

Lee, Chang Heon; Zhao, J. Leon; Hassna, Ghazwan

Article

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Government-incentivized crowdfunding for one-belt, one-road enterprises: design and research issues

Chang Heon Lee ^{*}, J. Leon Zhao and Ghazwan Hassna

* Correspondence: changlee@cityu.edu.hk
Department of Information Systems,
City University of Hong Kong,
Kowloon, Hong Kong SAR

Abstract

Background: Local, state, and federal governments have started exploring the potential of crowdfunding in transforming conventional financing methods used previously to fund public projects and services. While crowdfunding has been applied to improve government financing methods in recent years, little is known about how this new model can be extended and applied in international collaboration among government-incentivized projects.

Methods: In this paper, we explore what roles crowdfunding can play as a financial intermediary to support government-incentivized multinational projects in the context of the One-Belt, One-Road initiative.

Results: We conjecture that crowdfunding can offer an efficient mechanism to improve participatory budgeting and facilitate private–public collaboration while providing a high level of transparency in the budget decision process.

Conclusions: The paper also discusses research issues and challenges, including features of the crowdfunding platforms that can affect the adoption and use of the crowdfunding platforms in multinational initiatives.

Keywords: Crowdfunding, Government Incentivized Projects, Participatory Budgeting, Public-Private Collaboration, One Belt One Road

Background

Crowdfunding has gained popularity as an alternative means of obtaining financing for new ventures. As an emerging form of venture finance, crowdfunding has enabled entrepreneurs to bypass the traditional financial intermediaries and seek initial capital directly from the crowds. Crowdfunding has expanded exponentially in many countries, suggesting that such online platforms are a sustainable capital intermediary (Aggarwal et al. 2012). According to Massolution's 2015 report (2015), there exist more than 1200 crowdfunding platforms worldwide as of January 2015. Online crowdfunding as a phenomenon has grown, attracting over \$16 billion in funding volume worldwide in 2014 (Baumgardner et al. 2015). This phenomenon has also been used to support a variety of projects including entrepreneurial ventures, citizen journalism, social ventures, and scientific research. Further, the Jumpstart Our Business Startups Act or JOBS Act signifies that crowdfunding has caught the attention of policy makers and regulators in the US. Despite the increasing attention on online crowdfunding

marketplaces, few systematic studies have been conducted to provide an integrated view of the emerging crowdfunding systems.

Ever since crowdfunding became an attractive option for financing, it mainly but not exclusively has targeted creative and entrepreneurial projects in the private sector (Mollick 2014). Recently, however, crowdfunding has started dealing with civic projects initiated by the public sector, including local, state, and federal governments. New vibrant types of crowdfunding intermediaries have emerged in the public sectors of different countries. Crowdfunding can loosely be categorized into four distinct models, primarily based on the goals structured by both entrepreneurs and supporters: donation-, lending-, equity-, and reward-based models (Mollick 2014). In general, the reward-based projects initiated by entrepreneurs represent pre-order mechanisms in their reward structures. Unlike donation-based models, reward-based crowdfunding requires a tangible exchange. Such contractual relationships between entrepreneurs and consumers are comparable to those established in traditional venture capital models (Aggarwal et al. 2012).

Crowdfunding in the public sector is another innovative way of participating in the financing of a project benefiting from government funds, assets, or sponsorship (Carvajal et al. 2012; Wheat et al. 2013). Civic crowdfunding mechanisms have made it possible to support diverse projects of public infrastructure including the Statue of Liberty in New York and London's Royal Albert Hall (Harrison 2013). Most early civic crowdfunding did not rely on a partnership with social enterprises or other agencies; rather, in most cases, public institutions or governments directly asked social enterprises or citizens to fund public or government projects (Lehner 2013). In recent years, we have witnessed governments actively engaging in partnering with civil societies to initiate projects through diverse crowdfunding platforms (Miglietta et al. 2014). However, the current form of civic crowdfunding has some significant technological limitations since several barriers are impeding transactions and restricting market access, in particular for cross-border public projects.

