EXPLORING THE CHANGING INSTITUTIONS OF EARLY STAGE FINANCE

ABSTRACT

Since the end of the shakeout following the bursting of the dot com bubble, we have seen substantial innovation in the institutions and organizational arrangements used to finance early stage high growth technology companies. This paper will document the emergence of business accelerators, angel groups, micro venture capital funds, and online equity crowdfunding platforms, and show the rapid growth in angel investing over this period. It will also document the corresponding movement away from traditional venture capital activity at the early stage of company development. The paper will explain how technological advance, specifically the decline in the cost of bringing a new software product to market, has driven this shift in the institutions of early stage finance.

INTRODUCTION

Since the end of the dot com boom, the institutions for financing high growth technology companies have changed dramatically. Prior to 2002, new high potential companies in technology-intensive industries typically received financing from a handful of individual angel investors – people who invest their own money in private companies owned and operated by others who are neither their friends nor family members – who were geographically proximate to them, followed by money from venture capital firms – investment funds that seek investment from investors needing long term returns, such as pension funds and university endowments.

Since 2001, however, the institutions of early stage finance have changed substantially. Innovation in software and computing has lowered the cost of bringing new software projects to the market. These changes have given rise to the emergence of new early-stage finance institutions. The fraction of the population that invests in early stage companies has increased. The magnitude of the average investment has declined. Angels have invested further afield from their locations. Four institutions in the world of financing high-potential early stage companies have either started or grown: angel groups, business accelerators, micro venture capital funds, and equity crowdfunding platforms.

This paper focuses on chronicling these significant institutional changes in detail, but also offers some speculative explanations for how these phenomena relate to theories of institutional change. Technological change, particularly the dramatic decline in the cost of bringing new software products to market, has undermined the traditional venture capital model, which has shrunk substantially since 2001. It has also led to the growth of angel investment activity, and innovations in the institutions of early stage finance described above. While other trends – the generation of great wealth among angel investors in Silicon Valley and legal changes that made

equity crowdfunding possible, and declining cost of capital – also occurred during this period, a careful look at the data suggests that the decline in the cost of bringing new products to market was the primary source of the changes seen in the market for early stage finance.

This article proceeds as follows: The next section describes fundamental changes in the process of bringing new software products to market and explained how these changes have altered the institutions of early stage venture finance. The third section describes how these new institutions, in turn, have altered the venture capital industry. The fourth section describes how these changes have altered the angel capital market. The fifth section concludes.

THE EFFECT OF CHANGES IN SOFTWARE INNOVATION ON EARLY STAGE FINANCE

To understand the way that the system for financing early stage high-potential companies has changed since the start of the new millennium, we need to look at the way that innovation has changed in the primary industry that these investors fund. Since the early 1980s, investors have put more money early stage high potential software companies than businesses in any other industry (CVR, 2015; NVCA, 2016). Because software companies have historically received such a large share of the investments and investment dollars in early stage finance, changes to the process of software innovation cannot help but to influence the process of financing new early stage companies.

The process of developing new software products has changed profoundly since 2001. Two of these changes – the dramatic decline in the cost of bringing a new software product to market and the tremendous rise in the capability of software to automate many very-difficult-to-

measure-activities and to connect disparate people has dramatically changed the world of financing early stage companies[1]. I deal with each of these changes in turn.

Back in the late 1980s it cost more than $20 million in today's dollars to bring a new software product to market (Lambert, 2016). Companies needed to spend heavily on infrastructure to develop their new products and to market and sell the product to customers (Suster, 2012). With this capital-intensive model of innovation, start-ups raised money by going to traditional venture capital firms in places like Sand Hill Road and pitched their business ideas to them (McClure, 2014).

The Rise of Angel Groups

Over time, the cost of bringing new software products to market dropped systematically, falling to about $5 million at the time of the dot com bubble bursting in 2001 (Lambert, 2016). This decline in the cost of software development made it possible for angel investors to begin to compete directly with venture capitalists as a source of financing of early stage software companies. While individuals angels could not provide the kind of capital necessary to finance early young software companies on their own, by working with other investors, individual angels could begin to reach the levels of financing necessary to finance the initial round of money needed by software start-ups. As a result, the early 2000s witnessed a period of rapid rise of angel groups – collectives of accredited investors meet on a regular basis to hear entrepreneur's pitches for funding and often conduct due diligence and invest collectively.

[1] This was not the case in other growing industries such as biotechnology where the cost of bringing a product to market has remained relatively high (Di Masi and Grabowski, 2007; Stewart, Allison and Johnson, 2003).

Lerner and Schoar (2016: 3) explain that "Beginning in the mid-1990s, angels began forming groups to collectively evaluate and invest in entrepreneurial ventures." But angel group numbers did not begin to take off until the start of the current millennium. Data from the Angel Capital Association, the trade association for angel groups, shows that in 1999, there were fewer than 100 American angel groups. By 2013, that amount had more than tripled, to 385 (Hudson, 2014).

The Birth of Business Accelerators

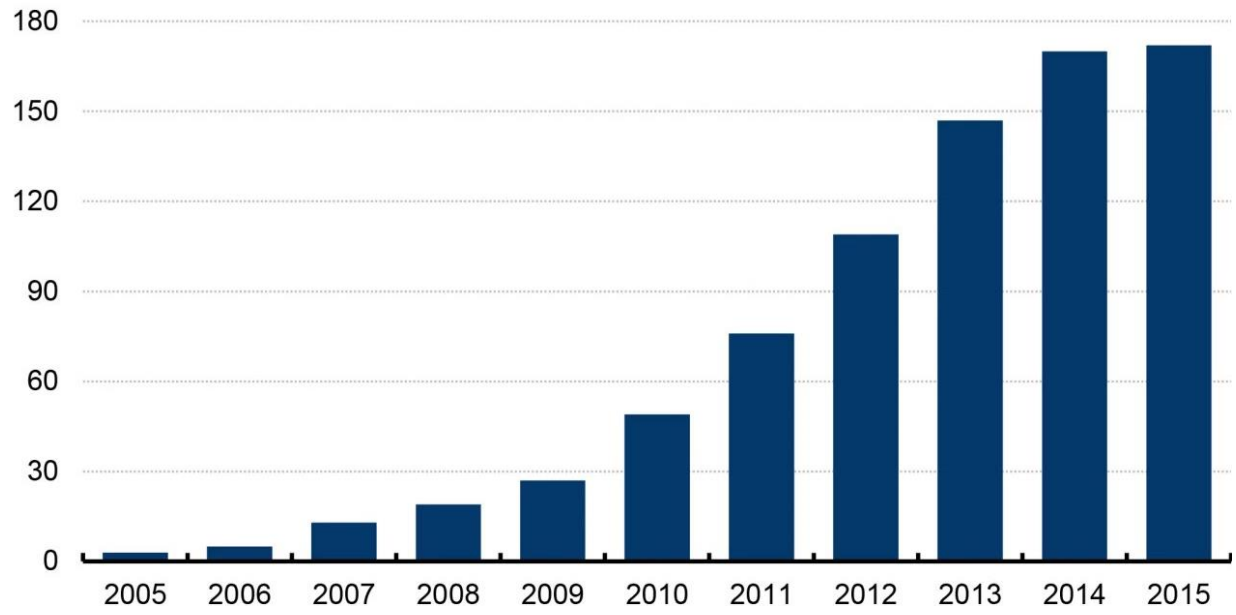
The declining cost of bringing new software products to market in the 1990s was only the beginning of the process of cost reduction. Between 2000 and 2004, the cost of developing new software products continued to decline. Salesforce.com introduced the process of delivering enterprise applications over the Internet. Amazon Web Services began in 2002, and open source software began to drive down the cost of developing new software products. On the marketing side, the formation and growth of Google in internet search, SMS technology on mobile phones, and PayPal in payments, led to further cost reduction. By 2004, the cost of bringing a software product to market had shrunk to about $3 million (Lambert, 2016).

