

Democratizing Innovation and Capital Access:

THE ROLE OF CROWDFUNDING

Ethan Mollick

Alicia Robb

This article focuses on how crowdfunding might democratize the commercialization of innovation as well as financing. First, it examines how crowdfunders decide what effort to support and asks how do crowd and expert decisions differ? Second, it investigates whether crowdfunding democratizes access to capital by asking whether groups that have historically been underrepresented in capital markets gain additional access to capital markets through crowdfunding. Finally, it investigates whether crowdfunding leads to the growth of new firms in the same way that traditional funding does. Taken together, these questions point at a potentially vast alternative infrastructure for developing, funding, and commercializing innovation. (Keywords: Capital Investment, Crowdsourcing, Organizational Behavior, Women in Business, Commercialization, Disruptive Technology, Entrepreneurship, Innovation)

While innovation is ubiquitous, the choice of which innovations become commercialized has historically been profoundly undemocratic. Small groups of experts, whether Fellows of the Royal Society or modern venture capitalists, have been responsible for deciding which innovations gain institutional support. In most cases, the innovators that bring their ideas before these wise men (and, historically, they have mostly been men) are themselves members of a small elite of highly educated, highly connected individuals. Even as this formula has thrived, mounting evidence has shown that innovation is not restricted to elites, but, rather, that good ideas are everywhere.

As an example of the ubiquitous nature of innovation, over 8% of all consumer households in the UK have engaged in innovative activity in product development in the last three years. Almost a third of these innovations were considered to be the first of their kind, and a quarter were ultimately adopted by others.¹ Indeed, decades of research have shown that users of technology, rather than manufacturers, create key innovations across industry areas ranging from

scientific instruments to sporting goods. Further increasing the spread of innovative activity, the cost of developing innovation has also dropped considerably over the course of the last decade (in the case of web-based businesses, by orders of magnitude), driven by improvements in software, outsourcing, and a wide variety of other factors.

Even with the lower costs of innovating, turning innovations into marketable products still requires capital, and access to funding is tremendously limited for many people. As one example, consider venture capital. A recent report by Babson College found that companies invested in by venture capital are overwhelmingly male; only 2.7% of VC-backed companies had a female CEO.² Other research has found that only a tiny fraction of VC-funded startups were founded by African Americans.³ There is also a lack of diversity among angel investors, who are another important source of equity financing for entrepreneurs. In 2014, women angels represented 26.1% of the angel market, while minority angels accounted less than 10% of the angel population.⁴

This is troubling given that venture capitalists and angel investors are the ones providing the vast majority of the seed funding to get ideas into the marketplace. Research findings from the Center for Talent Innovation, a New York-based think tank headed by Sylvia Ann Hewlett, found that having something inherently in common with the funder, decision maker, or investor makes an enormous difference in fundraising success. In that study, 56 percent of decision makers did not value ideas they didn't personally see a need for, even when evidence suggests that it's a good, marketable idea.⁵ The lack of diversity in the suppliers of equity financing is problematic on its face, but even more so if it leads to a failure to commercialize good ideas from non-traditional sources.

In this context, crowdfunding offers something other funding mechanisms do not—a way to democratize access to the capital needed to commercialize and distribute innovation. Over the past several years, we, along with a variety of other researchers, have investigated the rapid rise of this more democratic world. Our research has primarily focused on Kickstarter, the leading reward-based crowdfunding platform, but we have also looked at some of the emerging class of equity-based platforms. Some of this research is published; much more is still going through the peer review process. Thus, we focus here primarily on our own work, and that done with co-authors, since we can more accurately discuss this work than other papers that still might be subject to change or revisions. However, we do highlight a few research efforts by other authors that touch on this issue as well.

We have focused on several key questions in this early research focusing on if, and how, crowdfunding might democratize the commercialization of innovation. First, we wanted to examine how crowdfunders decide what effort to support, as crowdfunding represents a shift from expert-based decision making to crowd-based decisions. This leads to our first question: how do crowd and expert decisions differ? Second, we wanted to know whether funding is, indeed, democratized: do groups that have historically been underrepresented in capital markets, on both the supply side

Ethan Mollick is the Edward B. and Shirley R. Shils Assistant Professor of Management in the Entrepreneurship Group at the Wharton School of the University of Pennsylvania.

Alicia Robb is a Senior Fellow at the Ewing Marion Kauffman Foundation and a Visiting Scholar at the University of California, Berkeley.

and demand side, gain additional access to capital markets through crowdfunding? Finally, we want to look at the longer term and understand whether crowdfunding leads to the growth of new firms in the same way traditional funding does. Taken together, these questions point at a potentially vast alternative infrastructure for developing, funding, and commercializing innovation. We want to offer some early glimpses into how this world operates.

How Does the Crowd Decide?

Before crowdfunding, experts traditionally oversaw the fundraising process. The first critical issue to understanding the implications of crowdfunding, therefore, is to understand how the opinions of the crowd differ from that of experts. We launched two separate investigations into these potential differences. The first looked at funding in high-technology, product-oriented industries. Startups in these industries are those most likely to seek venture capital, so we sought to understand how the decision criteria used by VCs compared to these decisions made by the crowd. The influence of crowdfunding is not limited to traditional industries, and it is also being felt in artistic and cultural fields. Thus, our second study (with Ramana Nanda) examined arts funding (a large portion of overall crowdfunding goes to the arts) and sought to understand how expert critics and amateur crowdfunders differed in their selection of which products to fund.