Over the past few years, governments have started to utilize crowdfunding as an alternative tool of funding community projects such as education programs and park redesigns (Hollow 2013). While the utilization of crowdfunding in public sectors offers many advantages, little is known about how crowdfunding can be extended or adapted in the government or public sector. However, few studies have investigated how crowdfunding can be extended into the public sector to support local, state, and federal government-initiated public projects. Thus, this article studies what roles crowdfunding can play as a financial intermediary to support government-incentivized projects launched under One-Belt, One-Road (OBOR) initiatives. We conjecture that crowdfunding can offer an efficient mechanism to improve participatory budgeting, facilitate private-public collaboration, and achieve transparency. Particularly, in this paper, we address the following questions: 1) How can crowdfunding be extended as a mechanism to support government-incentivized projects? 2) What components of crowdfunding technology can be used in financing government-incentivized projects?

Crowdfunding for government projects and services

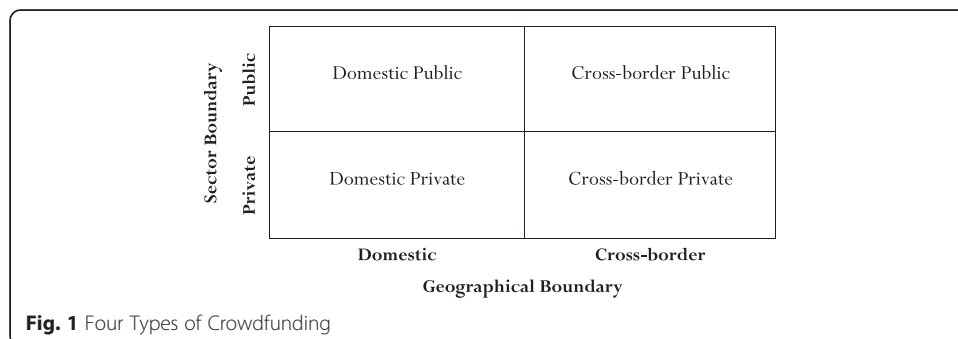
We can differentiate crowdfunded projects in the proposed framework by what types of projects are proper candidates for certain forms of crowdfunding. When examining

a broad spectrum of existing and emerging crowdfunded projects on a global scale, it is desirable to identify and examine crowdfunding archetypes based on more integrated aspects. We propose two dimensions to classify emerging crowdfunded projects: geography concentration and ownership concentration, rendering four categories of projects (Fig. 1). First, in crowdfunding, geography matters as crowdfunded projects are mostly confined and maintained in geographical locations where the financing transaction takes places. Geography concentration on funding operation refers to the extent to which a project is concentrated in a particular geographical location or more generally dispersed at a few versus many places nationally or internationally. Public ownership refers to the government or public institution’s provision of public goods or services, while private ownership refers to ownership by individuals or private entrepreneurs in the private sector.

From private crowdfunding to civic crowdfunding

Private crowdfunding is the most popular sub-type of crowdfunding through which entrepreneurs or individuals in private sectors raise capital from crowds to fund their private projects (Belleflamme et al. 2014; Schwienbacher and Larralde 2010). Private crowdfunding uses an online platform for the arrangement of large amounts of small capital contributions from lots of individuals—to produce private goods. The emergence of Web 2.0 has enabled new forms of private crowdfunding platforms, and most of the activities in crowdfunding have been centered around entrepreneurial projects (Mollick 2014).

In crowdfunding context, civic crowdfunding refers to the direct funding of civic, or community projects initiated by governments (Carvajal et al. 2012). With the increased popularity of this approach as an alternative way of financing, and with the increased pressure faced by governments today to be more responsive to their citizens’ needs and more transparent in their policy formation and execution, many public agencies have started investigating the potential of crowdfunding in reforming their financing approach to public services and projects. To distinguish these types or uses of crowdfunding from the conventional use by individuals or entities from the private sector, we refer to them as civic crowdfunding. In the literature, civic crowdfunding refers to the direct funding of public, civic, or community projects by citizens, in collaboration with local, federal, or national governments (Davies 2015; Hollow 2013; Lehner 2013). As the crowdfunding market grows, platforms are increasingly exploring and expanding how applications of the model in a broad range of civic crowdfunding projects ranging



from physical structures to public services. Examples of civic crowdfunding platforms include Spacehive, Neighbor.Ly, Citizeninvestor, IOBY, and Patronhood. These platforms allow both citizens and governments to project civic ideas or public projects such as parks, playgrounds, railroads, and airports, potentially opening up whole new sources of investment for public goods (Davies 2015).

