Does Crowdfunding Democratize Access to Capital? A Geographical Analysis

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Abstract

One aspect of crowdfunding that has garnered large interest of late is the ability of crowdfunding to 'democratize' access to capital. Entrepreneurs initiating crowdfunding projects, located anywhere, are able to access sources of capital from anywhere. As such, potential originators of entrepreneurial activities that face less attractive credit environments may on the margin choose to engage in crowdfunding. Similarly, projects in geographically less populated areas may benefit from crowdfunding. In this paper, we examine how geography affects the formation of crowdfunding projects. We collect data on changes in housing prices and geographical proximity to banks in a local area that are closely related to the cost of accessing traditional sources of credit and match these data to a novel data set from a leading crowdfunding market. We find that small cities appear to get a disproportionate benefit from crowdfunding. Our findings also show that difficulty accessing credit from banks induces entrepreneurs to rely more on crowdfunding. Moreover, tighter credit constraints due to a drop in housing prices have a stronger effect on entrepreneurs who initiate large projects and live in high income areas. The impact of geographical proximity to banks is almost entirely via 'location-independent' projects that attract less funding from local people. Overall, we provide evidence that web-enabled crowdfunding has potential to democratize access to capital in that it can be a viable option for entrepreneurs having difficulty accessing traditional offline channels of credit.

Keywords: crowdfunding, internet markets, housing prices, geography, channel competition

1. Introduction

Crowdfunding is an emerging method for funding new ventures in which small amounts of capital are obtained from a large number of individuals. Crowdfunding projects range from small creative projects to social and entrepreneurial ventures seeking millions of dollars in capital. The crowdfunding marketplaces have grown rapidly in recent years, attracting an estimated $2.8 billion worldwide in 2012.[1] Kickstarter, one of the leading online crowdfunding marketplaces, had received about $450 million in pledges by the end of 2012.[2]

This massive growth has received enormous attention by policy makers. Until now, if funders of Kickstarter projects were to earn a return on their money, they would be subject to federal and state laws governing the sale of securities. The Jumpstart Our Business Startups (JOBS) Act in the United States (US) allows an exemption to this rule. It makes it easier for ordinary investors to participate in entrepreneurial ventures that were up-to-now only reserved to sophisticated investors. When signing the JOBS Act in April 2012, President Obama announced that "Startups and small businesses will be allowed to raise up to $1 million annually from many small-dollar investors through web-based platforms, democratizing access to capital".[3] This democratization of access to capital has attracted even greater attention in recent economic downturns. The recent financial crisis and economic downturns have led to a significant reduction in the availability of capital and credit, especially for cash-strapped individuals and small businesses (Greenstone and Mas 2012; Laderman and Reid 2010). As a consequence, providing small businesses with needed capital has been more crucial and crowdfunding has been viewed as a viable alternative for raising capital.

However, academic research on crowdfunding has largely neglected this important question of whether and how crowdfunding helps in democratizing access to capital. What would the democratization of access to capital look like? We could say that crowdfunding contributes to democratizing access to capital if it provides a new channel of capital to individuals and small businesses that have promising ideas but have difficulty initiating them with traditional sources of financing. Obviously, this can take different forms. Projects in small cities may have lower odds of being funded. Similarly, local market conditions, such as a drop in housing prices and fewer banks, may lower the availability of credit to individuals and thus limit the feasibility of their ventures. In addition, not all projects and project creators may benefit equally from crowdfunding as an alternative source of capital. In this endeavor, this paper

[1] http://www.crowdsourcing.org/document/crowdfunding-industry-report-abridged-version-market-trends-composition-and-crowdfunding-platforms/14277
[2] http://www.kickstarter.com/help/stats
[3] http://www.whitehouse.gov/the-press-office/2012/04/05/president-obama-sign-jumpstart-our-business-startups-jobs-act

examines conditions under which such venture activities benefit more from online crowdfunding markets as an alternative source of financing. Specifically, we ask the following three questions: 1) *What is the geographic distribution of crowdfunding projects between small and large cities?* 2) *How does the availability and cost of traditional sources of financing influence the propensity to use crowdfunding?* 3) *What variables moderate the decision to seek crowdfunding over traditional financing?*

Little is known regarding the factors that contribute to the initiation of crowdfunded projects. However, previous literature on entrepreneurship suggests that access to capital and credit is a primary factor in spurring entrepreneurship (Combes and Duranton 2006; Samila and Sorenson 2011). Previous work has shown that household wealth is vital for the creation of new businesses (Evans and Jovanovic 1989; Hurst and Lusardi 2004). In particular, housing wealth, which represents the bulk of household wealth, has been shown to ease credit constraints for entrepreneurs and thereby boost entrepreneurship (Fairlie and Krashinsky 2012; Fan and White 2003). Following prior literature (Adelino et al. 2013; Mian and Sufi 2011), we focus on housing prices as a proxy for credit availability for entrepreneurs. We expect that housing price decline during the recent economic downturn has driven entrepreneurs facing tough credit constraints to seek alternative sources of financing such as crowdfunding.[5] We also examine the number of banks in a local market that can affect the cost of accessing credit from traditional sources (Guiso et al. 2004). It is well known that small business lending often relies on "soft" information, which would be collected through long-term relationships with borrowers (Petersen and Rajan 2002). As such, geographical proximity should matter in this kind of lending. Thus, when entrepreneurs live farther from their local banks, they are likely to pay higher (monetary and non-monetary) costs for funding projects, thus making them use crowdfunding more.

This paper studies the research questions in the context of an online crowdfunding market. The data for this study was collected from Kickstarter, one of the leading online crowdfunding marketplaces. Since its beginning in April 2009, Kickstarter has emerged as the major online crowdfunding marketplace for creators initiating various projects, especially creative projects. We collected data on Kickstarter projects from April 2009 through January 2013; overall, we gathered data on 70,654 projects that have attracted more than $450 million in pledges from about 2.47 million contributors.

We investigate whether we can find support for the notion that crowdfunding 'democratizes' access to capital. In order to do this, we first report the geographical distribution of crowdfunding projects. We then examine whether entrepreneurs with limited access to traditional sources of financing have a higher propensity to use crowdfunding. In order to identify the causal effect of the credit availability

[5] The Survey of Consumer Finances has recently shown that median household net wealth during the period 2007-10 dropped significantly and that the drops have been mainly driven by significant decline in house prices (Ackerman et al. 2012).

proxied by housing price we instrument for the change in housing prices between 2009 and 2012 using the measure of housing supply elasticity developed by Saiz (2010), which exploits exogenous geographical and regulatory restrictions on housing supply. Subsequently, we examine whether this effect varies across categories. We focus on two major category characteristics- the share of local contributions and the average project size. Third, we investigate whether this effect varies across different cities with a particular attention paid to income differences. Last, we conduct several robustness tests to rule out alternative explanations.

We find that small cities appear to get a benefit from crowdfunding that is disproportionate to that which they receive from traditional means: compared to venture capital investments, smaller cities get disproportionately more projects and contributions in crowdfunding. We also show that tighter credit constraints due to housing price decline or fewer banks in a market increase the use of crowdfunding. This is consistent with the notion that crowdfunding is serving as an alternative to traditional sources of financing. We further observe that the effect of a decline in housing prices on crowdfunding is stronger for categories that require larger funding, confirming that our main finding is driven by the collateral effect. The impact of geographical proximity to banks is almost entirely via 'location-independent' projects that attract less from local people. Next, we find that the effect of changing housing prices is significant only for high income (and high education) Metropolitan Statistical Areas (MSAs). This implies that crowdfunding will be helpful mainly for entrepreneurs who are facing a temporary credit shock because of a drop in housing prices but have a certain level of skills and wealth. Last, we see that housing price change is influential only for MSAs that have low competition between banks in a local market, indicating that a credit shock from house price drop will be stronger for entrepreneurs who have a higher cost of accessing retail banks.

This study makes several significant contributions to the relevant literature. First, our study is the first to show systematic evidence of a significant relationship between local credit conditions and the use of crowdfunding in the local region. In this regard, our study complements recent empirical studies shedding light on the importance of location in the context of crowdfunding (Agrawal et al. 2011; Lin and Viswanathan 2013; Mollick 2012). Second, our paper contributes to a body of empirical literature on the consumer substitution between online and offline channels (Anderson et al. 2010; Brynjolfsson et al. 2009; Choi and Bell 2011; Ellison and Ellison 2009; Forman et al. 2009; Ghose et al. 2012; Goolsbee 2000, 2001; Langer et al. 2012). Most of this prior work focuses on consumer substitution between the two channels in the context of non-financial products. Our paper explores how local credit market conditions affect the propensity of entrepreneurs to use web-based crowdfunding. Third, our study advances a small body of literature showing that the geographical distance in online transactions matters more for certain products (Blum and Goldfarb 2006; Brynjolfsson et al. 2009; Hortacsu et al. 2009; Sinai and Waldfogel 2004). We not only report significant variation in contribution patterns across categories, but also provide evidence that this can affect the decision of creators using crowdfunding. Finally, and more broadly, this study extends the growing body of literature that studies how IT-mediated online platforms contribute to consumer welfare. The literature has shown how online platforms benefit consumers with increased product variety (Brynjolfsson et al. 2003), lower transaction costs (Overby and Jap 2009), lower prices (Baye et al. 2006), more liquid markets for information goods (Ghose et al. 2006), higher price elasticity (Granados et al. 2012) and better information about product quality (Mudambi and Schuff 2010). We contribute to this literature by showing that online crowdfunding platforms have potential to democratize access to capital.