Comparing Crowds to VCs

As outlined in the working paper “Swept Away by the Crowd,” we start with perhaps the most well-known group of experts in funding new innovations, venture capitalists.⁶ Despite their biases, venture capitalists are probably the most well-studied and well-regarded assessors of the value of innovations. In trying to understand how venture capitalists make decisions, researchers have found that since technology entrepreneurship is inherently uncertain, venture capitalists often need to act on partial information about particular ventures. Especially important in the selection process, given the often diffuse and unreliable data that surrounds new ventures, are potential signals of quality. These signals can include endorsements from trusted third parties, the backgrounds of the founders, and the degree of preparation and care that goes into the pitches made by entrepreneurs. The expert VC selection process is often highly personal in nature, with these signals communicated during face-to-face meetings, shared activities, and the extensive use of shared network connections.

While a lot is known about the signals VCs look for when funding a venture, we know much less about how the crowd decides what to fund. We started to address this issue by examining the signals that the crowd looks for when funding new ideas, and then comparing them to what experts seek. If crowdfunding responds to known quality signals in the same way as venture capitalists, it reinforces both the validity of these factors in predicting the performance of entrepreneurial ventures and the ability of crowdfunding to select appropriate ventures to back. At the same time, complete overlap between venture capitalists and crowdfunding would suggest that crowdfunding would be no more democratic than other forms of fundraising.

So what do VCs look for? Of the many potential signals of future success for startups, scholars have found that venture capitalists seem to be particularly attentive to the quality of the startup team in making decisions about whether to invest in a particular venture.⁷ In particular, given the variability in individual ability, the backgrounds and past successes of founders are used as signals of potential future success. VCs have come to believe that past performance is the best indicator of future performance, and thus are more likely to fund organizations that spin off from prominent firms or successful projects.

Signals of quality can come not just from the startup teams themselves, but from outside endorsements, whether in the form of articles written by journalists or positive word-of-mouth from prominent experts in the field. Finally, expert VCs also judge the degree to which entrepreneurs are prepared to exploit the opportunity they have identified. While research has been divided on the importance of business plans in general, venture capitalists look for preparation as a signal that entrepreneurs understand the risks and pitfalls of a new business, and have a plan to overcome obstacles that present themselves.

To find out whether the factors that mattered to VCs—team pedigree, outside endorsements, and extensive preparation—influenced crowdfunding success, we examined 2,101 projects that fit within the typical purview of VC-backed companies: hardware, software, video games, and product design spaces that had raised at least \$5,000. For each project, substantial data was gathered from the Kickstarter site and researchers were used to code the degree to which projects demonstrated outside endorsements (such as media quotes), provided evidence of prototypes or early versions of projects, and invoked past successful projects or employers by name. The raters agreed in the vast majority of cases (88% agreement on endorsement, 91% on prototypes, and 81% on the use of past project names).

All three signals proved to be highly influential on the crowd. The findings suggest that the signals of quality that are used by VCs to assess the viability of new ventures are also used by crowdfunders. This suggests that crowdfunding has the ability to distinguish quality potential projects from less-promising ones. From this perspective, funders act like venture capitalists or other traditional sources of capital and evaluate the quality of the product, the team, and the likelihood of success. Not every project gets funded, and those that are funded tend to be ones that show signals of success that experts, such as venture capitalists, look for in companies that they invest in. Having teams with histories of success, demonstrating prototypes, and other factors that show that a team is of high quality are all correlated with a higher likelihood of a project getting funded. Projects that do not have these characteristics or aren't as well prepared are more likely to fail; for example, spelling errors in a campaign's pitch lower the chance of being successfully funded by 13%.

Given these results, it is perhaps unsurprising that crowdfunding and venture capital are increasingly seen as complements. Crowdfunding serves as an excellent tool for demonstrating demand, since it shows a willingness to pay for a product. It also represents free cash flow for the creators. Analyst firm CB Insights found that, as of mid-2014, over \$320 million dollars of VC funding had gone to companies that had started through crowdfunding.⁸ While it remains too early to tell if crowdfunding

will be a complement or substitute for angel and VC capital, early evidence suggests that it may play both roles.

The crowd does not simply select projects; there seems to be strong evidence that the crowd also does a good job performing due diligence on projects as well. Despite a lack of official oversight or controls, successfully funded fraudulent projects are rare.⁹ The amount of money pledged to projects that ultimately seem to have no probability of being delivered accounts for less than 0.1 percent of all pledged funds. This is not because of regulation, but rather because the crowd, collectively, is wise in spotting fraud. This is the principle of Linus's Law (named by Eric Raymond after Linus Torvald, the inventor of Linux): that any given problem is trivial to somebody with the right experience. When a project is interesting to a community, many individuals will examine it, and there is a very good chance that at least a few of them have the expertise to detect errors and omissions that could indicate less-honest creators.

Comparing Crowds versus Experts in the Arts

At the same time, if VC and crowdfunding are sensitive to similar signals, it suggests that perhaps crowdfunding may not be as democratic as expected. In order to better examine this, we turn to another study examining crowds versus experts in the arts. By sheer numbers of projects, the arts dominate crowdfunding, making up, conservatively, 80% of the projects on Kickstarter. In fact, by most measures, since 2012 more money has gone to the arts through Kickstarter than the National Endowment of the Arts, meaning the crowd now has more influence on funding new artwork than expert grant judges. This represents a profound change in how the arts are funded, but also raises important questions about how these changes in funding approaches may ultimately alter what sorts of art is created. Traditionally, there has been a huge gap between the "high culture" of critics (opera, classical music) and the "low culture" of a popular audience (rock, hip hop). Does switching from an expert-run to a crowd-focused system mean the end of high culture? Or does the crowd simply follow the same signals as experts?