However, in civic crowdfunding, the most important and distinguishing factor is that the outcomes of the crowdfunding efforts should be public products or services that can be used by the community. The literature shows that the initiators of civic crowdfunding can be any individual or entity and are not restricted to the public sector or governmental agency as long as the final product or service will be utilized by the public. We go one further step here by looking at “*Public Crowdfunding*” as a subcategory of “*Civic Crowdfunding*,” one in which the final product or service is going to be utilized by the public and where the initiator or the owner of the crowdfunding campaign or capital-seeking request is a public or governmental agency.

A majority of crowdfunding systems operate within a national boundary, but the launch of the global platforms has aimed to recognize opportunities beyond borders and to support cross-border projects. Domestic projects originally initiated within a particular geographical location remain in such designated areas while cross-border projects are initiated to attract a large number of investors across nations.

How can crowdfunding help support government-incentivized projects?

Considering the capabilities that crowdfunding has demonstrated during the last few years, and taking into account the emerging needs and goals of the governments today, we believe that crowdfunding can play a vital role in providing an alternative source of funding for government-incentivized projects. Furthermore, it can offer a mechanism for boosting the participatory budgeting approach by empowering citizens, enabling high levels of transparency over the budgeting and financing processes, and encouraging public-private collaboration as will be explained below. Fig. 2 presents three key enablers of crowdfunding to the government-incentivized projects in the public sector.

Given the recent widespread acceptance of crowdfunding as a financial intermediary system – in what remains the fastest-growing online platform – it is important to discuss the implications for the public sector, particularly regarding financing efforts for

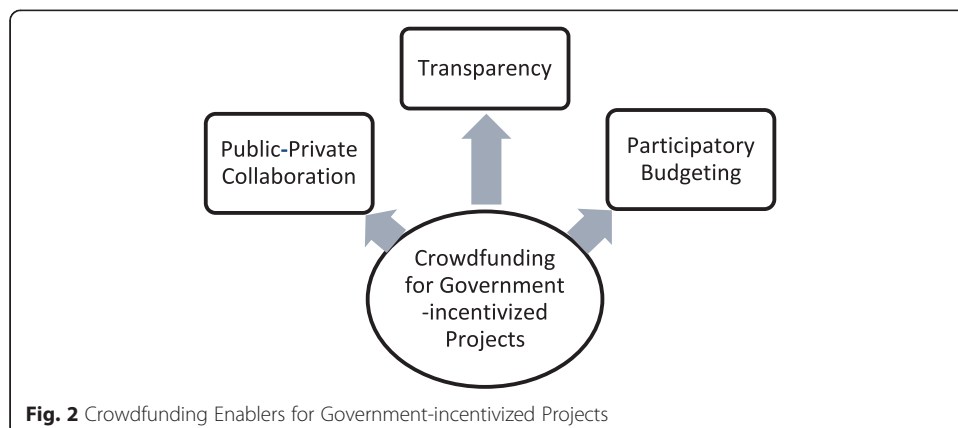


Fig. 2 Crowdfunding Enablers for Government-incentivized Projects

government-incentivized projects. That is, it is imperative to make evident how essential features and practices of crowdfunding can be extended and applied to help support the financing of government-incentivized projects. Furthermore, the crowdfunding system has considerable distinguishing features, along with several intertwined traits, such that it makes sense to demonstrate or consider each as distinct components. The following section will first introduce five conjectures. These statements articulated in each section might be collectively augmented into appropriate applications for or lessons of current crowdfunding successes following the debate, discussion, and verification.

