

REPORT
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CROWDFUNDING AS A CAPITAL SOURCE FOR WOMEN ENTREPRENEURS

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A2F Consulting LLC
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1. STUDY RATIONALE

This research was commissioned by The National Women Business Council (NWBC) to explore the distinct relationship between crowdfunding and women entrepreneurship, and develop a deeper understanding of crowdfunding as capital source. The research aims to: i) identify and document available demographic and other descriptive quantitative information on crowdfunding, including equity crowdfunding; ii) identify gender differences in crowdfunding in terms of industry, goals, investors, platforms used, and success; iii) document existing policies that may support or hinder women’s participation in crowdfunding campaigns; iv) provide additional information and guidance to women entrepreneurs seeking to raise capital through crowdfunding; and v) provide policy recommendations for supporting women entrepreneurs. This will be carried out by synthesizing existing theoretical and empirical literature and analyzing available data on crowdfunding.

Crowdfunding is an alternative finance solution that attempts to fill the gap left by traditional financing sources, especially as it relates to small and medium enterprises (SME) financing needs. Despite the fast growth, the crowdfunding market is still in a nascent stage of development, where future policies and regulations will be shaped by the behavior and experiences of funders and entrepreneurs. As with any new market, it will be prone to distortions caused by the behavior of market participants that expose funders – or in the case of equity crowdfunding - investors to risk. This is why equity-based crowdfunding has, until recently, been the domain of accredited investors (individuals with a large net worth, who can presumably “afford” potential losses). Future studies on the behavioral, as well as traditional economics of crowdfunding, will also play a significant role in the future of the crowdfunding market. The crowdfunding landscape will continue to evolve as legislators seek reforms aimed at addressing these issues and investor protections as the platforms themselves look to introduce mechanisms that assuage investors’ fears.



The crowdfunding market is growing and evolving at a rapid pace. In 2011 crowdfunding platforms raised nearly USD 1.5 billion and funded more than one million successful campaigns, most of which were based in Western Europe and North America. By 2015, the total funds raised reached USD 34 billion.¹ Currently, over 70% of this amount consists of lending-based models. However, equity-based models are expected to lead growth in the market over the near-term, following the relaxation of SEC rules on equity crowdfunding. Indeed, according to Statista, equity-based crowdfunding transaction volume is expected to increase at a rate of 40% annually between 2016 and 2020 in the U.S., rising from 2.1 billion to 8.5 billion over the same period. Regionally, total crowdfunding is dominated by North America at USD 17.3 billion, accounting for 50% of the world's crowdfunding. This is followed by Asia (30.6%) and Europe (18.9%).²

There are currently four types of crowdfunding models: donation-based, rewards-based, lending-based, and equity-based. All models are facilitated through online platforms, where ordinary people, groups, entrepreneurs, and businesses can publish their projects, allowing them to raise money from the crowd. These different forms of crowdfunding use different funding mechanisms, project types, participant profiles, and requirements. Hence, the benefits of different crowdfunding models are likely to differ between entrepreneurs and businesses as well as during different stages of business growth. It is, therefore, important to understand the basis of the crowdfunding platforms. A key difference between the platforms is how they are regulated. Both donation-based and reward-based crowdfunding models are unregulated, whereas lending-based and equity-based crowdfunding models are regulated.

¹ <http://crowdexpert.com/crowdfunding-industry-statistics/> (Accessed 8th of September 2016)

² <http://crowdexpert.com/crowdfunding-industry-statistics/> (Accessed 8th of September 2016)



This report is organized as follows: i) a brief overview of platforms; ii) detailed review of the existing literature; iii) insights into the data perspective and data availability, as well as common challenges facing researchers regarding data; iv) descriptive analysis of pre-scraped datasets using data from Kickstarter (i.e. one of the largest reward-based crowdfunding platforms in the U.S.); and v) conclusion. Literature review and descriptive analysis constitute two primary sections of this report. The literature review synthesizes existing research related to crowdfunding as a capital source, with a focus on women-run crowdfunding campaigns and descriptive analysis that incorporates high-quality sources of available data to analyze the observed patterns and provide an in-depth description of crowdfunding as capital source. In the conclusion section, we summarize the key findings from the literature and descriptive analysis, as well as policy directives derived from the research.



2. DATA AVAILABILITY

2.1. OVERVIEW OF THE CROWDFUNDING PLATFORMS

Kickstarter and Indigogo are the two largest reward-based crowdfunding platforms in the world. Kickstarter is a U.S.-based crowdfunding platform founded in 2009. The company's stated mission is to help bring creative projects to life. Kickstarter has reportedly received USD 2.6 billion in pledges from 11 million backers and is the largest reward-based crowdfunding platform in the world. Indigogo, another U.S.- and reward-based crowdfunding platform founded in 2008, was one of the first to offer crowdfunding. Indiegogo allows people to solicit funds for an idea, charity, or start-up business through two optional business models; namely "keep it all" and "all or nothing".

Among lending-based platforms, Prosper and Kiva are among the most prominent. Kiva is a non-profit organization that allows people to lend money via the internet to low-income entrepreneurs and students in over 80 countries. Kiva provides 0% interest loans to borrowers and its key mission is to "connect people through lending to alleviate poverty". Since 2005, Kiva has raised more than 1.5 million loans totaling in excess of USD 900 million. Prosper on the other hand, has been a more attractive platform to investors. Interest rates on Prosper range from 4.32% to 11.25%, depending on the loan term and borrower rating. Since its inception, Prosper has raised about USD 915 million for nearly two million borrowers.

Equity-crowdfunding is rather new in the U.S. and the largest platforms to date are based in Europe and Australia. Crowdcube is one of the largest equity crowdfunding platforms in the world. It is based in the United Kingdom (UK) and was established in 2011. The platform has approximately 300,000 users searching for interesting investments. Investing in businesses on Crowdcube is free, quick, and entails no obligations. To date, Crowdcube has raised over GBP 160 million. Australian Small Scale



Offerings Board (ASSOB) is another renowned equity-based platform, specifically for small businesses in Australia. ASSOB has permission to raise up to USD 5 million, and to allow registered brokers to assume some legal responsibilities associated with the offer. Investors may choose between start-ups, early, and growth stage businesses.

The new set of rules for U.S. equity-based crowdfunding were signed into law under the Jumpstart Our Business (JOBS) Act. The JOBS Act was intended to encourage the funding of U.S. small businesses and early stage companies. The law comprises several titles exempting companies from the Securities Act of 1933. One of these titles, the Title III rule made the offering of equity on crowdfunding platforms possible. This exemption enables non-authorized investors to enter the U.S. securities market and invest in start-ups and small businesses. The final rules were adopted by the Securities and Exchange Commission in October 2015 and effectively put in place on May 16, 2016. Companies can raise a maximum aggregate amount of USD 1 million through crowdfunding offerings in a 12-month period via registered Title III platforms, whereas non-authorized investors are given restrictions on the investment amount.³

Table 1 presents the list of the main U.S.-based crowdfunding platforms. These platforms are representative across the different crowdfunding models. Furthermore, Table 2 provides a complete list of registered U.S. Title III equity-based crowdfunding platforms. Currently, 20 equity-based platforms are registered with the Securities and Exchange Commission (SEC). Registering with the SEC is a requirement to operate as a Title III, equity-based crowdfunding platform. To date, approximately 85 companies⁴ have successfully raised equity-based crowdfunding capital.

³ The final rules of the JOBS Act permit individual investors, over a 12-month period, to invest in the aggregate across all crowdfunding offerings up to: (i) USD 2,000 or 5% if their income or net worth is less than USD 100,000; or ii) if both their annual income and net worth are equal to or more than \$100,000, 10 percent of the lesser of their annual income or net worth

⁴ According to a phone conference with SEC (August 23, 2016) on how small businesses can learn to take advantage of the new rule.