The decline in the cost of bringing new software products to market also began further strain the traditional venture capital model. Traditional venture capital firms cannot provide a lot of assistance and mentoring to more than a handful of start-up company founders. Traditional venture capital firms do not invest in large numbers of companies. Moreover, much of the time of venture capitalists is spent monitoring their investments and sitting on boards. Traditional VCs could not easily provide hands on assistance to a lot of software startups.

This shrinking cost of bringing software to market led some forward-looking folks to introduce a new innovation in the market place, the business accelerator, which began with the formation of Y Combinator in 2005. Accelerators are organizations that provide early stage companies with mentoring, capital and access to investors in return for an equity.

Since 2005 accelerators have become one of the most rapidly growing institutions in early stage finance. AngelList, an online platform that matches high potential startups with investors and employees currently indicates 578 accelerators in operation, up from one in 2005. As Hathaway (2015) explains, the number of accelerators began to rise rapidly in 2007 and expanding until about 2014.

Figure 1: United States Accelerator Pool by Year



Source: Hathaway (2016)

The Emergence of Micro Venture Capitalists

The cost of bringing new software products to market has continued to fall over time, declining to about $1 million in 2010 (Lambert, 2016). According to Suster (2011), open source computing, horizontal computing and Amazon web services drove down computing and operating costs by about 90 percent since 2001 (Suster, 2011). The notable innovations in software development that have reduced the cost of bringing new software products to market include Ruby on Rails, open source software that was introduced in 2004. Also beginning in 2006, Amazon made it possible for small companies and individuals to rent computers to run their own applications.

Costs also began to fall on the marketing and distribution side of the equation. Facebook began in 2004, YouTube in 2005, and Twitter started in 2006. All of these new companies dramatically reduced the cost of reaching customers. As Jim Goetz, a partner at Sequoia Capital mentions: "….today start-ups have the App Store and Google Play, which allow them to touch 3 billion consumers. For the first time in the mobile ecosystem, you can reach half the planet without building a distribution system" (Harvard Business Review, 2016).

The opportunity to reach customers on mobile devices also emerged in this period. Smart phones began to be sold in significant numbers in 2007, with Apple's introduction of the iPhone. The declining amount of capital required to build and bring new companies to market led to a dramatic rise in the number of people who were willing to try to start software companies (McClure, 2014). The increase in the number of businesses experimenting with minimum viable products and business models made it more difficult for investors to engage in the process of selecting new companies to back. At this very early stage in the life of a company, the ability to differentiate winners from losers is nearly impossible. These investors needed to make a philosophical shift in their process of managing uncertainty. Rather than trying to identify

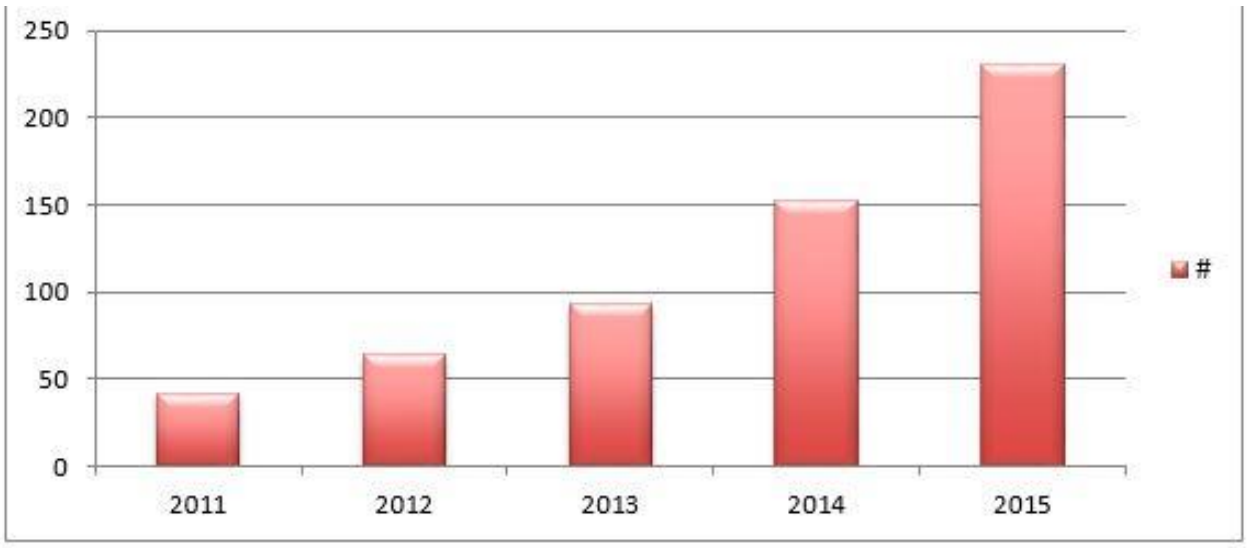
winners, they began to think that massive diversification was the only solution. They would invest small amounts of money in a large number of companies and then invest further in those that showed traction (McClure, 2014).

When companies need $100,000 to $200,000 to test a product idea, the traditional venture capital model breaks down. Traditional venture capital is too labor intensive for fundraising efforts of less than $1 million, let alone for the less than $250,000 first financing rounds that had become common for software start-ups. Traditional VCs are structured to make a handful of several-million-dollar investments every year. Their transaction costs are too high; they raise too much money; and they have processes that are too labor intensive to invest tiny amounts in a large number of companies.

