

# BUILDING THE NEXT SILICON VALLEY: THE ROLE OF ANGEL INVESTORS IN ECONOMIC DEVELOPMENT

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*The success of California's Silicon Valley has led other regions to attempt their own high-tech transformations, yet most imitators have failed. To build a start-up driven high-tech community, at least two base elements must be present: entrepreneurs and funding for their ventures. While some regions face a shortage of talented entrepreneurs, other regions may encounter a larger problem on the funding side. This Article reveals that angel investors, through their recent organization into professional investment groups, are now uniquely positioned to fund local entrepreneurs in non-tech regions. Unlike private venture capitalists, angel groups are found in all areas of the country and prefer early stage start-ups, and unlike state-sponsored alternatives to venture capital, angel groups have both the market incentives and expertise necessary to select and develop the best local entrepreneurs. Angel groups are only about a decade old, but given their advantages might be able to spur high-tech transformations in more regions in the future.*

## INTRODUCTION

How might a region transform itself into a high-tech entrepreneurial community? The success of California's Silicon Valley makes high-tech transformations the holy grail of economic development. Regions that continue to lose traditional jobs in manufacturing, agriculture, and other sectors have actively pursued high-tech transformations because of the high-paying new jobs, increased tax revenues, and educated workforce they bring. In light of Silicon Valley's success, there have been any number of attempted Silicon Prairies, Silicon

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Forests, Silicon Alleys, and Silicon Beaches throughout the United States and abroad.<sup>1</sup>

Yet despite a few successes, most imitators have failed.<sup>2</sup> High-tech firms are important drivers of U.S. economic growth in today's knowledge economy, yet gains from this growth are highly skewed toward a few regions. As economic developers in other regions have learned, there is no "secret sauce" that will lead to a broader distribution of these gains.<sup>3</sup> Causal relationships are exceedingly difficult to draw, and nowhere is that more true than in this area. The best we may be able to hope for is to learn from Silicon Valley's success to better understand the forces that drive entrepreneurship. With the limits of such an undertaking in mind, scholars from multiple disciplines have examined Silicon Valley in an attempt to understand its key elements. Their work has revealed the importance of the region's history, institutions, culture, legal infrastructure, venture capital market, and other elements.<sup>4</sup>

Most would-be imitators will not be so fortunate as to possess all, or even most, of these elements. Probably the best imitators can do, even if successful, is to create Silicon Valley "lites," or regions that possess the core elements of a start-up driven-community, yet are less dynamic – perhaps far less so – than Silicon Valley itself. As Martin Kenney astutely observes, the "ultimate result [of cloning efforts] could be regions that, although possibly not as dynamic as Silicon Valley, might become self-

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<sup>1</sup> This Article confines its analysis to the United States. For discussions of international high-tech communities, see generally DAVID ROSENBERG, CLONING SILICON VALLEY: THE NEXT GENERATION OF HIGH-TECH HOTSPOTS (2002) (discussing Cambridge, Helsinki, Tel Aviv, Bangalore, Singapore, and Hsinchu-Taipei).

<sup>2</sup> Even Silicon Valley visionary Frederick Terman, discussed in *infra* note 25 and accompanying text, could not help other regions recreate his model. See generally Stuart W. Leslie & Robert Kargon, *Selling Silicon Valley: Frederick Terman's Model for Regional Advantage*, 70 BUS. HIST. REV. 435 (1996) (discussing the failures of New Jersey and Dallas but the surprising success of Korea); Stuart W. Leslie, *The Biggest "Angel" of Them All: The Military and the Making of Silicon Valley*, in UNDERSTANDING SILICON VALLEY: THE ANATOMY OF AN ENTREPRENEURIAL REGION 67 (Stanford Press, 2000, Martin Kenney ed.) [hereinafter UNDERSTANDING SILICON VALLEY] (arguing that Terman "overemphasized the university's value in the Silicon Valley equation, a common pitfall, as subsequent efforts at high-technology regional development would show."); see also Timothy J. Sturgeon, *How Silicon Valley Came to Be*, at 47, in UNDERSTANDING SILICON VALLEY, *supra* ("As economic development tools, these schemes [to recreate Silicon Valley through university-industry collaborations] have met with very limited success. However, they continue to absorb the resources of planning agencies and universities in countless locations.").

<sup>3</sup> "There is no secret sauce" (June 9, 2008), <http://www.theconglomerate.org/2008/06/there-is-no-sec.html>.

<sup>4</sup> See *infra* Part I.A.

reinforcing hotbeds of innovation, with their own set of institutions dedicated to new firm formation.”<sup>5</sup>

So what are the core elements of Silicon Valley that could be replicated in new regions to create Silicon Valley lites? This Article starts with what I hope will be an uncontroversial premise – that is, whatever else a region might need to become a start-up driven entrepreneurial community, at the most basic level it will need a functioning venture capital market. Venture capital markets are defined broadly by Professor Ron Gilson in an important article to mean both entrepreneurs and funding for their ventures.<sup>6</sup> Under Gilson’s framework, innovation funding consists of both risk capital and knowledgeable financial intermediaries to invest it.<sup>7</sup> Therefore, the uncontroversial premise is that without ideas and funding for their commercialization, there is little chance for high-tech growth no matter the region’s history, institutions, or culture. As a result, although establishing a venture capital market might be only one part of creating Silicon Valley lites, I argue here that it is an essential part, and one that most imitators have not gotten right. With this framework in mind, this Article seeks to make an important contribution to the literature on creating new venture capital markets.

Of Gilson’s three base elements required for a functioning venture capital market – entrepreneurs, risk capital, and financial intermediaries – the Article has the least to say about entrepreneurs. Undoubtedly in many regions of the U.S. there exists a shortage of quality entrepreneurs with high-tech innovations worth commercializing. Some scholars focus on the lack of creative talent in certain regions, and without empirical work, it cannot be estimated to what extent a lack of entrepreneurs is stifling would-be entrepreneurial communities from taking form.<sup>8</sup> On the other hand, some non-tech regions are home to at least some entrepreneurial talent and some high-tech innovations, and the larger problem might instead be local funding for innovation.<sup>9</sup> Again, without empirical work, it is difficult to know.