Table 1: Non-exhaustive List of Crowdfunding Platforms (Reward-based and Lending-based)

Crowdfunding Platform	Year	Key Statistics	Characteristics
Reward-based crowdfunding			
Kickstarter	2009	Funding Raised: <ul style="list-style-type: none"> - USD 2.6 billion Successful Projects: <ul style="list-style-type: none"> - 111,500 Number of Backers: <ul style="list-style-type: none"> - 11 million Overall Success Rate: 36%	<ul style="list-style-type: none"> - Emphasis on creative projects - “All-or-Nothing” approach - U.S.-based Due diligence process: Project Creators must comply with certain requirements. This process is conducted by an algorithm
Indiegogo	2008	Funding Raised: <ul style="list-style-type: none"> - USD 800 million Venture Capital Funding: <ul style="list-style-type: none"> - USD 500 million Number of Backers in 2015 <ul style="list-style-type: none"> - 2.5 million 	<ul style="list-style-type: none"> - “Keep-it-All” approach > 95% of campaigns - “All-or-Nothing” approach <5% of campaigns - U.S.-based - 47% of successful campaigns are run by women
Lending-based crowdfunding			
Prosper	2006	Funding Raised: <ul style="list-style-type: none"> - USD 7 billion Number of Lenders: <ul style="list-style-type: none"> - 2 million 	<ul style="list-style-type: none"> - Three or five-year fixed interest rate - Interest rate determined based upon borrowers’ credit category - Seven credit categories ranging from 4.32% -11.25% - U.S.-based
Kiva	2005	Funding Raised: <ul style="list-style-type: none"> - USD 915 million Number of Borrowers: <ul style="list-style-type: none"> - 2 million Number of Lenders: <ul style="list-style-type: none"> - 1.5 million 	<ul style="list-style-type: none"> - Operates in 82 developing countries partnering with microfinance institutions - Social mission/poverty alleviation - Kiva Zip/USA. was piloted in 2011 - “All-or-Nothing” approach - Interest-free funding



Table 2: Registered U.S. Title III Equity-Based Crowdfunding Platforms⁵

Title III Crowdfunding Platforms	
Crowdboarders LLC	NetCapital Funding Portal Inc.
Crowdfunder.com	NextSeed US LLC
DreamFunded Marketplace, LLC	Not So Small Change, LLC
GrowthFountain Capital, LLC	OpenDeal Inc. (Republic.co)
FlashFunders Funding Portal, LLC	Razital, Inc.
Gridshare LLC	SI Portal, LLC
GrowthFountain Capital, LLC	StartEngine Capital LLC
Indie Crowd Funder, LLC.	Trucrowd INC
Jumpstart Micro, Inc	UFP, LLC
Ksdaq Inc.	Wefunder Portal LLC

2.2. THE DATA PERSPECTIVE

The crowdfunding research relies heavily upon publicly available information that can be extracted from the internet. Web-scraping has enabled researchers to access publicly available information. Relatively large sets of transactional data can be scraped from the websites of crowdfunding platforms. However, information of previously listed campaigns is often deleted from the platform. Kim & Hann (2015) and Marom et al. (2016) explain that the structure of the Kickstarter webpage made it challenging to obtain information on failed projects as these are not directly indexed for internet searches. Furthermore, demographic characteristics of entrepreneurs and backers such as race, ethnicity, age, and gender are not usually publicly available, which limits a wide range of interesting research questions, in particular in regards to gender.

To determine gender, researchers apply proprietary or third-party algorithms designed to recognize female names and thereby assign the gender attribute to project creators. Researchers including Greenberg and Mollick (2014) and Marom et al. (2016) have previously used such techniques. Greenberg & Mollick (2014) used

⁵ <http://www.finra.org/about/funding-portals-we-regulate> (Last Accessed: November 1, 2016)



Genderize.io, whereas Marom et al. (2016) developed a bank of names using online resources and ran their algorithms against it. The method is, however, contingent upon the availability of first names. Indiegogo, for instance, restricts the extraction of names from their crowdfunding platform and is thus excluded from the descriptive data analysis. Collaboration with platforms enables researchers to obtain internal data. Internal data is naturally preferable as it is normally all-inclusive and reliable.

Data availability is even more constrained for equity crowdfunding. As of mid-2016, only about 85 companies had successfully raised equity through crowdfunding in the U.S. The data for a rigorous and significant statistical analysis is thus simply not available. Equity crowdfunding platforms outside of the U.S., such as Crowdcube in the United Kingdom and ASSOBS in Australia, have significant transaction history, which could provide a good basis for research.



3. GENDER ANALYSIS OF KICKSTARTER DATA

3.1. METHODOLOGY

The objective of the descriptive analysis is to employ high-quality and updated sources of available data to further describe crowdfunding as a capital source. It also aims to provide a better understanding of the current patterns with respect to the key available variables such as gender attributes, funding goals, pledges, and spatial attributes. Table 3 presents the complete list of variables obtained and analyzed for the purpose of this study.

Table 3: Kickstarter Dataset - Overview of Variables Obtained from Webrobots.io

Kickstarter Variables	
Extracted Variables	
Name of the project	The project title
Sub-categories	Hundreds of sub-categories falling into one of the following main categories: Art, Comics, Dance, Design, Fashion, Film and Video, Food, Games, Music, Photography, Publishing, Technology, Theatre
Project/funding goal	The amount founders seek to raise using crowdfunding
Amount pledged	Funding achieved using crowdfunding
Name of the project creator	Name of the project creator/entrepreneur
Status	Status of the project includes: i) successful; ii) failed; iii) cancelled; iv) suspended; and v) currently ongoing
Entrepreneur location	Geographical location including city and state
Country	Country in which entrepreneurs reside
Number of project backers	The number of individual backers supporting each campaign
Date	Dates of the launch and end of the project campaign
Generated Variables	
Funding level	The percentage of a project's goal actually raised by project creators
Pledge/backer	Average amount pledged by individual backers
Duration	The number of days for which a project accepts funding
Share of female backers	Percentage of women supporting the project



Descriptive analysis was carried out on a pre-scraped Kickstarter dataset obtained from Webrobot.io. Webrobot.io is a platform for web-scraping and crawling. The obtained dataset contains 129,636 launched campaigns from April 24th, 2009 to September 15th, 2016. It is worth noting, however, that the current analysis is limited to an observational study of project creators. Due to Kickstarter's protection policy, information on individual backers in the pre-scraped dataset is not available.

The study sample is comprised of 86,038 observations, all of which are listed in the U.S., with a total of 51.3% of projects listed as failed and 48.7% listed as successful. The large number of data will provide in-depth insights about the nature of reward-based crowdfunding, crowdfunding dynamics, and its evolution over time. About 25,344 (29.5%) of the project creators in the sample are women, whereas 60,694 (70.5%) are men. The percentage of women is slightly lower than in the study conducted by Marom et al. (2016). He noted that approximately 35% of project creators were women; however, his data covered periods from 2009 to 2012. It is worth mentioning that all previous researchers have used older data. Using the most updated data would provide an opportunity to capture the most recent changes in dynamics of the U.S. reward-crowdfunding over time.

A gender was assigned to all project creators based on his/her first name. API NamSor, a software that classifies names by gender, country of origin, or ethnicity, was used for this purpose. NamSor covers all languages, alphabets, countries, and regions and hundred-thousands of names. The approach is similar to the techniques applied by Marom et al. (2016) and Greenberg and Mollick (2014). In order to ensure the most accurate name-to-gender attribution (male or female), Greenberg and Mollick (2014) generated a probability parameter. In 90.57% of the cases, the probability of assigning the right gender exceeded 90%, suggesting a high degree of accuracy. Marom et al (2016) used a similar approach.



The original pre-scraped Kickstarter dataset was processed and cleaned prior to performing the descriptive data analysis. First, following Marom et al. (2016), a total of 11,601 observations, whose gender were either missing or unknown, were dropped. A large number of the dropped observations included company names. Second, the sample was limited to the U.S. campaigns only, which covered 79% of the original sample. Third, the suspended (636), cancelled (8,760) and ongoing/live (2,529) project campaigns were dropped from the sample. Previous researchers removed campaigns with extreme values, since such values most likely do not represent serious efforts to raise funds, and also distort the results (Mollick 2014, Thies et al. 2016). As a result, this study dropped all observations above USD 8 million (39 campaigns) as well as observations below USD 5 (123 campaigns).

Several challenges were reported by the researchers in relation to the process of data extraction and data scraping. First, Marom et al. (2016) and Kim and Hann (2015) explained that the structure of the Kickstarter webpage made it difficult to obtain failed projects, as these are not indexed for internet searches. Marom et al. (2016) noted that it was possible to recover the information on failed projects if a funder on a failed project also invested in a successful project or an ongoing project during the extraction process. Webrobots.io crawls the Kickstarter platform once a month to include all current and historic projects. However, Kickstarter recently began limiting the number of projects a user may view in a single category and, as a result the data of the projects provided is most likely not as complete as the official raw data.

Some discrepancies were observed between the pre-scraped dataset and the official statistics provided by Kickstarter. On October 31st, 2016, Kickstarter reported a total of 324,179 launched campaigns since the platform's inception, whereas the pre-scraped data counted 129,636. Furthermore, Kickstarter's official success rate was 35.77%, with a total of 114,274 and 205,237 successful and unsuccessful projects, respectively. In the pre-scraped data, the number of successful projects are 54,699, whereas the number of



failed projects are 63,012, leading to a success rate of 46.52%. Marom et al. (2016), Kim and Hann (2015) and Mollick (2014) also noted the presence of discrepancies between the web-scraped data and the official Kickstarter statistics. Mollick (2014) calculated a success rate of 48.1% compared to the official Kickstarter rate of 44.7% (in 2012), pointing out that this was possibly due to issues with extracting data from the Kickstarter site.