As a result, a new innovation in the financing process, micro venture capital funds, began to emerge around 2008. These are limited partnerships that raise money from their own investors that then make $100,000 to $200,000 investments in early stage companies (Suster, 2011). To operate effectively making a large number of small investors, these entities needed to change the venture capital process. These investors began to routinize activities, positing that customized term sheets and sitting on boards was too cumbersome for the new type of early investment in start-up companies. They also changed how they approached due diligence, leaving many questions about downstream activities unanswered until later and began to use data to select ventures and set valuations.

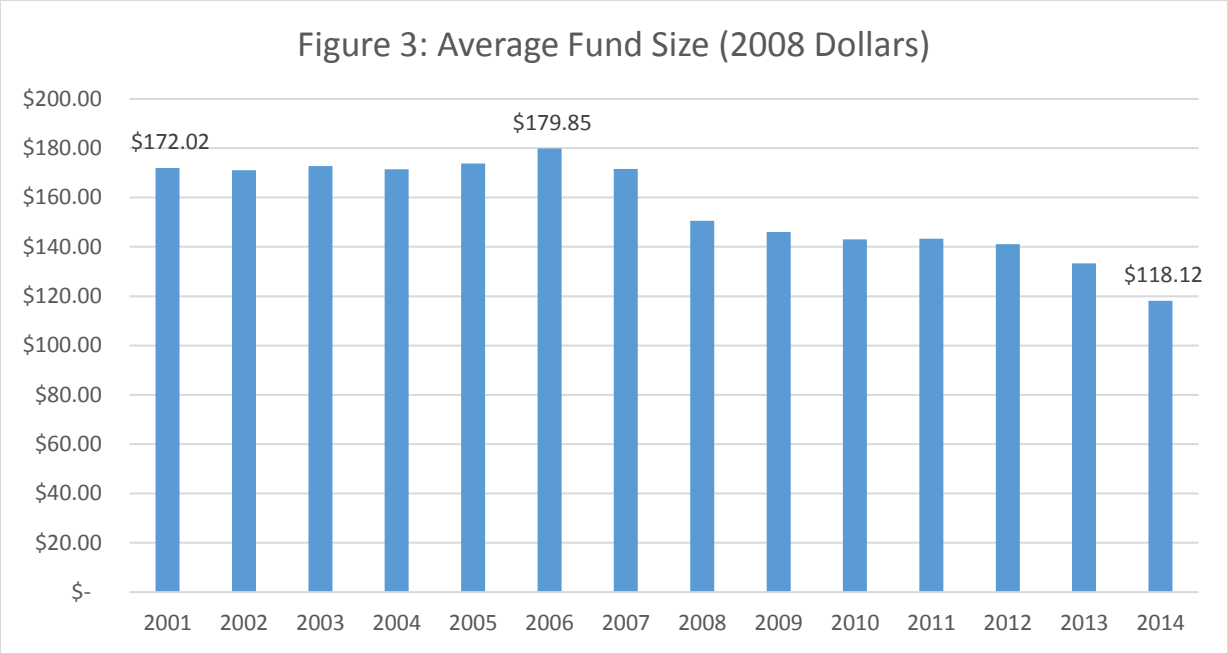
The number of micro venture capital firms – funds that raise money from limited partners to invest small amounts of money in a large number of very early stage companies – have grown dramatically in recent years. From fewer than 50 funds in 2011, the numbers swelled to nearly 250 by 2015.

Figure 2: Number of Active Micro Venture Capital Firms



Source: Samir Kaji, https://www.cbinsights.com/blog/past-present-future-micro-vc/

The introduction of micro venture capital funds to the venture capital mix has had a dramatic effect on the composition of venture capital funds. Since 2007 has the size of the average venture capital fund declined significantly when measured in inflation adjusted terms as tiny funds were added into the pool with mega funds.



Source: Created from data from the National Venture Capital Association

The Growth of Online Platforms

Advances in software continued to change the world of venture finance after 2010. The cost of bringing a new software product to market continued to decline. By 2014, the cost was estimated to be as low as $200,000, and by 2016 this cost had fallen to around $100,000 (Lambert, 2016) with further expansion of open source computing, horizontal computing and Amazon web services on the development side and lower cost search, social networking and media advances (e.g., Instagram and Snapchat) on the marketing and distribution side (McClure, 2014).

As the volume of start-ups seeking tiny amounts of money at very early stages in their lives began to grow, other innovations became necessary. Of particular importance has been the post 2010 introduction of online tools to facilitate investment in young companies. Different platforms – Gust, AngelList, Seedinvest, Crowdfunder, Wefunder, CircleUp, CB Insights, Crunchbase, and

Pitchbook – began to emerge to overcome several obstacles in making tiny investments by large numbers of people in very early stage businesses.

Some innovations, like AngelList, made it possible to bring together investors very quickly and to provide the back office process of managing investments. AngelList is a marketplace that allows the buyers (angels) and sellers (startups) to come together. It facilitates introductions, saving on the time spent setting up meetings and traveling to pitch sessions, as well as syndicating deals and managing the process of making investments, reducing legal and organizing costs (Wilson, 2014).

Other platforms, like Gust, Pitchbook, CB Insights and Crunchbase allow more quantitative approaches to early stage investing by providing access to data about valuations, company traction, and investment management (McClure, 2014). Gust, for instance, provides the back-end collaboration tools needed to invest at large scale, while Pitchbook and CB Insights provide information about trends in valuation and exits.

Still other platforms like in FundersClub, CircleUp, and SeedInvest provide individual investors with access to deal flow unimaginable in 2001. Beginning with the Jumpstart our Jobs Act in 2010, early stage investors could learn about companies seeking financing on websites devoted to this purpose. As a result, finding out about deals was no longer a local operation. Massolution (2015), for instance, estimates that global equity crowdfunding has jumped from just $400 million in 2013 to $2.6 billion in 2105.