To find out, Mollick and Nanda asked professional judges, such as those that sat on official NEA panels, to rate projects posted on Kickstarter along a wide range of criteria, including artistic merit, innovation, and audience reach.¹⁰ Surprisingly, the experts and the crowd usually agreed on which projects were of high quality across a wide variety of measures, which is similar to the results from the earlier VC study. The overlap was not complete, however, and when the crowd and experts disagreed it was, in over two-thirds of the cases, because the crowd was willing to fund projects that the experts alone were not. The crowd therefore increased the number of high-quality works being funded over the expert-run system.

Further, when these projects were tracked, it appeared that those funded by the crowd were slightly more likely to fail, but also appeared to be more likely to actually achieve giant success—such as winning prestigious theater awards or running off-Broadway. The crowd actually seemed to do a good job of selecting more artistically daring projects than the traditional expert-run system.

Taken together, these results suggest some important features of a more democratic funding system for new innovations. First, the way that crowds assess innovations seems to frequently align with the assessment of experts, so a more democratic world is not necessarily one in which populism trumps quality. Second, the crowd seems to be good at spotting fraud. Far from being naïve, the crowd tended to do an excellent job in identifying and avoiding projects that were simply designed as money grabs. Finally, though the crowd follows similar signals as experts, they allow more projects to be funded, offering a chance to get more ideas of high quality funded and lowering the barrier to entry while keeping quality high.

Does Crowdfunding Democratize Capital Markets?

In our first set of studies, we examined whether the crowd made good decisions compared to experts, and the answer appeared to be yes. However, a rational crowd does not necessarily mean that funding is available to more innovators. To examine the degree to which crowdfunding democratizes access to funding, we look at two potential types of bias: geographic and gender bias.

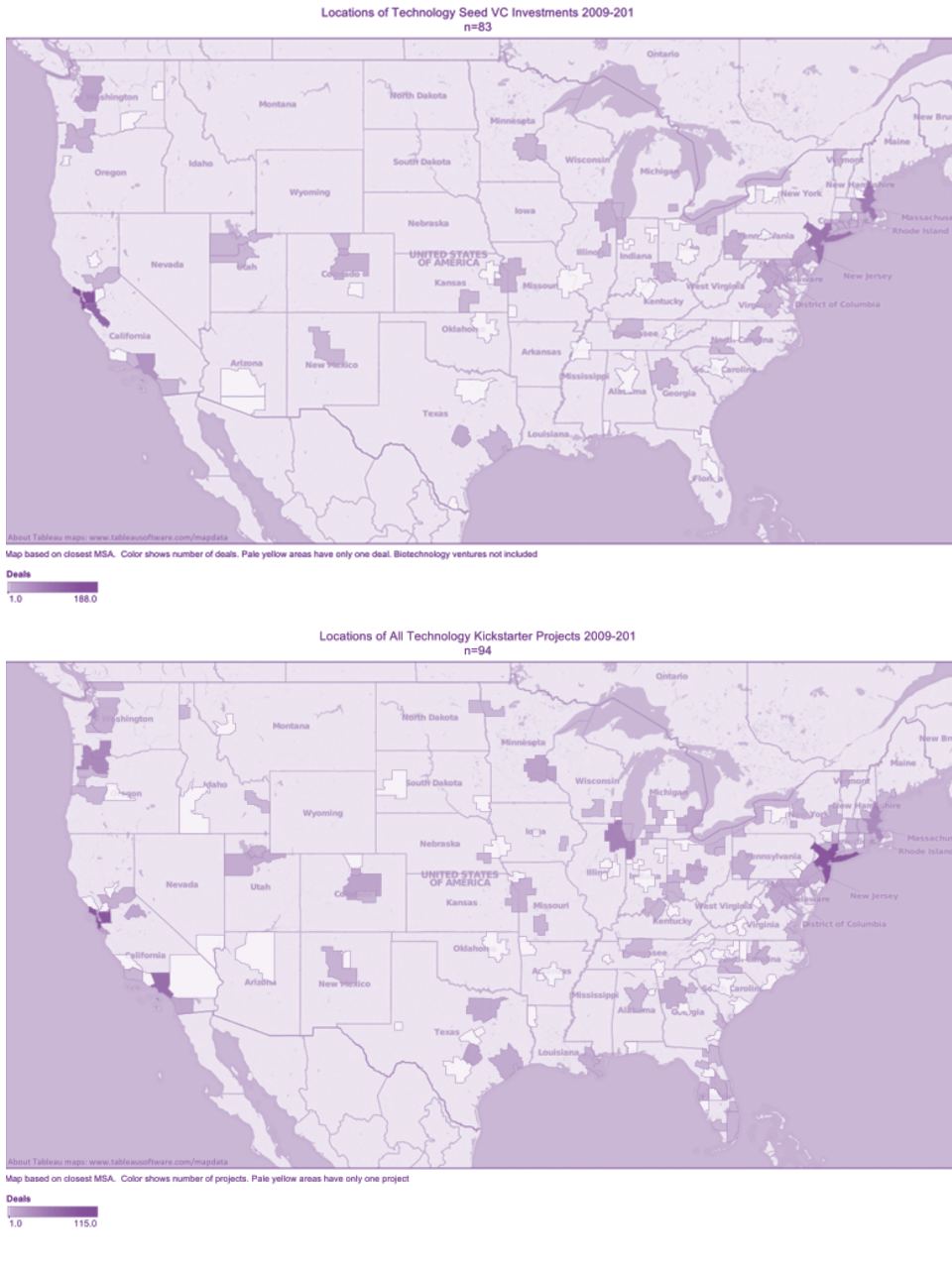
Democratization and Geography

Due to the need for in-person evaluation and monitoring, venture capital investments are highly concentrated in just a few geographic areas, where both entrepreneurs and venture capital firms are located.¹¹ In fact, Stuart and Sorenson found that the average distance between a lead VC and his or her investment is 70 miles. However, crowdfunding need not be subject to the same geographic constraints as VC investment. In Agarwal, Catalini, and Goldfarb's study of crowdfunding in the recording industry, they find that backers are much more widely geographically distributed, though backer distance is constrained by the social networks of the musicians seeking funding. This wider funder distribution relaxes a geographic constraint on where funding comes from, but it does not directly address the geographic distribution of successful projects themselves. Here, we might expect to see a similar effect. If monitoring is less of an issue, and backers are willing to fund projects outside of their local areas, then successfully funded entrepreneurs themselves might be more widely and democratically distributed in crowdfunding than in VC selection.