2. Literature Review

2.1. Crowdfunding

A growing body of literature has examined the concept of online crowdfunding platforms. In general, crowdfunding platforms differ in terms of the funder's primary motivation. Funders participate in expectation of some sort of financial return (e.g., in *Crowdcube*), no monetary compensation (e.g., in *Kiva*), or tangible, but non-financial, benefits (e.g., in *Kickstarter*) for their financial contributions. Market participants are expected to behave differently depending on different types of incentives (Kuppuswamy and Bayus 2013). Existing work on crowdfunding has provided conceptual and legal analysis (Belleflamme et al. 2010; Schwienbacher and Larralde 2010). For example, Agrawal et al. (2013) provide a good overview of the economics of crowdfunding, especially crowdfunding for equity, which is often called equity-based crowdfunding. They consider crowdfunding as a puzzling market, since funders appear to make contributions in the market with high levels of information asymmetry and risks without practicing careful due diligence. They describe incentives of all participants in crowdfunding (i.e., creators, funders, and platforms) and discuss market mechanisms that may be effective in reducing potential market failures.

A small body of literature has provided empirical evidence of the behavior of market participants in different crowdfunding markets. Social influence among funders has been the most examined factor in the literature. This topic has been examined in donation-based markets (Burtch et al. 2013), reward-based markets (Kuppuswamy and Bayus 2013), revenue sharing-based markets (Agrawal et al. 2011), and lending-based markets (Lin et al. 2013; Zhang and Liu 2012). Altogether, the literature shows that social influence does matter for crowdfunders but the direction of the influence varies depending on funders' incentives. Agrawal et al. (2011) further examined the role of geography in contribution patterns and suggested a reduced role for geographical proximity. Lin and Viswanathan (2013) have also looked at a similar question in an online lending-based market, showing there is still a significant “home bias” in the market. Though an increasing body of literature has been examining crowdfunding markets, almost all the studies have focused mainly on crowdfunders. Thus, we know little about what drives entrepreneurs to use crowdfunding. Specifically, whether and how geography affects the incentive of entrepreneurs to use crowdfunding are important issues but have remained unknown so far. Our study attempts to fill this gap.

2.2. Geography and Entrepreneurship

Since creating a crowdfunding project can be thought of as a new form of entrepreneurship, our study also relies on the literature on entrepreneurship, especially examining the role of geography in entrepreneurship. The existing literature offers several explanations on why entrepreneurship differs by geography. The first explanation focuses on the supply of potential entrepreneurs. This theory suggests that the level of initial human capital base in an area affects the entrepreneurial rate in the area. A second explanation highlights the importance of a large customer base. Entrepreneurs may start businesses to cater to this customer base (Glaeser 2007). Customers may also play a role in providing capital and investment support to certain projects (Ordanini et al. 2011). This is particularly plausible for our context. Many consumers who are really enthusiastic about a project are likely to become crowdfunders, who contribute a small amount of money to the project. The ability of some areas to foster new ideas is another potential reason why they become hubs of entrepreneurship. Entrepreneurial ideas are often recombinations of existing ideas (Fleming 2001; Nelson and Winter 1982). Hence, the presence of suppliers of ideas can spur entrepreneurship by facilitating the creation of new ideas and the transfer of existing ones. A fourth view points to a local culture of entrepreneurship as a key determinant. Some regions may simply have a strong culture of entrepreneurship, while others may just follow tradition and old social norms. This implies that positive social spillovers from entrepreneurship may generate significant variation across regions (Glaeser and Kerr 2009).

Entrepreneurship is also likely to be driven by the presence of suitable input suppliers. One of the most important inputs into entrepreneurship is access to capital and credit (Kerr and Nanda 2011). A large portion of small businesses uses some form of credit such as small business loans, credit card loans, home equity loans and traditional bank loans (Laderman and Reid 2010). This is often because credit constraints at the household level matter to individual entrepreneurs (Evans and Jovanovic 1989; Holtz-Eakin et al. 1994; Hurst and Lusardi 2004). In particular, housing wealth has been shown to ease credit constraints for entrepreneurs and thereby become a primary factor for financing entrepreneurship (Adelino et al. 2013; Bernanke and Gertler 1989; Fairlie and Krashinsky 2012; Fan and White 2003). Thus, it is likely that when housing prices are going down, entrepreneurs will face tight credit constraints.

Even though access to credit matters to entrepreneurs, it is not clear whether local sources of financing are needed for local entrepreneurship. Local banks are likely to matter only when entrepreneurs prefer borrowing money from their local banks (Guiso et al. 2004). A stream of literature shows that distance still matters to small business lending, although technology weakens the dependence of small businesses on local lenders (Brevoort et al. 2010; Petersen and Rajan 2002). This is mainly because small business lending often requires collecting “soft” information about small businesses over time through relationships with those firms, making local presence critical. Amel and Brevoot (2005), for example, found that only about 10 percent of small business lending is from banks with no branch in the local region. This suggests that entrepreneurs are likely to rely mainly on banks within their home area which may provide better lending terms through long-term relationships (Berger and Udell 1995). Furthermore, when they should incur higher transaction costs of borrowing from local lenders, entrepreneurs may search for alternative sources of financing such as crowdfunding.[6] To the extent that crowdfunding serves as a viable alternative to traditional sources, we should see more crowdfunding activities in regions that have more concentrated credit markets.

2.3. Consumer substitution between Electronic and Physical Channel

Since crowdfunding is thought of as an emerging online channel that provides access to credit to entrepreneurs, the literature on the consumer substitution between online and traditional offline channels is also useful for our study (Lieber and Syverson 2012). Starting with the seminal paper by Balasubramanian (1998), theoretical studies on multichannel retailing provide valuable frameworks for understanding the competition between online and offline vendors (see Forman et al. (2009) for more literature). One strand of empirical research has examined the factors affecting consumers’ channel choice such as product variety (Brynjolfsson et al. 2003), product information (Koppius et al. 2004; Kuruzovich et al. 2008), lower transaction costs (Kambil and Van Heck 1998), price (Brynjolfsson and Smith 2000). Especially, previous empirical research has found that consumer demand through the Internet is higher when their local markets face higher prices, face higher sales tax rates, have more local content online, or have fewer local physical stores (Anderson et al. 2010; Brynjolfsson et al. 2009; Ellison and Ellison 2009; Goolsbee 2000, 2001; Sinai and Waldfogel 2004). The literature implies that geography plays a role in driving consumers’ online demand. We contribute to this literature by highlighting how local credit market structure can affect an creator’s behavior on an online crowdfunding market.

In addition, a small body of research suggests that consumers’ online demand for local products can be different with product type. Blum and Goldfarb (2006) showed that even among digital products with zero trade cost, some products have their demands reduced by distance. They found that “taste-dependent” products such as music, pornography, and gambling are affected by geographical distance, while more homogenous products such as software and technology are not. Hortascu et al. (2009) also

[6] Lieber and Syverson (2012) report that the fraction of buying home equity loans online is just 1.8% in 2007, implying that the online channel may not be a viable option for creators in our data.

found a negative effect of distance on trade on online auction sites and observed a strong "home bias" effect. They further observed that the negative distance effect is strongest for goods that are location-specific, such as opera tickets. Using a similar kind of reasoning, we expect that there is likely to be a certain home bias in contribution patterns for project types that are 'location-dependent.'

3. Data and Empirical Analyses

3.1. Data and Variables

For this study, we have collected data from several sources. We gathered information on crowdfunding activity from Kickstarter, which is a leading crowdfunding platform. The site started operations in April 2009 and provided a market where everything from films, games, and music to art, design, and technology can be supported with the help of a large number of contributors. We extracted data regarding all transactions on Kickstarter from its inception to January 2013 and could locate 35,156 successful projects, 33,022 unsuccessful projects, and 2,476 live projects. As compared with overview statistics published by Kickstarter, we have a fairly complete list of successful projects and around 73% of failed projects.[7] The missing failed projects are mainly because of issues extracting data from Kickstarter.[8] Among those projects, 62,163 projects are from the US. We focused only on US projects mainly due to the availability of geographical data. For each project we have information regarding the project owner-specific characteristics (e.g., user name, location) and project-specific characteristics (e.g., goal amount, pledged amount, category, project location, crowdfunders and their contributions).