Boosting participatory budgeting

Previous research suggests that sound public participation practices can aid governments be more open, transparent, and responsive (Shah 2007). Further, such practices can enhance the citizen opinions of government performance (Sintomer et al. 2008). Citizens usually value what the public receives from the government when they are actively engaged in the process of participatory budgeting. In other words, the budget participation feature of crowdfunding plays a critical role where governments typically lack resources, such as human and knowledge resources. This flexibility utilized in government-incentivized crowdfunding can provide the opportunity to engage diverse participants – including the citizens, the private partners, and the government. As a result, crowdfunding is not only operated as a financial mechanism for finding funds for government-incentivized projects but also creates value beyond just the financing benefits. This crowdfunding might work reasonably well, and budget participation empowers governments to reach out to diverse knowledge repositories through private–public collaboration. At the same time, governments’ decision-making processes become transparent to the private sector and their citizens so that governments are discouraged from making decisions in isolated situations. Such open environments ultimately improve governments’ decision-making procedures.

Participation is among the most important pillars of the good governance agenda for any government today. Participation is about empowering citizens to have full control over the funding and management of public projects (Arnstein 1969). This conception of participation was developed to represent the interaction between the community and the planning process to generate some community-led decision-making models that enable the community to support their interests (Abbott 2013; Brownell and Dunk 1991). For several decades, governments, especially in the area of urban and municipality planning, have attempted to offer new approaches and models that can make the planning process more participatory. The efforts have been directed to open up the planning processes in order to share agency between public officials and the communities they serve in a way that improves the planning processes and outcomes. This is achieved by gaining more insights and input from the public, while at the same time giving them more control and power over the planning process to reduce future dissatisfaction and complaints. With the emergence of crowdfunding as a collaborative approach that can be seen as a co-creation activity where people can participate in the selection and development of the projects through providing funds, or feedbacks, government agencies started

investigating the potential of using such approaches to serve the dual demand of the participatory approach (i.e., resources and management).

Encouraging private-public collaboration

We conjecture that crowdfunding can serve a crucial function in promoting public-private engagement, essentially stimulating not only a constructive relationship but also a partnership with citizens, communities, and governments (Lehner 2013; Miglietta et al. 2014). Previous studies show that governments frequently lack sufficient resources to produce public or community services, and the incentives of the market may not align with those of communities. Crowdfunding encourages not only simultaneous public-private engagement but also makes the selection procedures of such projects more efficient. However, in the early stages of expansion, civic crowdfunding had promising potential to support private-public partnership, and more broadly to enhance private-public collaboration due to its potential impact on the engagement of diverse entities from both private and public sectors.

Current practices of civic crowdfunding have proven successful in funding civic projects ranging from education programs to infrastructure developments. Furthermore, crowdfunding operating in the public sector offers a reasonably cost-effective alternative means for the privatization of public sector assets. Prior studies show that crowdfunding enables social entrepreneurial processes by engaging individuals. As a result, a new form of collaborative partnership has emerged to serve a particular role in orchestrating the crowdfunding system by identifying business opportunities and facilitating the partnering process. Thus, we argue that crowdfunding encourages emergent interactions and collaborations – among individual, private, and public entities – ultimately leading to the effective partnership between them. It is a well-known fact that coordinating the partnership for funding or managing the public projects initiated by governments is an enormously difficult task (Shah 2007). Crowdfunding can facilitate a searching process of relevant partners from both private and public sectors and help form emergent interest groups for new projects. It has been recognized as a venture-financing tool, which not only focuses on boosting competition among ventures or entrepreneurs but also has evolved in such a way as to improve private–public collaboration or partnership, especially in the public sector.

Improving transparency of budgeting and financing processes

It is widely acknowledged that crowdfunding has evolved to improve transparency in term of information disclosure and exchange since information visibility is closely associated with accountability of crowdfunding. For government-incentivized projects, a budget is an essential information element that lays out a government's economic priority. Budget transparency refers to the full information disclosures about government allocation and is viewed as a fundamental requirement for public accountability (Lindstedt and Naurin 2010).