Importantly, I am not claiming that deserving entrepreneurs go unfunded. In other words, contrary to the claims of some other scholars, I do not believe that the market for entrepreneurial finance is necessarily

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<sup>5</sup> Martin Kenney, *Introduction*, in UNDERSTANDING SILICON VALLEY, *supra* note 2, at 12.

<sup>6</sup> Ronald J. Gilson, *Engineering a Venture Capital Market: Lessons from the American Experience*, 55 STAN. L. REV. 1067 (2003); *see also infra* Part I.B.

<sup>7</sup> *See id.*

<sup>8</sup> *See infra* Part I.B.1.

<sup>9</sup> *See infra* Part I.B.2.

inefficient.<sup>10</sup> I am arguing, however, that entrepreneurs go to where the money is. Entrepreneurial relocation to Silicon Valley from non-tech regions is not an uncommon occurrence.<sup>11</sup> Entrepreneurial relocation may not decrease social welfare in the aggregate, but it does keep gain distribution skewed toward existing tech regions. This may not be a bad result in the aggregate.<sup>12</sup> However, my focus is on distribution of these gains. Therefore, while keeping a broader focus on venture capital markets, this Article narrows its attention to the problem of local sources of innovation funding in non-tech regions. The existing literature, which I will show to be too narrow in scope, assumes there are only two candidates that might fund local innovation: private venture capitalists or state-sponsored alternatives. And for most regions, neither are promising options for reasons that will be discussed.

All of which leads to this Article's main contribution. Working within the broad framework of recreating Silicon Valley, but with a particular focus on the funding side of new venture capital markets, it is here that I take my point of departure from the existing literature and offer a new solution. This Article contends that there is an overlooked source of innovation funding, available in all regions, that can theoretically serve both the risk capital and financial intermediary functions necessary to create new venture capital markets. That source of funding is the angel investor.

Angel investors are wealthy individuals who invest their personal funds in high-tech start-ups throughout the United States. Angels invest smaller amounts than venture capitalists, but in more start-ups, and therefore in total comprise a \$25 billion source of annual funding for innovation – the same size as the aggregate venture capital market.<sup>13</sup> There is a wide range of individual who falls into the category of “angel,” which broadly defined includes friends and family members of the entrepreneur, wealthy high-profile individuals such as Microsoft co-founder Paul Allen, and the more professional investors now found in regional angel investment groups (which this Article will discuss in some detail).

When done by the more sophisticated parties, at least, the key feature of angel investing is its ability to combine both the risk capital and financial intermediation functions necessary for innovation funding. First, angels use personal funds as risk capital. Second, although angels are not

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<sup>10</sup> See *infra* note 127 and accompanying text.

<sup>11</sup> See *infra* notes 49-50 and accompanying text.

<sup>12</sup> [Discuss reasons why supporting existing clusters rather than creating new ones might be better from an aggregate social welfare perspective]

<sup>13</sup> See *infra* notes 88-89 and accompanying text.

technically financial intermediaries because they use personal funds, they retain Gilson's distinguishing characteristics for what a financial intermediary must be able to do. That is, to fill the financial intermediary function, a party must first possess the expertise to select and develop the most promising local start-ups. Second, a party must possess the market incentives – or desire for profit – that will drive them to do so. The key trait of angel investors is that most of them, especially the more sophisticated ones, are *ex-entrepreneurs* who ran successful start-ups.<sup>14</sup> These experiences left them not only with capital to invest in other start-ups, but also the know-how to invest it. Also, as private actors, angels have market incentives to guide their portfolio companies to similarly successful exits.

Although angel investors have helped to create existing entrepreneurial communities and the modern venture capital industry, they have not received sufficient attention as agents of economic development. This is probably because, on the one hand, there is still much confusion and variation as to who (or what) an angel is. Therefore, while everyone knows that venture capitalists Kleiner Perkins and Sequoia Capital funded Google, not everyone knows that Andy Bechtolsheim, one of the founders of Sun Microsystems and an angel investor, funded Google at an even earlier point in its history.<sup>15</sup> On the other hand, angels might not receive more credit for entrepreneurial communities because, although they operate most everywhere in the U.S., this has not translated to places like Toledo or Tucson becoming high-tech hubs. Why angels have not spurred more high-tech transformations presents something of a puzzle considering their many advantages as a source of local innovation funding. The reason soon becomes clear, however, when this Article shows that significant downsides accompany the traditional form of angel investing – that is, angels operating individually rather than as part of a formal angel group.

Yet a sea change in angel investing has taken place over the past decade – a move from informal, hobby-like investing by individuals to the professional organization of regional angel groups. Angel groups are more visible, of more uniform quality, and can send positive signals to venture capitalists for follow-on investments. As this Article will show, the signals sent by angel group investments compare favorably to the other signals that venture capitalists rely on when making investment decisions,

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<sup>14</sup> See *infra* note 103 and accompanying text.

<sup>15</sup> Michael V. Copeland, *How to Find Your Angel Investor*, BUS. 2.0 MAG., February 28, 2006, <http://money.cnn.com/2006/02/28/magazines/business2/angelinvestor/index.htm> (this angel funding allowed Google co-founders Larry Page and Sergey Brin to “move out of their dorm rooms and into the marketplace”); see also <http://www.google.com/corporate/history.html#1998>.

including patents and investment contracts. While angel groups do face some weaknesses of their own, on balance this recent change in angel investing is eliminating the traditional weaknesses associated with angel investing and positioning angel groups to help build new venture capital markets, and possibly new entrepreneurial communities, in the future. This Article's thesis, then, is that while it is too soon to tell due to the newness of angel groups, the groups have the potential to stimulate more regional economic growth in the future.

