependent. Navis (2016) differentiates the effects of narcissism observed in novel and familiar venture contexts. Haynes (2015) suggests that the effects of negative personality traits are different in start-ups, family firms and corporate ventures. According to Tuck et al. (2016), the impact of the dark triad traits is more or less positive / negative depending on the stage of the entrepreneurial process. Our current project opens the door to a series of comparative projects by providing convincing evidence for the effect of narcissism on early-stage entrepreneurial ventures.

7. Appendix

Narcissism	Ratio of the number of first person singular pronouns (I, me, my, mine, myself) to first person pronouns (first person singular pronouns *plus* the pronouns we, us, our, ours, ourselves) used in the project description (following Raskin and Shaw (1988).
High Narc. (>0.5)	Dummy variable equal to 1 if the *Narcissism* variable is greater than 0.5, and 0 otherwise.
Goal	Funding goal in USD, set by the entrepreneur at the beginning of the crowdfunding campaign. If the funding goal was in another currency, the value is converted to USD using the semester average currency exchange rate.
Ln(Goal)	Natural logarithm of *Goal*.
AON Dummy	Dummy variable equal to 1 if the funding model of the campaign is All-Or-Nothing, and 0 if the funding model is Keep-It-All (following Cummings et al., 2016).
Team Size	Number of persons running the crowdfunding campaign.
Verified Non-Profit	Dummy variable equal to 1 if the campaign is set up by a US-registered 501(c) non-profit organization, and 0 otherwise.
Rewards Offered	Number of reward levels offered by the entrepreneur to backers. Each level corresponds to a different, pre-defined reward associated with a pre-defined pledge.
Duration	Duration of the crowdfunding campaign, in days.
Desc. Length	Length (in number of characters) of the project short description presented on the index page.
Full Text Length	Length (in number of characters) of the project full description presented on the project page.
Gallery	Number of items (pictures, graphics, figures ...) presented in the project gallery.
Video Pitch	Dummy variable equal to 1 if the project page shows a video introducing the project, and 0 otherwise.
Social Networks	Number of social network platforms or external websites where the project is also present (e.g., Facebook, Twitter, Instagram, and dedicated websites) and mentioned on the project description website.
A.R.I.	'Automated Readability Index' score of the project full description, as defined in Senter and Smith (1967). This score is computed as ARI = 4.71*(total characters/total words) + 0.5*(total words/ total sentences) - 21.43. It aims to represent the US grade level needed to comprehend the text. A higher value of the index means the text is more difficult to understand.
Pledged	Total amount (in USD) pledged by the project backers at the end of the campaign.
Success Dummy	Dummy variable equal to 1 if the total amount pledged by all the backers is greater than or equal to the campaign goal (i.e., *Pledged* / *Goal* ≥ 1), and 0 otherwise.
Backers	Number of backers participating in the project.

Chapitre 3: Does the Crowd Forgive?[21]

1. Abstract

In the literature about serial entrepreneurs, experience and network gained from previous entrepreneurial projects is considered having a positive impact on the outcome of following ventures, offsetting the negatives effects of past failures. On the other hand, previous research shows that a "stigma a failure" exists for entrepreneurs. That stigma lower the ability for an entrepreneur with a first failed experience to reenter a new proejct. In this paper, we show that serial entrepreneurs with a first failed crowdfunding campaign are unable to reverse the negative opinion of the crowd on their ability to lead a project. Despite the adjustments made by the entrepreneurs on their new crowdfunding campaigns based on what they have learned from previous experience, we show that their new campaigns, despite an increase in the number of backers and in the money raised, still show lower success rate than for first timers or for entrepreneurs with a successful previous campaign.

21. *This chapter is based on the working paper "Does the Crowd Forgive?" by Gaël Leboeuf. I am grateful for helpful comments and suggestions from Armin Schwienbacher, Ignacio Requejo and seminar and conference participants at Aix-Marseille University CERGAM-GREQAM, 9th IAFDS Doctoral Symposium, AFFI's 33rd Annual Conference at HEC-Ulg, EntFin conference Lyon, IPAG 7th International Research Meeting in Business and Management.*

2. Introduction

"Failure is a step to success" said William Whewell[22]. By the way, when a project's success depends on others' faith in the leaders capacities, to recover their confidence after a first failure may be much more difficult than succeeding the project in itself.

In entrepreneurial finance, serial entrepreneurs are entrepreneurs reentering a new project after the success or the failure of a previous entrepreneurial project. In this paper, we analyze the process of serial crowdfunding: the fact for an entrepreneur to start a new campaign after a successful or failed previous crowdfunding's experience[23].

Our analysis focuses on the reward-based crowdfunding. In this type of crowdfunding, the entrepreneur asks to the crowd for a donation and promises a reward if the project is successful. The reward is most of the time the product created or produced by the entrepreneur with the funds collected during the campaign. Some extra features are generally added to create various "super-rewards" in order to induce the backers to give more money than the value of the basic product (for instance a limited collector edition of the product).

22. *Nineteenth century's British polymath from University of Cambridge.*

23. *Crowdfunding is the fact to finance a project by making a call to many individuals – the crowd, to provide money in the form of small contributions compared to the project size. This call is made most of the time through the Internet, on a crowdfunding platform – some kind of "market place" where entrepreneur present their project and individuals choose to participate or not (Schwienbacher and Larralde, 2012)*

Here we use the term "new project" instead of "new venture" to account for various forms that an entrepreneurial activity can take (Wright et al., 1997a). Moreover, in crowdfunding, and more specifically in the reward-based crowdfunding , a new project is not necessarily a new venture.

For instance, a music band can create a crowdfunding campaign to finance the recording of a new album without creating a new venture. In the same way, a new music album can in some way be seen as a new entrepreneurial activity since it involve a “new combination of resources” (Guth and Ginsberg, 1990). In our case, we talk about the new funding. The band creates a new product, which is different from previous one, with new funding coming from the crowdfunding campaign.

In crowdfunding, when an entrepreneur decides to launch a second campaign, he already knows the first opinion of the crowd toward his project, positive or negative. If the first campaign failed, and even if he is able to use the first campaign's feedbacks to improve his project and to match his new project with the crowd's expectations, we think that a harder work may be needed to tackle the reputation of "loser" that he inherited from his first public failure. Crowdfunding campaigns leaded by serial entrepreneurs offer us a unique opportunity to analyze the ability of an entrepreneur to adapt his offer to the market. At the same time, we are able to observe the reaction of the crowd to these second funding attempt, taking into account the reputation gained from a first campaign. Moreover, due to the fee mechanism of the crowdfunding's platforms (fees are

proportional to amount raised), launching a new crowdfunding campaign have almost no other friction than the will of the entrepreneur.

This study is based on a database of more than 22,000 crowdfunding projects including 687 second campaigns. We show that, when the entrepreneurs are persevering in the crowdfunding after a first failure, and even if they adjust the characteristics of the campaign to mimic the successful projects, they are unable to regain the faith of the crowd in their ability to succeed. As expected, the outcome of a second campaign leaded by an entrepreneur with a first failed experience is lower than the second campaigns of successful entrepreneurs. Moreover, this paper shows that it is even inferior to the results of first-timers, involving that they are unable to circumvent the bad reputation inherited from the first public failure. Based on these results, we show that a crowdfunding campaigns need to be highly prepared because the entrepreneurs won't be able to get a second chance to seduce the crowd. Like the adage said : You never get a second chance to make a first impression.