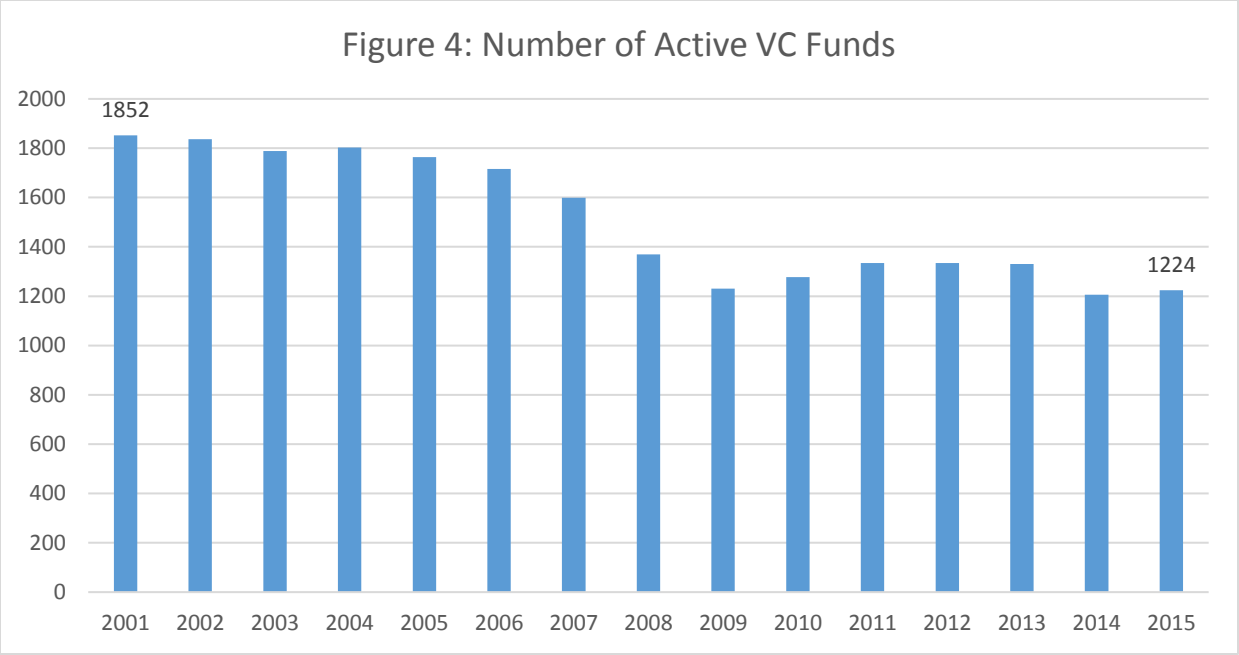
CHANGES IN VENTURE CAPITAL SINCE 2001

The institutional change in the market for early stage finance described above has changed the venture capital industry in three significant ways. First, the venture capital industry has shrunk

in size. Second, traditional venture capitalists have moved later in the start-up lifecycle, with a large number of early stage investors and a small number of very large late stage investors. Third, the industry has become increasingly concentrated in the one region where the traditional model remains strong – Silicon Valley.

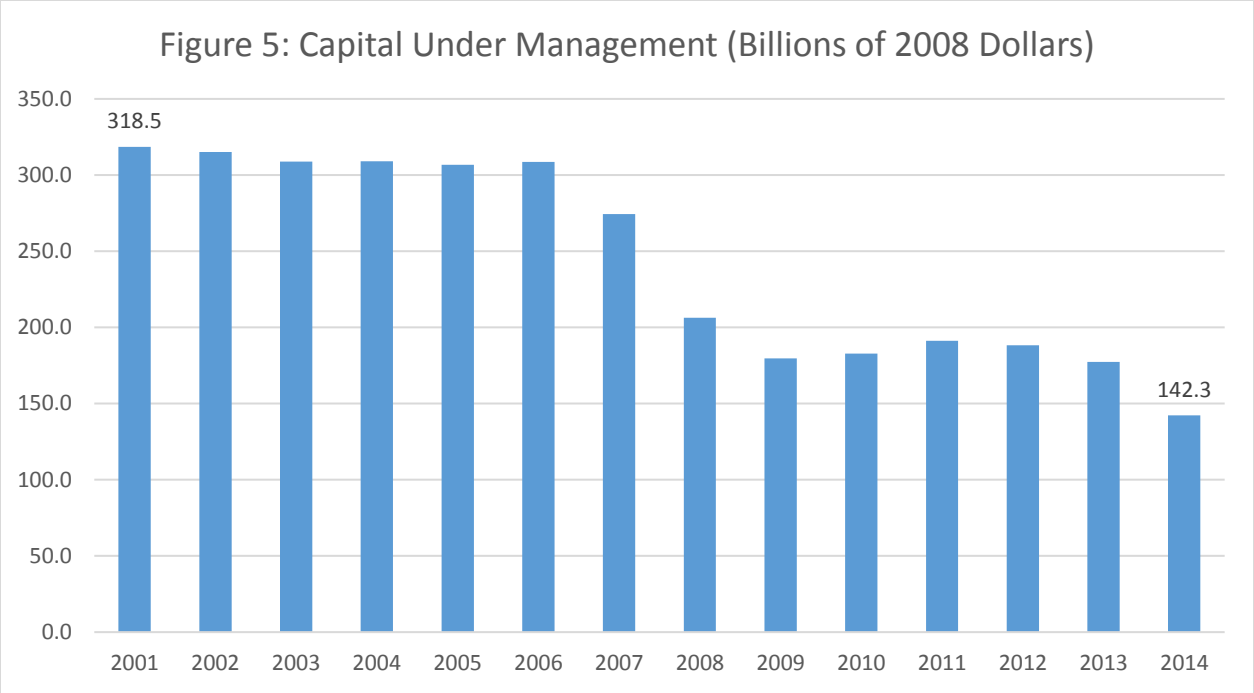
The Industry has shrunk

Venture capital activity has shrunk since the end of the dot com boom in 2001. One measure of this decline is the number of venture capital firms. Fewer active venture capital firms exist now than in 2001 and fewer of those firms are actively raising funds. As Figure 4 shows, between 2001 and 2015, the number of active venture capital firms decreased from 1852 to 1224, a decrease of more than one third. Similarly, the number of venture capital firms raising a new fund in the previous eight years had fallen from 923 in 2001 to 798 in 2015, data from the National Venture Capital Association indicates. The number of venture capital professionals decreased from 14,777 in 2003 to 5,891 in 2013 (Cook, 2014).