This Article proceeds as follows. Part I dissects the literature on Silicon Valley to discover its key elements. It then narrows its focus to venture capital markets, and in particular funding for innovation, and explores why this base element has proved problematic to replicate in other regions. Part II moves into fresh territory by introducing angel investors as a preferable funding source for innovation in new regions. It begins with an historical look at the role angel investors have played in creating Silicon Valley and the modern venture capital industry, followed by a discussion of the advantages of individual angel investing over other funding sources. It also explains why, despite these advantages, angel investing by individuals has failed to spark more high-tech communities. Part III introduces the recent advent of angel groups and discusses why, despite a few drawbacks of their own, these groups now present the most promising option for innovation funding in non-tech regions in the future.

## I

### WHAT MAKES A SILICON VALLEY?

#### A. The Elements of Silicon Valley

It is easy to see *why*, as the U.S. moves from a manufacturing economy to a knowledge economy, other regions would want to clone Silicon Valley. High-tech communities offer high-paying new jobs, increased tax revenues, local wealth, and an educated workforce. The problem is *how* to accomplish a high-tech transformation. On a macro level, there are two competing models for high-tech growth. On the one hand, both Silicon Valley and Boston's Route 128 sprung up organically rather than through centralized government planning. In addition, both are driven by smaller, highly innovative start-ups as opposed to established firms. Compare this to the very different model we see in North Carolina's Research Triangle Park (RTP). Rather than sprouting up organically, RTP was entirely planned by state and local officials, including then-Governor Luther Hodges.<sup>16</sup> Also, rather than relying on start-ups, the state focused on attracting major corporations or their

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<sup>16</sup> See generally ALBERT N. LINK, A GENEROSITY OF SPIRIT: THE EARLY HISTORY OF THE RESEARCH TRIANGLE PARK (1995, Research Triangle Foundation of North Carolina).

research divisions.<sup>17</sup> Thus in RTP we see a centrally planned rather than organic process driven by established firms rather than start-ups. Austin, Texas, another successful imitator, appears to be somewhat of a hybrid between the two models. It began its transformation under the vision of George Kozmetsky<sup>18</sup> by luring major corporations to the area,<sup>19</sup> but also houses its fair share of start-ups, including now-giant Dell Computer, as well as a prominent venture capital firm, Austin Ventures. Despite the relative successes of RTP and Austin, this Article focuses on organic, start-up driven model for high-tech growth, recognizing that a very different analysis might apply to the RTP model.<sup>20</sup>

By any standard, Silicon Valley remains the most sophisticated and enviable high-tech community in the world. Its remarkable high-tech transformation turned what was as recently as 1950 the Prune Capital of America into one of the most advanced and prosperous regions anywhere. Most regions, especially those losing traditional jobs in manufacturing and agriculture to globalization, would welcome similar high-tech transformations to keep pace in the knowledge economy. Therefore, it is unsurprising to find a number of efforts to understand Silicon Valley's particular brand of success. Of course, even if we understand Silicon Valley, that does not mean we can replicate it. Gordon Moore, one of the

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<sup>17</sup> See *id.* at 87-93 (discussing some of the early companies (including IBM) and federal research centers to relocate to RTP).

<sup>18</sup> George Kozmetsky was co-founder of the technology giant Teledyne and “the father of Austin high technology.” Jim Rapp, *The Austin Miracle: Silicon Hills*, available at <http://www.asra.gov.ab.ca/resources/publicdocs/ict/ITCcore08a.html>.

<sup>19</sup> See Jonathan Miller, *Regional Case Study: Austin, Texas or “How to Create a Knowledge Economy,”* Washington, DC: Delegation of the European Commission to the United States, European Union, 1999 (the “watershed event in Austin’s high tech development occurred in 1983 when the city won the nationwide competition for Microelectronics and Computer Technology Corporation (MCC”). After MCC, Austin was able to recruit major divisions of 3M, SEMATECH, IBM, and Motorola. Joel Wiggins & David V. Gibson, *Overview of US Incubators and the Case of the Austin Technology Incubator*, 3 INT. J. ENTRP. AND INNOVATION MGMT., 56, 59 (2003).

<sup>20</sup> The reasons for my focus on the organic, start-up driven model are: 1) manifestations of this model – Silicon Valley and Route 128 – remain our most notable success stories; 2) my general faith in private actors driven by market forces over government intervention when it comes to economic matters; and 3) other commentators’ skepticism toward centrally planned processes. On the last point, see Martin Kenney & Urs Von Burg, *Institutions and Economies: Creating Silicon Valley*, in UNDERSTANDING SILICON VALLEY, *supra* note 2, at 239 (Attempts to clone Silicon Valley “have been conceived by government officials and local land developers with little understanding of the historical conditions that evolved into Silicon Valley....We are somewhat pessimistic at the policies aimed at cloning Silicon Valley”); Leslie, *supra* note 2, at 48 (“Some localities, following the lead of the Research Triangle, designate technology parks on the theory that if you build it, they – branch plants of multinational corporations – will come”).

founders of Intel, warns against a formulaic approach to cloning efforts.<sup>21</sup> While the existing literature fills numerous books and articles and reveals a complex economic and social phenomenon, some central themes about Silicon Valley may be extracted and will now be briefly explored.