The rest of this paper is structured as follow: in the following section, we review the literature about crowdfunding and about serial entrepreneurship in order to construct our hypotheses about the existence of a second crowdfunding campaign and about the characteristics and the outcome of that new attempt to rise funding. The fourth section describes our database and the variables used in our models. The section five presents our results which will be discussed in the last chapter.

3. Literature and Hypotheses

Previous empirical research on crowdfunding does not distinguish between projects leaded by serial, and thus more experienced, entrepreneurs or by first-timers (Agrawal et al., 2015; Cumming et al., 2015; Mollick, 2014).

Despite that the size of the network increases with experience (Starr and Bygrave, 1991) it is not a good indicator of the experience in crowdfunding. On the Internet, network size is more associated to community activities than to experience in a field. Many crowdfunding guides recommend to entrepreneurs interested in crowdfunding to create a community around their project, on Facebook or similar website, before launching a crowdfunding campaign (Lawton and Marom, 2013). As far as we know, no previous research takes into account the impact of the experience of the entrepreneur in crowdfunding on the strategy set up for his campaign (goal, funding model, disclosure) nor in the reaction of the crowd and on the success or failure of the new crowdfunding campaign.

On the other side, research on serial entrepreneurs shows the importance of experience and reputation for the entrepreneur in the success of his new project. Two main theories discuss the consequences of a venture success or failure on the entrepreneurs behavior. On one hand, the prospect theory, applied to serial entrepreneurs, propose that entrepreneurs with past unsuccessful experience will more likely be risk-takers, will “play again” and will even play bigger, trying to recover their losses until they succeed (Hsu

et al., 2015). On the other hand, the literature on self-efficacy shows that successful entrepreneur will gain confidence in their ability to reach their goals and to overcome difficulties, leading to a positive effect on outcome (Bandura, 1982).

3.1. Hypothesis on the launch of a second campaign

Based on Hsu et al.'s research, we should expect to find, at least at short term, more second campaigns by entrepreneurs with unsuccessful first experience than by entrepreneurs with successful fundraising. Indeed, assuming that entrepreneur with successful campaign had fixed their first campaign's goal at the right level, no extra funding should be needed to complete the project and they should be working at completing their first project before launching a new one. By the way, overall, on a long enough period and based on Bandura's conclusions, a successful entrepreneur should be more prone to re-enter a new crowdfunding campaign. So we can conclude that based on self-efficacy literature, the success will increase the entrepreneurs self-efficacy and their motivation to pursue new projects in the future. Our first hypothesis on the launch of a second crowdfunding campaign can then be formulated as:

→ *H1: Overall, entrepreneurs with a successful first crowdfunding campaign will more likely launch a second campaign to finance a new project.*

3.2. Hypotheses on the characteristics of a second campaign

As shown in Cumming et al. (2015), the outcome of a crowdfunding campaign is linked to a risk/return trade-of faced by the entrepreneur when he set the goal and the funding model of his crowdfunding campaign. We can assume that the entrepreneur sets the goal of his campaign based, of course, on his financial needs but also by taking into account the price of the product he is offering as reward and the potential number of backers he is able to attract.

Concomitantly to the goal, he chooses a funding models, "Keep-It-All" (KIA) or "All-or-Nothing" (AON). On the AON funding model, the entrepreneur receive the money if, and only if, the total amount offered by the backers reaches the goal set at the beginning of the campaign. On the other hand, in the KIA funding model, he can choose to keep the money offered by the backers even if the goal is not reached. Thus, he starts the project underfunded and relies on a future fundraising (through crowdfunding or not) to complete his project[24].

To construct our hypotheses on the choices made by the entrepreneurs based on their previous experience, we can rely on prospect theory (Sitkin and Pablo, 1992). This theory shows us that failures increase attractiveness of risky option to gain back the losses and that entrepreneurs exposed to gains have the feeling that they have more to lose so they are

24. *The choice between crowdfunding models is discussed in detail in Cumming et al. (2015).*

less likely to take risks. In our crowdfunding context, it can be translated as choosing less risk for entrepreneurs with previous success: lower goal and/or KIA funding model and more risk for entrepreneurs with previous failure: higher goal and/or AON funding model. As exposed in previous reward-based crowdfunding's research (Cumming et al., 2015; Mollick, 2014), choosing the AON funding model and setting a high goal can be interpreted as a measure of the risk for the entrepreneur. He bear the risk not to receive any money from the crowdfunding campaign. Indeed, the higher the goal, the more backers the entrepreneur will need to convince to reach his goal, thus increasing the risk of failure.

We can thus write the following hypothesis:

→ *H2: Entrepreneurs with previously failed campaign will most likely take risk by setting higher goal and by opting for AON funding model.*

Since the entrepreneur presents his project on an internet website, he is able decide freely of the soft information (text, pictures, video,...) he will publicly disclose to attract backers and to arouse enough confidence in his project to induce crowd participation. Based on previous research, we can assume that the amount of disclosed information is positively impacting success (Cumming et al., 2015; Mollick, 2014) and that experience will increase the amount of disclosure (Yamakawa et al., 2015). Our third hypothesis can be formulated as:

→ *H3: Second campaign will disclose more information.*

3.3. Hypotheses on the outcome of a second campaign

The literature about entrepreneurial finance is almost unanimous on the benefits from a previous entrepreneurial experience on subsequent projects, either the previous experience has been a success or a failure (Chandler and Hanks, 1998; Macmillan et al., 1985; Stuart and Abetti, 1990; Ucbasaran et al., 2003) . We can assume this should be the same for crowdfunding.

We observe also that VCs tend to prefer serial entrepreneurs (Wright et al., 1997b) since experience is a good signal for outcome of new ventures. Here also, we can expect that the crowd see experience as a good signal and that previous experience is positive for crowdfunding.

The main reasons for these benefits come essentially from two factors. The first factor is the reputation. Winners gain good reputation which is important to attract investors (Ebbers and Wijnberg, 2012) and the lack of reputation may be a cause of failure (Nicolò, 2015). The second factor is the experience. By providing network (Starr and Bygrave, 1991), it permit to find more investors (Mahto and Khanin, 2013). Here, a previous campaign already attracted some viewers and backers. The entrepreneur is able to recontact them easily, creating a first pool of potential backers for the new project, even before the campaign launch.

Thus, even if we can expect the effect to be more pronounced for entrepreneurs with a successful first campaign, overall, we can hypothesize that:

→ *H4: A second crowdfunding campaign will always be more likely successful.*

4. Methodology

4.1. Database

The dataset used in this study is the same as used in Cumming et al. (2015). Data includes all finished crowdfunding campaigns presented on Indiegogo website until October 2013. This dataset includes campaigns with a goal of at least $5,000. Since Indiegogo allow to raise money in other currencies, we converted all amount in USD using the yearly average exchange rate. This lower bound of $5,000 is used in most other research about reward-based crowdfunding (Cumming et al., 2015; Mollick, 2014) to avoid projects that rely mostly on money from family, friends and relatives. The dataset was also truncated for goals above the 99th percentile (i.e. above $200,000). Computer-based data collection led to a loss of less than 5% of observations due to inconsistency in the HTML tags across indigogo website. As far as we are able to investigate, the loss seems randomly distributed and should not lead to any corruption of our results. Since all entrepreneurs are identified by a unique number, we were able to classify campaigns in 3 categories: a “unique campaign” if the entrepreneur's identifier is unique in the dataset, a “first campaign” if the entrepreneur is the leader of more than one campaign and if the campaign was the first to start (based on the campaign's launch date) and a “second campaign” if the campaign was leaded by an entrepreneur with already a first campaign. It is important to notice that since

the database is observed at a defined date, some serial entrepreneurs may not have entered a second campaign but will do in the future. In our sample he is considered in the pool of first-projects but does not account as a serial. This can have some issues that will be discussed further in the chapter and that we will take into account. We dropped all campaigns after the second (if an entrepreneur has three or more campaigns, we dropped all campaigns starting from the third). Our final sample is composed of 22,739 crowdfunding campaigns.