Source: Created from data from the National Venture Capital Association

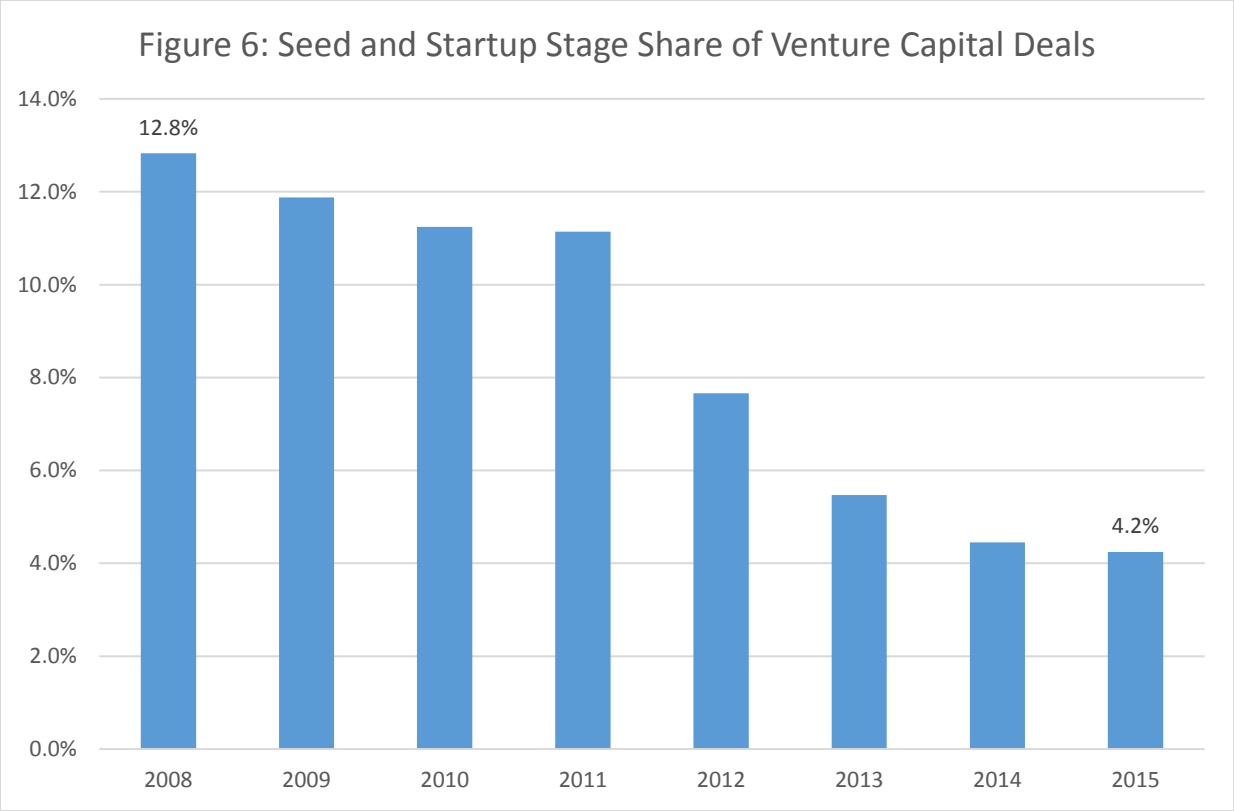
Another measure is capital under management. Venture capitalists are managing substantially less capital than they did in 2001. The figure below shows the amount of capital venture capital firms have under management measured in inflation-adjusted terms. In 2001 the amount of capital under VC management was $319 billion (in 2008 dollars). By 2014, it had declined to $142 billion (in 2008 dollars). Both for venture capital funds and capital under management, 2006 appears to be the point at which substantial decline began.



Source: Created from data from the National Venture Capital Association

The Industry has moved to Later Stage

Traditional venture capital firms have moved away from investments at the earliest stages in the life of companies. In 2008, 12.8 percent of venture capital investments occurred at the seed and start-up stage. By 2015, that fraction had fallen to 4.2 percent. In 2001, venture capital firms put $1.1 billion (in 2015 dollars) into 282 seed or start-up stage deals. In 2015, they put $1 billion into 186 companies, a nine percent decline in dollars and a 34 percent decrease in the number of companies backed.



Source: Created from data from the National Venture Capital Association

CHANGES IN ANGEL INVESTING SINCE 2001

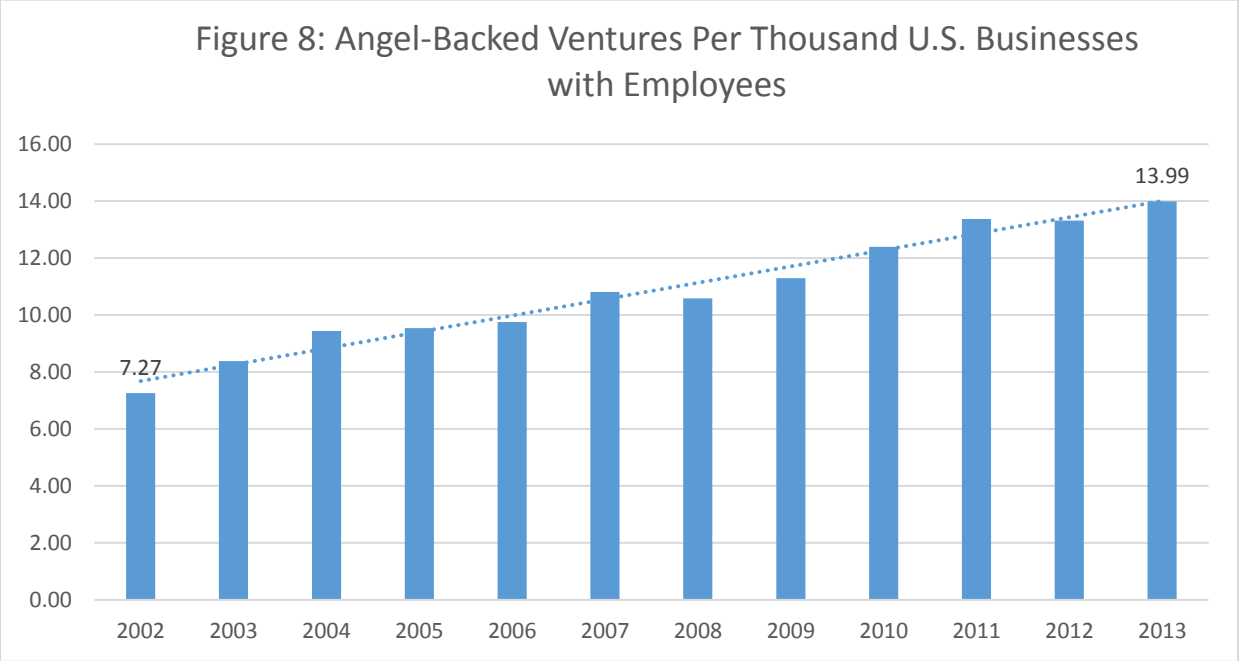
Angel investing has changed substantially since 2001. In contrast to what has happened in venture capital, angel investment activity – efforts by individuals to finance private companies owned and operated by people who are neither their friends nor their relatives – has grown. Moreover, angel investment activity has become less geographically concentrated now that it has moved online to a sizable extent.

Angel Investment Activity has Grown

In contrast to the decline in venture capital activity in recent years, angel investment activity has increased substantially. Since 2002, a period in which the number of venture capital

firms shrank by one-third, the number of angel investors has risen by 52 percent, data from the Center for Venture Research at the University of New Hampshire (CVR) reveals.