We know each project's location, city and state, which allows us to determine the local conditions for each project. We then matched each project to a Core-Based Statistical Area (CBSA). This may be either a Metropolitan Statistical Area (MSA) (containing an urban area of 50,000 or more population) or a Micropolitan Statistical Area (containing an urban area of at least 10,000 (but less than 50,000) population). Our use of CBSA as the unit of location is driven by the fact that Kickstarter provides only city and state information. CBSAs appropriately assign both the urban core and adjacent counties to one location. However, our main analyses focuses on the subset of MSAs for which we have the measure of housing supply elasticity (which we will explain in detail below), although other variables are more widely available for both metropolitan and micropolitan statistical areas. This measure is available for

[7] According to the 2012 Kickstarter stat, it has received $320 million in pledge in 2012. Our sample has a total of $313 million during the same period.

[8] Kickstarter makes it hard to find failed projects, since projects are not indexed for Internet searches and there is no page on the site to find projects that didn't meet their funding goals. The failed projects are on the profile pages of project contributors, though. We visit every contributor and attempt to get as many projects as possible. Thus, this method cannot collect around 11% of failed projects that get no funding. Also, around 30% of failed projects fund less than 20% of the goal amount.

about 250 large MSAs. Since our sample includes the large MSAs, it covers about 90% of crowdfunding projects initiated since the introduction of Kickstarter.

Once we match each project to an MSA, we measure the level of crowdfunding activities made by creators during our study period at the MSA and project category level. In our analyses, we focused on the MSA-category level rather than the MSA level, because we also wanted to look at category heterogeneity in the effect of key variables of interest. Kickstarter provides 13 categories that creators can choose for listing their projects. These are art, comics, dance, design, fashion, film & video, food, games, music, photography, publishing, technology, and theater. We considered three measures to represent cumulative crowdfunding activities at the MSA-category level during the period. The three measures are the number of total projects per million people at the MSA-category level, the log of the number of total projects at the MSA-category level, and the log of total contributions (in $) to all projects at the MSA-category level. Tables 1 and 2 present the definitions and the descriptive statistics of crowdfunding activities as well as other variables.

We also have all of the individual contributions for each project in our sample. All the projects in our data have attracted 4,429,622 specific contributions from 2,470,566 crowdfunders. About 12.7% of crowdfunders disclose the location, accounting for 29.0% of all contributions, suggesting that experienced crowdfunders are more likely to share the location information. Crowdfunders in the US comprise 68% of all crowdfunders that share the location information and are responsible for 20.5% of all contributions. We exploit this information to determine the type of each category. We first considered all the contributions from crowdfunders who release their location and examined whether the contributions are made to 'local' projects, i.e., which come from the crowdfunders' home MSA. We then calculate the share of 'local' contributions for each category. Table 3 presents this by category.[10] We see that dance, food, and theatre have a higher share of local contributions than the other categories. In contrast, the game and the technology categories received most of the contributions from non-local crowdfunders. This is consistent with recent evidence that even in online transactions geographical distance matters more for certain products (Blum and Goldfarb 2006; Hortascu et al. 2009). Since there are a significant number of contributions for each category, despite a small share of crowdfunders with location information we are confident that our sample is capturing the qualitative difference across categories accurately. In this paper, we will call projects in some categories with a high share of local contributions as 'location-dependent' and call those in other categories with a low share as 'location-independent'.

[10] We further observe that bigger MSAs, especially the top 3 MSAs, tend to attract more contributions from local people. Nonetheless, even the largest MSA have more than 70% of non-local contributions. This indicates that crowdfunders are willing to invest outside of their home regions.

To this data, we add relevant demographic and socioeconomic variables from multiple sources. First, our key variable of interest is the housing price index. We get the housing price index at the MSA level from the Federal Housing Finance Agency to use as a proxy for the availability of credit. Home equity comprising the majority of household wealth is important for obtaining credit because of the importance of personal collateral and guarantees in small business lending (Avery et al. 1998). Also, home ownership has been shown to decrease the probability of loan denials (Cavalluzzo and Wolken 2005). This measure has been similarly used in other studies (Adelino et al. 2013; Fairlie and Krashinsky 2012). Hence, this variable allows us to test whether crowdfunding serves as a viable alternative to the traditional lending channels for creators who face tougher credit constraints. This is operationalized as the change in house prices at the MSA level between 2009 and 2012.[11] We generally observe house price decline in a local region during our study period.

Another key variable is *bank branch density* which is a measure of bank accessibility. To operationalize this, we used data from the US Federal Deposit Insurance Corporation on the number of financial branches. The land area data collected from the 2010 US Census is used as a denominator to transform the number of financial branches in an MSA into the variable *bank branch density*. Thus, this measure represents transaction costs of using offline bank branches (Forman et al. 2009) and/or competition among banks in a local region (Brynjolfsson et al. 2009). As the number of competing bank branches in a local market decreases, people will incur more costs of using the channel (Kerr and Nanda 2011) and are, on the margin, more likely to use the online crowdfunding channel for financing where they do not incur transaction costs due to geographical distance.

In addition, we used as control variables several demographic and socioeconomic variables that previous literature has shown to be key determinants of entrepreneurship. We first included the Internet connectivity as proxied by the number of high-speed internet service providers (ISPs). The information on the number of ISPs at the county level is extracted from the Federal Communications Commission.[12] This information is then averaged across all counties in an MSA. This variable represents the diffusion of the Internet within the MSA which may affect crowdfunding activity (Agarwal et al. 2009; Seamans and Zhu 2011; Wallsten and Mallahan 2010). We included several variables to represent local economic conditions. We first used Small Area Income and Poverty to get information on the median household income. We collected data on the unemployment rate from Bureau of Labor Statistics. We also got data on the number of small establishments from the County Business Patterns. Small establishments are those with 1-4 full-time employees. These variables are used to test whether better local economic conditions induce local people to create more crowdfunding projects in expectation of greater contributions.

[11] We use the house price index measured at the third quarter of each year.
[12] http://transition.fcc.gov/wcb/iatd/comp.html

We also collected MSA-level data on total population, education profile, race profile, and age profile from the American Community Survey (ACS). These variables as a whole help account for several determinants of entrepreneurship such as a pool of entrepreneurs, consumer base, and labor input. The ACS is a nationwide survey designed to collect and produce economic, social, and demographic information annually. The information from the ACS allows us to control for the underlying propensity of the MSAs to engage in crowdfunding.

3.2. Empirical Implementation

The base equation for testing the impact of MSA-level variables on crowdfunding activities is:

$$Total\ Crowdfunding_{mj} = \beta_0 + \beta_1 \Delta House\ Price\ Index_m + \beta_2 Bank\ Branch\ Density_m + \beta_3 X_m + v_j + \epsilon_{mj}$$

where the subscript represents MSA m in category j. We use three outcome variables to represent total crowdfunding activities in the MSA-category from April 2009 to January 2013 when we collected the data. These are the number of total projects per million people at the MSA-category level, the log of the number of total projects at the MSA-category level, and the log of total contributions (in $) to all projects at the MSA-category level.

In addition, we included the change in house price index at the MSA level in the regressions. We are interested in testing whether β_1 is negative, which would confirm that a drop in house prices leads to more creation of crowdfunding projects. Another key independent variable is the bank branch density at the MSA level. We would expect that a smaller number of banks are associated with more crowdfunding activities. $\mathrm{X_m}$ is a vector of location-level variables that vary by MSA. This vector includes growth in unemployment rate, growth in small establishments, number of ISPs, total population, median income, and some demographic variables. The growth in unemployment rate is measured between 2009 and 2012, while the growth in small establishments is between 2008 and 2011 due to unavailability of 2012 data. The other control variables are measured in 2008, because 2008 is the year right before our study period. We log-transform total population in the analysis. We included a vector of category fixed effects $\mathrm{v_j}$ that controls for fixed category specific differences such as category size, crowdfunding rate, competition, etc. We cluster standard errors by MSA.