4.2. Variables

Most of the control variables used in our analysis were previously used in Cumming et al. (2015). We will here describe all the new variables generated for this paper and all the variables of interest useful for our analysis. All other control variables are fully described in appendix A1.

All variables constructed on entrepreneur's identifier are based on the campaign leader. When there are several team members for a project, we assume that the first presented on Indiegogo is the team leader. For the rest of this paper we will assume that "the entrepreneur" refers to the team leader.

The variable "First was successful" is a dummy that identifies serial entrepreneurs with a first successful campaign. It is equal to 1 for serial entrepreneurs with a first success and zero if the first campaign failed. It allows us to take into account the reputation of the entrepreneur.

The variable “Time between project 1 & 2” is the number of days between the start of the first and the start of the second campaign for a serial entrepreneur. It allows us to gauge the preparation of the entrepreneur for his second campaign.

The variable “New category” identifies an entrepreneur that switches from the category of the first project to another category for his second campaign. Since we can think that the crowd will more likely forgive an entrepreneur when he starts a totally new project, this variable allows us to control for this case.

We also created four variables comparing the characteristics of the second campaign with the characteristics of the first campaign leaded by the same entrepreneur. These variables are “2nd have higher goal”, “2nd changes funding model”, “2nd shows more text” and “2nd shows more pics”. These are dummy variables and these account respectively for an increase in the goal of the campaign, a switch of funding model (from KIA to AON or from AON to KIA), an increase in text length and an increase in the number of pictures or graphics provided.

We finally created 2 variables comparing outcome between both campaigns of the serial entrepreneur : “Raise more money” and “Attract more backers”. Both are dummy variables equal to one if the money or the number of backers increased between the first and the second project.

The other variables of interest are goal, flexible dummy, full text length, video, gallery's items, success dummy and percentage of completion. “Goal” is the amount that the entrepreneur sets as the campaign's target.

“Flexible dummy” is equal to 1 if the funding model is KIA and to 0 otherwise. “Full text length” is the length, in number of characters, of the text describing the campaign on the projects presentation page. “Gallery's items” gives the number of pictures presented by the entrepreneur. “Video” is a dummy variable equal to one if the project's page presents a videopitch introducing the project. “Success dummy” is equal to 1 if the amount raised during the campaign from backers is at least equal to the goal and “Percentage of Completion” is the ratio between the amount raised and the goal sets by the entrepreneur.

4.3. Summary Statistics

Table I presents the summary statistics for our full sample and for two subsamples, one showing only the firsts campaigns and the other only the second campaigns. A mean difference test between both subsamples is also provided.

Table I: Summary Statistics

*This table shows summary statistics for our final sample and then separately for firsts and for seconds campaigns. The last column reports a mean difference test between firsts and seconds campaigns and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	Full Sample				First Campaigns				2nd Campaigns				
Variables	Obs.	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Mean. Diff. Test
Success dummy	22,739	0.180	0.380	0	22,052	0.180	0.380	0	687	0.200	0.400	0	-0.025*
Completion Ratio	22,739	0.440	1.200	0.220	22,052	0.430	1.200	0.220	687	0.510	1.110	0.240	-0.082*
ln(Goal)	22,739	21,068	26,606	10,000	22,052	21,128	26,699	10,000	687	19,144	23,387	10,000	1,983.709*
Keep-It-All Dummy	22,739	0.950	0.220	1	22,052	0.950	0.220	1	687	0.970	0.170	1	-0.024***
Verified Non-profit	22,739	0.100	0.300	0	22,052	0.100	0.300	0	687	0.190	0.390	0	-0.094***
Team Size	22,739	2.400	2.030	2	22,052	2.400	2.020	2	687	2.420	2.170	1	-0.0250
Reward's Levels	22,739	7.440	3.940	8	22,052	7.440	3.930	8	687	7.420	4.340	7	0.0150
Full Text Length	22,739	4,659	3,439	3,808	22,052	4,657	3,434	3,814	687	4,721	3,625	3,733	-64.27
Gallery's items	22,739	6.810	10.53	3	22,052	6.840	10.58	3	687	5.850	8.980	3	0.991**

In line with our hypothesis 1, we observe that 18% of the first campaigns succeeded in fund raising. We also observe that 20% of second campaigns succeeded as well, showing a significant increase in outcome (even if it is low). The table shows that, if the average goal of a second campaign is lower, it is weakly significant and that the median goal is the same for both subsamples. Overall, a second campaign will more likely use the Keep-It-All funding model, will be more used by non-profit organizations and will disclose approximately the same amount of information: on average, the full text length and the median number of pictures in the gallery are similar.

In table II, we compare the second campaigns leaded by an entrepreneur with a first successful experience with those having an unsuccessful first experience. Here also, a mean difference test is provided between the both subsamples.

Table II: Seconds Campaigns Summary Statistics

*This table shows a summary statistics comparison between seconds campaigns launched by entrepreneurs with a successful or unsuccessful first crowdfunding campaign. The last column reports a mean difference test between firsts and seconds campaigns and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	2nd Campaigns				2nd Campaigns after Success				2nd Campaign after Failure				
Variables	Obs.	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Mean Diff. Test
Success dummy	687	0.200	0.400	0	167	0.430	0.500	0	520	0.130	0.340	0	-0.296***
Completion Ratio	687	0.510	1.110	0.240	167	1.000	2.030	0.610	520	0.360	0.440	0.190	-0.640***
ln(Goal)	687	19,144	23,387	10,000	167	21,458	25,750	11,325	520	18,401	22,552	10,000	-3,100
Keep-It-All Dummy	687	0.970	0.170	1	167	0.960	0.190	1	520	0.970	0.160	1	0.009
Verified Non-profit	687	0.190	0.390	0	167	0.250	0.430	0	520	0.170	0.380	0	-0.071**
Team Size	687	2.420	2.170	1	167	2.650	2.330	2	520	2.350	2.110	1	-0.303
Reward's Levels	687	7.420	4.340	7	167	7.680	4.710	8	520	7.340	4.220	7	-0.334
Full Text Length	687	4,721	3,625	3,733	167	5,025	3,706	4,367	520	4,623	3,596	3,613	-401.2
Gallery's items	687	5.850	8.980	3	167	6.880	11.07	3	520	5.520	8.190	3	-1.365*
First was Successful	687	0.240	0.430	0	167	1	0	1	520	0	0	0	-1
Time Between Project 1 & 2	687	202.8	150.5	173	167	209.0	138.8	185	520	200.8	154.1	168	-8.194
New Category	687	0.250	0.430	0	167	0.180	0.390	0	520	0.270	0.440	0	0.088**
2nd have Higher Goal	687	0.360	0.480	0	167	0.570	0.500	1	520	0.300	0.460	0	-0.271***
2nd changes Funding Model	687	0.050	0.210	0	167	0.040	0.200	0	520	0.050	0.220	0	0.008
2nd shows More Text	687	0.520	0.500	1	167	0.600	0.490	1	520	0.490	0.500	0	-0.110**
2nd shows More Pics	687	0.330	0.470	0	167	0.280	0.450	0	520	0.340	0.470	0	0.0670
Raise More Money	687	0.410	0.490	0	167	0.290	0.460	0	520	0.450	0.500	0	0.153***
Attract More Backers	687	0.400	0.490	0	167	0.290	0.450	0	520	0.430	0.500	0	0.143***