Government-incentivized crowdfunding can help enhance budget transparency by opening up budgets for public projects. Furthermore, by properly implementing diverse functions, crowdfunding can achieve better information dissemination and offer ease of

access to such budget data. If the budget information is more accessible to citizens and private agencies in open crowdfunding platforms, a more effective budgeting process can be achieved. Thus, we argue that crowdfunding can deliver several benefits to citizens as well as streamlining the budget process. Budget transparency achieved through crowdfunding reduces the likelihood of corruption occurring in the public projects. Public institutions and governments are less likely to misuse allocated funds or resources since full information disclosure prevents deviation from legitimate budget allocation activities. That is, crowdfunding can offer various feedback mechanisms in which citizens not only monitor off-budget activities but also influence resource allocations.

Use of crowdfunding to support the One-Belt, One-Road initiative

The One-Belt, One Road initiative

Investing and manufacturing at home while targeting emerging markets to sell commodities is the economic model that has led to the booming of the Chinese economy during the last 30 years. Recently, China's leadership found the fast rising demand of its neighbors an opportunity to utilize the excess capacity of Chinese manufacturing. One of the most significant hurdles in using this opportunity is the weak infrastructure that connects China to its neighbors. To overcome such barriers, and using the Chinese overcapacity and capital, China's leaders started the One-Belt, One Road (OBOR) initiative to direct these resources to develop a regional infrastructure that can facilitate the trading and economic exchange between Asia and Europe through the Middle East and Africa (Swaine 2015). The initiative aims at developing the infrastructure to create a land road that links Asia, West Asia, The Middle East, and Europe from one side, and a maritime road that connects European ports going through the Mediterranean Sea straight through the Suez Canal along the African coast to the Chinese ports. The political initiative currently involves around 60 countries, representing about half of the world's population, with a vision to extend the initiative to Africa and Latin America in the future.

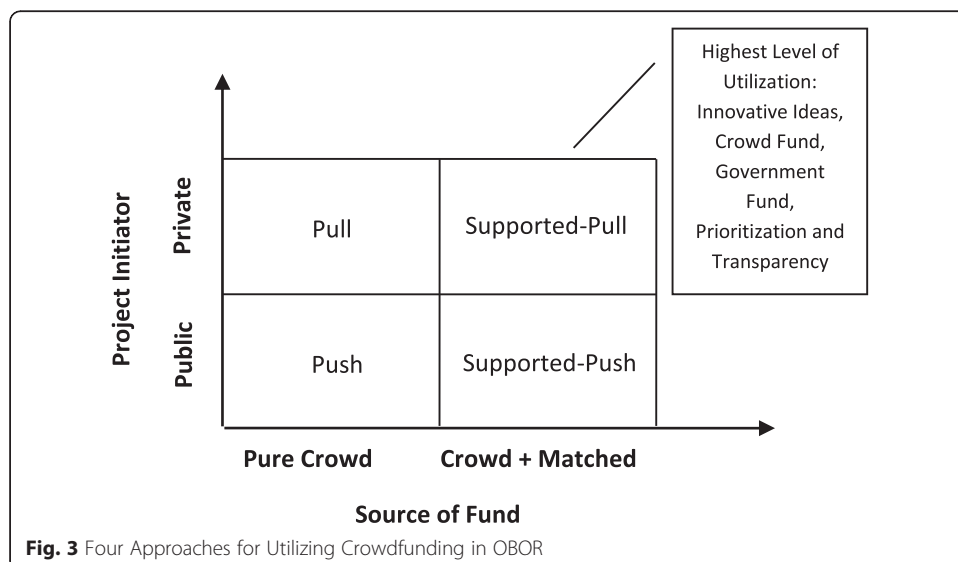
However, the size of the initiatives implies an enormous funding requirement, and a significant degree of cooperation and coordination with the various participating countries at the macro level. Considering the potential that crowdfunding has exhibited in transforming conventional financing methods in different areas, we investigate the potential that crowdfunding has in supporting the funding of such large-scale, cross-border, multinational initiatives, especially as the current participating countries represent almost half the population of the world.