First, history matters. Both Silicon Valley and Route 128 received significant funding from the U.S. military. MIT was the bigger beneficiary of military funding during World War II due to the political connections of former MIT electrical engineering professor Vannevar Bush.<sup>22</sup> Silicon Valley, on the other hand, made more substantial gains due to military funding during the early Cold War.<sup>23</sup> Early collaborations between academia and industry are another staple of the Silicon Valley literature. Many accounts of the region's history begin with the founding of the Hewlett-Packard Company in 1938.<sup>24</sup> Co-founders Bill Hewlett and Dave Packard were Stanford University students and protégés of Frederick Terman, the Stanford engineering professor, dean, and later provost who served as the “spark that transformed orange and walnut groves into the center of high technology.”<sup>25</sup> Terman actively encouraged collaborations between Stanford and the booming electronics industry, and the resulting knowledge spillover ran in both directions. Stanford was a large producer

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<sup>21</sup> According to Moore and Kevin Davis, the formula looks something like: “Combine liberal amounts of Technology, Entrepreneurs, Capital, and Sunshine. Add one (1) University. Stir Vigorously.” Gordon Moore & Kevin Davis, *Learning the Silicon Valley Way*, in *BUILDING HIGH TECH CLUSTERS: SILICON VALLEY AND BEYOND* (Timothy Bresnahan & Alfonso Gambardella, eds.) ((2007).

<sup>22</sup> See SUSAN ROSEGRANT & DAVID LAMPE, *ROUTE 128, LESSONS FROM BOSTON'S HIGH-TECH COMMUNITY* 80 (BasicBooks 1992) (“Probably no other state benefited as much from Bush's redirection of government research spending – and the commercial spillover that resulted – as Massachusetts. And without a doubt, no university reaped more rewards than MIT, which became the nation's unofficial center for wartime research.”)

<sup>23</sup> See Leslie, *supra* note 2, at 67 (attributing the successful collaboration between Stanford and local industry to “a mutual dependence on the special circumstances of the early Cold War”).

<sup>24</sup> Kenney, *supra* note 5; *but see infra* note 94 and accompanying text (dating Silicon Valley back further, to the 1909 founding of the Federal Telegraph Corporation). For detailed histories of Hewlett-Packard, see DAVID PACKARD, *THE HP WAY: HOW BILL HEWLETT AND I BUILT OUR COMPANY* (1996); MICHAEL S. MALONE, *BILL & DAVE: HOW HEWLETT AND PACKARD BUILT THE WORLD'S GREATEST COMPANY* (2007).

<sup>25</sup> John C. Dean, *Fueling The Revolution: Commercial Bank Financing*, in *THE SILICON VALLEY EDGE: A HABITAT FOR INNOVATION AND ENTREPRENEURSHIP* 315 (Stanford Press, 2000, Chong-Moon Lee et al. eds.) [hereinafter *THE SILICON VALLEY EDGE*]; see also Leslie & Kargon, *supra* note 2, at 435 (“If anyone deserved to be called ‘the father of Silicon Valley,’ it was Frederick Terman. As Stanford University Professor, dean of engineering and provost, it was Terman who first envisioned Silicon Valley's unique partnership of academia and industry and trained the first generation of students who made it happen.”).

of the first wave of Silicon Valley entrepreneurs, who then returned to campus to share their wisdom, which helped produce new entrepreneurs. The Stanford Research Park, where many of the start-ups were housed, was integral to these collaborative efforts.<sup>26</sup> Accounts of Route 128 and RTP likewise emphasize the importance of top universities, innovative industries, and university-industry collaborations.<sup>27</sup>

Second, institutions matter. In addition to the academic institutions and industrial institutions mentioned in the preceding paragraph, along with the financing institutions of venture capital mentioned later in this Section, Silicon Valley's success has also brought about support institutions including law firms, investment banks, marketing consultants, executive search firms, and intellectual property liquidators.<sup>28</sup> While most of these support institutions also operate in other regions, their operation in Silicon Valley is unique. For example, Silicon Valley investment banks specialize in underwriting high-tech IPOs, and Silicon Valley executive search firms boast expertise in high-tech placements.<sup>29</sup> Mark Suchman's work on Silicon Valley law firms reveals a prime example of Silicon Valley's unique support system.<sup>30</sup> While business lawyers are traditionally thought of as purely economic actors, or in Ron Gilson's terms "transaction cost engineers,"<sup>31</sup> Suchman revealed that Silicon Valley lawyers play more of a sociological, networking function than serving traditional economic goals of protecting intellectual property and litigating disputes.<sup>32</sup>

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<sup>26</sup> See Leslie & Kargon, *supra* note 2, at 440-41 (describing Stanford Research Park as "the earliest and perhaps most successful effort to foster academic-industrial cooperation by developing a high technology park on university land"). Stanford Research Park housed, among many other tenants, the legendary Fairchild Semiconductor, the firm in which the integrated circuit was developed. See *infra* notes 42-43 and accompanying text.

<sup>27</sup> See ROSEGRANT & LAMPE, *supra* note 22, at 13 (attributing Route 128's success to the interplay between MIT, local industry, and the federal government); LINK, *supra* note 16, at 4 (theory of RTP was that the region's "three academic institutions could act as a magnet to attract research companies to North Carolina. The location of research companies would lead to the development of new industry, and new industry would in turn spur the state's waning economic base").

<sup>28</sup> Kenney, *supra* note 5, at 5.

<sup>29</sup> Thomas F. Hellmann, *Venture Capitalists: The Coaches of Silicon Valley*, in THE SILICON VALLEY EDGE, *supra* note 25, at 291.

<sup>30</sup> Mark C. Suchman, *Dealmakers and Counselors: Law Firms as Intermediaries in the Development of Silicon Valley*, in UNDERSTANDING SILICON VALLEY, *supra* note 2, at 72.

<sup>31</sup> Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 253-256 (1984).

<sup>32</sup> Suchman, *supra* note 30.