To test whether geographic distribution in crowdfunding is less concentrated than VC funding, we needed a comparison between crowdfunding and venture capital. We used VentureExpert to identify all seed-level VC funding rounds in high technology (excluding biotechnology) from March 2009 through July 2012 in the United States. A total of 835 deals, totaling \$2.7 billion, were found. Funding recipients were identified by MSA, of which 83 (out of 366 in the United States) had funding activity. We compared this to the 582 successful Kickstarter technology entrepreneurship projects that represented 109 MSAs, as well as to the wider universe of 954 technology entrepreneurship projects that received any funding, no matter how small. These areas are mapped in Figure 1.

In order to calculate geographic concentration, we used the locational Gini coefficient.¹² The coefficient takes values greater than zero if the distribution of funded seed projects is more skewed than the overall population, with a 1 indicating

FIGURE I Distribution of Funding



complete concentration. Locational Gini was calculated in two ways. The first method, an absolute score, was based on an even distribution of populations across the 366 MSAs. The second method was a relative score, which compared concentration of funding to the 2010 census population figures per MSA.

Overall, locational Gini coefficients were smaller for crowdfunding, indicating less concentration than in the case of VC seed funding. Three of the four Gini coefficients for crowdfunding were significantly lower than that of VC funding. However, the difference between the relative locational Gini coefficient for crowdfunding of large (over \$5,000) projects was not significantly different than the Gini coefficient for VC funding. These results match visually with the maps in Figure 1, which show that while both crowdfunding and VC selection are clustered, they are not necessarily clustered in the same areas. Thus, crowdfunding is more democratically distributed than VC funding in terms of geography. Clustering still occurs, however, and the unequal distribution of high-technology projects is not that different in magnitude than the inequality of VC-backed projects. So, as of 2012, which was the last date of the data collection, crowdfunding relaxes geographic constraints, but not completely. More research is underway to better understand these issues.

Gender Constraints

More pervasive and difficult to change than geographic bias is gender bias in funding. Numerous studies have documented that female entrepreneurs launch firms in sectors with lower capital requirements, such as retail and services, and, regardless of industry, with significantly smaller amounts of capital than men. The gender gap is even larger on the investor side: Women make up 26 percent of angel investors in the U.S. and less than 6 percent of partners at venture capital firms.¹³ The academic literature clearly documents that women are not participating at rates that men do in either entrepreneurship or in business investing.

These issues are not limited to venture capital. In terms of debt financing, the literature on traditional banking provides some evidence that lenders discriminate against female borrowers as well.¹⁴ A recent Majority Report by the U.S. Senate found that Women entrepreneurs account for just \$1 out of every \$23 in small business lending.¹⁵ Yet, recent studies of online lending platforms in Germany and the United States find that female borrowers have equal or better chances of obtaining funds than do males. Hence, female discrimination in lending seems to be eased through online platforms due to the “wisdom of the lending crowd.”¹⁶

In fact, many crowdfunding supporters argue that crowdfunding of all kinds has the potential to democratize the entrepreneurship funding process and capital markets by serving as a means for both entrepreneurs and investors who have typically been underrepresented in these markets (i.e., women and minorities) to participate more fully.¹⁷ Our present work focuses on gender, but we seek to expand our research to include the study of minorities as well.

A study by Dan Marom, Alicia Robb, and Orly Sade used custom software that retrieved information on 16,641 successful projects, 8,432 failed projects, 22,580 entrepreneurs, 1,108,186 investors (backers), and investments that total more than \$120 million, covering the period from April 2009 (which denotes the inception of Kickstarter) up to March 2012.¹⁸ Using a customized algorithm to determine the gender of the entrepreneur(s) and investor(s), they classified, by gender, 13,533 projects with a single entrepreneur and 539 projects with teams of entrepreneurs, out of a total of 25,073 projects.

They found that women are participating as project leaders on the Kickstarter platform at about the same rate as women in entrepreneurship in the United States (35%). Their findings that women had lower goals and lower raises across project categories are similar to findings from the entrepreneurial finance literature more generally. However, they also found that women enjoy higher rates of success in funding their projects, even after controlling for category and goal amount.

An examination of Kickstarter data by Meek and Sullivan found somewhat higher levels of equality in a narrow category.¹⁹ They identified all successfully funded crowdfunding campaigns in the United States between 2009 and 2012 on sustainably oriented agriculture businesses in the Food category. They found no significant differences in funding goals of men and women, nor in the amount of money raised. In addition, they further examined whether differences existed relative to men and women's firms that were still operating as of March 2015 compared to those that were not operating—again, finding no significant differences.

Perhaps more interesting, Marom, Robb, and Sade found that women were participating at higher rates on the platform as investors than as project leaders, making up nearly 45 percent of the investors. This is important because they found that more than 40 percent of the investments made by female investors went to female-led projects, compared with less than 23 percent of investments made by male investors. Men are even less likely to invest in projects that are female led in categories that are non-traditional industries for women, such as Games and Comics, where men make up the vast majority of leaders.