3.2. RESULTS

Table 4 shows a summary statistics for funding goals, amounts pledged, the number of project backers, pledges/backers, and duration for the study sample. This included the total sample of 86,038 project campaigns. In order to capture variations within the different categories, the data was disaggregated by gender and status of the project. At first glance, the table reveals a huge dispersion in the data. For example, the average goal overall is USD 19,776, whereas the standard deviation is USD 117,618. The large standard deviation is due to a significantly right-skewed distribution caused by a small percentage of project creators with large funding goals (see Appendix 2). This indicates that the average overall funding goal is increased by the greater proportion of unrealistic goals, but also due to higher average funding goals overall.

The average funding goal for men is much higher than the average funding goal for women, whereas the average amount pledged is approximately the same. This is partly explained by a larger standard deviation. The failed projects' funding goals are three times higher than successful funding goals on average. Furthermore, successful projects receive 18 times more funding than failed projects. The amount pledged on the other hand is equivalent irrespective of gender. Overall the findings are in line with results of previous studies, which found that women in general set lower funding targets but enjoy higher success rates (Marom et al 2016; Greenberg and Mollick 2014).



Table 4: Summary Statistics

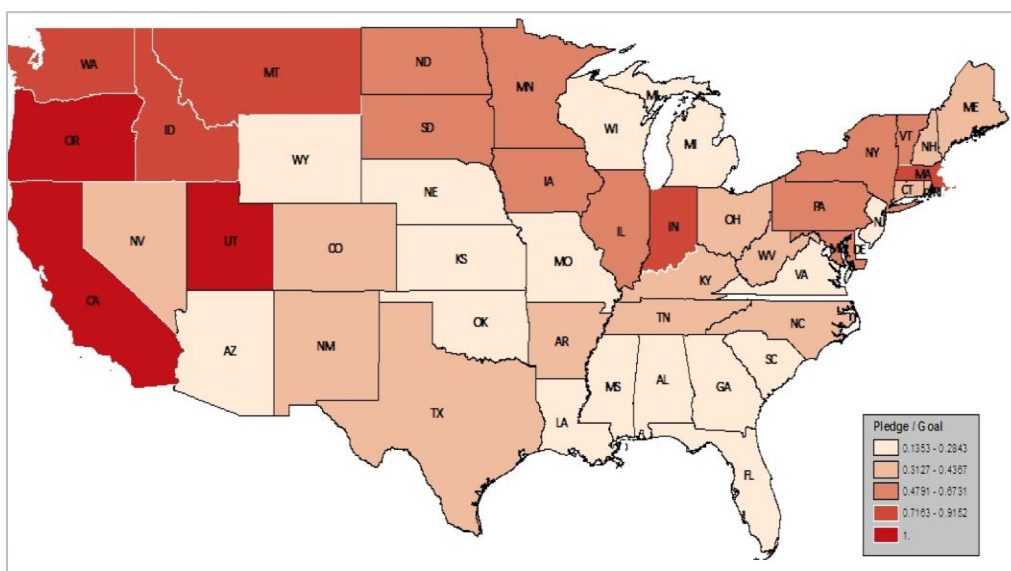
VARIABLES	Number	Mean	Standard Deviation (SD)	Min	Max
Total					
Goal	86,038	19776	117618	5	7,300,000
Amount Pledged	86,038	11,396	127,969	0	20,300,000
Project Backers	86,038	126	880	0	105,857
Pledge/Backer	86,038	65	117	0	10000
Duration	86,021	34	12.5	1	92
Female					
Goal	25,344	14,782	82,232	5	5,000,000
Amount Pledged	25,344	11,184	172,738	0	20,300,000
Project Backers	25,344	118.5	980	0	78,741
Pledge/Backer	25,344	66	101	0	5,012
Duration	25,338	34	12.5	1	92
Male					
Goal	60,694	21,862	129,508	5	7,300,000
Amount Pledged	60,694	11,485	103,706	0	13,300,000
Project Backers	60,694	129	835	0	105,857
Pledge/Backer	60,694	65	123	0	10,000
Duration	60,683	34	12.6	1	92
Successful					
Goal	41,896	9,116	24,286	5	1,100,000
Amount Pledged	41,896	22,136	182,609	8	20,300,000
Project Backers	41,896	243	1,248	1	105,857
Pledge/Backer	41,896	88	118	1.17	5,010
Duration	41,894	33	12	1	92
Failed					
Goal	44,142	29,894	161,847	5	7,300,000
Amount Pledged	44,142	1,203	7,516	0	607,628
Project Backers	44,142	15	92	0	6,550
Pledge/Backer	44,142	43	113	0	10,000
Duration	44,127	35	13	1	92
Table 4 and Figure 1 include the complete data set from April 24 th , 2009 to September 15 th , 2016 Figures 2-5 include data for full calendar years from 2010 to 2015					

The spatial allocation of average funding pledges over funding goals across the various states shows a regional concentration. The average amount of capital pledged flowing to Western U.S. states has exceeded average funding goals, with only a few exceptions. These findings are in line with findings of other studies. Agrawal et al. (2013) noted that although crowdfunding certainly breaks the traditional relationship of funding and



location, crowdfunding funds still flow disproportionately to the same regions as traditional sources of finance. Glaeser and Kerr (2009) argued that some regions simply have a stronger culture of entrepreneurship, which may lead to notable variation across the country, whereas Agrwal et al. (2013) observed that there is a strong correlation between state-level venture-capital financing and funding for technology projects on Kickstarter.

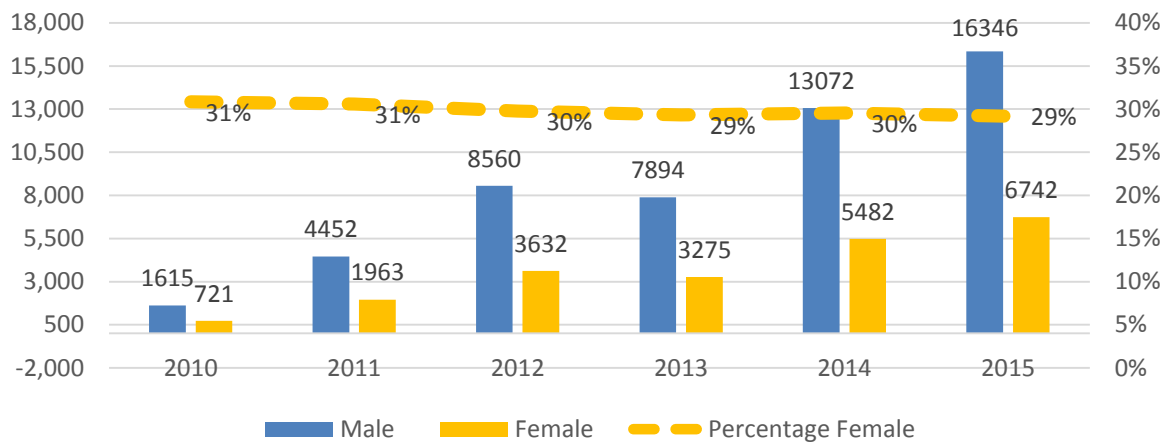
Figure 1: Funding Level by Geographical Location



The ratio of female and male participants has remained unchanged. In 2010, a total number of 2,336 male and female project creators posted Kickstarter campaigns. Between 2010 and 2015, the number of project creators increased by 888%, reaching a total of 23,088 campaigns. While the number of male- and female-led campaigns have increased since Kickstarter’s inception, according to the data, the female participation rate has remained stable ranging between 29% and 31%.



Figure 2: Male & Female Participation/ Female Participation Rate in %



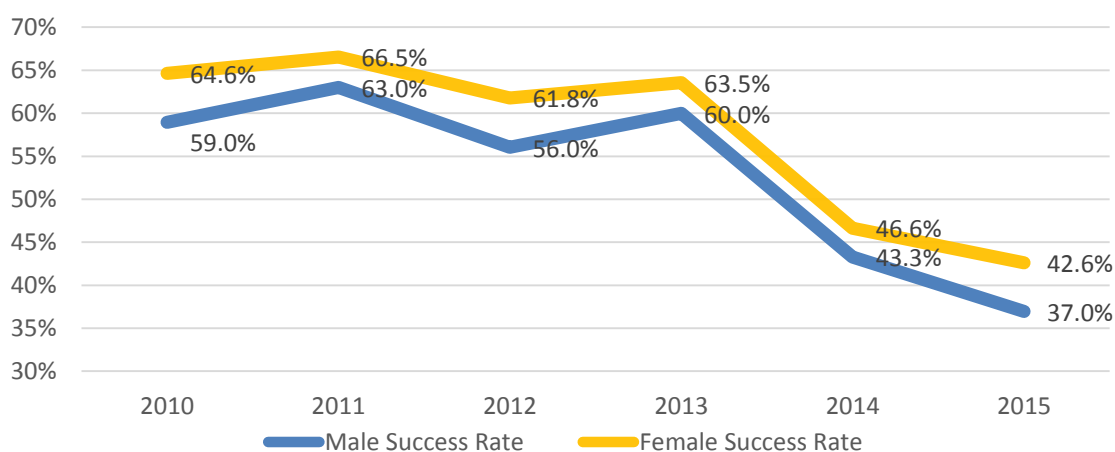
While success rates have diminished overall, female project creators remained more successful in comparison to men. Women are on average 4.6% more successful than their male counterparts. This is the case despite diminishing overall success rates for both women and men between 2010 and 2015. According to Kickstarter, the diminishing success is most likely a result of changing crowdfunding dynamics. When Kickstarter was launched, the project creators engaged in crowdfunding oftentimes had an established network or offline ‘backer community’. However, the increasing popularity of raising monetary contributions from a large number of backers led to the emergence of a more widespread and a broader range of project creators, the majority of whom are without established communities.