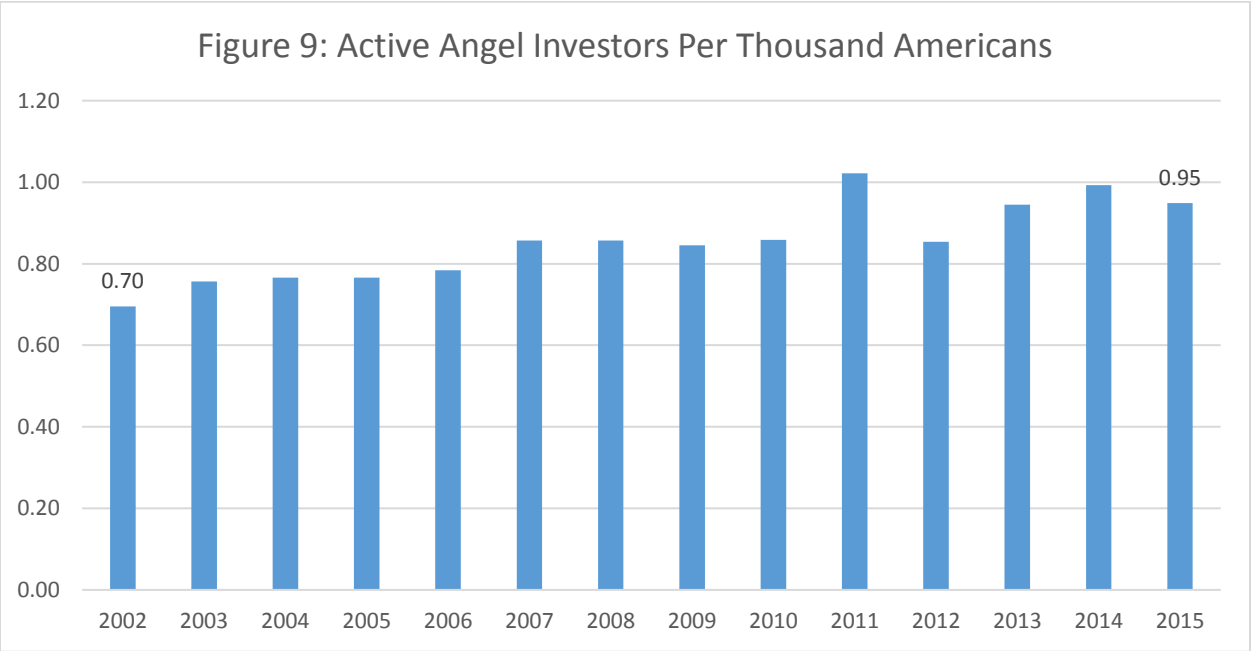
Moreover, angel investment activity has increased relative to the stock of businesses and people in the economy. Figure 8 compares CVR data with data from the U.S. Census Bureau on the number of U.S. businesses with employees to provide a measure the trend in the rate of angel investment activity in the economy since 2002. As the figure shows, the change is substantial. In 2013, there were 13.99 angel-backed businesses per thousand employers, nearly double the ratio of 7.27 in 2002.



Source: Created from data from the Center for Venture Research and Census Bureau

Unfortunately, the data on the number of employer businesses isn't available for more recent years than 2013. But we can compare the number of angel investors to the population to get a different measure of the rate of angel investment activity. Figure 9 shows that comparison.

As the figure reveals, in 2015 the "active angel" fraction of the U.S. population was 36 percent higher than it was in 2002.



Source: Created from data from the Center for Venture Research and the U.S. Census Bureau.

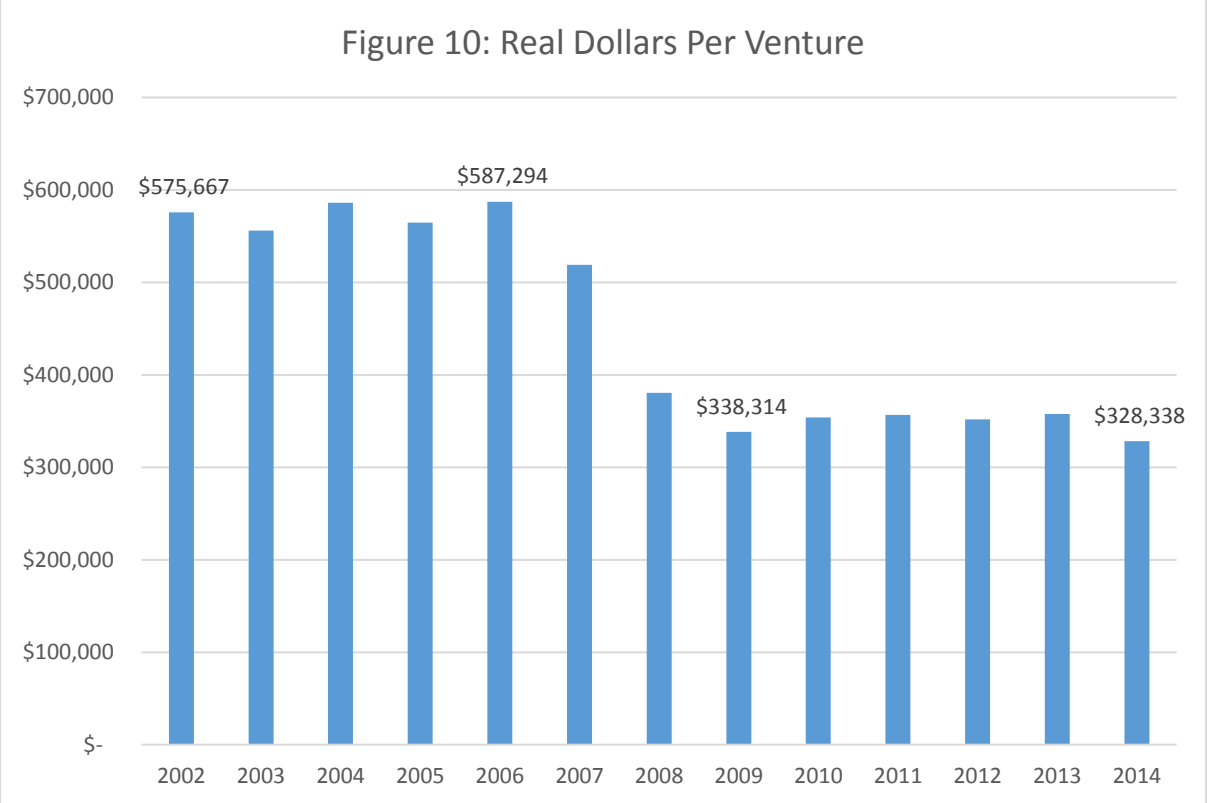
As would not be surprising from the above discussion in trends in both angel investment and venture capital activity, angel investment activity has increased *relative* to venture capital. In 2002, there were 13.3 angel-backed companies for every venture capital-financed business in the United States, a comparison of NVCA and CVR data show. By 2015, that ratio was 19.2. Similarly, in 2002 there were 108.9 active angels for every venture capital fund in operation. In 2015, there were 249.1 active angels per VC fund.