They conducted a survey of Kickstarter investors and found striking gender differences in reasons for investing in projects. More than half of men contributed for the reward, compared with less than 30 percent of women. Women were much less likely to contribute to campaigns of people not known to them. The authors used survey answers about gender equality questions to investigate if taste-based discrimination played any role in the investment decisions. Their results were consistent with taste-based discrimination by men for female-led projects.

On the flip side of taste-based discrimination, Jason Greenberg and Ethan Mollick examined why, all other things being equal, women are 13% more likely than men to succeed in raising their goal in a crowdfunding campaign. Using lab experiments and data drawn from Kickstarter, they found that women seemed to succeed in areas where female investor concentration was low, rather than high. In a series of experiments, they demonstrated that a proportion of women exhibit "activist choice homophily"—showing a preference for female-led projects. For these activists who were interested in supporting other women, crowdfunding was a way of rectifying historical disadvantage.

Research using equity platforms is much more limited. OurCrowd is a leading global equity crowdfunding platform for accredited investors that funds early stage startups, mainly technology companies.²⁰ Data were provided to Marom, Robb, and Sade on investments during the period October 2012 to January 2015, totaling \$78 million to fifty-three firms. Unfortunately, it turns out that since none of the CEOs or leading founders of these fifty-three technology-related firms was female no analysis was possible. CircleUp, an equity crowdfunding

platform focused on consumer products and retail, has helped 106 companies raise over \$125 million. More than a third of all capital raised has gone to female-led companies. In addition, female-led companies are more likely to be successful in their fundraising on the platform, compared with male-led companies (52% vs. 39%).²¹ Unfortunately, no data are available about the investors on the platform. Even so, these results are promising.

Taken together, this work suggests that some female entrepreneurs who are aware of the differences in discriminatory treatment among investors may choose two strategies. First, she may choose to concentrate effort on those areas where she will find investors that are less likely to discriminate against her, which could explain the concentration of females in female-related categories on the platform. On the other hand, women in predominately male-dominated industries may receive an advantage from activist support by other women. These suggest two potential paths to rectify historical disadvantage through crowdfunding. It is also consistent with the recent emergence of new crowdfunding platforms that specifically support female-led businesses and projects such as MoolaHoop (<www.moola-hoop.com/>), Plum Alley (<<https://plumalley.co/>>), Portfolia (<<http://portfolia.com>>), and others. A variety of crowdfunding platforms are pursuing both of these paths to explicitly include a mission of democratization as part of their fundraising goals.

Among crowdfunding platforms, Portfolia is the only one currently raising equity capital that is focused of female entrepreneurs and female investors. Portfolia creates a social network of engaged investors around women-owned entrepreneurial ventures. Its digital platform makes it possible for individuals and affinity groups to discover and invest in private entrepreneurial companies in their areas of expertise and interest. Companies access both money and markets as investors engage their social networks and collective buying power for the company's competitive advantage and mutual long-term financial gain.

Any equity crowdfunding platform will need to provide investors a flow of positive returns in order to be successful in the long run. The Portfolia community scouts out women entrepreneurs who are creating growth-oriented companies. It searches for companies and teams that understand the importance of connecting with customers early in order to get feedback on products and services, to share the company story with friends and colleagues, and to provide growth capital by investing in the company. Most importantly, Portfolia looks for founding teams that have the expertise and commitment to deliver on their vision.

Shebooks is an example of a company that has raised funds on Portfolia. Shebooks offers a curated selection of short e-books on the topics women care about most. Sold singly or by subscription and downloadable to tablets, smart phones, and e-readers, Shebooks are designed to be read in under 2 hours, perfect for busy women and their book clubs. The Portfolia platform attracted several successful women executives who invested equity for the first time in this company. Once these women and others like them became a part of the platform, they went on to invest in other companies as well.

In the more established rewards-based space, MoolaHoop is a platform created by women to help women leverage the “power of the crowd” to grow their businesses. MoolaHoop enables female entrepreneurs, business owners, and managers to garner financial support for their projects by reaching out to their customers through rewards in the form of special pricing on their products and services and unique experiences. MoolaHoop recognizes women’s expertise in relationship-building and networking, and has created a secure web-based platform especially for female entrepreneurs to help them extend their own “crowd” of supporters in the form of existing and potential customers, professional networks, friends and family. Launched in July 2013, the MoolaHoop site marks the first step in the design and development of a robust ecosystem—the “Hoop”—to fund ideas and provide ongoing services to women business owners. As envisioned by company co-founders Brenda Bazan and Nancy Hayes, MoolaHoop will eventually grow through partnerships to offer a suite of resources supporting women-owned and women-led businesses, including access to funding sources, expert advice, education, and mentoring. Their target market is small businesses aiming to raise \$10,000-\$20,000. Although MoolaHoop targets small firms rather than high-growth ventures, it does provide an alternative source of funding for early stage entrepreneurs, since many women launch their firms with relatively modest goals.

Plum Alley, another rewards-based crowdfunding platform targeting women, grew from a desire to support women entrepreneurs and innovators in a meaningful way. Deborah Jackson, founder of Plum Alley, realized that crowdfunding could serve as a means for encouraging women’s innovation and increasing their access to financial capital. Jackson states, “Plum Alley exists for two reasons: To get more money to women’s ventures and to increase the number of women and men who provide dollars to fund them. This isn’t just a ‘nice to have.’ This is the way that our economy will grow and new jobs will be created.”