It is challenging to establish a causal relationship between the availability of credit to project owners proxied by housing prices and the creation of crowdfunding projects, since there are many omitted variables that could simultaneously affect both housing prices and crowdfunding activities. For example changes in expected household income in the area or improvements in entrepreneurial opportunities can affect both housing prices and crowdfunding activities. As a result, we need an exogenous source of variation in housing price change to properly identify the effect of credit availability on crowdfunding activities. We instrument housing price change between 2009 and 2012 with the measure of MSA-specific housing supply elasticity of Saiz (2010). This measure is constructed using geographical and regulatory constraints to the expansion of housing volumes. Therefore, an increase in housing demand during the economic boom period is likely to translate into higher housing prices and collateral value in low elasticity areas, whereas it translates into a greater volume of houses built in high elasticity areas (Adelino et al. 2013). In the same logic, when bad economic conditions reduce housing demand, we would observe smaller decreases in housing prices in high elasticity areas than in low elasticity areas. Column (4) of Table 6 provides evidence to confirm this. The housing supply elasticity is positively and significantly associated with housing price increase. Using exogenous restrictions on housing supply will thus provide us with proper identification unless our instrument impacts crowdfunding activities for reasons other than changes in housing price. This identification strategy has also been implemented in recent papers (Adelino et al. 2013; Mian and Sufi 2011).

Our main analysis takes *bank branch density* as exogenous to predict the propensity to use crowdfunding. We believe that this assumption is valid in our study and do not expect that reverse causality exists. It is unlikely that the anticipation of many crowfunding projects in an MSA encourages banks to enter the region given that crowdfunding is still in its infancy. Also, omitted variable biases may not be significant. Some unobserved socioeconomic factor or preference may lead to a higher crowdfunding demand while affecting the number of local banks. However, since the number of local bank branches in 2008 that we use in our model predates the rise of crowdfunding, it is unlikely to be correlated with any unobserved factor that affects creator's crowdfunding demand during 2009-2012. Nonetheless, we collected data on the number of local bank branches in 2000 which should be more exogenous and used it as the instrument variable for the number of local bank branches in 2008 in a robustness check (Brynjolfsson et al. 2009).

There are two additional properties of our empirical framework that are important to discuss here. First, one could argue that during our study period, housing prices have largely declined and crowdfunding has taken off, thus finding a negative relation between housing price change and crowdfunding. However, we are examining cross-sectional variations in crowdfunding activities across MSAs rather than within-MSA variations over time. Hence, even when all the MSAs experience a decline in housing prices, we could get a positive coefficient for a change in housing prices if MSAs with a smaller decline in housing prices have more crowdfunding activities. Another possible specification is to disaggregate observations to the MSA, category, and year level, yielding a larger number of observations than in the specification above. When using this disaggregated data we can include MSA fixed effects in the regression, which allows us to control for fixed shocks to each MSA. This helps control further for time trends in crowdfunding activities by including yearly dummies. However, the biggest concern for this model is that it is a challenge to assemble suitable time-varying instruments for housing price index. Since our study period is relatively short (i.e., 2009-2012), GMM-typed regressions are not feasible for our study. Nevertheless, in a robustness check we show that our main findings are qualitatively similar when we conduct panel data regressions without any instrument.

4. Empirical Results

4.1. Geography of Crowdfunding

We first present geographical variation in crowdfunding activities to see how crowdfunding projects spread across CBSAs. In order to generate Tables 4 and 5, we used all the US-based projects in both MSAs and non-MSAs. Table 4 reports the geography of crowdfunding projects on Kickstarter by CBSA across time. The three centers of crowdfunding activity are New York, Los Angeles, and San Francisco and account for slightly over 30% of all crowdfunding activities across all years. However, the share of the top three CBSAs has continuously decreased from 43.3% in 2010 to 28.2% in 2012 while the number of crowdfunding projects has increased by around six times during the same period. For the top ten CBSAs, their total shares of crowdfunding projects have also decreased from 61.1% to 45.2%. The share of non-top ten CBSAs is noteworthy. Chen et al. (2010) showed in a venture capital context that the top three (nine) Combined Statistical Areas take about 49.4% (74.0%) of all portfolio companies funded between 1975 and 2005. In unreported results, we further calculate the location quotient of crowdfunding projects. This measure is calculated as the percentage of crowdfunding projects in the CBSA divided by the percentage of total population in the CBSA. The location quotients for the top three CBSAs are all greater than 2, indicating that the top three CBSAs take a disproportionately larger share of crowdfunding projects.

In Table 5, we report the geography of contributions by CBSA over time based on the location of crowdfunders. To generate this table, we use more than 1.1 million contributions that have the location information of crowdfunders. We find similar patterns to what we see in crowdfunding projects. The share of the top three has continuously decreased from 50.3% in 2010 to 38.3% in 2012, with the average share of 39.2%. The non-top ten CBSAs account for 35.7% of all crowdfunds in all years. This suggests that compared with venture capitalists, more crowdfunders are located outside of the top three (Chen et al. 2010). The non-top ten CBSAs take around 36% of total contributions. This share is smaller than the non-top ten share of around 51% in terms of the number of projects. In this regard, the non-top ten CBSAs appear to get a disproportionate benefit from crowdfunding.

4.2. Main Effect on Crowdfunding

Figure 1 shows the relationship between the change in housing prices and the number of crowdfunding projects at a scatterplot of our raw data. In order to draw this plot, we confined our sample to 249 MSAs that we used for our main analyses. While crowdfunding activities vary by MSAs, we have a downward sloping regression line. This suggests that housing price changes are strongly and negatively correlated with crowdfunding activities in these 249 MSAs.

We conducted a series of regressions to examine the effect of both housing prices and bank branch density on crowdfunding activities. Columns 1 through 3 of Table 6 report findings from Ordinary Least Squares (OLS) estimates without instrumenting house price change. Our coefficient of interest, i.e., housing price increase, is negative and highly significant for all three dependent variables. This indicates that a decrease in housing prices drives creators under tighter credit conditions to rely more on crowdfunding. The effect is economically significant. The coefficient on the change in house price in column (2) of Table 6 shows that a 10-point decrease (about one standard deviation change) in housing prices translates into a 7 percent increase in the number of crowdfunding projects in MSA-category which corresponds to one project. When it comes to total contributions, a 10-point decrease in housing prices leads to a 46 percent increase in total contributions to all projects in MSA-category which corresponds to an increase of $47,369 in total contributions. This implies that the effect of the credit availability may be stronger for larger projects, because *total contributions* put more weight on larger projects.

Since the house price change is likely to be endogenous, we next instrument for this using the housing supply elasticity developed by Saiz (2010). In column (4) we show the first stage regression of housing price change on the measure of housing supply elasticity. The coefficient for the Saiz measure is highly significant at the 0.1% level and positive, implying that high elasticity MSAs experienced a lower decline in housing prices between 2009 and 2012.

From column (5) we report the second stage regressions with the housing supply elasticity as an instrument for the change in housing prices. We generally see negative and significant relationships between crowdfunding activities and housing price change. Regarding the log of the number of projects, the two-stage least squares (2SLS) regression is not significant (p-value is 0.16). However, the Poisson IV regression is highly significant at 0.1% level, since it increases efficiency.[13] Our IV regressions indicate that ignoring endogeneity could bias the OLS estimates toward zero. This makes sense because omitted variables such as unobserved investment opportunities are likely to affect both housing prices and crowdfunding in the same direction.

We note that the demand effect, if any, will not purely drive our findings. The literature suggests that the effect of housing price increases can also be explained by the demand channel that housing price growth increases the local demand for crowdfunding projects. However, if there is any demand effect, it should drive the coefficient for the housing price increase upwards, thus making it harder to find a negative coefficient. Therefore, the negative coefficient reflects that limited availability of collateral in

[13] We will use the 2SLS regressions rather than the Poisson IV regressions with our main specifications, because the 2SLS regressions are easy to interpret and the Poisson IV regressions do not converge in some specifications.

the form of lower housing prices can positively affect the creation of crowdfunding projects by project owners.

Table 6 also shows the effect of bank branch density on crowdfunding activities. The OLS and 2SLS regressions both imply that an increase in local banks decreases the propensity of initiating crowdfunding projects, generally large projects. Project owners are less likely to fund their projects by crowdfunding as they have more local banks so can borrow money easily and cheaply. Based on column (3), a one standard deviation increase (i.e., 1 unit increase) in *bank branch density* is associated with a 25 percent increase in total contributions.

With respect to the control variables, our results are in line with expectations. We find that MSAs with more educated people and more people aged between 40 and 59 are associated with more crowdfunding activities. Furthermore, bigger cities tend to initiate more crowdfunding projects mainly because more people are living in those cities. However, we do not find that people in big cities necessarily have a higher propensity to use crowdfunding. Internet connectivity is generally not significant. An increase in unemployment rate may lead to a reduction in crowdfunding activities, although the relationship is not statistically significant.

4.3. Heterogeneous Effect of House Price Increase across Different Categories

We now turn to the differential effect of house price increase across different categories. We focus on two major category characteristics: the share of local contributions in a category and the average project size in a category. First, although all contributions are made online, some categories may attract more local contributions. 'Location-dependent' projects which cater more to local consumers' tastes could get more contributions from local crowdfunders than 'location-independent' projects. In this regard, an increase in demand due to an increase in housing prices may benefit certain categories more than others. To test this we exploit variation in the share of local contributions across categories. We observe that there is huge variation in the share of local contributions across categories ranging from 3.72% (game) to 49.71% (theater). Since local demand is more important for certain categories with a higher share of local contributions, we expect that an increase in local demand through house prices should matter more for those categories.