In short, since 2002, angel investment activity in the United States has risen, both in terms of the number of angel investors and the number of companies they finance. Moreover, angel

investment activity has increased relative to venture capital activity, which has declined over the same period.

Angel Investments in Start-up Companies Have Become Smaller

While the amount of angel investment activity has increased since 2002, the size of the average angel company raise has shrunk. Data from the CVR show that the average angel-backed company received 42.3 percent less money in 2014 than in 2002, when measured in inflation-adjusted terms. In 2002, the average angel-backed venture received nearly $576,000 in angel money (when measured in 2014 dollars). But in 2014, the average angel-financed business received only $328,000.



This decline in funding comes from two sources. First, the average amount invested per angel today is nearly 27 percent smaller than it was in 2002, when measured in inflation adjusted terms. Second, the number of active angels per angel-backed company has also declined, falling from 5.6 to 4.3 between 2002 and 2014.

Angel Investment Has Become Less Geographically Concentrated

Historically, one of the rules of thumb about early stage investment is that they invest in companies no more than a two hour drive from their location. Investing locally, the theory holds, provides better information about entrepreneurs and facilitates the monitoring of portfolio companies.

That rule of thumb has been changing. The Angel Capital Association (ACA) reports that accredited angel investors are more willing to invest in geographically distant start-ups than they once were. The March 2015 ACA Member Group Survey of 106 angel groups revealed that less than 13 percent of groups preferred to invest in start-ups located within a two hour drive of their homes. In 2008, that fraction was nearly 28 percent.

One reason for this shift is the rise of online platforms. A Comparison of the number of angels who are members of ACA-listed angel groups and the number of angels on online platforms such as SeedInvest and AngelList indicates that the number of angels on each of the platforms now exceeds the total membership of all ACA-affiliated angel groups. While being a member of an angel group and being on an online platform are not mutually exclusive, the numbers indicate that online platforms are a key way that many angels are now finding deals.

IMPLICATIONS FOR UNDERSTANDING INSTITUTIONAL CHANGE

Four new institutional arrangements have emerged or have grown in the world of early stage venture finance: angel groups, business accelerators, equity crowd-funding platforms and micro-venture capital funds. As these new institutions have emerged, we have seen a subtle rotation in the world of early stage finance. Traditional venture capital has declined, while angel investment activity has increased. This section considers how economic theories for institutional change might account for these new arrangements.

One might view the market for early stage finance as a case study in institutional change. Institutional change involves alteration of the "rules of the game in a society" (North, 1990). A shift in production technology – the declining cost of developing new software products – has led to shifts in the institutional arrangements of early-stage finance in ways consistent with economic theories that depict technological change as a key driver of institutional change (e.g. Nelson 2005; Kingston and Cabellero 2009; Ayres 1944). The shift appears to have occurred in software and information technology and not in biomedical side of early-stage finance. In addition, the timing of the shift appears to be more the result of technological change than a shift in attitudes or a decline in the cost of capital.

Technical changes can affect institutions by changing transactions in early-stage finance. For example, the automation of investment activities in micro venture capital significantly reduced measurement costs in the valuation and selection of new ventures (Barzel, 1982). What was once unquantifiable has become more quantifiable, leading to new and more efficient institutional arrangements, such as crowdsourcing platforms, that economize on the costs of cognition. Furthermore, the emergence of information technologies has reduced search, negotiation and enforcement costs involved in connecting geographically dispersed agents and investors in early-stage finance. The declining cost of software development has reduced the capital needs of early

stage software companies, and has made large venture capital institutions inefficient for handling very early-stage start-ups. As a result, these entities have shifted to making later stage investments.

Changes in production technology have also reduced the costs of particular market-making activities, such as acquiring information about the valuation of very early start-ups. As a result, they support new investment management strategies (e.g. equity crowdfunding platforms' making very small investments in a large number of very early-stage start-ups). (Ahlers et al, 2015; Casson 1982). These technological developments reduced the obstacles to market-making at every stage: contact-making between investor and start-up entrepreneurs; specification of the "deal"; negotiation (by providing benchmarks for similar early-stage finance transactions); monitoring and so on.

The changes in information technology and institutional arrangements have together lowered information costs, increased capital mobility and allowed investors to spread risk through greater portfolio diversification. In turn, these changes have led investors and entrepreneurs to adopt new financial instruments, such as Structured Agreements for Future Equity (SAFEs) and convertible notes (North, 1990).

Both institutional evolution and processes of deliberate design appear to be present in these institutional changes. A large literature views institutional change as an evolutionary process (Kingston and Caballero, 2009). The emergence of new institutions has been largely self-generating and bottom-up (Stringham, 2002), as entrepreneurs and investors have pursued profitable opportunities through the processes of variation, selection, and retention (Nelson, 2005). The new institutions of angel groups, business accelerators, micro VC funds, and online crowdsourcing platforms have largely emerged spontaneously through trial-and-error processes, have proved successful and profitable and that have spread by imitation and replication.

However, the demarcation between spontaneous and deliberately designed institutional formation is not clear-cut. Individual actors consciously designed and created the rule systems that constitute online equity crowdfunding platforms and accelerators (Ahlers et al, 2015; Guenther et al, forthcoming), but once established, a spontaneous network of connections among investors and startups emerged and coalesced around these deliberately designed rule systems.

The paper also illustrates the speed of adjustment of institutional change in finance markets. New institutions have emerged in a short timeframe – less than a decade. The low degree of asset specificity involved in venture financing may account for the fast speed of response to parametric changes software development costs (Hodgson, 2015). Financial markets are very supple at generating new governance arrangements and institutional structures. They did not get stuck in a "sub-optimal equilibrium", nor did they require legislation or political entrepreneurship to adapt to new circumstances.

This paper has offered a detailed case study of changes in institutional structure within modern capitalism. It illustrates the mutual interactions between economic actors and institutional structure. However, much about this topic remains unexplored. Future research would do well to better identify co-evolutionary processes between institutions in early-stage financing and new technology, describing the pathways through which the four institutional changes feed back into or stimulate other technological changes. Similarly, future research should examine how informal rules, social norms, conventions, and organizational routines might have changed in early-stage financing. Identifying the sources of inertia among established large venture capitalists and path-dependence in the processes would also be valuable. Finally, future work should also explore the extent to which the four main institutional changes are contingent upon the existence of an effective public legal framework that protects private property and enforces contracts and the

significance of legal changes (such as the Jump Start Our Start Ups Act 2010) relative to other changes.