Crowdfunding for the One-Belt One-Road initiative

In the context of the OBOR initiative, many projects will be required to build specific parts of the planned infrastructure. To execute such projects, governments will be facing two scenarios: governments already have the necessary funding to finance these projects, or they are not able to fund them due to a lack of funds. For the first scenario, the most significant challenge for governments is to make sure that the funds go to the right project at the right time (i.e., the project is a priority for their citizens at a specific given point of time). In the second scenario, considering that governments don't

have the funds to support these projects, conventional approaches to obtaining funds for such projects include either seeking funds from international financing institutes (e.g., the Silk Road Infrastructure Fund, Asia Infra Investment Bank, or New Development Bank) or searching for an alternative way of collecting funds to fulfill this need. In both scenarios, transparency and accountability are required in addition to a high level of citizen participation in decision-making.

One of the most important aspects of crowdfunding as a sub-domain of crowdsourcing is the utilization of the collective intelligence of the crowd. Crowdfunding in this regard can be seen as a collaborative activity involving the collection and utilization of ideas and insights from crowds. In OBOR contexts, governments can utilize the power of crowdfunding and the collective intelligence to generate more creative and innovative ideas for projects that can support the initiative. From another perspective, crowdfunding can also be utilized as an alternative model for financing public projects within the initiative. Instead of borrowing money from external international funding institutions, crowdfunding can play a role in collecting the required funds for projects where governments are not able to fund them independently, by soliciting smaller amounts of capital from the large number of citizens in those countries. In both cases, crowdfunding can be used as an approach to boost citizen participation in the process of suggesting, prioritizing, selecting, and budgeting projects in the initiative. Crowdfunding can play a role in encouraging citizens' involvement in the context of OBOR initiatives by empowering citizens from the different participating countries to have more control over these processes while providing a high level of transparency. Based on this argument, we present here four different approaches in which crowdfunding can be applied to support projects in the OBOR initiative. As shown in Fig. 3, approaches are categorized based on the type of project initiator (i.e. public vs. private) and the type of collected funds (i.e. purely from the crowd vs. partially from the crowd with matched funds from the government).



Push Approach: government-to-citizens crowdfunding

In this approach, projects are chartered by public institutions in OBOR member countries and listed by those institutions on a particular crowdfunding platform created specifically for supporting the OBOR initiative. The projects must be accessible to all citizens from the participating countries, who can browse, review, select, and fund those projects. In this approach, project ideas will come directly from public institutions without utilizing the collective intelligence of the crowd, but citizens will be utilized as a tool for prioritizing those projects and providing required funds.

Supported-push approach: supported government-to-citizens crowdfunding

Similar to the previous approach, government institutions propose projects to the public who are empowered through the same dedicated crowdfunding platform. Citizens will browse, review, select, and consequently prioritize the projects that most reflect their interests and needs by providing funds. When projects reach a particular threshold of accumulated funds, which reflects the importance of those projects to the public, government institutions will support those projects by providing matching funds that can enable those projects to reach their set goals. In this approach, the collective intelligence of the crowd is not utilized for creating innovative ideas. However, the crowd is utilized to provide funds and participate in project prioritizing while matching government funds partially support successful projects.

Pull approach: citizen-to-citizens crowdfunding

In this approach, some citizens or companies from the private sector may suggest innovative projects that can contribute to the OBOR initiative. Projects are listed on the dedicated crowdfunding platform to be accessible to citizens of all participating countries. Citizens will select and fund projects that more reflect their needs and preferences. In this approach, citizens are utilized as a source of innovation as they can generate creative ideas to support OBOR. Citizens are also acting as a prioritizing tool and a funding source while the role of the government is only to give the required permissions to the successful projects to be implemented on the ground.

Supported-pull approach: supported citizen-to-citizens crowdfunding

Citizens or third parties may suggest and list projects that contribute to the OBOR initiative and seek funds from the crowd exactly as in the previous approach. Citizens from the participating countries will select projects that most reflect their interests and needs. When projects reach a specific amount of accumulated funds representing the citizens' interest in those projects, governments may decide to support those projects by providing matching funds that enable those projects to reach their goals.