The average funding goal set by men is consistently higher than the average funding goal set by women. The average funding goal set by men has disproportionately increased when compared to that of women. Between 2010 and 2013, the average women funding goal ranged between 79%-89% of men’s funding goal, whereas in 2013 it was 77%, in 2014 about 65%, and in 2015 no more than 60%. Along with the average amount of money being pledged per project having increased, the difference between average pledged contributions and average goals has increased in the last two years as



well, particularly for men. In 2014, males on average reached 58% of their average goals, whereas by 2015, they only reached 37%. Women on average reached 55% of their average funding goals in 2014 and 74% in 2015.

Figure 3: Male vs. Female Success Rate (%)



According to Marom et al. (2016), the lower funding goals observed among women, is not the only reason for the higher female success rate. As mentioned earlier, women’s funding goals are consistently lower than men’s funding goals. In contrast, women’s success rates are consistently higher. These findings are in line with those discussed by Marom et al. (2016). Empirical evidence indicates that higher funding goals have a negative correlation to the likelihood of success. However, by pairing 911 projects with similar goals, Marom et al. (2016) found that lower funding goals are not the only driver for the higher success rate of women. Frydrch et al. (2014) argued that women’s generally stronger social networks compared to men’s, might be another reason for their higher success rates.



Figure 4: Average Goal and Average Pledged by Gender

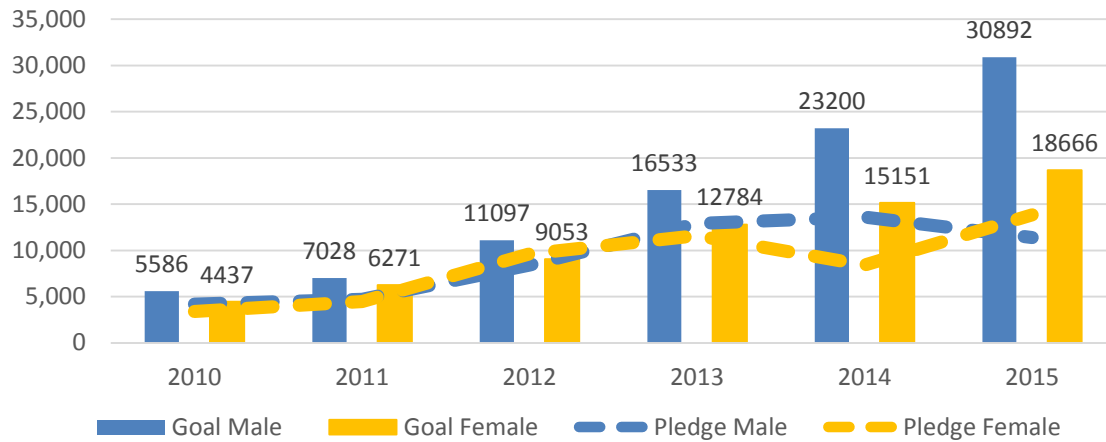
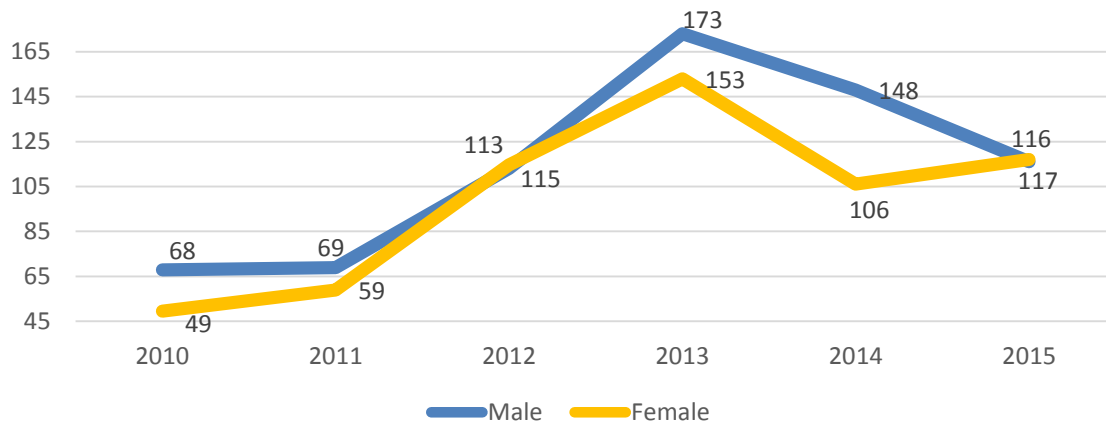


Figure 5: Average Number of Backers by Gender



The percentage of project campaigns with zero backers increased as the average number of backers per campaign grew. In 2010, women project creators attracted on average 49 backers, whereas males attracted on average 68 backers. By 2015, this number had equalized to 117 backers for female project creators and 116 for men. The number of backers has overall increased; however, the same is true for the distribution of the number of project backers per project. In 2010, 9.4% of project campaigns did not receive any support, whereas in 2015, the percent of project creators with no backers



doubled, reaching 18.2%. The increase in the number of projects without any support is likely related to the decrease of the offline 'backers' community'. The decrease in success rates is thus most certainly a result of changing crowdfunding dynamics, leaving a larger proportion of projects unsupported.

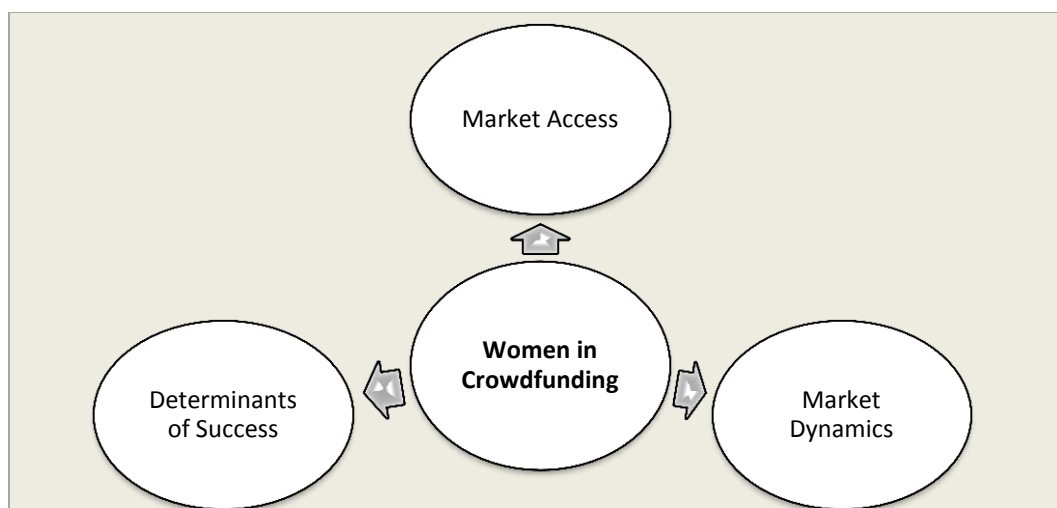


4. FURTHER INSIGHTS FROM ACADEMIC RESEARCH

4.1. MARKET ACCESS

This section provides an overview of existing academic research on women in crowdfunding in respect to market access. Market access in this context encompasses issues such as discrimination and the gender gap in traditional capital markets and the ways and methods by which crowdfunding can help women overcome such market constraints. Also, this section discusses the potential role of market regulations, such as those introduced by the JOBS Act, as well as business models adopted by individual platforms encouraging women investors and entrepreneurs in participating more fully in crowdfunding markets.

Figure 6: Thematic Classification of Existing Academic Research



Several studies argue that women entrepreneurs face more barriers to early-stage financing than their male counterparts in the traditional capital market⁶. Blake (2006) suggests that women do not participate at the same rate as men in entrepreneurship or

⁶ In the literature, traditional capital market primarily includes bank lending, business angels and venture capitalists.



business investing. Women comprised only 36% of business owners and only 20% of businesses with employees other than the owner.⁷ Even for women who start firms, many studies show that women launch firms in sectors with lower capital requirements, such as retail and services, regardless of industry, with significantly smaller amounts of capital than men (Coleman and Robb 2009). Lower levels of capital can limit the ability of firms to grow, as well as increase the risk of financial distress.