We can observe that the second campaigns leaded by an entrepreneur with an unsuccessful first experience, despite similar goals and disclosures (full text length), show lower success rates and lower percentages of completion compared with campaigns with a first success. It is also interesting to note that these outcomes are lower than values for first campaigns in table I. Overall, first campaigns show 18% of success rate. This success rate drops to 13% for second campaigns of entrepreneur with past failure and raises up to 43% for the entrepreneurs with previous success. The results are similar for the percentage of completion. The first campaigns reach an average completion of 44% where second campaigns reach, on average, 36% or 100% depending on whether the first campaign was a failure or a success.

Table III: Correlation Table for Main Variables

Panel A: For First Campaigns
The star reports a 10% significance level

		1.	2.	3.	4.	5.	6.	7.	8.
1.	Success dummy	1							
2.	ln(Goal)	-0.1339*	1						
3.	Keep-It-All Dummy	-0.1031*	-0.0929*	1					
4.	Verified Non-profit	0.0375*	0	0.0781*	1				
5.	Reward's Levels	0.0635*	0.1257*	-0.0792*	0.00800	1			
6.	Team Size	0.0743*	0.0960*	0.000300	0.0982*	0.1941*	1		
7.	Full Text Length	0.0418*	0.1783*	-0.0992*	-0.0132*	0.3155*	0.1827*	1	
8.	Gallery's items	0.0794*	0.0738*	-0.0219*	0.000600	0.1868*	0.2217*	0.2332*	1
9.	Completion Ratio	0.3681*	-0.0827*	-0.0406*	0.0117*	0.00980	0.0273*	0.0374*	0.0594*

Panel B: For Second Campaigns
The star reports a 10% significance level

		1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	Success dummy	1								
2.	ln(Goal)	-0.0711*	1							
3.	Keep-It-All Dummy	-0.0861*	-0.0693*	1						
4.	Verified Non-profit	0.0137	0.0321	0.0844*	1					
5.	Reward's Levels	0.1093*	0.1861*	-0.0310	-0.0255	1				
6.	Team Size	0.1418*	-0.0186	-0.0141	0.0428	0.2011*	1			
7.	Full Text Length	0.0836*	0.1650*	-0.0608	-0.00120	0.2821*	0.1537*	1		
8.	Gallery's items	0.1340*	0.0137	-0.0193	-0.0522	0.2020*	0.2279*	0.2296*	1	
9.	Completion Ratio	0.4956*	-0.0843*	-0.0495	-0.0160	0.0777*	0.1849*	0.1033*	0.1707*	1
10.	First was Successful	0.3172*	0.0561	-0.0230	0.0768*	0.0331	0.0599	0.0475	0.0652*	0.2486*
11.	Time Between Project 1 & 2	0.0509	-0.0776*	0.0102	0.1309*	0.1257*	0.1023*	-0.00490	-0.0186	-0.0107
12.	New Category	-0.0502	0.0940*	-0.1222*	0.0303	-0.0760*	0.0194	-0.0288	-0.0490	-0.0566
13.	2nd have Higher Goal	-0.0470	0.3367*	-0.0670*	0.0842*	0.0335	0.0364	0.00140	0.0328	-0.0160
14.	2nd changes Funding Model	0.1422*	0.0383	-0.4470*	-0.0577	0.0848*	-0.0156	0.1112*	0.0387	0.0597
15.	2nd shows More Text	0.0137	0.1094*	-0.0640*	0.0294	0.1075*	0.0901*	0.3280*	0.1168*	0.0605
16.	2nd shows More Pics	0.0233	0.0612	-0.0273	-0.0476	0.0244	0.0718*	0.0276	0.4127*	0.0527
17.	Raise More Money	0.3218*	0.0314	-0.0144	0.000100	0.0948*	0.1393*	0.0369	0.0890*	0.2278*
18.	Attract More Backers	0.2256*	0.0486	-0.0546	-0.0246	0.1035*	0.1508*	0.0776*	0.1325*	0.1672*

		10.	11.	12.	13.	14.	15.	16.	17.
10.	First was Successful	1							
11.	Time Between Project 1 & 2	0.0234	1						
12.	New Category	-0.0873*	0.0442	1					
13.	2nd have Higher Goal	0.2414*	0.1423*	0.1019*	1				
14.	2nd changes Funding Model	-0.0162	-0.0353	0.0930*	0.0282	1			
15.	2nd shows More Text	0.0947*	-0.00810	-0.00730	0.0979*	-0.0137	1		
16.	2nd shows More Pics	-0.0612	-0.0610	0.0209	0.0806*	0.0616	0.1216*	1	
17.	Raise More Money	-0.1333*	0.0917*	0.0748*	0.0784*	0.1039*	0.0664*	0.1224*	1
18.	Attract More Backers	-0.1257*	0.1193*	0.0905*	0.1486*	0.1104*	0.0824*	0.1925*	0.6099*

In the correlation matrix (see Table III-B), we can observe high correlation for the second campaigns between a first success (variable “First was successful”) and the outcome variables “Success Dummy” and “Percentage of Completion”. Moreover, the first campaign's outcome seems to have also impact on second campaign characteristics. The variable “First was successful” shows positive and significant correlations with “2nd have higher goal” and “2nd shows more text”. Nevertheless, a first success seems to have negative correlation with the amount raised and the number of backers.

5. Empirical Results

5.1. About the launch of a second campaign

The table IV shows the determinants of the launch of a second crowdfunding campaign by an entrepreneur. The dependent variable for this table is a dummy equal to 1 if the entrepreneur is a serial entrepreneur and equal to 0 if the entrepreneur didn't start a new campaign during the observed period. For all the models in this table, we used probit regressions and we reported the marginal effects. The standard errors are clustered by category. All models show a positive and highly significant coefficient for the success dummy. The entrepreneurs with a first successful crowdfunding campaign are thus more likely to launch second campaign. This validates our hypothesis 1 and is in accordance with self-efficacy theory's predictions. When an entrepreneur succeeds in a first campaign, self-efficacy feelings will increase and he will gain motivation and self-confidence to launch a new campaign.