Design implications of crowdfunding platforms to support government-incentivized projects**Culture sensitive platform design**

While crowdfunding is not a new concept in itself, what has made the concept a popular approach today is the use of Web 2.0 capability to enable communication and community forming between interested stakeholders. Online crowdfunding overcomes

contradictions and tensions related to distance, time differences, and the need for continuous monitoring. Previous studies show that online crowdfunding has removed distance-related frictions, and that distance has no effect on the success of crowdfunding (Aggarwal et al. 2012; Mollick 2014). That is, online crowdfunding removes distance frictions between seekers and investors when controlling for offline friendship or family relationships that may exist in the physical location of the fund seeker.

In the context of OBOR, crowdfunding might remove the distance-related tension so that citizens from different countries can contribute to the projects from other countries in the same initiative. The initiative aims at linking 65 countries belonging to three continents (i.e. Asia, Europe, and Africa) with distinctively different languages and cultures. Even though crowdfunding can help bridge the distance-related gaps, language and culture differences may create a barrier to fully utilizing the power of crowdfunding. Extant literature suggests that culture can have serious implications for website adoption, usability, trust, satisfaction, and loyalty (Cyr et al. 2005; Cyr et al. 2009). In our OBOR context, culture may create different challenges to the acceptance, adoption, and use of the online crowdfunding platform in general and in the browsing, selection, and funding of crowdfunding projects listed on the platform in particular. Citizens coming from different cultures may behave in different ways regarding the adoption and use of the platform. A solution for such arising challenges can be the adoption of the recommendations provided by previous literature in the domain of web design (Cyr 2008; Li and Yeh 2010). Among the recommendations is the localization of the website design to respond to the cultural sensitivity. In this process, not only idiomatic language translation is required, but also other details such as time zones, currency, culturally desired colors, the name of the product or service, the roles different genders can play, and the examples related to the geography (Cyr & Trevor-Smith 2004; Cyr 2008).

The issues of localization and culturally sensitive crowdfunding platform design could be an interesting research area for scholars interested in the impact of culture on the design and use of online crowdfunding platforms. Researchers can study the effects of the different design features of crowdfunding platforms on user behaviors of this platform considering the differences in culture. Scholars can also utilize these behavioral studies in proposing design theories about the cultural design adaptation of online crowdfunding platforms to improve crowdfunding platform adoption and use internationally.

Social media and social network

Extant literature on entrepreneurship shows that venture capital professionals use trustworthy agencies or information from traditional media when seeking for new ventures (Connelly et al. 2011). However, recent studies show that publicity in forms of online news and blog coverage can attract attention from professional investors or venture capitalists, increasing start-ups' legitimacy and sequentially amplifying their chances of raising money (Aggarwal et al. 2012). In contrast with traditional VC funding, crowdfunding with embedded social networks transforms the fundraising process. With 73 % of online adults engaging in some forms of social media (Taylor et al. 2014), firms are now embracing social media channels as

a marketing strategy to facilitate firm-consumer interaction and improve brand engagement among consumers (Hu et al. 2012; Wu et al. 2015). Seventy-seven percent of Fortune 500 firms utilizes Facebook fan pages and Twitter channels (Barnes 2014). Similarly, governments or other public sectors might benefit from investment in social media as a communication medium as many citizens utilize social media such as Facebook and Twitter to connect with governmental service agencies (Taylor et al. 2014).

Prior studies have shown that social media are more effective than traditional advertising (Katz and Lazarsfeld 1955; Onishi and Manchanda 2012). Recognizing such opportunities, governments can readily reach out to vast online communities and ask citizens as potential funders to support civic or public project initiated by governments. Furthermore, crowdfunding platforms utilized by governments or associated public agencies can promote innovative ideas around the public projects and enable fostering citizens' participating in the budget process. However, it is largely unknown about how citizens' participation in such public crowdfunding platforms differ when they are engaged in the private crowdfunding. Thus, governments need to consider a design of platform carefully. From the citizen perspective, the citizen can have easy access to all publicized public projects and related budget allocations within a platform and share them through their social networks. Thus, government-incentivized crowdfunding can improve the visibility of public project and transparency of budgetary activities. Moreover, it promotes information dissemination among citizen, private enterprise and governments. These factors suggest that examining the role of social media and social network is essential to understanding citizens' participation and contribution behavior in public crowdfunding.