Box 1: Statistical Versus Taste-Based Discrimination

Economic theories distinguish between two types of discriminations: i) statistical discrimination and ii) taste-based discrimination. According to the statistical discrimination theory, inequality may exist and persist between demographic groups when economic agents are rational and non-prejudiced. On the other hand, taste-based discrimination explains that inequality between groups may exist due to the presence of prejudice. Accurate statistical discrimination is economically efficient for the decision-maker, while taste-based discrimination stems from non-economic motives and is often costly to the decision-maker (Becker 1993).

In lending-based crowdfunding, Pope and Sydnor (2011) found that African-Americans were 2.4 to 3.2 percentage points less likely to be funded and they often pay higher interest rates. However, they found that the higher interest rates paid by African-American borrowers are associated with their higher statistical probability to default, thus establishing a case for statistical discrimination. Rhue and Clark (2016) found that in reward-based crowdfunding African-American fundraisers face significantly lower success rates, even when controlling for observable project characteristics establishing existence of taste-based discrimination. A general limitation of studies on demographic characteristics and other visual features is that researchers usually classify these aspects manually, using borrowers' profiles pictures, which can be subjective and prone to error. Also, controlling for systematic differences among projects for establishing a causal relationship is another challenge in such studies.

Women participation on the investors side is even lower. Women comprise less than 20% of angel investors in the United States (Sohl, 2014) and less than 6% of partners at

⁷ See NWBC Fact Sheet



venture capital firms (Brush et al. 2014). Research shows that female entrepreneurs are more likely to apply for funding from angel networks with high share of women investors, and, similarly, female investors are more likely to invest in companies with women in their team composition (Becker-Blease and Sohl 2007; Brush et al. 2014), suggesting the potential suppression for women in accessing funds due to a relatively smaller number of female angel investors and venture capitalists.

Research on the causality of the gender gap observed in traditional finance has so far been inconclusive. The major challenge is to distinguish direct or innate gender discrimination referred to as taste-based discriminations from endogenous characteristics or discrimination due to the social context in which female entrepreneurs operate, also referred to as statistical-based discrimination (Carter et al. 2007; Pope and Sydnor 2011). For instance, Coleman and Robb (2009) state that female founders tend to launch firms in industries that are either less attractive to venture capitalists or have lower levels of investor interest, and seek lower levels of capital. Several studies on traditional capital markets, when controlling for these factors, have not found a direct relationship between gender and the ability to secure loans (Carter et al. 2007).

Brooks et al. (2014) offer evidence of a predisposition against women. They find that both real venture capitalists and experimental subjects tend to invest more in pitches made by men than those made by women even when the content of the pitch delivered is consistent. This indicates that when investors cannot perfectly predict the success of a venture and find that on average women have less success, a rational investor may have a bias against women simply because the investor prescribes a worse posterior to the unobservable characteristics. When investment quality cannot explain discrimination against women, it is referred to as intrinsic gender bias — a form of taste-based discrimination.

Literature points to several ways how crowdfunding at least partly addresses gender-



related constraints in fundraising. In essence, crowdfunding platforms make projects equally visible where they either succeed or fail based only on merit (Greensberg 2015, Slate 2013). Some argue that even if the internet does not reduce individual biases, it may enable founders to access a sufficient number of investors, who would fund the founder — a benefit for both male and female founders. The internet brings a larger number of “like-minded” individuals than is normally possible with geography or socially constrained searches (Agrawal et al. 2011). In the academic literature, this has been referred to as democratizing the entrepreneurship funding process.

The “democratization” of entrepreneurship through crowdfunding allows women entrepreneurs, as well as women investors, to participate more fully and actively.

Marom et al. (2016) found that between April 2009 and March 2012, one-third of single-entrepreneur projects were led by women. Women raised on average around 87% of what men raised, however, women-led funding campaigns were more likely to meet their target (69.5% for women versus 61.4% for men). Greenberg & Mollick (2015) and Marom et al. (2016) argue that, compared to traditional sources, the relatively higher proportion of female investors in crowdfunding platforms can partially explain these successes. This view has been also supported by Vismara (2016).

Crowdfunding also appears to reduce constraints for female founders in women-led technology projects.

Results of the Greenberg and Mollick (2014) study showed that in addition to providing access to a wide net of people motivated to help and higher female representation among backers, women’s success in online crowdfunding is driven by the success of female founders in developing technology projects. This is surprising as technology is an industry that is generally male dominated, and has the fewest female backers.

Market regulations and the specific business models of the individual platforms can affect market access. For instance, market regulations introduced by the JOBS Act can



incentivize investors by mitigating risk (e.g. fraud), and potentially introduce some barriers for entrepreneurs. Also, business models adopted by platforms offer a standardized process for both sides of the transaction and facilitate the decision-making process by providing information and a means of communication, thereby reducing information asymmetry and risk while encouraging investors to participate more fully in crowdfunding (Elsner 2013; Haas et al. 2014).

However, a strict regulatory environment could also encourage women investors by reducing the risk of fraud. Studies in financial behavior very often report that women have lower risk propensity compared to men (i.e. this issue will be discussed in more detail in the next section). Although there is still much debate over this issue, assuming lower risk propensity for women, strict regulatory structure could increase the number of women investors in equity crowdfunding. It is worth mentioning that the reported fraud rate in reward-based crowdfunding is low despite the lack of significant outside vetting for projects (Mollick 2015; Schwienbacher 2015).

Similarly, a number of intrinsic features of crowdfunding platforms contribute to reducing the risk of fraud. Examples include threshold funding, the active participation by large communities, the frequent interaction between founders and potential funders, and the ability of founders to broadcast signals of quality through descriptions and biographic information. Mollick (2015) also points out that mass-vetting would expose potential cases of fraud. He notes that crowds seem to be attentive to details of the projects such as spelling errors in the description of the project, manifesting rational behavior in following the herd. Furthermore, Cumming et al. (2015) proposed a hypothesis for future researchers that gender diversity can potentially play an important role in reducing the frequency of frauds.

Different business models used by the platforms may also encourage - at varying degrees - market participation by women. For instance, some crowdfunding platforms



apply the “All or Nothing” (AON) rule, in which donations are returned to investors/backers if a project does not meet its goal. Other sites use a “Keep It All” (KIA) structure, where all donations are kept by the project even if the total is insufficient. Cumming et al (2015), using 22,850 projects from 2011 to 2013 in Indiegogo showed that the AON business model is interpreted by investors as a signal of reduced risk, as underfunded projects will not be undertaken by entrepreneurs. Therefore, one might conclude that AON would be a business model that is preferable for women investors as it is associated with lower risk by participants. Similar findings also were reported by Wash and Solomon (2014).

4.2. MARKET DYNAMICS

This section provides an overview of existing academic research on women in crowdfunding around the theme of market dynamics. Market dynamics refer here to aspects such as funding patterns, gender distribution across different industries, interactions between capital seekers and capital providers by gender, etc. This section also describes observed gender differences on some interesting variables such as funding target (goal), actual raised amount (pledge), and raised premiums in crowdfunding.

Women are overrepresented in some industries and underrepresented in others. Kickstarter projects are divided into 13 categories: Art, Comics, Dance, Design, Fashion, Film and Video, Food, Games, Music, Photography, Publishing, Technology, and Theater. According to Marom et al. (2016), a majority of female entrepreneurs are in the Dance category (77%), and women also make up more than half of the project leaders in the Fashion and Food categories (58% and 54%). These categories are female dominated, however, women representation is also relatively high in Theater (45%), Photography (41%), Publishing (41%), and Art (49%). On the other hand, the shares of male



entrepreneurs are very high in the Comics, Design, Games, and Technology categories which range between 75-92%.

Funding patterns and interactions between funders and project founders are further aspects of market dynamics on crowdfunding platforms. Marom et al (2016) report that, while the majority of investors on the Kickstarter platform are men (56% vs 44%), there is a larger percentage of women investing than seeking funding on Kickstarter. This is an interesting observation given that there is a lower percentage of women investors than entrepreneurs in traditional capital markets. Marom et al. (2016) also conducted a survey of nearly 200 investors (backers) to investigate the gender investment patterns and motivations in Kickstarter. Results from responses received indicate that having invested at least once, women are more likely than men to make more than 10 investments on a crowdfunding platform (13% vs 10%) and less likely than men to make one investment (15% vs 20%). Also, women show a higher tendency to make multiple contributions to a given campaign. Marom et al. (2016) reported a low response rate as one of the limitations in their research.

Equity-based crowdfunding features distinct characteristics with respect to the market dynamics. Herve et al. (2016) reviewed all investments (i.e. 10,142 individual investments) made on the French platform WiSEED in equity and real estate crowdfunding campaigns since its start in 2009. The majority of participants (93%) were men — similar to the findings from Vismara (2016). The authors also found that women invest more often and with higher amounts in safer investments, such as real estate, and less often in risky investments. Furthermore, they found that higher social interactions and communication lead to higher investments for women — perhaps due to the decrease in uncertainty resulting from discussions with others. As a result, the authors suggest that entrepreneurs, who communicate directly with women through email, might attain stronger involvement from them.