Table IV: Determinants of Second Campaign's Launch

*This table shows the impact of the outcome and the characteristics of a first crowdfunding campaign on the launch of a second campaign by the same entrepreneur. The dependent variable is a dummy equal to 1 if the same entrepreneur launched a second campaign (ie is a serial entrepreneur) and 0 otherwise. We use a probit regression model and the table reports the marginal effects. Model 1 shows impact of the outcome, model 2 includes variables for project characteristics, model 3 includes variables for soft information (proxying for effort) and the model 4 includes country, semester and category fixed effects. All models use category-clustered standard errors and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	(1)	(2)	(3)	(4)
First Campaign Outcome				
Success Dummy	0.0131***	0.0161***	0.0155***	0.0177***
Project Characteristics				
ln(Goal)		0.0050**	0.0051**	0.0083***
Keep-It-All Dummy		0.0101	0.0095	0.0020
Verified Non-profit		0.0033	0.0032	0.0086**
Reward's Levels		-0.0010**	-0.0010**	-0.0005
Soft Information (proxy for effort)				
Full Text Length			-7E-07	-5E-07
Gallery's items			0.0003***	0.0002**
Country/Category/ Semester F.E.	No	No	No	Yes
Observations	22,052	22,052	22,052	21,186
Pseudo R-squared	0.003	0.007	0.009	0.104

In the models 2, 3 and 4, we introduce also the characteristics of the project as independent variables. We observe that the goal of the first campaign shows also a positive and highly significant impact on the existence of a second campaign by the same entrepreneur. This new result can be formulated as follow: an entrepreneur leading a first campaign with a high goal is more likely to launch a second campaign. This is in line with the idea that financial needs for large projects are quite complicated to evaluate before to start the project. Such type of projects may need several funding rounds to be fully funded. Since the crowdfunding has low barriers to entry, this process allows entrepreneurs to launch easily a second campaign to complete the funding of their project. Our conclusions are robust to project's category, semester and country fixed effects (see model 4).

A problem still remains in these models: we are unable to observe entrepreneurs that will reenter a new campaign in the future, especially for first campaigns starting very close of our observation date. Intuitively, we may think that entrepreneur will need some time to launch a second campaign and that after a too long time, he will not be willing to launch a new campaign (if the venture goes well or if he finds another job). Thus we can expect a distribution of delay with a first low period, then a period with high rate of reentrant and again declining at the end. Figure 1 shows the distribution of delay between first and second campaigns and figure 2 shows the estimated cumulative hazard function.

Figure 1: Second Campaign Delay Distribution

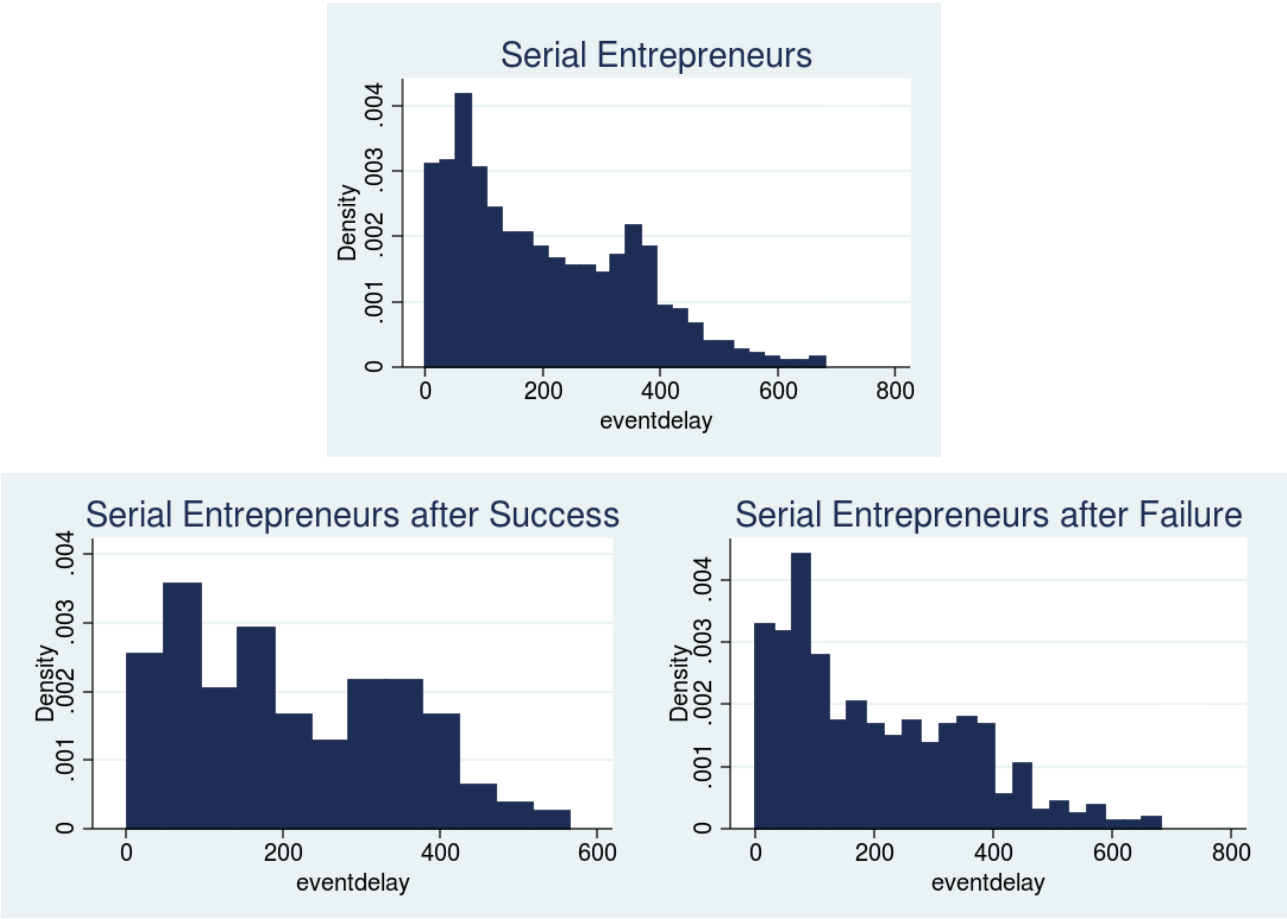
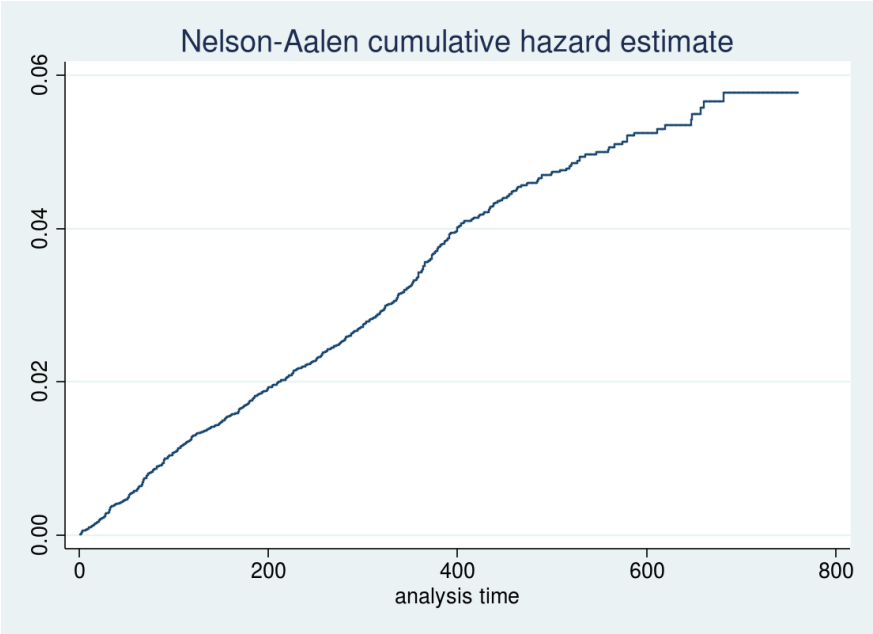
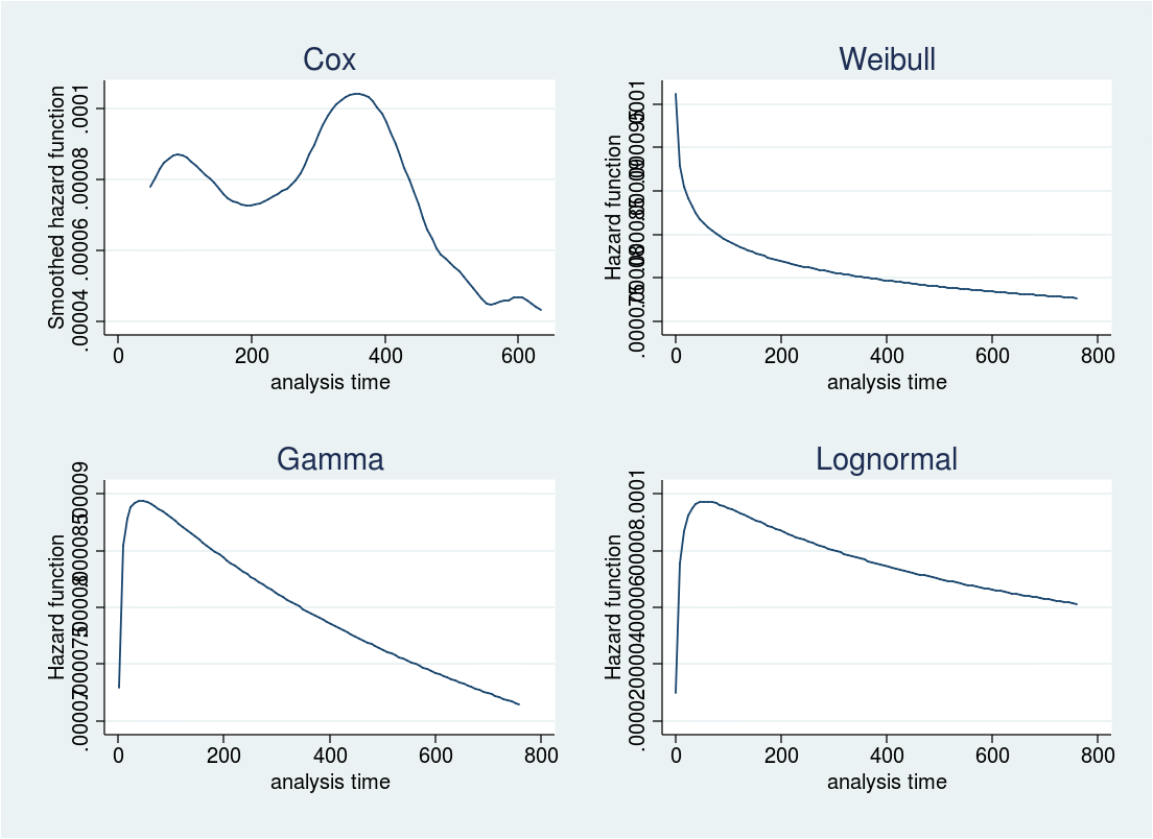