Cross-border transactions for crowdfunding

Several technological factors at multiple levels tend to drive or impede cross-border crowdfunding. The ability to transfer data and to complete transactions across borders is critical for crowdfunding to work fully as a platform across countries. While it is possible for an individual in one nation to open a private company in another jurisdiction, the different jurisdictions make cross-border access to investments a time-consuming and expensive undertaking. There are very few crowdfunding platforms that resolve this problem of cross-border access to investments. For instance, a Helsinki-based crowdfunding company, Invesdor, is the first one to obtain a license from the Finnish authorities, thereby being able to offer debt and equity crowdfunding services across all European countries. One of the notably specialized functions in cross-border crowdfunding is that it enables citizens of certain countries to access all relevant information and make investments.

Research issues in government-incentivized crowdfunding

Social inequality and crowdfunding

As civic crowdfunding may democratize financial markets, there might be unintended or unforeseen consequences resulting from this funding phenomenon. It is important to examine whether public crowdfunding could improve or worsen social inequality. There are concerns that civic crowdfunding could further broaden social inequalities.

That is, wealthy communities may benefit disproportionately from civic or public projects, while poor neighborhoods may not observe social benefits from the combination of government funding and private financial support. Recent research shows that the distribution of civic projects such as infrastructures and community development is deeply skewed and unevenly distributed such that a majority of funding transactions for civic projects are more concentrated in metropolitan areas than in rural areas (Davies 2015). Such distribution inequality is not confined to civic crowdfunded projects, since private projects follow the similarly skewed distribution as well (Agrawal et al. 2013). When considering the possibility of civil crowdfunding that can lead to greater social inequality, it is important to study what factors contribute largely to social inequality and what design features can reduce social inequality. So far, there have been few experiments or field studies examining such phenomenon in the context of civic crowdfunding. Research, thus, would take existing theory, such as digital inequality, and adapt it where possible to consider drivers and impediments to social inequality (Rufin et al. 2014).

Funding risk and information asymmetry

Information asymmetry is one of the key issues of entrepreneurial financing, since multiple parties engaging in such marketplaces do not have access to the same level of information (Healy and Palepu 2001). Prior studies show that in the crowdfunding market, this information asymmetry problem can be more notably salient, since entrepreneurs or project initiators might be reluctant to disclose all required information to potential funders (Ahlers et al. 2015). Similarly, citizens engaging in government-incentivized crowdfunding are not specialists or experts in this domain and thus are likely to have access only to limited information about public projects. Furthermore, the citizens are not knowledgeable enough to evaluate the publicized projects, hardly being able to estimate the social benefits from such projects. Both private and public crowdfunded projects differ primarily based on the information sources of campaigned projects; thus, information disclosure quality is expected to be different. We can suggest that it is appropriate to examine how disclosure quality is associated with the degree of information asymmetry and uncertainty (Brown and Hillegeist 2007).

Concluding remarks

In this study, we explored how crowdfunding can be extended as a financial intermediary to support government-incentivized projects. We investigated both financial and non-financial mechanisms that crowdfunding can offer and summarized how such features can improve participatory budgeting, facilitate private–public collaboration, and achieve transparency. One aspect of participatory budgeting emphasizes that crowdfunding can provide a key approach to reach out to the crowd and help finance projects initiated by the public sector. Insight from private–public collaboration shows that crowdfunding can be operated as a co-creation activity, where multiple parties such as citizens, social enterprises, and governments can jointly participate in the selection and development of the public projects via private–public collaboration. From the government perspective, governments can leverage crowdfunding not only to bring new resources to public projects but also to improve transparency of project selection and

budget allocations. From the design perspective, the mechanism of cultural adaptive design and localization, information provision, social media, and payments should be properly integrated into crowdfunding, since these features can facilitate transactions of government-incentivized crowdfunding.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

CHL and LZ developed the central idea of the research and contributed to the conceptualization of the study. CHL and GH have been involved in drafting the manuscript. All authors read and approved the paper.

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