Findings on female risk aversion are inconclusive. There is an established body of literature on gender-related differences with respect to investment behavior (Burtch et al. 2014). However, the findings of laboratory experiments are somewhat less conclusive and there is enough counter-evidence to warrant caution (Powell and Ansic 1997; Shubert et al. 1999; Eckel and Grossman 2008). For example, both field and lab studies typically fail to control for knowledge, wealth, marital status, and other demographic factors, which might bias measures of male/female differences in risky choices. Also, there is the lack of comparability across studies. Studies differ by the degree of the risk, the potential payoffs, as well as the nature of the decision that subjects are required to make. In practice, risky financial decisions are inherently contextual.

Marom et al. (2016) found significant signs of intrinsic gender homophily in reward-based crowdfunding. Analysis of investors and project leaders with respect to the gender attribute in Kickstarter indicated that more than 40% of investments (i.e. by number of investments, not amounts) made by female investors were in female entrepreneur-led projects compared to only 22.6% of the investments made by male investors. Marom et al. (2016) observed that the higher the share of females in a project or proportion of female founders, the higher the share of female investors. Their research also confirmed the effects of entrepreneurs' gender on the share of female investors. Brush (2014) found similar results.



Box 2: Gender Homophily

Gender homophily refers to the tendency to prefer one's own gender when making investments. There are two main drivers of gender homophily. First, a person may have a psychological bias in favor of lending to their own gender, which cannot be explained by the return on investment alone. This is referred to as **intrinsic gender homophily** (Greenberg and Mollick 2014). Second, female entrepreneurs disproportionately tend to enter industries with female-dominated customer bases such as fashion, cosmetics, and cooking. The overwhelmingly male investor base may be less suited to evaluate the value of such businesses, and therefore, less likely to invest. **This is called industry-mediated gender homophily** (Brooks et al. 2014). Industry-mediated gender homophily is also evidenced in the U.S. Census Bureau data as women-owned firms are more concentrated in sectors such as health care and social assistance, educational services, retail, administrative and support services, and other services.

Equity crowdfunding shows mixed results with respect to gender homophily on different platforms. Vismara et al (2016) found the number of female investors in campaigns by female-led projects to be nearly twice as high compared to their male counterparts when evaluating a sample of 58 investors from Seeders, a UK-based equity crowdfunding platform. Mohammadi and Shafi (2016), however, in an exploratory study using a sample of 1979 investors from the Swedish equity crowdfunding platform FundedByMe, found that female investors are more likely to invest in projects, in which the proportion of male investors is higher. This is in contrast with intrinsic homophily observed in other types of crowdfunding platforms (e.g., reward-based, donation-based).

Funding targets differ depending on the gender of the project creator. Marom et al. (2016) showed that, on the reward-based Kickstarter platform, the average goal set for female founders exceeded that of male founders in the four categories of Comic, Dance, Music, and Technology. In the female-dominated categories of Comic, Dance, and



Music, that outcome could be expected. However, in the Technology category — a male-dominated category — it is quite surprising that women set higher goals and achieved higher success rates in terms of raising capital. In other male dominated categories, women set lower funding goals but still raise substantially more than the set goals when compared to men.

Female founders overall set lower goals, but they enjoy higher success rates in reward –based crowdfunding. Marom et al. (2016) compared the distribution of successful projects by gender with the original distribution of projects. They found that females had larger rates of success across every single category/industry except for Games. The success rates are positively associated with categories, in which women have higher shares such as Dance and Fashion. They noted that in Fashion, where the percentage of women-led projects is 58%, there is a 64% success rate. Clearly, one factor of this success rate is the lower financial target set by women entrepreneurs. Since the outcome of the campaign is a binary indicator; success is only 100% if the goal is met.

Women’s higher success rates in reward-based crowdfunding, however, is not only due to setting lower financial targets. After Marom’s et al. (2016) initial observation regarding higher success rates of women and to investigate this issue further, they used propensity score matching to pair similar projects with the only difference being founders’ gender, resulting in 911 matched pairs. Interestingly, they found that, even with similar funding goals, women still demonstrate higher success rates (80% vs 73.7%), confirming the fact that a lower funding target is not the only driver of higher success rates among female entrepreneurs. Frydrych et al. (2014), using data from Kickstarter, obtained similar results.

The analysis of amounts raised in excess of the original funding goal (i.e. Raised Premium) also reveal differences between men and women. According to Marom et al (2016), on average for successful projects, male entrepreneurs raised more than five



times their funding target and their mean premium was more than three times that of women. Women on the other hand raised 45% more than their funding target. However, raised premiums and the gender differences in those premiums varied noticeably by industry. For instance, in Fashion, where women constitute the majority of project founders, they raised on average more than six times their funding target as compared with men, who raised about 30% on average more. It is possible this could be related to women's lower funding goals.

For group projects, team composition is a noteworthy aspect in crowdfunding. Marom et al. (2016) found that approximately 61% of the total teams — projects that involved at least two leading entrepreneurs — included a female, compared with 79% for males. Comparing these figures with teams of business owners indicates that women are less likely to be part of a team of business owners, particularly in businesses with high growth potential. In fact, partnership with men, especially in male-dominated industries/categories, could be considered as one way for female entrepreneurs to overcome obstacles in accessing resources for their ventures (Coleman and Robb 2012).

“Herding Behavior” in crowdfunding might provide unique benefits for women by allowing them to take full advantage of their social capital. Herding occurs when individuals' private information is influenced by public information about the decisions of a group (Baddleley 2012). Herzenstein et al. (2011) estimated that a 1% increase in previous “bids” on Prosper leads to a 15% increase in the probability of an additional bid to the point at which it has received full funding. Previous studies indicate that early funding is associated with family, friends, and one's social network (Agrawal et al. 2013; Herzenstein et al 2011, Ajrouch et al. 2005). Although this may seem to have a small impact at the initiation of the funding process, it could potentially have a much larger impact as a result of herding. Mohammad and Shafi (2016) assessed gender-related herding effects in equity-based crowdfunding, and found that such herding is rational as opposed to the intrinsic gender homophily found in other types of crowdfunding.



The herding effect differs by types of crowdfunding. Previous support lead to increased momentum for future support on most crowdfunding platforms; however, the Kuppusvamy and Bayus (2015) study of Kickstarter data showed that the support of reward-based crowdfunding is negatively related with past funders' support. They also found that additional backer support is positively related to project updates, and updates are more likely to be posted during the first week and last three days of the funding cycle. Therefore, backers are more likely to contribute to a project in the first and last week as opposed to the middle period, when updates are posted forming a U-shaped pattern.

The spatial allocation of capital for early-stage projects points to another important difference between crowdfunding and traditional finance. Given the online nature, crowdfunding can help increase access to financial capital in regions that had disproportionately less access in traditional capital markets. Crowdfunding breaks the traditional association between funding and location proximity. However, collective studies investigating the relationship between crowdfunding and location proximity show that although online platforms have disconnected geographical constraints to some extent, the geographical distance between funders and capital seekers still matters.

Crowdfunding can be particularly helpful for women entrepreneurs in financially underserved regions. Kim and Hann (2015), using data from Kickstarter, conducted a series of regressions to examine the effect of housing prices on crowdfunding activities across various Metropolitan Statistical Areas (MSAs). The sample was constrained to projects in the Technology and Games categories due to similarities with traditional technology ventures. Using housing prices as the proxy for the cost of traditional sources of financing, they concluded that online crowdfunding may offer new opportunities for entrepreneurs in geographic areas facing difficulty accessing traditional offline channels of credit.



4.3. DETERMINANTS OF SUCCESS

This section provides an overview of existing academic research on women in crowdfunding around the theme of determinants of success. Determinants of success include issues such as general predictors of success in different types of crowdfunding, roles of social networks, the signaling effect in helping women achieve higher success rates, and overall reduce risk of investment and information asymmetry. It also discusses the general role of incentives and motivations in different crowdfunding platforms and how these motives can affect the overall success of crowdfunding campaigns.

Determinants of success vary among different types of crowdfunding. In reward-based platforms, Frydrych et al (2014) point out that lower funding targets and shorter duration periods are primary predictors of success. Studies show that lower funding targets have contributed partly to women's success in crowdfunding campaigns (Marom et al. 2016; Greenberg and Mollick 2014). In lending-based platforms, Lin et al. (2009) note that sharing reputable hard information leads to success for borrowers. In equity-based platforms for capital seekers, a higher rate of return is a primary incentive and one predictor of success (Agrewal et al. 2013). Moreover, both theory and empirical data confirms that social or non-profit companies are more likely to succeed in reward-based crowdfunding campaigns (Belleflamme et al 2013; Schwienbacher et al 2013) as non-profit organizations might be viewed by crowdfunders as more credible due to their larger community commitment.