Kathryn Moos, Founder and CEO of Vrou, a company that infuses water with essential minerals, antioxidants, and electrolytes, used Plum Alley to raise more than \$30,000 to test new flavors and build out an e-commerce site.²² She exceeded her funding goal, and her products can now be found on the Vrou website and Amazon.com as well as in Whole Foods stores. Commenting on her experience with Plum Alley in a Wall Street Journal blog, Moos stated: “I don’t know if it will ultimately solve the problem for women entrepreneurs that want to really scale their business, but we see this as an opportunity to start to really build upon our brand.”²³

Consistent with Moos’ observation, although Plum Alley and MoolaHoop can serve small businesses, these platforms have not yet been used by companies that need to raise significant amounts of capital. Alternatively, equity platforms such as Portfolia and CircleUp provide larger amounts of capital for firms on a higher growth path. As an example, Willa founder Christy Prunier raised \$1 million on CircleUp to fund her natural skincare company, while Meika and Jeffrey Hollender used CircleUp to raise \$600,000 for their socially conscious condom company, which markets primarily to women and donates a part of its profits to improving women’s reproductive health. These examples are just a few that illustrate both the accessibility and flexibility of crowdfunding as a financing strategy for women entrepreneurs, a growing

number of whom are already using new and established platforms to raise financial capital for a broad range of business needs.

What Happens in the Long Term?

Crowdfunding shows promise in rectifying historical disadvantage, and seems to result in rational decision making by the crowd. However, funding is just the first step on a long path towards successful companies. Early stage fundraising through crowdfunding can help startups grow, perhaps even offering an alternative to the traditional pre-seed financing or a pre-stage to the current seed funders, venture capital or governmental support. As an example, Oculus Rift raised about \$2.5 million for a virtual reality (VR) headset designed specifically for video games. Oculus VR—the company behind Oculus Rift—went on to raise \$16 million in a Series A round, and another \$75 million in a Series B round before being acquired by Facebook for \$2 billion.²⁴ We now consider the degree to which crowdfunding can result in long-term success. Especially pressing is the question of whether reward-based crowdfunding can lead to real companies and jobs.

Early studies are promising, though more work is underway. An initial study by Mollick and Kuppuswamy sampled both successful and unsuccessful projects on Kickstarter. In order to examine projects that most closely approximated more conventional startup companies, they limited their sample to three categories: Technology, Product Design, and Video Games. They also examined only larger projects seeking over \$5,000 in funding and those that completed funding between 2009 and July 2012. This resulted in a sample of 596 successful and 1,509 failed projects. Of the failed projects, they randomly selected 550 for follow-up. For successful projects, they received responses from 230 subjects (response rate of 39%) and, after accounting for duplicate and incomplete entries, ended up with complete response data from 158 projects (26.5% of the original sample), although many other responses were substantially complete. Yet statistical testing showed the successful respondents to be representative in terms of goals, funding, and other factors. Responses from unsuccessful projects were lower, with 128 total responses (23.3%) of which 83 (15.1%) were complete.

Of the successful projects, a very high percentage (over 90%) remained ongoing ventures, 32% of which reported yearly revenues of over \$100,000 a year after the Kickstarter campaign (10% of these represented ongoing companies that had already been making that much). Further, successful projects added an average of 2.2 employees per project—and this does not include outliers like Oculus Rift, which did not respond to the survey. The survey also suggested that crowdfunding did much more than provide funds, unlocking the ability to reach customers, press, employees, and outside funders.

Some projects raised additional funds beyond crowdfunding. Most common was additional self-funding (in over 20% of successful projects) or friends and family funding (in over 15% of successful projects), but outside risk capital in the forms of loans, venture capital, or angel investments occurred as well. Successfully funded projects with larger goals and projects that had the highest levels of over-funding were the most likely to achieve outside funding. Additionally, having a

substantially complete business plan before fundraising was also predictive of receiving outside funding. Finally, projects where the creators had specific industry experience were three times as likely to get outside funding as those that did not have similar backgrounds.

Successful campaigns not only raised millions of dollars through crowdfunding, but realized other benefits as well. Many firms reported that their campaigns helped them in building customer communities, learning about markets, and generating publicity. Our research also suggests that crowdfunding can also lead to sustainable, long-term ventures as well as job creation.

Anecdotally, one great example is the Pebble Smart Watch (<<https://getpebble.com>>), which was designed by Canadian engineer Eric Migicovsky while he was still a student at the University of Waterloo in Ontario. Eric noticed that he was continually pulling out his cell phone to check messages. It occurred to him that this would be much easier and less disruptive if the messages would just show up on his wristwatch. Together with several friends, Migicovsky developed an early version of the watch in the garage of their home. In 2011, the project was accepted into Y Combinator, a high-tech business incubator in California that provided seed funding, guidance, and key contacts. Eric attempted to raise additional funds through the traditional venture capital route with limited success. Assuming it was a long shot, he decided to try raising capital through the Kickstarter crowdfunding site.²⁵ Migicovsky launched his Kickstarter campaign on April 11, 2012, with an initial goal of \$100,000, which he achieved within two hours. Migicovsky's firm, Pebble Technology, closed its funding campaign on May 18 after raising \$10.2 million from 68,929 backers, making it the largest funded project in Kickstarter's history at the time.

The Kickstarter funding enabled Pebble Technology to begin its rapid growth trajectory by producing and shipping watches on a larger scale. This set the stage for a Series A round of funding from Charles River Ventures for \$15 million. Over time, Pebble added a number of features including waterproofing, caller ID, a control for music played on a phone, and a variety of apps. Although earlier versions of the Pebble watch sold for approximately \$150, the most recent version, the Pebble Steel, launched in 2014, sells for \$249 and is a dressier and more stylish version. While Migicovsky initially focused on developing the hardware for his product, today he is much more focused on software applications. The Pebble Appstore was launched in February 2014 to take advantage of this trend and now features over 1,000 different apps.

Although the Pebble Smart Watch, created by a male entrepreneur, is the poster child of successful Kickstarter campaigns, a growing number of women entrepreneurs are also raising funds through this platform. In fact, Julie Uhrman, founder of video game console maker Ouya, chose Kickstarter to raise capital. In the first ten hours, OUYA had raised more than \$1 million, and ultimately raised \$8.6 million—the third most successful crowdfunding campaign on Kickstarter to date.