CONCLUSIONS

The period since the end of the dot com boom has been one of tremendous innovation in markets for early stage finance. Four new institutional arrangements have emerged or have grown in the world of early stage venture finance: angel groups, business accelerators, equity crowd-funding platforms and micro-venture capital funds. As these new institutions have emerged, we have seen a subtle rotation in the world of early stage finance. Traditional venture capital has declined, while angel investment activity has increased. Ever so subtly the balance of investment dollars has moved from big institutional funds that invest money raised from university endowments, insurance companies and pension funds towards dollars invested directly by individual angel investors.

While the generation of wealth from previous generations of entrepreneurs played a role in this transformation, as did regulatory changes such as the Jump Start Our Startups Act, those changes were more of complementary shifts to a more fundamental technological change. As Suster (2011) McClure (2014), Lambert (2016) and others have pointed out, the massive decline in the cost of bringing a new software product to market – from $20 million in the mid-1980s to about $100,000 today – has made it virtually impossible for traditional venture capital firms to fund very early stage companies. Moreover, the increase in the number of people seeking to start high-potential companies that has resulted from this decrease in the cost of bringing new products

to market has created a need for investors to make a very large number of small investments in very young companies.

Making large numbers of small investments in very early stage companies is facilitated by a shift at the margin from traditional venture capitalists who make large bets slowly to angel investors who make small bets more quickly (Simeonov, 2011). It has also been facilitated by the development of four new institutional arrangements in early stage venture finance – angel groups, business accelerators, micro venture capital funds, and online platforms.

REFERENCES

Ahlers, G., Cumming, D., Gunther, C., and Schweizer, D. 2015. Signaling in equity crowdfunding. Entrepreneurship Theory and Practice, March: 1-26.

Angel Capital Association. 2015. ACA member groups: 2015 demographics. Angel Capital Association, http://www.angelcapitalassociation.org/data/Documents/2015ACAMemberDemographics07-20-15.pdf

Ayres, C. 1944. The theory of economic progress. Chapel Hill: University of North Carolina Press.

Casson, M. 1982. The entrepreneur: An economic theory. Totowa, NJ: Barnes and Noble Books.

Center for Venture Research. 2015. The angel investors market in 2015: A buyer's market, https://paulcollege.unh.edu/sites/paulcollege.unh.edu/files/webform/Full%20Year%202015%20Analysis%20Report.pdf

Cook J. 2014. Shrinkage: Number of VC professionals plummets 60% in past 10 years, funds decline 25%. http://www.geekwire.com/2014/shrinkage-number-venture-capital-professionals-plummets-60-past-10-years-funds-decline-25/

DiMasi JA, Grabowski HG. 2007. The cost of biopharmaceutical R&D: is biotech different? Managerial & Decision Economics 28:469-479.

Garland, A. 2014. Will software disrupters be disrupted by equity-based crowdfunding? Sandhill.com, http://sandhill.com/article/will-software-disruptors-be-disrupted-by-equity-based-crowdfunding/

Guenther, C., Johan, S., and Schweizer, D. Forthcoming. Is the crowd sensitive to distance? How investor decisions differ by investor type. Small Business Economics.

Harvard Business Review. 2016. How Unicorns Grow. January-February. Reprint F1601A.

Hathaway, I. 2016. Accelerating growth: Startup accelerator programs in the United States. Brookings Institution, https://www.brookings.edu/research/accelerating-growth-startup-accelerator-programs-in-the-united-states/

Hodgson, G. 2015. Conceptualizing Capitalism: Institutions, Evolution, Future. University of Chicago Press.

Hudson, M. 2016. Angel investments in the U.S. – helping startups be successful. Angel Capital Association, https://www.angelcapitalassociation.org/data/Documents/Resources/ACATaiwanSummitRev09-06-16.pdf

Kaji, S. 2015. Small giants: The past, present, and future of micro VCs. https://www.cbinsights.com/blog/past-present-future-micro-vc/

Kingston, C., and Caballero, G. 2009. Comparing theories of institutional change. Journal of Institutional Economics, 5(2): 151-180

Lambert, D. 2016. Implications of the Startup Capital Revolution for Investors, Presentation, October.

Lerner, J., and Schoar, A. 2016. The Rise of the Angel Investor: A Challenge to Public Policy. The Third Way, http://www.thirdway.org/report/rise-of-the-angel-investor-a-challenge-to-public-policy

Malik, M. 2013. Day traders, angels and venture capital: The internet changes everything including money. Gigacom. https://gigaom.com/2013/09/24/day-traders-angels-and-venture-capital-the-internet-changes-everything-including-money/

Massolution._____2015. The equity crowdfunding report. http://reports.crowdsourcing.org/index.php?route=product/product&path=0_20&product_id=54

McClure, D. 2014. Changes in venture capital and building startup ecosystems. http://www.slideshare.net/dmc500hats/building-startup-ecosystems-cairo-oct-2014

National Venture Capital Association. 2016. National Venture Capital Association Yearbook, Washington DC: NVCA.

Nelson, R. 2005. Technology, institutions and economic growth, Cambridge, MA: Harvard University Press.

North, D. 1990. Institutions, institutional change and economic performance, Cambridge: Cambridge University Press.

Simeonov, S. 2014. Patterns of successful angel investing. http://www.slideshare.net/simeons/patterns-of-successful-angel-investing-8306787/30-50x_vs_1000x_returns_cap80604020

Stewart JJ, Allison PN, Johnson RS. 2001. Putting a price on biotechnology. *Nature Biotechnology* 19:813–7. DOI: 10.1038/nbt0901-813

Stringham, E. 2002. The emergence of the London stock exchange as a self-policing club. Journal of Private Enterprise, 17(2): 1-19.

Surowieki, J. 2010. What's Wrong with Venture Capital? MIT Technology Review, https://www.technologyreview.com/s/417603/whats-wrong-with-venture-capital/

Suster, M. 2011. Understanding changes in the software and venture capital industries. June 29, https://bothsidesofthetable.com/understanding-changes-in-the-software-venture-capital-industries-b69a7e3a1ec7#.o6tefmd6a

Suster, M. 2012. Changes in the venture capital funding environment. https://bothsidesofthetable.com/the-continued-changes-in-the-venture-climate-331c69cc4be4#.d286el90c

Willis, T. 2014. Fred Wilson on the future of venture capital. The Big Think, http://bigthink.com/cue-the-future/fred-wilson-on-the-future-of-venture-capital