The role of social networks as a determinant of success in funding new ventures has long been emphasized (Hsu 2007 and can be particularly advantageous for women entrepreneurs. Ajrouch et al. (2005) point out that women tend to have larger and closer social networks, but smaller professional networks. While the latter is more



important for business-related pursuits, it is plausible, if not likely, that the social network overall is more relevant for crowdfunding success. This might be another fundamental reason that crowdfunding is more amenable to women entrepreneurs. In a major study using data from Kickstarter, Mollick (2014) used Facebook friends as a proxy for the size of the founder's social network and found that the size of a founder's social network is a predictor of success⁸.

Social networks have “signaling effects”, which can influence the success of project campaigns on crowdfunding platforms. Signaling effects refer to the manner, in which entrepreneurs signal their venture's value. Normally, founders are assumed to be more informed about a venture's true value than the potential investors. Potential investors in crowdfunding platforms are typically small investors that lack extensive experience in assessing an investment while Venture Capitalists (VCs) are generally very skilled in assessing start-ups (Moritz and Block 2016). Compounding this lack of experience, small investors usually only hold a small portion of equity; therefore, they do not normally have the incentives to extensively research and assess potential investments.

The role of social capital as a signal of quality and a determinant of success in equity-based crowdfunding has not yet been completely determined. Social capital refers to the links and shared values in society that enable individuals to trust each other and work together (OECD 2007). In crowdfunding literature, social network is typically used as a proxy for social capital. Vismara (2016) used a sample of 271 projects from 2011-2014, listed on Crowdcube to examine the effect of social capital on fundraising success. Their findings are contrary to the findings of Ahlers (2015). While Ahlers (2015) did not find social networks significant, Vismara (2016) noted that social connections in equity crowdfunding will help increase pitch popularity and, as a result, attract more investors and capital.

⁸ Also their results show that having no Facebook account is better than having few online connections.



Several studies suggest that online crowdfunding platforms may help men and women investors to quantify 'soft information'⁹. For instance, verifiable friendships can be considered as an example of soft information. In lending-based crowdfunding, Lin et al. (2012) found verifiable friendship to be a credible signal of credit quality that lenders take into consideration in their investment decision. Friendship in this context refers to friendship ties formed on the platform, not number of friends on Facebook or other social networking websites, where lenders can check such friendships ties on the platform. Results indicate that borrowers with a larger online social network are more likely to be funded successfully, with lower interest rates and less likelihood of default.

In lending-based platforms, friendship ties can also be a success factor due to the social stigma associated with default. Social stigma has been highlighted by academic literature as an additional cost of loan default (Grenadier and Malenko 2010; Morellec and Schurho 2010). If a borrower fails to return the loan, he/she will suffer consequences such as lower credit scores, increase in credit costs, or contraction in credit supply (Crocker, Major and Steele, 1998). The social stigma effects are relevant only when friends are aware of the default and can associate it with the borrowers. Lin et al. (2012) mention that, "If social stigma costs matter, borrowers who perceive themselves as being likely to default should avoid forming friendships." This makes lack of friendships a potential signal of default, since borrowers who perceive themselves as incapable of returning their debt might avoid creating a large network of friends in such platforms.

There is evidence that female investors consider retaining equity by owners as a quality signal. Mohammadi and Shafi (2016), using data from a the Swedish equity-based crowdfunding platform FundedByMe, found that female investors in particular are less likely to invest in the equity of firms that have a high percentage of equity

⁹ Soft information is non-standard information about borrowers; the finance literature has emphasized its importance in the mitigation of adverse selection (Petersen and Rajan 2004).



offerings. Ahlers et al. (2015) also explored the role of venture quality (e.g. human capital) and uncertainty of fundraising success (e.g. share of equity retained by owner) using 160 investments extracted from the ASSOBS platform. They noted that intellectual capital, as measured by patents and social capital, had little or no significant impact on funding success. Rather, retaining equity and providing more detailed information about risks are interpreted as effective signals by investors and increase the likelihood of funding success.

Financial roadmaps, risk factors, and internal governance also appear to be significant signals for investors. Ahlers et al. (2013) investigated signals used to convince small investors to commit financial resources in an equity crowdfunding context for start-ups. Using 100 investments from 2006 to 2012 extracted from the Australian equity-based crowdfunding platform ASSOBS, explored the impact of firms' financial roadmaps (e.g.. preplanned exit strategies such as IPOs or acquisitions, external certification), awards, government grants and patents, internal governance (e.g. board structure, and risk factors), amount of equity offered and the presence of disclaimers on fundraising success. One limitation of the study is the small sample size. The authors note, however, that 100 investments can be considered comparable to sample size examined by previous studies (Kaplan and Strömberg 2004).



In general, founders who resort to crowdfunding for obtaining capital are motivated by raising money, getting public attention, and obtaining feedback. Gerber et al. (2015) performed a qualitative study of the crowdfunding community by performing 83 semi-structured interviews with both founders and funders via skype or face-to-face. Motivations on the funder side include the desire to collect rewards, help others, support causes, and be part of a community. They also explored disincentives to crowdfunding participation, whereby they found that among creators the fear of failure, and for supporters the lack of trust are major disincentives. These results are in line with Belleflamme et al (2013). Hemer et al (2010) also pointed out that closing the early stage funding gap in the financing process is one of the major incentives for startups and entrepreneurs.

Box 3: Incentives & Motivations

Incentives and individual motivations can play an important role in the success of crowdfunding campaigns. Previous studies have highlighted different motivations among men and women investors. Marom et al. (2016), through a survey of nearly 200 investors (backers), found that reward is the major driving factor for more than 50% of the men, whereas less than 30% of women reported reward as the major reason for their investment. More than 82% of women contributed to support the **person** leading the campaign, compared with about 75% of men. By comparison, less than 59% of women contributed to support a **cause** versus nearly 68% of men.

Equity crowdfunding features distinct motives for investors from other types of crowdfunding (Vismara 2016). The major driver for equity crowdfunding investors is financial return (Cholakova and Clarysse 2015; Vismara 2016). Non-financial motives play an insignificant role in equity crowdfunding investment decisions, in contrast to non-equity crowdfunding campaigns, in which typical funders are individuals who share a social connection (e.g. family, friend, etc.) with the project founder during the early stage of the funding process (Agrawal et al. 2011). According to the NESTA (2014) survey, the support of a family member, friend, or local business are the least important motivations to invest for equity crowdfunding investors



5. OUTLOOK FOR FUTURE POLICY RESEARCH

This report was aimed at facilitating a deeper understanding of crowdfunding and its potential from the perspective of women. Crowdfunding has the potential to serve large numbers of small entrepreneurs that would have previously been unable to obtain finance from traditional sources. Over the last 15 years, crowdfunding has grown substantially, enabling entrepreneurs with creative ideas to obtain financing by “tapping the crowd”. In October 2015, the U.S. Securities and Exchange Commission (SEC) adopted a new set of rules for equity-based crowdfunding. These new regulations are expected to have a strong influence not only on the crowdfunding market, but also in terms of strengthening small and medium enterprises’ (SME) access to venture capital.

Academic research suggests a greater participation of women in crowdfunding compared to the traditional capital market. A majority of project creators/entrepreneurs on Kickstarter are men, 54% compared to 46% of women. While the ratio of male creators to investors are 54% vs 53%, female investors show a slightly higher rate (47%) compared to participating women entrepreneurs (46%). Given that women investors in traditional capital markets are heavily underrepresented, this indicates that crowdfunding has inspired larger participation of women investors. Greater women participation is important, as findings indicate that women and men favor to lend to their own gender. Research showed that female-led projects received 40% of investments from women as compared to only 22.6% of investments from men.

Although a gender gap also prevails in crowdfunding, the market structure offers women entrepreneurs wider access to like-minded individuals. This is normally impossible in traditional financing methods with geographic or social constraints. There is a universal agreement on the positive effect for women entrepreneurs from the democratization brought by crowdfunding. Literature suggests that the discrimination of women in accessing funding in traditional capital markets is potentially due to a relatively smaller number of female angel investors and venture capitalists.



Crowdfunding platforms make projects equally visible, so they either succeed or fail based only on merit. Therefore, by widening the options for both groups, women entrepreneurs and women investors will be able to participate more actively in receiving or providing funding.

The analysis of the Kickstarter data indicates that the average funding goal set by men is consistently higher than the average funding goal set by women (USD 21,862 vs USD 14,782), whereas the average amount pledged is approximately the same. While the number of male and female led campaigns have increased since Kickstarter's inception, the mentioned ratio of women participants has remained unchanged at about 30%. Nonetheless, women are on average 4.6% more successful than their male counterparts. Finally, analysis of spatial attributes in Kickstarter showed that crowdfunding funds still flow disproportionately to the same regions as traditional sources of finance.

Research on equity crowdfunding is still very incipient. Academic research shows that equity-based crowdfunding is male-dominated with a still existing gender disparity, however, it is more diverse than traditional capital markets. Academic literature also presents contradictory results with respect to gender homophily on different equity crowdfunding platforms. Research also suggests that women invest more often with higher amounts in safer investments and are more responsive to higher social interactions and communications with project owners. Hence, it is expected that entrepreneurs who communicate directly with investors attain stronger involvement from women.