Figure 2: Cumulative Hazard Function



We observe that if the overall shape of the distribution is declining, the very first period is a little lower and that we have two major peaks, a first after 30/60 days and a second after 350/400 days. These results seems quite similar for second campaigns with a first success or with a first failure. The cumulative hazard function shows similar results (convex-concave-convex). To account for the lack of information about serial entrepreneurs that are going to reenter but that we are unable to observe at the time of the extraction, we use survival analysis (Hosmer et al., 2008)to estimate hazard rate by taking into account for these. Many hazard models exist depending on the expected shape of the distribution. By plotting our hazard function with several models, we observe that each of them have specific interest in our case.

Figure 3: Estimated Hazard Functions



Cox's model takes into account our two peaks, Weibull model fit more closely the highly declining rate of events and the gamma and log-normal models take into account the three periods (low-high-low) and the general shape of our observed distribution. Table V shows regressions similar to table IV but using various hazard models.

Table V: Survival Analysis – Hazard Models

*As for table IV, this table shows the impact of the outcome and the characteristics of a first crowdfunding campaign on the launch of a second campaign by the same entrepreneur, taking into account that since the sample is extracted at a defined date, the future behavior of entrepreneurs is not observable. We use various survival models to estimate the coefficients and/or the hazard rates. Models 1 and 2 use Cox model and the models 3, 4 and 5 respectively use Weibull, Gamma and Log-normal distributions. All models use category-clustered standard errors and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	(1) Cox (Coef.)	(2) Cox (H.R.)	(3) Weibull (H.R.)	(4) Gamma (Coef.)	(5) Lognormal (Coef.)
Keep-It-All Dummy	0.2057	1.2284	1.2132	0.8188	0.8267
Success Dummy	0.5202***	1.6824***	1.6819***	0.5784***	0.5830***
ln(Goal)	0.2164***	1.2416***	1.2480***	0.7838***	0.7704***
Verified Non-profit	0.241	1.2725	1.2667	0.7933	0.8092
Total Backers	0	1	1	1	1
Completion Ratio	0.0355	1.0361	1.0363	0.958	0.9462
Sub-Category F.E.	Yes	Yes	Yes	Yes	Yes
Observations	22,048	22,048	22,048	22,048	22,048

The coefficients are positives and highly significant for success dummy and for goal, as expected an in accordance with our previous findings. Projects with high capital needs are more likely to reenter a second campaigns and hazard rates indicates that successful entrepreneurs have 68% more chance

to reenter a second campaign than entrepreneurs with a first failure. These results are stable across models.

5.2. About the characteristics of the second campaign

The table VI shows us the strategic changes made by an entrepreneur when he decides to launch a second campaign. These decisions are here analyzed through the adjustment of the goal, of the funding model and of the disclosures (text and photos). Models 1, 2 and 3 present the goal's adjustments. The dependent variable is a dummy equal to one if the goal of the second campaign is higher than the first. As shown, the outcome of the first campaign and the time between both campaigns have a high impact on the goal. If the first campaign was successful, the entrepreneur will more likely increase the goal and will more likely decrease in case of a first failure. These conclusions are not in line with our second hypothesis. By the way, this result tends to confirm self-efficacy theory (i.e. the “winners” will gain more self-confidence and feel able to reach higher levels) and to invalidate prospect theory (i.e. the “losers” are willing to choose riskier options to compensate their loss).