Third, culture matters. As AnnaLee Saxenian has observed, Silicon Valley is home to unique sociological networks and an open and sharing entrepreneurial culture, even among high-tech competitors.<sup>33</sup> Saxenian also explains how Silicon Valley's high degree of labor mobility allows it to experience repeated bursts of innovation over time. It is here that Saxenian differentiates Silicon Valley from Boston's Route 128. Route 128 possessed many of the same initial elements as Silicon Valley – first-rate entrepreneurs like Digital Equipment Corporation's Ken Olson, the first venture capital firm of American Research and Development, and the early advantage in wartime funding. Yet Route 128 failed to build upon its initial success, which allowed Silicon Valley to surpass it as the world's premier high-tech region. Saxenian attributes Silicon Valley's regional advantage to its capacity to reset, repeat, and regenerate, which Route 128 did not possess – self-regeneration that was made possible through high levels of labor mobility and the resulting knowledge spillover it produces. Saxenian credits progressive West Coast cultural norms for the fluid movement of high-tech talent in Silicon Valley, while stodgy East Coast norms kept would-be entrepreneurs within the same, established firms.

Fourth, legal infrastructure matters. Building on Saxenian's framework and basic premise, Ron Gilson reveals how a unique legal infrastructure – California's refusal to enforce noncompete agreements – allows for the high-tech mobility that Saxenian credits with Silicon Valley's regional advantage.<sup>34</sup> Massachusetts, on the other hand, enforces non-compete agreements and thus prevents this mobility. The combination of Saxenian's and Gilson's efforts paint Silicon Valley as a place where high-tech talent moves horizontally among firms, but Route 128 as a place where such talent is confined to move vertically in a single firm.

Finally, venture capital markets matter. According to Gilson, venture capital markets consist of three elements: entrepreneurs, risk capital, and specialized financial intermediaries.<sup>35</sup> In Silicon Valley, venture capital firms act as financial intermediaries with pension funds, endowments, and individual investors supplying the risk capital. Silicon Valley is home to the world's leading venture capital firms. These firms probably became a key Silicon Valley institution in 1972 with the

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<sup>33</sup> See generally ANNALEE SAXENIAN, *REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128* (1994).

<sup>34</sup> See generally Ronald Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 NYU L. REV. 575 (1999).

<sup>35</sup> Gilson, *supra* note 6, at 1069.

founding of Kleiner Perkins Caufield & Byers.<sup>36</sup> The lead up to the founding of Kleiner Perkins is worth examining. Before that time, funding for innovation was mostly supplied by angel investors in search of profit<sup>37</sup> and the U.S. military in search of technological wartime advantage. Also, Kleiner Perkins may have been one of the early venture capital firms in Silicon Valley,<sup>38</sup> but the distinction of the first venture capital firm belongs to Georges Doriot's American Research and Development, founded in Boston in 1946.<sup>39</sup> Even in Silicon Valley, the precursor to today's limited partnerships (the dominant organizational form for venture capital funds) were formed in the late 1950s and early 1960s by angel investors availing themselves of matching funds from the federal government's SBIC program.<sup>40</sup> From SBIC-origins, the limited partnership form emerged. The next Section explores venture capital in more detail.

## B. Venture Capital Markets: An Essential Element

The preceding examination of Silicon Valley reveals several elements that play a part in a start-up driven community's success, with a functioning venture capital market among the most important. While Gilson's idea of a venture capital market – again, entrepreneurs, risk capital, and financial intermediation – is less expansive than Silicon Valley itself as a fully evolved high-tech community, the former might be thought of as a precursor to the latter. Or, to put it differently, venture capital markets can be thought of as a necessary, if not sufficient, element of high-tech communities, at least of the start-up driven-variety. With this basic framework in mind, this Section will now explore the elements of a venture capital market.

### 1. Entrepreneurs

To undertake a high-tech transformation, a region must possess – and *keep* – talented entrepreneurs. Although this Article's focus is not on entrepreneurs per se, and is instead on funding, it will digress briefly to ask how a region attracts or produces entrepreneurial talent. Here, the histories of existing entrepreneurial communities are instructive. Three

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<sup>36</sup> See TOM PERKINS, VALLEY BOY, THE EDUCATION OF TOM PERKINS 101-125 (2007) (detailing the origins of Kleiner Perkins).

<sup>37</sup> See *infra* notes 98-102 and accompanying text.

<sup>38</sup> Other, earlier venture capital firms in Silicon Valley included Davis & Rock (founded in 1961) and Venrock (founded in 1969).

<sup>39</sup> See SPENCER E. ANTE, CREATIVE CAPITAL: GEORGES DORIOT AND THE BIRTH OF VENTURE CAPITAL 129-146 (2008).

<sup>40</sup> See *infra* notes 100-102 and accompanying text.

common sources of entrepreneurs are universities, other start-ups, and established firms.

Entrepreneurs often hail from great research universities. Stanford and MIT are obvious examples. Most readers will be familiar with Stanford alums Bill Hewlett and Dave Packard (Hewlett-Packard), Jerry Yang (Yahoo), and Sergey Brin and Larry Page (Google), but perhaps less familiar with MIT's Ken Olson (Digital Equipment Corporation). Olson's reshaping of the computer industry led Fortune magazine to describe Olson in 1986 as the "most successful entrepreneur in the history of American business."<sup>41</sup>

Entrepreneurs also come from other start-ups. The legendary Silicon Valley company Fairchild Semiconductor spun off from Shockley Semiconductor in 1957.<sup>42</sup> The "Traitorous Eight" defectors from Shockley went on to develop the integrated circuit while at Fairchild and later spin off into several more start-ups, most notably Intel (Robert Noyce and Gordon Moore).<sup>43</sup> (Another Fairchild founder, Eugene Kleiner, went on to found Kleiner Perkins.) Another source of entrepreneurial talent is established firms, which may have begun as start-ups. Consider the many software entrepreneurs in Microsoft-dominated Seattle or Internet entrepreneurs located near AOL's headquarters in Northern Virginia.<sup>44</sup> Some important studies have sought to document the sources of entrepreneurial talent empirically.<sup>45</sup>

Because high-tech communities attract top entrepreneurs, it is not surprising to find fewer quality entrepreneurs in other regions. But this does not mean that important innovations cannot come from entrepreneurs in those regions. Other regions are home to research universities, established firms, and possibly other start-ups. For example, while few universities possess the overall excellence of Stanford or MIT, many

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<sup>41</sup> Fortune, 1986.