Second, we exploit variation in the scale of projects across categories to confirm the importance of the collateral channel for crowdfunding. The effect of credit availability is likely to be stronger for categories that need greater funding, since creators will face more difficulty leveraging their house to finance their larger projects. Project owners are likely to use different forms of credit, such as small business loans, credit card loans, home equity loans and traditional bank loans, to finance their projects. When they launch small projects, they may succeed in funding their projects without seeking for alternatives. On the other hand, when they initiate large projects, they may feel that they need to find another source of financing such as crowdfunding. Table 3 shows that there is significant variation in the average goal amount by category, ranging from $5,347 (Dance) to $41,189 (Game). We will use the average goal amount in a category as a proxy for the average project size in the category.

Table 7 shows the results from the 2SLS estimates where we have the interactions of house price increase with both the share of local contributions and the average project size. We include both of the two interaction terms since having them together will help us examine both the collateral and demand effects. Categories with larger projects may attract less from local people, thus making the average project size correlate with the share of local contributions. Hence, having both of the interaction terms will allow us to separate out the two effects. We present the results for the whole sample in columns 1 through 3. For all the three dependent variables, the coefficient on the interaction between housing price increase and average project size is negative and statistically significant, indicating that the effect of decline in housing prices is stronger for categories that require large funding. The effect tends to monotonically increase with the average size of a category. This is consistent with the collateral channel of credit availability being an important mechanism for the creation of large crowdfunding projects. This confirms that a simple demand story is not driving our results. The coefficients on the interaction between housing price increase and the share of local contributions are all negative but statistically significant only in column (1).

We next split the sample into two groups by the share of local contributions. We report the 2SLS estimates in columns (4), (6), and (8) for categories with low shares of local contributions and in columns (5), (7), and (9) for those with high shares. We still see the negative interaction effects of house price increase and the average project size for all the estimates. When it comes to the share of local contributions, we have more consistent results after splitting the sample. For categories that have high shares of local contributions, we observe that the effect of house price change decreases as a category has a higher share. This is likely because the demand effect is significant for this group and increases with the share of local contributions. On the other hand, for categories that have low shares of local contributions, the interaction has the opposite sign, which is not consistent with the pure demand effect. The effect of house price change increases as a category has a higher share. For this group, the demand effect is likely weak. Also, house prices may not be critical for certain categories that have a very low share of local contributions, such as game and technology. Since those categories can more easily raise funds outside of their local area, project owners in those are more likely to initiate their projects irrespective of local conditions. We note that our findings are not significant for *total contributions*.

We further observe that *bank branch density* is generally stronger for categories that have a low share of local contributions. This effect is not significant for categories that have high shares of local contributions. Thus, the impact of bank branch density on crowdfunding demand is almost entirely via 'location-independent' projects that attract less from local people. Meanwhile, 'location-dependent' projects offered online are virtually immune from the competition between crowdfunding and traditional banks. This is consistent with Brynjolfsson et al. (2009) showing that the competition between online and offline channels is significant only for popular products that are available both online and offline.

4.4. Heterogeneous Effect of House Price Increase across Different MSAs

We examine whether the effect of credit availability varies across MSAs. One important question is whether house prices will have a stronger effect on crowdfunding in high income MSAs. On one hand, low income people could rely more on crowdfunding, because they are likely to face tighter credit constraints with a drop in house price. On the other hand, given that crowdfunding projects in our data are generally creative projects which may be thought of as 'luxury' goods, low income people may not be able to even start their own projects. In our data, the mean (median) number of crowdfunding projects at MSA-category level is 2 (0) for the bottom 25% income MSAs and 53 (10) for the top 25% income MSAs. Hence, the credit availability may matter more for high income people who have a certain level of wealth, skills, and time.

To test this, we interact house price increase with median household income at a MSA. We present the estimates obtained from the 2SLS models in columns (1)-(3) of Table 8. The interactions for all the three models are negative and also statistically significant except for *total contributions*, indicating that the effect of house prices increases with the median income at a MSA. We further compare the effect between the top 25% and bottom 25% income MSAs. We observe that the effect of house price change is significant only for high income MSAs (see columns (4)-(9)). Low income MSAs are not influenced significantly by house prices. This finding is consistent with a theoretical prediction of Evans and Jovanovic (1989) that the propensity to start a new business is a function of personal wealth if would-be entrepreneurs are credit constrained. We further compare the effect between the top 25% and bottom 25% high education MSAs and find that the effect is stronger for MSAs that have a higher share of educated people (unreported but available upon request). All in all, our findings suggest that crowdfunding will be helpful mainly for high-ability creators who are facing a temporary credit shock because of a drop in house price but have higher income and skills. This finding is in line with some studies showing that high-income, educated people are more likely to adopt the Internet (Goldfarb and Prince 2008; Sinai and Waldfogel 2004).

We next examine how our two key independent variables interact. To the extent more competition among banks in a local market represents better borrowing conditions, more competition might dampen a credit shock driven by a drop in house price. In this way, house price change may be less significant for MSAs that have more competition among banks. To test this, we consider the bottom 25% and top 25% MSAs in terms of bank branch density and then compare the effect of house price change between the two. As expected, we find that house price change is influential only for MSAs that have low competition among banks, although this does not hold for the log of number of projects (see Table 9). This indicates that a credit shock from house price drop will be stronger for project owners who have a higher cost of accessing retail banks. We note that this difference is not purely driven by the size of MSAs. Although bank branch density is highly correlated with total population, the division by total population does not produce a similar and significant heterogeneity. Table 9 also provides suggestive evidence that the substitution effect between crowdfunding and bank loans depends on local competition among banks.

4.5. Robustness Checks

Validity of Instrument

Our identification relies on the assumption that housing supply elasticity affects the creation of crowdfunding projects only through its effect on house prices. The exclusion restriction would be violated if housing supply elasticity is correlated with crowdfunding activity for reasons unrelated to house price drop. First, one possible concern with the instrument is that bank lending behavior was different between low and high elasticity areas (Adelino et al. 2013). If other forms of credit were also less available in low elasticity MSAs relative to high elasticity MSAs during our study period for reasons other than house price drop, this would violate the exclusion restriction for our instrument. To test this, we use data on denial rates of mortgage applications from the House Mortgage Disclosure Act. We assume that higher denial rates represent overall stricter credit decisions in a local market. The denial rate is defined as the number of denied applications divided by the total loan applications in a MSA and in a year. We then compute the proportional change in denial rates between 2008 and 2011.[14] We find that there is no significant difference in denial rates between low and high elasticity areas (unreported but available upon request). We further add the proportionate rate in denial rates directly to our main models and find that our main findings still hold. Last, since small business lending is also a major source for small businesses, we get data on small business lending from the Community Reinvestment Act and calculate the proportionate rate in small business lending in the same way with denial rates. Our findings are robust to including this. Overall, these allow us to rule out an alternative explanation that our instrument may pick up differences in credit conditions across MSAs for reasons unrelated to house prices.

Panel Data Regressions

Since our main cross-sectional models rely heavily on the validity of our instrument, there is always the fear that our instrument may be correlated to some unobserved regional variables that could also affect crowdfunding activities. To dampen this concern, we also conduct panel data regressions while noting a big caveat of this approach to not have any instrument for house price index. Below is the panel data model we are based on:

[14] The data is not available for 2012.

$$Total\ Crowdfunding_{mjt} = \beta_0 + \beta_1 House\ Price\ Index_{mt} + \beta_2 Bank\ Branch\ Density_{mt} + \beta_3 X_{mt} + u_m + v_{jt} + \epsilon_{mjt}$$

where the subscript represents CBSA *m* in category *j* at year *t*.[15] X_{mt} is a vector of location-level variables which vary by CBSA-year. We include a vector of CBSA fixed effects u_m that controls for differences across CBSAs that do not change over time and are common for all categories. Finally, we include in each estimation a vector of category-year fixed effects, v_{jt}, that control for fixed differences in category sizes, crowdfunding rates, competition and so on. These category-year fixed effects also control for different variation in crowdfunding propensity across categories over time. We cluster standard errors by CBSA. Table 10 shows that our main findings are qualitatively the same. Our two main variables of interest appear to become more significant both when we use only the same set of MSAs as our cross-sectional models (see columns (1)-(3)) and when we include all the MSAs where all the variables in the models are available (see columns (4)-(6)).