Table VI: Changes in Goal, Funding Model and Disclosure for Second Campaigns

*This table shows the impact of the outcome of a first campaign and of the characteristics of a second campaign on the strategy used by the entrepreneur in terms of risk (goal and funding model) and of disclosures for his second campaign. Models 1 to 3 show the impact on 2nd campaign goal, model 4 on funding model and models 5 and 6 shows show results for disclosure (text or pictures). All models use category-clustered standard errors and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	(1)	(2)	(3)	(4)	(5)	(6)
	2nd have Higher Goal	2nd have Higher Goal	2nd have Higher Goal	2nd changes Funding Model	2nd shows More Text	2nd shows More Pics
First was Successful	0.2518***	0.2478***	0.2924***	-0.0183	0.0725	-0.0844*
Time Between Project 1 & 2		0.0004***	0.0004***	0	-0.0001	-0.0003**
New Category			0.1249*	0.052	-0.0236	-0.0051
2nd have Higher Goal				-0.0286	0.0315	0.0960**
Keep-It-All Dummy			-0.1037		-0.0887	-0.1801
Team Size			-0.0017	-0.0089	0.0173***	0.0121*
ln(Goal)				0.0278**	0.0816***	0.0436*
Category/ Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	687	687	625	432	637	638
Pseudo R-squared	0.043	0.058	0.123	0.288	0.064	0.052

The model 4 presents the adjustment of the funding model for the second campaigns. If globally, an entrepreneur will prefer the less risky option for the second campaign by opting more likely for the KIA funding model (see tables I & II). We can see that this is not linked to the outcome of the first campaign but, as presented in Cumming et al. (2015), linked to the intrinsic goal's level.

The third part of the table VI (models 5 & 6) shows the changes in disclosure for the second campaigns. By looking at the text length or at the number of pictures presented in the projects gallery, we can not observe any highly significant change in the quantity of information disclosed by the entrepreneurs. Nevertheless, even if the coefficients are not significant for text, results for pictures show a small positive link between a first failure and the number of pictures disclosed in the second campaign. By the way, the global adjustment made by entrepreneur with a failed first campaign are very small (no adjustment in text size and low adjustment in number of pictures). A limitations of our measure is that it assess only the quantity and not the quality of disclosures. Since we observe highly positive impact of information disclosure on success, we are unable to explain why an entrepreneur with a first failure will not adjust his disclosures to increase his chances of success, invalidating our third hypothesis.

5.3. About the outcome of the second campaign

The table VII shows the impact of intrinsic characteristics of projects, of strategical choices made for the second campaigns and of first campaigns' outcome on the outcome of the second campaigns.

Models 1 and 2 shows results including all projects. The dependent variable is a success dummy. The model 1 confirms results observed in previous researches: the high goal and the flexible funding model have negative impact on outcome. Non-profit, team size and number of rewards offered to backers are positively affecting the success, ditto for disclosures (text length and gallery items). In model 2, we add two variables to distinguish the second projects and the second projects after a success. We can see that if second campaigns have globally less success, it's not the case for second campaigns after a first success, where the coefficient is positive and highly significant. Based on model 2, we can assume that a first success will increase by 22% the chance of success of the second campaign. In models 3 and 4, we keep only the second campaigns and we find similar results for the impact of a first success on the outcome of the second campaign. Results in model 4 shows that reputation (result of the first campaign) is much more important on the second campaign's success than any of other adjustment made by the entrepreneur. Neither the project characteristics changes (goal level or category) nor the disclosures (more text or more pictures) will have any significant impact on the second campaign's success.

Table VII: Outcome of Serial Crowdfunding Campaigns

*This table shows the impact of the outcome of a first campaign and of the strategic adaptations made by the serial entrepreneur on the outcome of his second campaign. Model 1 shows the projects characteristics that impact all campaigns, the second model include a dummy for second campaign and a dummy for second campaign after a first success. Models 3 & 4 show results only for second campaigns and model 5 & 6 shows result on the amount raised during the campaign (independently from the success of the campaign) and on the number of backers. All models use category-clustered standard deviations and significance levels are as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

	(1) Success Dummy (All projects)	(2) Success Dummy (All projects)	(3) Success Dummy (2^{nd} projects)	(4) Success Dummy (2^{nd} projects)	(5) Raise More Money	(6) Attract More Backers
ln(Goal)	-0.1147***	-0.1147***	-0.0879***	-0.0819***	-0.0426*	-0.0205
Keep-It-All Dummy	-0.1702***	-0.1703***	-0.1606	-0.0635	0.3931***	0.1541
Verified Non-profit	0.0520***	0.0502***	0.0363	0.0362	0.0171	-0.0254
Team Size	0.0137***	0.0136***	0.0157***	0.0170***	0.0297***	0.0254***
Reward's Levels	0.0076***	0.0076***	0.0083***	0.0072***	0.0108**	0.0055
Full Text Length	0.0000***	0.0000***	0	0	0	0
Gallery's items	0.0023***	0.0023***	0.0024**	0.0017	0.0011	0.0016
2nd Project Dummy		-0.0509***				
2nd Proj. After Success		0.2203***				
First was Successful			0.2258***	0.2399***	-0.2105***	-0.2066***
Time Between Project 1 & 2				0.0001	0.0003**	0.0002
New Category				-0.0223	0.0073	0.0368
2^{nd} have Higher Goal				-0.0424	0.1044***	0.1782***
2^{nd} changes Funding Model				0.2380**	0.2918***	0.2450**
2^{nd} shows More Text				0.0024	0.0489	0.0432
2^{nd} shows More Pics				0.0323	0.0709	0.1181***
Country/Category F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,506	22,506	586	586	636	645
Pseudo R-squared	0.094	0.097	0.202	0.222	0.109	0.117

This highlight one very important result: in literature about serial entrepreneurs, past experiences will most likely have a positive effect on future ventures outcome, through reputation or through experience. In the case of crowdfunding, the effect of reputation is so important that, if the reputation is bad (first failure), it will be much more difficult for entrepreneur to convince the crowd to participate, and thus much more difficult to succeed.

Our models 5 and 6 highlight one additional result. Here, the dependent variables are dummies equal to one if the second campaign raised more money or if the second campaign convinced more backers than the first. The coefficients for our "First was successful" variable are negative and highly significant, indicating that a first success will lower the absolute amount raised during the second campaign. The second success, if more probable, is less brilliant.

6. Discussion

If serial entrepreneurship is usually seen as a good thing, this paper shows that the crowdfunding can not, in this case, be compared with the classical financing methods. We show that the two main benefits of serial ventures, experience and network, are unable to overcome the negative effects of a bad public reputation. The behavior of uninitiated crowd cannot be compared to the financing decisions of professional investors.

Our findings show that even if entrepreneurs with a first failed crowdfunding experience try to reenter a new campaign, and despite the fact that their second attempt seems similar on key points with entrepreneurs with a first success (they mimic goal, funding model, disclosures), they get a lower outcome. Their probability of success is lower than for successful serial entrepreneurs, and even lower than for first-timers.

Nevertheless, there are still some key questions which this paper doesn't address yet. To be able to learn from business failure, the entrepreneur needs feedbacks (Shepherd, 2003) For the entrepreneurs with a first failed experience, maybe the formal feedbacks are insufficient (did they get enough comments during their first campaign to be able to adjust?) and thus we should expect some interesting results by looking at the impact of this parameter on the adjustment and on the outcome of the second campaign.

Moreover, there are many cultural differences across countries, and these differences are fundamental on the way we look at failure (Landier, 2005) These effects are not observed in our study for the moment.