<sup>42</sup> See generally Christopher Lecuyer, *Fairchild Semiconductor and Its Influence*, in THE SILICON VALLEY EDGE, *supra* note 25, at 158-183.

<sup>43</sup> See generally LESLIE BERLIN, THE MAN BEHIND THE MICROCHIP, ROBERT NOYCE AND THE INVENTION OF SILICON VALLEY (2005).

<sup>44</sup> See E. Floyd Kvamme, *Life in Silicon Valley: A First-Hand View of the Region's Growth*, in THE SILICON VALLEY EDGE, *supra* note 25, at 79 (using the examples of Microsoft and AOL to show "how much fruit can come from a single seed"); Susan Preston, *Seraph Capital Forum: National Trends in a Local Context*, in STATE OF THE ART: AN EXECUTIVE BRIEFING ON CUTTING-EDGE PRACTICES IN AMERICAN ANGEL INVESTING 63 (John May and Elizabeth F. O'Halloran, eds., 2003) [hereinafter, STATE OF THE ART] (discussing the pervasive influence of Microsoft in creating Seattle's entrepreneurial culture, including "the number of new ventures started by ex-Microsoft employees").

<sup>45</sup> [Cite Zucker & Darby, Elfenbein papers]

regions boast universities that are strong in *some* field of science or engineering. Consider, for example, just a few universities and their strengths: Carnegie Mellon (computer science), Washington University in St. Louis (medical), the University of Wisconsin-Madison (biomedical), and the University of Arizona (optical sciences).<sup>46</sup> Also, established firms are themselves spatially dispersed or have research divisions in multiple regions.

On the other hand, some of these regions might not be the sorts of places that attract what Richard Florida has referred to as the “creative class.”<sup>47</sup> For example, Florida argues that regions with high levels of “tolerance” for diversity (in all forms) attract the creative class and those with low levels of tolerance do not. Indeed, he puts two of the regions with strong research universities listed in the preceding paragraph, Pittsburg and Saint Louis, at the bottom of the tolerance scale.<sup>48</sup>

On balance, while non-tech regions might not produce a steady stream of top entrepreneurs, we can assume that at least *some* of these regions will house at least *some* entrepreneurial talent. One major problem for these regions is that their entrepreneurs sometimes relocate to be closer to funding sources, namely venture capitalists. I know of no empirical studies on the point, but anecdotal stories of entrepreneurial relocation to Silicon Valley or Route 128 are not uncommon.<sup>49</sup> In one example, the Florida legislature took up a proposal to create a state venture capital fund after more than twenty-five Miami-based start-ups moved their headquarters after being unable to obtain local funding.<sup>50</sup>

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<sup>46</sup> See Chong-Moon Lee et al., *The Silicon Valley Habitat*, in *THE SILICON VALLEY EDGE*, *supra* note 25, at 2 (asking why the IT industry never took off in Pittsburg despite Carnegie Mellon’s presence); Steven L. Brooks, *Comment, The Venture Capital Investment Act of 2001: Arkansas’s Vision for Economic Growth*, 56 *ARK. L. REV.* 397, 400-401 (2003) (detailing high-tech innovations at Arkansas universities, but arguing there is no funding for these ideas); *but see* Paul Graham, *How To Be Silicon Valley* (May 2006), available at <http://www.paulgraham.com/siliconvalley.html> (arguing that the university has to stand up to Stanford and MIT to attract high-quality entrepreneurs).

<sup>47</sup> RICHARD FLORIDA, *THE RISE OF THE CREATIVE CLASS: AND HOW IT’S TRANSFORMING WORK, LEISURE, COMMUNITY, & EVERYDAY LIFE* (BasicBooks 2002) (hereinafter “CREATIVE CLASS”); see also [cite Florida’s more recent books]

<sup>48</sup> See FLORIDA, *CREATIVE CLASS*, *supra* note 47, at xxi (Pittsburg is fifth from last and Saint Louis is last on tolerance index).

<sup>49</sup> See, e.g., *Mobile Portal Startup Expands Leadership, Moves HQ to Silicon Valley, Adds Offices to Accommodate Rapid Growth and Support Partnership Strategy*, available at [http://findarticles.com/p/articles/mi\\_pwwi/is\\_200802/ai\\_n24272998](http://findarticles.com/p/articles/mi_pwwi/is_200802/ai_n24272998) (February 2008) (discussing Berggi, a leading start-up in the mobile online applications and services market, which moved its headquarters from Houston to Silicon Valley).

<sup>50</sup> See, e.g., Terrance P. McGuire, *A Blueprint for Growth or a Recipe for Disaster? State Sponsored Venture Capital Funds for High Technology Ventures*, 7 *HARV. J. LAW & TECH.* 419, 424 (1994).

While relocation may be a rational move for the entrepreneur, it is a severe detriment to local communities. Relocation does not have social welfare effects from an aggregate perspective, but it does keep gains skewed distributionally toward existing high-tech regions. Relocation not only removes the promising start-up and its positive externalities to the community, it also deprives the region of future entrepreneurial talent. If the start-up were to receive local funding and prosper, it might attract other high-tech employees to the region, who could then spin-off their own ventures.<sup>51</sup> Similarly, the original entrepreneur might have become a serial entrepreneur and started another local venture, helped to develop local university-industry collaborations, or gone on to become an angel investor.<sup>52</sup> Therefore, if communities can keep their start-ups local, this can generate more local start-ups and permit repeated bursts of innovation.<sup>53</sup> When start-ups relocate, it prevents this chain of events. Without funding for their ventures, entrepreneurs will continue to relocate.