Word-of-Mouth Effect

The crowdfunding literature suggests that crowdfunding activity can be partly explained by the word-of-mouth (WOM) effect (Aggarwal et al. 2012). If the WOM effect was stronger in low elasticity areas relative to high elasticity areas, this could make our estimates biased. While it is not obvious why this should necessarily be the case, we want to address this. Since measuring the WOM effect in a local area is challenging, we cannot completely rule this out but suspect this will be the case. We already control for several variables, such as population, education, age, income, and race, which might be correlated with the WOM effect (Aral and Walker 2012). Hence, an omitted variable bias, if any, is likely to be small. For example, if large cities happen to have low elasticity areas, this might bias our estimates because large cities are likely to have the greater WOM. Adding population to our model helps us control for this. Furthermore, we use Google trend to generate the search volume on ′crowdfunding’ across states in the US. It is likely that higher search volume represents more popularity of crowdfunding in an area and then leads to more crowdfunding activity. When we directly add this as a proxy for WOM, our main findings still hold.

Endogeneity of Bank Branch Density

We now account for potential endogeneity of bank branch density. We collect data on the number of local bank branches in 2000 which should be more exogenous and use it as the instrument variable for the number of local bank branches in 2008. We present the results in Table 11. Table 11 indicates that our main findings are robust to accounting for this. Furthermore, we observe a significant difference in the effect of bank branch density across MSAs. This effect is significant only for MSAs that have a low

[15] We also drop projects in 2013, since we only have data in January 2013.

number of banks. This may suggest that the marginal effect of having another bank branch diminishes with the number of bank branches.

Nonlinear Effect of Change in Housing Prices

We examine the effect of house prices on crowdfunding during the period 2009-2012 when house prices were generally decreasing because of the recent financial crisis. Thus, one could argue that the importance of collateral availability is overestimated and it may be smaller if we test in the normal economic period with rising house prices. Since our sample is a short panel which spans from 2009 to 2012, it is not feasible to test this for now. Having said that, we have a test to speculate on how crowdfunding may unfold in normal economic periods. In our sample, there are a limited number of MSAs with rising house prices during our study period, while most MSAs were facing declining house prices. We split the sample into two groups depending on whether house price at a MSA has dropped between 2009 and 2012. Table 12 shows that house prices are more influential for MSAs that have declining house prices. This may imply that under normal periods, the collateral effect running through house prices may not be large and significant. However, we have to be cautious about interpreting the finding, since the two groups are not the same. Ideally, we would want to compare the effect of house prices on crowdfunding for the same MSAs between in the period of rising house prices and in the period of declining house prices.

5. Conclusion

In this paper, we have examined how geographic factors affect the creation of crowdfunding projects to provide some insights for the potential of crowdfunding to democratize access to capital. We find that small cities appear to get a disproportionate benefit from crowdfunding. In addition, we use a series of analyses to show that difficulty in accessing credit from banks induces creators to rely more on crowdfunding to fund their projects. Moreover, this effect varies across categories or across areas. We find that tighter credit constraints due to a drop in house price have a stronger effect on creators who initiate larger projects and live in high income MSAs. The impact of geographical proximity to banks is almost entirely via 'location-independent' projects that attract less from local people, whereas 'location-dependent' projects offered online are virtually immune from the competition between online crowdfunding and offline banks. Last, we see that house price change is influential only for MSAs that have low competition between banks in a local market, indicating that a credit shock from house price drop will be stronger for creators who have a higher cost of accessing retail banks.

The findings have interesting implications for the growing literature on crowdfunding, and more broadly for the entrepreneurship literature. Our findings indicate that crowdfunding can serve as a viable alternative for traditional sources of financing. As such, we provide evidence that web-enabled crowdfunding has potential to democratize access to capital in that it can be a viable option for entrepreneurs having difficulty accessing traditional channels of financing. One important question unanswered is whether crowdfunding supports entrepreneurs who are temporarily cash-strapped but have promising ideas (i.e., positive net present value projects) or those who have flawed projects that should not be funded anyway. We are unable to formally address this question here, because we do not have proper quality measures of projects. Having that said, we examine geographical variation in the rate of successfully funded projects. To the extent that the status of successful funding is related to true quality, it could provide us a valuable insight. Figure 2 shows the relationship between house price change and the success rate at a MSA in a scatter plot. We do not see any significant relationship in the plot, indicating that projects that are funded by crowdfunding under tight credit conditions may not be as bad as those funded under normal credit conditions. Furthermore, we regress this measure on house price change and the same control variables and find no significant relationship between house price change and the success rate. It would be of interest to examine whether reduced financing constraints brought about by crowdfunding will lead to the change in the composition of entrepreneurs (Guiso et al. 2004).

Our finding indicates that technology-related projects in game and technology tend to attract the vast majority of investments outside of their home regions. This shows sharp contrast with venture capital investments that are geographically concentrated. Hence, crowdfunding may become a more viable option for promising technology entrepreneurs located outside the three centers of venture capital activity: San Francisco, Boston, and New York. Nevertheless, since the industry is still in its infancy, more research is needed to look at the long-term effect of crowdfunding on technology entrepreneurs.

Our study focuses on the behavior of market participants, especially project creators, in a reward-based crowdfunding market. However, they are likely to behave differently in an equity-based crowdfunding market. Given the importance of the equity-based crowdfunding in supporting ‘real’ innovative firms, it is worthwhile to examine whether we would still find evidence of democratizing access to capital in the equity-based crowdfunding. If crowdfunders worry about the ability of investing firms to raise subsequent funding because of their location, geographical dispersion of crowdfunding activity in the equity-based crowdfunding may not be as large as it is in the reward-based crowdfunding (Agrawal et al. 2013). It would be of interest to investigate this in the future work.

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Table 1: Variable definition

Variable	Definition	Source
Number of crowdfunding projects	Number of projects at Kickstarter	Kickstarter
Credit availability	House price index	Federal Housing Finance Agency
Internet connectivity	Number of high-speed internet service providers	Federal Communications Commission
Unemployment rate	Unemployment rate	Bureau of Labor Statistics
Number of small establishments	Number of establishments with 1-4 employees	County Business Patterns
Total population	Total population	American Community Survey
Bank branch density	Number of bank branches/Land area	US Federal Deposit Insurance Corporation and 2010 US Census
Median household income	Median household income	Small Area Income and Poverty
% White	% population white people	American Community Survey
% Bachelor	% population university graduates	American Community Survey
% Male	% population male	American Community Survey
% population between 20 and 39	% population between 20 and 39	American Community Survey
% population between 40 and 59	% population between 40 and 59	American Community Survey

Table 2: Summary Statistics

Variable	Mean	SD	Minimum	Maximum	Observations
Number of crowdfunding projects in MSA-category	17.08	102.70	0	3,503	3,237
Number of crowdfunding projects per million residents in MSA-category	11.76	23.69	0	478.01	3,237
Total contributions ($) to all projects in MSA-category	123,036	917,538	0	29,600,000	3,237
Number of total contributions of all crowdfunders in MSA-category	229	1011	0	25,944	3,237
House price index in MSA	167	24.26	109.69	253.32	3,237
Change in house price index in MSA	-8.94	11.81	-46.23	30.45	3,237
Number of internet service providers in MSA	18.72	5.69	8.33	39	3,237
Unemployment rate in MSA	0.08	0.03	0.03	0.27	3,237
Number of small establishments in MSA	12,334	29,345	238	333,741	3,237
Total population in MSA	905,401	1,844,948	28,657	18,900,000	3,237
Bank branch density in MSA	1.03	1.07	0.01	8.64	3,237
Median household income in MSA	50,238	9,047	30,513	80,101	3,237
% white in MSA	79.23	11.64	47.69	96.89	3,237
% bachelor in MSA	26.13	7.75	12.5	55.9	3,237
% male in MSA	49.20	0.89	47.07	51.89	3,237
% population between 20 and 39 in MSA	27.45	2.86	20.9	40	3,237
% population between 40 and 59 in MSA	27.55	2.27	16.5	32.2	3,237

Note: The level of crowdfunding activities (i.e., number of crowdfunding projects, number of crowdfunding projects per million residents, total contributions ($) to all projects) are measured between April 2009 and January 2013. House price index and unemployment rate are measured between 2009 and 2012. Number of small establishments is measured between 2008 and 2011. The other variables are measured in 2008.