7. Appendix

Variable	Description
Success dummy	Dummy variable equal to one if the amount raised during the crowdfunding campaign is at least equal to the goal sets by the entrepreneur. The campaign is thus considered as successful.
Goal	The crowdfunding campaign goal in USD set by the entrepreneur. For campaigns based on a currency other than USD, we converted the amount into USD at the annual average exchange rate.
Keep-It-All Dummy	Dummy variable equal to one if the entrepreneur chooses a "keep-it-all" funding model and zero for the "all-or-nothing" funding model.
Verified Non-profit	Dummy variable indicating if the entrepreneur is a US registered non-profit organization.
Reward's Levels	Number of reward levels offered by the entrepreneur for his campaign.
Team Size	Number of members in the team leading the project.
Full Text Length	Length (in characters) of the full text of the project description on the project's main page.
Gallery's items	Number of pictures or videos presented in the media gallery.
Completion Ratio	Ratio between the total amount pledged by backers during the campaign and the campaign goal. Successful campaigns have a ratio higher or equal to 1.
First was Successful	For second campaigns, dummy variable equal to one if the first campaign of the serial entrepreneur was successful.
Time Between Project 1 & 2	Time between the start of the first and the start of the second crowdfunding campaign for serial entrepreneurs.
New Category	For second campaigns, dummy variable equal to one if the category of the second project is different than the category of the first campaign led by the serial entrepreneur.
2nd have Higher Goal	For second campaigns, dummy variable equal to one if the goal of the second campaign is higher than the goal of the first campaign.
2nd changes Funding Model	For second campaigns, dummy variable equal to one if the entrepreneur changes the funding model for the second campaign (for instance the first campaign was KIA and the second is AON).
2nd shows More Text	For second campaigns, dummy variable equal to one if the text that describes the second campaign his longer than the text of the first campaign.
2nd shows More Pics	For second campaigns, dummy variable equal to one if the entrepreneur provides more pictures for the second campaign than for the first.
Raise More Money	For second campaigns, dummy variable equal to one if total amount pledged by backers if higher for the second campaign than for the first
Attract More Backers	For second campaigns, dummy variable equal to one if more backers have participated to the second campaign compared to the first.

Conclusion Générale

Cette thèse nous a permis de donner un aperçu détaillé de trois caractéristiques fondamentales d'une campagne de reward-based crowdfunding. Premièrement, nous avons analysé le modèle de financement et nous avons montré que les différents modèles existants permettaient des répartitions différentes des risques entre l'entrepreneur et le public. En outre, nous avons pu voir également que certains projets (en fonction de leur taille ou de leur possibilité d'échelle) pouvaient mieux se prêter à l'un ou l'autre modèle. Nous avons également montré que le choix d'un modèle et donc la part de risque qui était transféré au public, avait une influence significative sur son comportement et sur le résultat de la campagne de crowdfunding.

Ensuite, dans le second chapitre, nous avons montré que les éléments factuels et quantifiables d'une campagne n'expliquaient pas totalement le comportement de la foule et que l'analyse de la personnalité propre de l'entrepreneur avait également un rôle primordial dans la réaction du public. Nous avons montré que le degré de narcissisme de l'entrepreneur avait non seulement des conséquences sur la manière dont il va "designer" sa campagne de crowdfunding (en terme de taille et d'information qu'il va souhaiter délivrer) mais était également directement lié à sa capacité, ou plutôt à son incapacité, à fédérer le public autour de son projet.

Enfin le troisième et dernier chapitre s'est attaché à deux éléments essentiels régissant la relation entre le public et l'entrepreneur, les expériences passées

et la réputation de l'entrepreneur. Nous montrons que même s'il est couramment admis en finance entrepreneuriale que l'expérience peut être considérée comme un élément positif, même dans le cas d'échecs précédents, quand il s'agit de la réputation d'un entrepreneur auprès d'un large public non-professionnel, il est très difficile pour l'entrepreneur de refaire une tentative de crowdfunding après une première campagne échouée.

Pour conclure cette thèse, nous dirons qu'elle met en évidence un point essentiel de la recherche à venir sur le crowdfunding. La quasi totalité des recherches menées observent le comportement de l'entrepreneur pendant et après la campagne. Les chapitres 2 et 3 de cette thèse montrent que la manière dont la campagne est mise en place et la manière dont va réagir le public à ses sources ancrées bien en amont de la campagne. Nous pensons que le prochain axe de recherche devra s'attarder sur l'entrepreneur en lui-même, son passé et sa personnalité. Il ne serait pas étonnant que ses différents choix soient intimement liés à son histoire personnelle. Il ne serait pas non plus étonnant que la foule puisse être beaucoup plus sensible au leader qu'au projet en lui-même. En effet, beaucoup de projet sont peu avancés et vont nécessiter des mois d'attente (voire des années) pour le public. Il sera dès lors nécessaire pour l'entrepreneur de gagner la confiance du public. Nous l'avons montré dans le premier chapitre, certains mécanismes peuvent servir de garantie au public, mais de toute évidence, ils sont insuffisants pour justifier à eux seuls la participation d'un grand nombre de personnes. Nous pensons qu'il faudra donc aller chercher au delà, en étudiant la personne au centre du projet: l'entrepreneur.

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Titre de la thèse en français : **Design des Campagnes de Crowdfunding**

Résumé

Si le succès d'une campagne de crowdfunding dépend du projet qui est financé, il est aussi fortement lié aux choix stratégiques faits par l'entrepreneur et par le design de la campagne de financement en elle-même. Cette thèse étudie trois composants principaux du design d'une campagne de crowdfunding en se basant sur une base de données unique de plus de 22 000 projets présentés sur la plateforme Indiegogo. Premièrement, en choisissant entre les modèles de financement "keep-it-all" et "all-or-nothing", l'entrepreneur a la possibilité de transférer le risque entre lui-même et la foule. Cela aura un impact sur la quantité d'informations qu'il divulguera et sur le comportement des participants. Deuxièmement, la personnalité de l'entrepreneur, et plus particulièrement son niveau de narcissisme, affecte également la manière dont la campagne est mise en place (taille, informations,...) et du soutien qu'il/elle obtient de la foule. Enfin, étant donné que nous savons que les entrepreneurs en série bénéficient habituellement de leur expérience via leur réseau et leur réputation, nous analysons sa capacité à recommencer une seconde campagne, la manière dont l'entrepreneur la conçoit et sa capacité à gagner, ou pas, le soutien du public après un premier succès ou un premier échec.

Mots clefs français : *Finance, Finance d'Entreprise, Finance Entrepreneuriale, Financement Participatif.*

Title: **Crowdfunding Campaigns Design**

Abstract

If the crowdfunding campaign success depends on the project that is financed, it is also closely linked to the strategic choices of the entrepreneur and by the design of the financing campaign in itself. This thesis investigates three main components of the campaign design by using a unique database of more than 22,000 crowdfunding projects presented on the Indiegogo platform. First, by choosing between the keep-it-all and the all-or-nothing funding model, the entrepreneur is able to shift the risk between himself and the crowd. This will impact the campaign disclosures and the behavior of the participants. Second, the personality of the entrepreneur and more precisely his level of narcissism also affects the way that the campaign is set up (size, soft information,...) and the support he/she receives from the crowd. Finally, since we know that serial entrepreneurs usually benefit from experience through network and reputation, we analyze his/her ability to restart a second campaign, the way that entrepreneurs design it and his/her capacity to gain, or not, support from the crowd after a first success or after a first failure.

Keywords: *Finance, Corporate Finance, Entrepreneurial Finance, Crowdfunding*

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