While most projects don't lead to such multimillion-dollar outcomes, there are many examples of companies that raise around a million or two. Bluesmart, a technology company that develops Internet-connected travel products, was founded in 2013 and is headquartered in Silicon Valley. Their first product was

a smart-connected suitcase for travelers. They ran a crowdfunding campaign on the Indiegogo platform, raising more than \$2 million from nearly 9,000 backers in more than 100 countries. Diego Saez-Gil, the co-founder and CEO of Bluesmart, said that he and his cofounders had planned to do a crowdfunding campaign from the beginning.²⁶ For a hardware startup, it is a great way to validate the demand of your product, gather feedback from actual customers, and attract the attention of the trade. They launched looking to raise \$50k and ended up raising \$2.1M, which was a total surprise to them.

Product crowdfunding platforms such as Indiegogo and Kickstarter are especially good for hardware startups that can pre-sell their products to their future customers. Equity crowdfunding platforms such as AngelList, FundersClub, and WeFunder are a growing alternative for any kind of startup. Before Indiegogo, Bluesmart did a “friends & family” round, and after the campaign they raised a new round of funding from institutional investors. At the time of our interview, they had pre-sold about 10,000 units of their product, which represents about \$2.7M in revenue, and they planned to start shipping the product over the summer. They continue to take pre-orders on their website, which later will sell products in real time, and they are in the midst of closing deals with retailers and distributors worldwide. The team is still small (14), but will be growing soon.

Two challenges post-crowdfunding are quite common. The first is to ship the product on time. The manufacturing of complex products can be challenging, as can ramping up production to meet numbers that might have been unexpected with a super successful crowdfunding campaign. That is why over 85% of large projects are delayed. A second challenge can be increased competition. For successful campaigns that pioneer a category and validate a market, many copycats will enter the market. Building a brand is a challenge and it takes time, so leveraging the campaign success to build a loyal group of customers and delivering a high-quality product on time are an imperative for long-term success.

Conclusion

Crowdfunding is exciting not just because of the innovation it is enabling today, but also because it gives us the opportunity to consider how a more social, interconnected world might drive future innovation. This form of fundraising was much more difficult to achieve before the widespread use of the Internet and social media. Crowdfunding efforts have allowed various enthusiast groups to find ways to bring their hobbies or interests together. This can be in the form of the millions of dollars raised to fund fan-made Star Trek movies or the extensive and innovative efforts of 3-D printing enthusiasts to advance the state of the art in their field through crowdfunding campaigns. We see this on the equity crowdfunding side as well. For example, Portfolia is a platform that helps women-led companies raise equity capital and actively seeks to bring communities of investors together that have an interest in supporting and investing in women-led enterprises.

Through the crowd, crowdfunding has the potential to not only democratize access to capital, but also to create entirely new forms of interaction between

project creators and entrepreneurs with their backers and investors. To make the most out of crowdfunding requires that we think not just about the money involved, but also the crowd itself. At its best, crowdfunding is about making a dream real, for both the crowd and the creator. The most successful crowdfunding campaigns, such as Oculus Rift or Pebble Smartwatch, have understood this. By drawing together the crowd, the funding, and open dialogue, crowdfunding can do more than just help get a project funded, it can help create a stable community around a product. A decade of research has shown that vibrant communities are a key to harnessing the best ideas from a crowd, to improving existing ideas, and creating breakthrough innovations.

For managers and executives, crowdfunding represents an exciting opportunity to examine the innovation process at the grassroots level. By observing crowdfunding campaigns, established companies can better understand consumer demand, user-driven innovations, and the nascent organizations that are trying to launch new ideas. Further, crowdfunding gives larger organizations the opportunity to intervene early in the evolution of a new venture, whether by providing resources, partnerships, or other forms of support. The result is greater transparency throughout the innovation and commercialization process for every party involved.

Crowdfunding can help take the democratization of innovation, entrepreneurship, and entrepreneurial finance even further. By giving a voice to people who would otherwise never even have a chance to seek funding, let alone provide it, crowdfunding creates opportunities for new businesses and innovations, as well as a new wave of investors. In addition, by engaging the crowd in funding and supporting projects, these crowdfunding platforms can reduce the need for inefficient (and often biased) middlemen. We are still in the early days of crowdfunding, especially on the equity side, and its evolution will be exciting to watch.

Notes

1. Eric Von Hippel, Jeroen P.J. De Jong, and Stephen Flowers, "Comparing Business and Household Sector Innovation in Consumer Products: Findings from a Representative Study in the United Kingdom," *Management Science*, 58/9 (2012): 1669-1681.
2. <www.babson.edu/Academics/centers/blank-center/global-research/diana/Documents/diana-project-executive-summary-2014.pdf>.
3. See, for example, T. Bates and W. Bradford, "Venture Capital Investment in Minority Business," *Journal of Money, Credit, and Banking*, 40/2-3 (March/April 2008): 489-504; T. Bates and W. Bradford, "Traits and Performance of the Minority Venture Capital Industry," *Annals of the American Academy of Political and Social Science*, 613 (September 2007): 95-107.
4. Jeffrey Sohl, "The Angel Investor Market in 2014: A Market Correction in Deal Size," Center for Venture Research, May 14, 2015.
5. Center for Talent Innovation, "Innovation, Diversity, and Market Growth," September 1, 2013, <www.talentinnovation.org>.
6. Ethan Mollick, "Swept Away by the Crowd? Crowdfunding, Venture Capital, and the Selection of Entrepreneurs," SSRN working paper, 2013, available at <<http://ssrn.com/abstract/2239204>>.
7. Nikolaus Franke, Marc Gruber, Dietmar Harhoff, and Joachim Henkel, "Venture Capitalists' Evaluations of Start-Up Teams: Trade-Offs, Knock-Out Criteria, and the Impact of VC Experience," *Entrepreneurship Theory and Practice*, 32/3 (2008): 459-483.
8. <<https://www.cbinsights.com/blog/crowdfunded-venture-capital-hardware/>>.