Table 3: Key Characteristics by Category

Category	Share of local contributions (%)	Average project size in category ($)
Art	27.91	$6,456
Comics	8.06	$8,037
Dance	46.19	$5,347
Design	6.88	$24,130
Fashion	14.43	$9,152
Film	25.66	$22,066
Food	32.67	$14,488
Games	3.72	$41,190
Music	25.91	$8,976
Photography	23.41	$6,969
Publishing	18.19	$12,162
Technology	6.52	$29,950
Theater	49.71	$8,072

Table 4: Geography of Crowdfunding Projects at Kickstarter

		Num of projects				Share (%)			
MSA	MSA name	2010	2011	2012	Total	2010	2011	2012	Total
35620	New York-Northern New Jersey-Long Island, NY-NJ-PA	1511	3200	4073	9304	25.71	16.52	12.21	14.97
31100	Los Angeles-Long Beach-Santa Ana, CA	728	2485	3841	7436	12.39	12.83	11.51	11.96
41860	San Francisco-Oakland-Fremont, CA	304	1035	1499	3008	5.17	5.34	4.49	4.84
16980	Chicago-Naperville-Joliet, IL-IN-WI	230	804	1245	2429	3.91	4.15	3.73	3.91
42660	Seattle-Tacoma-Bellevue, WA	151	526	970	1748	2.57	2.72	2.91	2.81
14460	Boston-Cambridge-Quincy, MA-NH	154	549	896	1698	2.62	2.83	2.69	2.73
38900	Portland-Vancouver-Beaverton, OR-WA	184	552	730	1541	3.13	2.85	2.19	2.48
12420	Austin-Round Rock, TX	122	457	636	1279	2.08	2.36	1.91	2.06
37980	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	104	383	603	1150	1.77	1.98	1.81	1.85
34980	Nashville-Davidson--Murfreesboro, TN	102	368	580	1098	1.74	1.90	1.74	1.77
	Others	2286	9011	18293	31472	38.90	46.52	54.83	50.63
	Total	5876	19370	33366	62163	100.00	100.00	100.00	100.00

Note: When we calculate the total numbers, we also include projects in 2009 and in Jan 2013.

Table 5: Geography of Contributions at Kickstarter

		Num of contributions				Share(%)			
MSA	MSA name	2010	2011	2012	Total	2010	2011	2012	Total
31100	Los Angeles-Long Beach-Santa Ana, CA	4,590	27,794	137,153	175,937	10.08	13.13	16.90	15.46
35620	New York-Northern New Jersey-Long Island, NY-NJ-PA	15,027	43,639	90,671	157,669	33.01	20.62	11.17	13.85
41860	San Francisco-Oakland-Fremont, CA	3,280	18,844	82,696	112,361	7.21	8.90	10.19	9.87
42660	Seattle-Tacoma-Bellevue, WA	977	11,227	58,378	75,760	2.15	5.30	7.19	6.66
16980	Chicago-Naperville-Joliet, IL-IN-WI	3,831	9,449	32,325	48,680	8.42	4.46	3.98	4.28
14460	Boston-Cambridge-Quincy, MA-NH	1,586	7,158	31,411	43,020	3.48	3.38	3.87	3.78
38900	Portland-Vancouver-Beaverton, OR-WA	1,740	8,167	24,776	36,634	3.82	3.86	3.05	3.22
12420	Austin-Round Rock, TX	969	5,159	25,767	33,142	2.13	2.44	3.18	2.91
41940	San Jose-Sunnyvale-Santa Clara, CA	330	1,776	24,236	28,729	0.73	0.84	2.99	2.52
47900	Washington-Arlington-Alexandria, DC-VA-MD-WV	368	2,475	12,822	19,624	0.81	1.17	1.58	1.72
	Others	12,819	75,997	291,240	406,779	28.16	35.90	35.89	35.73
	Total	45,517	211,685	811,475	1,138,335	100.00	100.00	100.00	100.00

Note: When we calculate the total numbers, we also include investments in 2009 and in Jan 2013.

Table 6: Credit Availability and Crowdfunding Activity

	OLS				2SLS IV	2SLS IV	Poisson IV	2SLS IV
Dependent variable	# of projects per million people	Ln(# of projects)	Ln(total amount of contributions to all projects)	Increase in House Price Index	# of project per million people	Ln(# of projects)	# of projects	Ln(total amount of contributions to all projects)
				1st stage	2nd stage	2nd stage	2nd stage	2nd stage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Increase in House Prices	-0.231***	-0.007***	-0.045***		-0.475***	-0.012	-0.068***	-0.102***
	(0.060)	(0.003)	(0.008)		(0.115)	(0.008)	(0.015)	(0.023)
Housing Supply Elasticity				3.029***				
				(0.639)				
Bank Branch Density	-0.438	0.062	-0.219**	0.269	-0.343	0.064	-0.016	-0.197*
	(0.831)	(0.051)	(0.100)	(1.001)	(0.824)	(0.050)	(0.073)	(0.118)
Internet Connectivity	0.126	0.002	0.002	-0.391**	-0.014	-0.001	-0.014*	-0.030
	(0.131)	(0.006)	(0.017)	(0.164)	(0.160)	(0.008)	(0.007)	(0.024)
Increase in Unemployment Rate	-37.918	-2.382	-5.900	59.309	-35.941	-2.344	-1.476	-5.439
	(27.548)	(1.799)	(4.965)	(43.754)	(29.152)	(1.796)	(3.500)	(5.858)
Increase in Small Establishments	0.004**	0.000	-0.000	0.006***	0.005***	0.000	0.000***	0.000
	(0.002)	(0.000)	(0.000)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
Ln(Pop)	0.793	0.816***	2.240***	2.465***	1.084	0.822***	1.248***	2.308***
	(0.918)	(0.048)	(0.109)	(0.751)	(0.938)	(0.049)	(0.043)	(0.121)
Median Income	-0.000	0.000	0.000	-0.000	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% White	0.026	0.001	0.022***	0.241***	0.080	0.002	0.022***	0.034***
	(0.055)	(0.003)	(0.008)	(0.067)	(0.060)	(0.004)	(0.006)	(0.010)
% Bachelor	0.973***	0.041***	0.185***	0.184	1.000***	0.041***	0.082***	0.191***
	(0.154)	(0.008)	(0.022)	(0.147)	(0.153)	(0.008)	(0.012)	(0.023)
% Male	0.914	0.066	0.068	0.169	0.852	0.065	0.046	0.053
	(0.829)	(0.045)	(0.132)	(1.061)	(0.824)	(0.044)	(0.096)	(0.138)
% 20-39	0.388	0.020	0.010	0.132	0.518	0.022	0.041	0.041
	(0.385)	(0.019)	(0.049)	(0.519)	(0.399)	(0.019)	(0.042)	(0.062)
% 40-59	1.000**	0.054**	0.097	0.563	1.162***	0.057**	0.086***	0.135*
	(0.404)	(0.023)	(0.062)	(0.456)	(0.401)	(0.023)	(0.027)	(0.069)
Cate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.3634	0.7627	0.5991	0.2739	0.3513	0.7615		0.5828
N	3237	3237	3237	3237	3237	3237	3237	3237

Note: The table reports the results from OLS and 2SLS estimations. Standard errors are clustered by MSA.
*** significant at 1%; ** significant at 5%; * significant at 10%

Table 7: Effect of Credit Availability by Project Characteristics

	DV: # of project per million	Ln(# of projects)	Ln(total contributions for all projects)	DV: # of project per million		Ln(# of projects)		Ln(total contributions for all projects)	
				Categories (Below 20% of local contributions)	Categories (Above 20% of local contributions)	Categories (Below 20% of local contributions)	Categories (Above 20% of local contributions)	Categories (Below 20% of local contributions)	Categories (Above 20% of local contributions)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Increase in House Prices	-0.005	-0.001	-0.033	0.835***	-0.616*	0.078***	-0.046***	-0.018	-0.086
	(0.166)	(0.010)	(0.040)	(0.322)	(0.365)	(0.024)	(0.012)	(0.086)	(0.071)
Increase in House Prices *share of local contributions	-0.012***	-0.000	-0.001	-0.067***	0.027***	-0.004***	0.002***	0.002	-0.001
	(0.003)	(0.000)	(0.001)	(0.019)	(0.010)	(0.001)	(0.000)	(0.005)	(0.002)
Increase in House Prices *Avg category goal amount/1000	-0.014**	-0.000*	-0.003**	-0.021***	-0.087***	-0.001***	-0.003***	-0.002	-0.001
	(0.006)	(0.000)	(0.001)	(0.007)	(0.028)	(0.000)	(0.001)	(0.002)	(0.003)
Bank Branch Density	-0.343	0.064	-0.197*	-1.167**	0.070	-0.015	0.078	-0.385***	-0.176
	(0.824)	(0.050)	(0.118)	(0.517)	(1.167)	(0.063)	(0.052)	(0.117)	(0.141)
Adjusted R^2	0.3478	0.7608	0.5811	0.3591	0.3109	0.7016	0.7402	0.5419	0.6021
N	3237	3237	3237	1494	1743	1494	1743	1494	1743

Note: The table reports 2SLS estimations. Standard errors are clustered by MSA. For columns (4)-(9), we split the sample into the following two groups by the share of local contributions of each category: categories with the low share (below 20%) of local control contributions (comics, design, fashion, publishing, game, and technology) and categories with the high share (above 20%) of local contributions (art, dance, food, photography, theatre, film, and music).
*** significant at 1%; ** significant at 5%; * significant at 10%