## 2. Funding

It could be that attracting or keeping entrepreneurs presents the greatest challenge in creating new venture capital markets. Richard Florida discusses places like New York and Chicago, that, even with their “scads of venture capital,” still had “very little venture capital-financed innovation.”<sup>54</sup> On the other hand, there is some support for the idea that funding for innovation presents a greater challenge than innovation itself.

First, of the over twenty-five states that have sought to stimulate high-tech growth, the dominant focus has been on finding capital for entrepreneurs rather than on finding entrepreneurs.<sup>55</sup> Second, in examining international efforts to create new venture capital markets, Gilson himself focuses on the funding side of the equation. He assumes that if providers of risk capital and financial intermediaries can be put in

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<sup>51</sup> See Homa Bahrami & Stuart Evans, *Flexible Recycling and High-Technology Entrepreneurship*, in UNDERSTANDING SILICON VALLEY, *supra* note 2, at 175-176 (citing numerous examples of interfirm movement in high technology).

<sup>52</sup> See James F. Gibbons, *The Role of Stanford University: A Dean's Reflections*, in THE SILICON VALLEY EDGE, *supra* note 25, at 208 (“entrepreneurs tend to stay in areas in which their success in a previous start-up is a significant asset in hiring a new team, attracting other funding, and fulfilling the other conditions for a successful start-up”).

<sup>53</sup> See generally Zoltan Acs et al., *The Knowledge Spillover Theory of Entrepreneurship*, Centre for Economic Policy Research Paper No. 5326 (2005).

<sup>54</sup> FLORIDA, CREATIVE CLASS, *supra* note 47, at 51.

<sup>55</sup> See McGuire, *supra* note 50, at 427 (“over half the states in the U.S. currently employ venture capital seed funds, grants, or loan programs directed at high technology companies”).

place, waiting entrepreneurs will be forced to “reveal themselves.”<sup>56</sup> Working from the assumption that innovation funding remains a significant problem in creating new venture capital markets (whether or not the leading problem – a question which only empirical work can begin to inform), this Section will explore the two sources of innovation funding that dominate the existing literature: private venture capital and, to a lesser extent, state-sponsored venture capital. It explains why private venture capital is not available for early stage start-ups in most regions and why state substitutes have not proved to be successful alternatives.

#### a. Private Venture Capital

Venture capital has proved remarkable at funding high-tech innovation. Venture capitalists are specialized financial intermediaries that obtain risk capital from investors including pension funds, endowments, and individuals which they then invest in start-ups. When a start-up has a successful exit, the profits are returned to the fund investors minus the venture capitalist’s management fee and profits (the “carry”). The process recycles when fund investors reinvest in venture capitalists, who in turn invest in a new group of start-ups.<sup>57</sup> In addition to funding, venture capitalists offer start-ups critical value-added services including advice on growth and exit strategies and connections to professional managerial talent.<sup>58</sup> Under Gilson’s framework, venture capitalists technically fill only the financial intermediary function. However, their strong track records allow them to attract risk capital. As a result, the presence of venture capitalists in a community effectively fills both elements on the funding side of the equation.

Despite its theoretical advantages, in practice venture capital is unavailable to most entrepreneurs. Venture capital is scarce for three reasons. First, demand exceeds supply. Even in Silicon Valley, with its high concentration of venture capitalists, only a small number of entrepreneurs receive funding.<sup>59</sup> Each investment requires the venture

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<sup>56</sup> Gilson, *supra* note 6, at 1094 (“Here the hypothesis is simply that the presence of a venture capital framework complete with funding will induce entrepreneurs to reveal themselves.”).

<sup>57</sup> See PAUL A. GOMPERS AND JOSH LERNER, *THE VENTURE CAPITAL CYCLE* 3-4 (2000) (discussing the interrelatedness of each piece of venture capital investing).

<sup>58</sup> See Darian M. Ibrahim, *The (Not So) Puzzling Behavior of Angel Investors*, 61 *VAND. L. REV.* \_\_\_ (2008), at \_\_\_ (citing sources).

<sup>59</sup> Estimates are that at most 1-3% of start-ups that seek venture capital are successful in obtaining it. See MARK VAN OSNABRUGGE AND ROBERT J. ROBINSON, *ANGEL INVESTING: MATCHING START-UP FUNDS WITH START-UP COMPANIES – THE GUIDE FOR ENTREPRENEURS, INDIVIDUAL INVESTORS, AND VENTURE CAPITALISTS* 146 (2000). For example, in 1997, a hot year for start-ups, leading venture capital firm Benchmark Partners funded only 9 of the 1,500 business plans submitted to them. RANDALL E.

capitalist to undertake careful due diligence and post-investment monitoring, meaning that human capital requirements also limit the number of investments a venture capitalist can make.<sup>60</sup> Not surprisingly, then, the entrepreneurs that do attract venture capital usually have an “in” through a business associate or lawyer.<sup>61</sup>

Second, the venture capitalist’s need to be highly selective in choosing investments results in funds being channeled to more mature start-ups, or those that have proven they can survive their first year of operation.<sup>62</sup> The practice of investing in later-stage start-ups has become more pronounced as venture capitalists become victims of their own success. After some astronomical returns from Internet investments, investors are directing more funds to venture capitalists. But because human capital requirements continue to limit start-up investments, each start-up now receives more funds per round, and the venture capitalist’s initial Series A or B financing round has spiked from \$2 million to \$5 million.<sup>63</sup> This trend toward larger investments serves to further limit the pool of venture capital available to early stage start-ups that need smaller, earlier infusions.<sup>64</sup>

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STROSS, *EBOYS: THE TRUE STORY OF THE SIX TALL MEN WHO BACKED EBAY AND OTHER BILLION-DOLLAR START-UPS* 24 (2000).