9. Ethan Mollick, "The Dynamics of Crowdfunding: An Exploratory Study," *Journal of Business Venturing*, 29/1 (January 2014): 1-16
10. Ethan Mollick and Ramana Nanda, "Wisdom or Madness? Comparing Crowds with Expert Evaluation in Funding the Arts," *Management Science*, (forthcoming).
11. Toby Stuart and Olav Sorenson, "The Geography of Opportunity: Spatial Heterogeneity in Founding Rates and the Performance of Biotechnology Firms," *Research Policy*, 32/2 (February 2003): 229-253.
12. Paul R. Krugman, *Geography and Trade* (Cambridge, MA: MIT Press, 1991).
13. Candida G. Brush, Patricia G. Greene, Lakshmi Balachandra, and Amy E. Davis, "Women Entrepreneurs 2014: Bridging the Gender Gap in Venture Capital," Arthur M. Blank Center for Entrepreneurship, Babson College, September 2014.
14. Alesina et al. found female business owners in Italy pay more for credit than men even though they are not riskier than men and do not differ with respect to other relevant information like credit history. Alicia Robb and Susan Coleman find that female-owned firms are discouraged from applying for bank loans and have a higher probability of having their loan applications denied than do male firms, even after controlling for a variety of firm and owner factors, including credit score. Stefani and Vacca find similar results in Germany. Alberto F. Alesina, Francesca Lotti, and Paolo Emilio Mistrulli, "Do Women Pay More for Credit? Evidence from Italy," *Journal of the European Economic Association*, 11/s1 (January 2013): 45-66; Alicia Robb and Susan Coleman, "Gender Differences in Innovation among US Entrepreneurs," in Kate V. Lewis, Colette Henry, Elizabeth J. Gatewood, and John Watson, *Women's Entrepreneurship in the 21st Century: An International Multi-Level Research Analysis* (Cheltenham, UK: Edward Elgar Publishing, 2014), p. 117; Maria Lucia Stefani and Valerio Paolo Vacca, "Credit Access for Female Firms: Evidence from a Survey on European SMEs," Bank of Italy Occasional Paper No. 176, 2013.
15. <www.sbc.senate.gov/public/?a=Files.Serve&File_id=3f954386-f16b-48d2-86ad-698a75e33cc4>.
16. Nataliya Barasinska and Dorothea Schäfer, "Is Crowdfunding Different? Evidence on the Relation between Gender and Funding Success from a German Peer-to-Peer Lending Platform," *German Economic Review*, 15/4 (November 2014): 436-452; E. Ravina, "Love & Loans: The Effect of Beauty and Personal Characteristics in Credit Markets," working paper, Columbia Business School, Finance and Economics, 2012; D.G. Pope and J.R. Sydnor, "What is in a Picture? Evidence of Discrimination from Prosper.com," *Journal of Human Resources*, 46/1 (2011): 53-92.
17. <www.forbes.com/sites/chicceco/2014/03/08/women-led-businesses-the-underserved-opportunity-sxsw-2014/>; <www.forbes.com/sites/women2/2013/12/04/why-equity-crowdfunding-is-good-news-for-women/>; <www.forbes.com/sites/geristengel/2014/03/26/equity-crowdfunding-site-targets-the-gigantic-untapped-consumer-market>; <www.85broads.com/public/blogs/85-broads/articles/crowdfunding-a-new-way-for-women-to-jumpstart-their-businesses>; <www.dallasnews.com/business/small-business/20130918-moolahoop-aims-to-help-female-entrepreneurs-raise-startup-capital-via-crowdfunding.ece?nclink_check=1>.
18. Dan Marom, Alicia Robb, and Orly Sade, "Gender Dynamics in Crowdfunding: Evidence on Entrepreneurs, Investors, and Deals from Kickstarter," working paper.
19. W.R. Meek and D.M. Sullivan, "Kickstarting New Businesses: Exploring the Dynamics of Gender and Crowdfunding," presented at the 2015 Diana International Research Conference, Wellesley, MA.
20. OurCrowd invests its own capital and brings selected startups to its accredited membership. OurCrowd investors must meet stringent accreditation criteria and invest a minimum of \$10,000 per deal of their choice. OurCrowd provides post-investment support to its portfolio companies, assigning industry experts as mentors and taking board seats.
21. <<https://circleup.com/community/article/when-raising-capital-online-the-gender-gap-is-shrinking/VW4XgysAAKAgTof/>>.
22. <www.vroulife.com>.
23. <<http://blogs.wsj.com/moneybeat/2013/10/23/crowdfunding-site-launches-for-the-female-entrepreneur/>>.
24. <www.wired.com/2014/05/oculus-rift-4/>.
25. Tim Simonite, "A Smart Watch, Created by the Crowd, Debuts in Vegas," *MIT Technology Review*, January 29, 2013.
26. Interview with co-founder and CEO Diego Saez-Gil, June 2015.

California Management Review, Vol. 58, No. 2, pp. 72–87. ISSN 0008-1256, eISSN 2162-8564. © 2016 by The Regents of the University of California. All rights reserved. Request permission to photocopy or reproduce article content at the University of California Press's Reprints and Permissions web page, <http://www.ucpress.edu/journals.php?p=reprints>. DOI: 10.1525/cmr.2016.58.2.72.

Copyright of California Management Review is the property of California Management Review and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.