Table 8: Credit Availability and Median Household Income

	# of project per million people	Ln(# of projects)	Ln(total amount of contributions to all projects)	# of project per million people		Ln(# of projects)		Ln(total amount of contributions to all projects)	
				Median Income (Below 25%)	Median Income (Above 75%)	Median Income (Below 25%)	Median Income (Above 75%)	Median Income (Below 25%)	Median Income (Above 75%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Increase in House Prices	1.759*	0.196**	0.101	-0.050	-1.754***	0.009	-0.080***	0.008	-0.197***
	(1.022)	(0.082)	(0.173)	(0.221)	(0.639)	(0.017)	(0.027)	(0.017)	(0.074)
Increase in House Prices * Median Income/1000	-0.045**	-0.004**	-0.004						
	(0.022)	(0.002)	(0.004)						
Median Income	-0.001**	-0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bank Branch Density	-1.869*	-0.095	-0.437***	-1.660	-1.341	-0.160	-0.057	-0.119	-0.265
	(1.022)	(0.079)	(0.143)	(2.843)	(1.947)	(0.232)	(0.081)	(0.184)	(0.231)
Adjusted R^2	0.3355	0.6854	0.5782	0.3671	0.3807	0.4796	0.7886	0.4301	0.4353
N	3237	3237	3237	806	806	806	806	806	806

Note: The table reports 2SLS estimations. Standard errors are clustered by MSA. *** significant at 1%; ** significant at 5%; * significant at 10%

Table 9: Credit Availability and Bank Branch Density

	DV: # of project per million		Ln(# of projects)		Ln(total contributions for all projects)	
	Bank branch density (Below 25%)	Bank branch density (Above 75%)	Bank branch density (Below 25%)	Bank branch density (Above 75%)	Bank branch density (Below 25%)	Bank branch density (Above 75%)
	(1)	(2)	(3)	(4)	(5)	(6)
Increase in House Prices	-0.472***	-2.414	-0.012	-0.136	-0.142***	-0.176
	(0.175)	(2.132)	(0.016)	(0.118)	(0.052)	(0.201)
Bank Branch Density	-7.441	-4.631	-0.922**	-0.294	-2.288	-0.539
	(6.479)	(5.949)	(0.414)	(0.336)	(1.867)	(0.617)
Cate FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.3860	0.0837	0.6421	0.4627	0.5025	0.4577
N	806	806	806	806	806	806

Note: The table reports 2SLS estimations. Standard errors are clustered by MSA.
*** significant at 1%; ** significant at 5%; * significant at 10%

Table 10: Panel Data Regressions

	Same set of MSAs as cross-sectional			All the MSAs		
	# of project per million	Ln(# of projects)	Ln(total contributions for all projects)	DV: # of project per million	Ln(# of projects)	Ln(total contributions for all projects)
	(1)	(2)	(3)	(4)	(5)	(6)
House price index	-0.134***	-0.016***	-0.061***	-0.082***	-0.010***	-0.050***
	(0.028)	(0.004)	(0.012)	(0.015)	(0.002)	(0.008)
Bank Branch Density	-3.286	-1.981*	-6.297**	-6.322*	-2.086**	-8.801***
	(4.063)	(1.143)	(3.046)	(3.423)	(0.828)	(2.656)
Unemployment Rate	-96.184***	-7.573***	-35.285***	-31.029***	-1.750**	-12.164***
	(18.751)	(2.488)	(8.575)	(6.568)	(0.707)	(3.282)
Internet Connectivity	0.092	0.025	0.010	0.073	0.007	-0.015
	(0.107)	(0.016)	(0.037)	(0.063)	(0.008)	(0.025)
Small Establishments	0.000**	0.000	-0.000***	0.000***	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln(Pop)	1.164	-0.493	7.360	4.346	0.293	5.538**
	(13.124)	(1.804)	(5.668)	(4.785)	(0.514)	(2.370)
Median Income	-0.000	-0.000**	-0.000***	-0.000	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R^2	0.3567	0.4145	0.4435	0.1890	0.2129	0.2594
N	12948	12948	12948	39013	39013	39013

Note: The table reports panel data estimations. Standard errors are clustered by MSA. For columns (1) through (3), I use only the same set of MSAs used in our cross-sectional IV regressions. For columns (4) through (6), I include all the MSAs where all the variables used in the models are available.
*** significant at 1%; ** significant at 5%; * significant at 10%

Table 11: Accounting for Endogeneity of Bank Branch Density

	DV: # of project per million	Ln(# of projects)	Ln(total contributions for all projects)	DV: # of project per million		Ln(# of projects)		Ln(total contributions for all projects)	
				Bank branch density (Below 25%)	Bank branch density (Above 75%)	Bank branch density (Below 25%)	Bank branch density (Above 75%)	Bank branch density (Below 25%)	Bank branch density (Above 75%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Increase in House Prices	-0.475***	-0.012	-0.102***	-0.449***	-2.347	-0.010	-0.133	-0.133***	-0.171
	(0.116)	(0.008)	(0.029)	(0.168)	(2.062)	(0.015)	(0.114)	(0.048)	(0.194)
Bank Branch Density	-0.330	0.054	-0.157	-11.571*	-3.562	-1.262***	-0.243	-3.968**	-0.462
	(0.860)	(0.048)	(0.120)	(6.455)	(5.267)	(0.434)	(0.293)	(1.906)	(0.538)
Category FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.3561	0.7632	0.5857	0.4051	0.1117	0.6533	0.4965	0.5245	0.4804
N	3237	3237	3237	806	806	806	806	806	806

Note: The table reports 2SLS estimations. Standard errors are clustered by MSA.
*** significant at 1%; ** significant at 5%; * significant at 10%

Table 12: Nonlinear effects of HPI

	DV: # of project per million		Ln(# of projects)		Ln(total contributions for all projects)	
	MSAs with an increase in house prices	MSAs with a drop in house prices	MSAs with an increase in house prices	MSAs with a drop in house prices	MSAs with an increase in house prices	MSAs with a drop in house prices
Increase in House Prices	0.764	-0.545***	-0.021	-0.020	0.371	-0.106***
	(1.804)	(0.144)	(0.067)	(0.013)	(0.449)	(0.026)
Bank Branch Density	-0.904	-0.808	0.224	0.043	-0.564	-0.252*
	(3.516)	(0.905)	(0.172)	(0.048)	(0.712)	(0.132)
Cate FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.3770	0.3417	0.7709	0.7618	0.4845	0.5687
N	676	2561	676	2561	676	2561

Note: The table reports 2SLS estimations. Standard errors are clustered by MSA.
*** significant at 1%; ** significant at 5%; * significant at 10%

Figure 1: House Price Change and Crowdfunding Activity by MSA

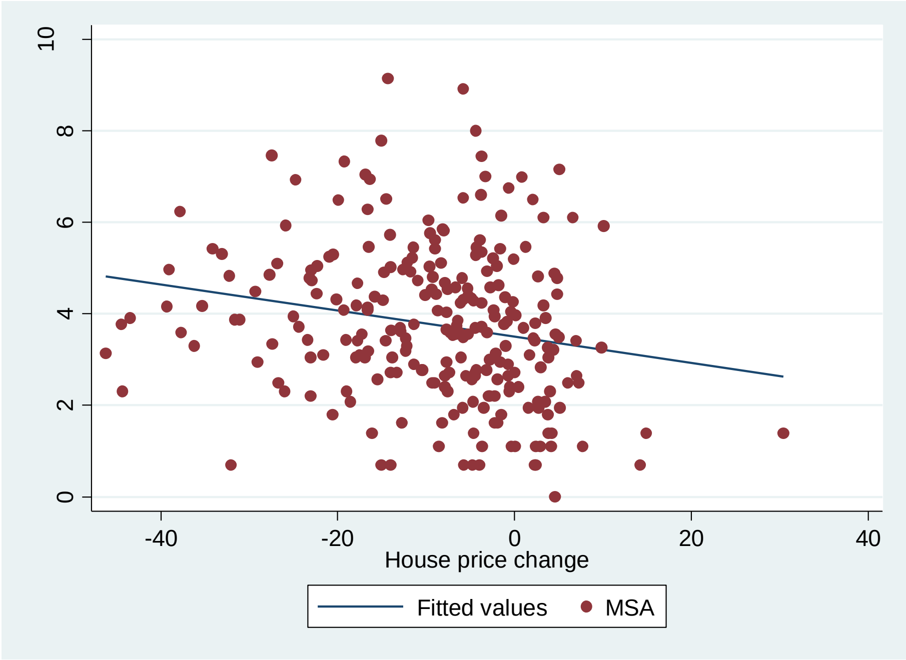

Figure 2: House Price Change and Success Rate by MSA