In summary, more research is required to understand the specific determinant of success for women in crowdfunding. Existing research notes that crowdfunding can increase the gender equality in capital markets. However, due to the novelty of the topic and limited data availability, very little is known about predictors of success for women



on these platforms, how these success factors for women differ from those of men, and how these success factors vary across different types of crowdfunding platforms. The findings of this study suggest that further investigation of such topics using updated and reliable data sources will contribute significantly to the current existing literature and yield valuable insights for policy makers and women entrepreneurs.

The impact of the JOBS Act on women entrepreneurs seeking equity funding also merits further investigation. There is much debate around whether the current regulatory structure of the U.S. equity crowdfunding is over regulated or not. However, due to limited data availability, it is still difficult to draw definite conclusions or policy recommendations in this regard. Analyzing the United Kingdom regulatory structure and its impacts on women investors and entrepreneurs would probably yield novel insights for policy makers on this topic. Literature supports the idea that women investors in crowdfunding show more cautionary behavior than their male counterparts and since equity crowdfunding has remained male dominated, strict regulations might be encouraging for women investors. On the other hand, equity crowdfunding typically features a riskier environment than other crowdfunding markets. However, it is still difficult to anticipate the effect of the JOBS Act on women entrepreneurs in equity crowdfunding.

There seems to be a regional concentration of crowdfunding activities and underserved regions might require special attention from policy makers. Results show that crowdfunding funds still flow disproportionately to the same regions as traditional sources of finance. There is also a strong correlation between state-level venture-capital financing and funding for projects on Kickstarter, particularly in the Technology category. Literature suggests several reasons for this manifestation, such as location of human capital and access to capital for follow-up financing. This disproportionate funding flow is expected to be even stronger in equity crowdfunding due to subsequent



financing risks. Therefore, supportive policies and methods to help women in underserved regions might be required from policy makers at the federal and state levels to fill this gap.

Crowdfunding might present unique opportunities for women in the Science, Technology, Engineering and Math (STEM) fields. Academic research showed that women entrepreneurs in Kickstarter not only reached higher success rates in funding their campaigns, but also set higher goals too. This is a surprising observation as data analysis showed that women overall tend to set lower funding goals than men. Since Technology is a male dominated category, these findings suggest that crowdfunding has helped women in Technology. These findings are interesting from a policy point of view, as previous studies found that women in STEM fields are less likely to start their own businesses. Other research suggests that women have been less likely to commercialize their STEM research or develop and launch products in companies they own compared to men. Therefore, further investigation of the ways that crowdfunding can help women in STEM fields would yield interesting insights for policy makers.

Last but not least, another interesting topic of future research could be the extent to which the current U.S. Small Business Administration's (SBA) instruments for financial assistance could be leveraged to further facilitate women's access to crowdfunding. SBA currently provides financial assistance programs for small businesses that have been specifically designed to meet key financing needs, including debt financing, surety bonds, and equity financing. From a policy perspective, it might be beneficial to explore methods that current SBA instruments could be leveraged to encourage women to turn to crowdfunding for their financing needs. For instance, SBA might consider offering matching or complementing funds to those women entrepreneurs, who use crowdfunding as a capital source, or it might consider designing new instruments that specifically help women entrepreneurs, who use crowdfunding for sourcing capital.



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7. LIST OF RESEARCHERS AND PLATFORMS INTERVIEWED

Name	Institution
Researchers	
Douglas Cumming	Schulich School of Business at York University in Toronto, Canada
Ferdinand Thies	Technische Universität Darmstadt, Germany
Dan Marom	The Hebrew University of Jerusalem, Israel
Mingfeng Lin	Eller College of Management at The University of Arizona, USA
Armin Schwiendbacher	SKEMA Business School, France
Jason Greenberg	New York University Stern School of Business, USA
Tim Wright	Twintangibles, United Kingdom
Richard Swart	University of California, Berkeley, USA
Platforms	
Katherine Lynch	KIVA
Michal Rosenn	Kickstarter

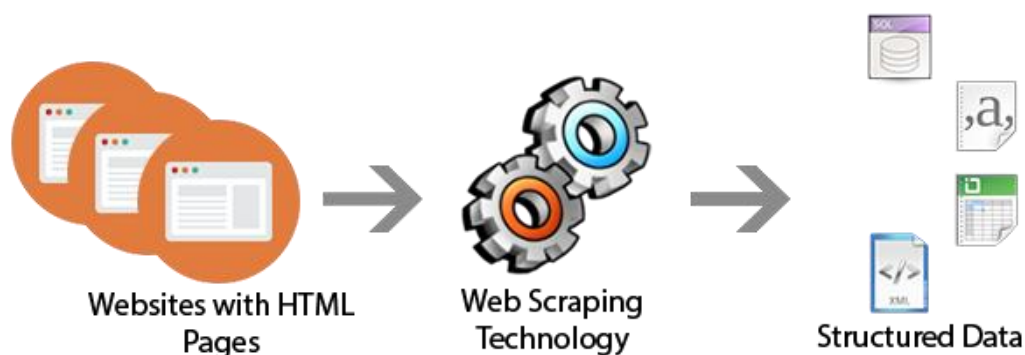


APPENDIX 1: ON WEB SCRAPING

What is Web Scraping?

Web scraping is a term for various methods used to collect information from the Internet. Web scraping is the process of using robots to extract content and data from a website. Generally, this is done with a web crawler that simulates human Web surfing to collect specified bits of information from different websites. Unlike screen scraping, which only copies pixels displayed onscreen, web scraping extracts underlying HTML code and, with it, data stored in a database.

Figure 7: Web Scraping



What is a Web Crawler?

A web crawler is an Internet robot, which helps in web indexing. They crawl one page at a time through a website until all pages have been indexed. Web crawlers help in collecting information about a website and the links related to them, and also help in validating the HTML code and hyperlinks. Information is then stored in a specific file format and analyzed by the user, this process is called data mining.



What is Data Mining?

Data mining is the process of analyzing and transforming hidden patterns of data, based on different perspectives for categorization, into useful information. The information is collected and assembled in common areas, such as data warehouses for efficient analysis, data mining algorithms, facilitating business decision making, and other information requirements to ultimately cut costs and increase revenue.

How Web Scraping Works

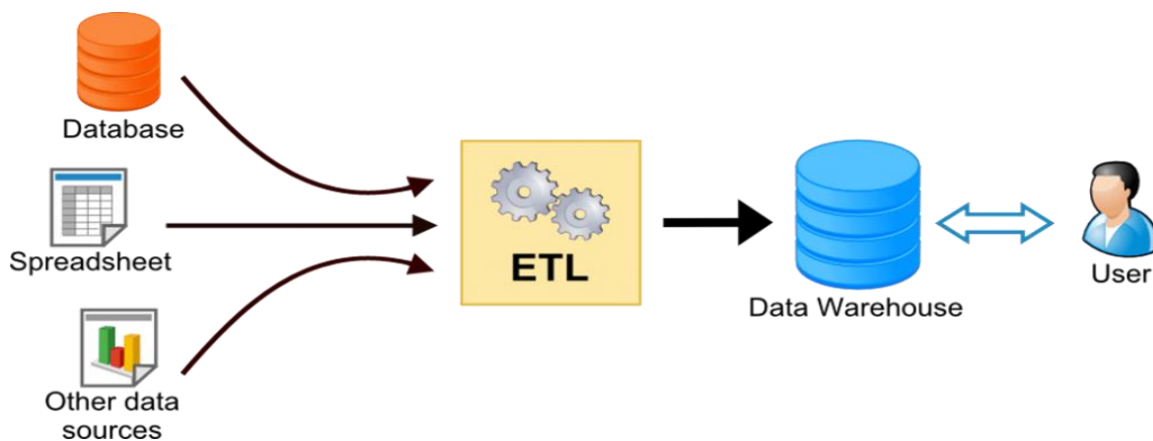
The process of scraping data from a single or multiple web pages can be done by using a tool, or by writing a customized code. It is often a second-best solution when other standardized data extraction and communication method such REST API, or JDBC are not available. The data extraction process under web-scraping works as follows:

1. Get the URL address where the data is displayed;
2. Extract the URL website underlying HTML code;
3. Filter whatever information is needed;
4. Store the remaining data into a specific file format or database.

Some data scraping tools offer immediate data transformation and loading once data has been formatted into CSV, XLS, etc., and provide, thereby, the final user with almost immediate visualization of the data in respect.



Figure 8: Extract Transform and Load (ETL)



Limitations of Web Scraping

Although web scraping has proven to be a powerful tool, there are some issues related to its implementation. First, it is not always easy to make sense of the data extracted. All websites present data in different ways. It is necessary to have a way to normalize it, otherwise it is difficult to derive insights from the data. Automated ways to organize and structure the varied data coming back from many different websites may solve this problem so that it can be integrated into existing business intelligence (BI) and workflows.



APPENDIX 2: DESCRIPTIVE ANALYSIS

Figure 9: Histogram of Funding Goal, Female (Left) vs Male (Right)