<sup>60</sup> VAN OSNABRUGGE AND ROBINSON, *supra* note 59, at 23 (“venture capitalists are rarely able to fund small start-up firms..., regardless of the quality of the venture, because of the very specific investment criteria and high costs of due diligence, negotiating, and monitoring”). Even in height of dot.com era, when the joke was that any Stanford student with an idea could obtain venture capital, only 28% of venture capital investments were directed at early stage companies. *Id.* at 49 (citing a 1998 statistic).

<sup>61</sup> See Martin Kenney & Richard Florida, *Venture Capital in Silicon Valley: Fueling New Firm Formation*, in UNDERSTANDING SILICON VALLEY, *supra* note 2, at 102 (“Venture capitalists receive an enormous number of business plans and fund only a very few. Usually, those funded arrive through recommendations.”).

<sup>62</sup> See Jesse M. Fried and Mira Ganor, *Agency Costs of Venture Capitalist Control in Startups*, 81 NYU L. REV. 967, 1009 (2006) (“Many startups are unable to secure VC or other institutional financing in the first year or so of the business, when risk is highest.”).

<sup>63</sup> See John L. Orcutt, *Improving the Efficiency of the Angel Finance Market: A Proposal to Expand the Intermediary Role of Finders in the Private Capital Raising Setting*, 37 ARIZ. ST. L.J. 861, 873-874 (2005) (explaining the “\$5 million minimum investment trend”); Preston, *supra* note 44, at 68 (venture capital investments are increasing from \$2 million to \$5 million); *Venture Support Systems Project: Angel Investors* (MIT Entrepreneurship Center, February 2000), available at <http://entrepreneurship.mit.edu/Downloads/AngelReport.pdf> [hereinafter MIT Study], at 14 (observing that venture capitalists are funding larger and later stage deals by more established start-ups).

<sup>64</sup> These infusions may well be necessary for start-ups to reach the point of maturity where they can effectively use the larger investments. See VAN OSNABRUGGE AND ROBINSON, *supra* note 59, at 64 (“few firms can raise \$5 million until they have raised up to \$500,000 for their early growth and development”).

Finally, and probably the most severe problem for the task at hand, venture capital is, as a general rule, not available *at all* to entrepreneurs outside of high-tech communities. Venture capitalists are concentrated in high-tech regions, most notably along Silicon Valley's Sand Hill Road, and fund start-ups close to home to permit easy due diligence and post-investment monitoring.<sup>65</sup> Data reveal that for the ten-year period from 1997-2006, 38.1% of all venture capital investments, representing 42.6% of all venture capital dollars, were located in California.<sup>66</sup> The next highest levels were in the 10% range, in Massachusetts.<sup>67</sup> Other states in the top ten received less than 5% of all venture capital funding.<sup>68</sup> Also, while the boom times of the late 1990s may have sent some venture capitalists searching for investments in other regions, the data suggest that venture capital is now becoming concentrated in California to an even greater degree. In 2006, California start-ups received 42.3% of all venture capital investments, representing 48.0% of all venture capital dollars, a slight increase over the preceding ten-year average.<sup>69</sup>

While it might seem that the subset of venture capital funds specializing in early stage investments would branch out to more open and less competitive markets, the geographic concentration of early stage venture capital mirrors that of its later-stage counterparts.<sup>70</sup> And while other regions do produce at least some entrepreneurial talent, venture capitalists have not typically branched out to these regions for a couple of reasons. First, there is often not enough entrepreneurial talent in those

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<sup>65</sup> A *Clustered Community*, in THE SILICON VALLEY EDGE, *supra* note 25, at 274; Hellman, *supra* note 29, at 291 (“within the United States, venture capital tends to be geographically concentrated in a few locations”).

<sup>66</sup> See George Lipper, National Association of Seed & Venture Funds, *NASVF Net News – Ten Year and \$350B of Venture Capital State by State*, available at [http://www.nasvf.org/web/all\\_press.nsf/pages/14989](http://www.nasvf.org/web/all_press.nsf/pages/14989) (January 29, 2007); see also GOMPERS & LERNER, *supra* note 57, at 14 (historical look at investment data shows a very high concentration of venture capital investment in California beginning in 1965 and remaining fairly constant over time).

<sup>67</sup> See Lipper, *supra* note 66.

<sup>68</sup> See *id.*

<sup>69</sup> See *id.* It used to be that “California” venture capital was synonymous with “Silicon Valley” venture capital, although now Southern California enjoys one of the largest influxes of venture capital dollars in the country. [cite Financial Times article] While Los Angeles boasts a strong media focus, Orange County is home to medical devices and software, and San Diego is strong in biotech.

<sup>70</sup> See *id.*; but see Steve Jurvetson, *Changing Everything: The Internet Revolution and Silicon Valley*, in THE SILICON VALLEY EDGE, *supra* note 25, at 125 (noting that the early stage venture capitalist Draper Fischer Jurvetson has opened branches in a number of U.S. cities).

regions to support the deal flow required to sustain a venture branch.<sup>71</sup> Second, as mentioned earlier, through the promise of funding and connections venture capitalists are often able to lure the entrepreneurial talent that *is* found in other regions to Silicon Valley, or wherever they may be. This relocation means entrepreneurs get funded – my argument is not that the market for entrepreneurial finance is inefficient – but they get funded only in existing high-tech regions.

## b. State-Sponsored Venture Capital

Because venture capital is not available in most regions, over half of the states have adopted or considered adopting some form of state-sponsored venture capital fund.<sup>72</sup> While some of these funds have produced decent returns,<sup>73</sup> state funds have not proved to be the answer to the local funding problem, and with good reason.

If a state program envisions the state as a direct investor in start-ups, we encounter Gilson’s problem of a financial intermediary without the proper market incentives or expertise. While successful programs may help politicians earn re-election, bureaucrats do not have the same market incentives as venture capitalists.<sup>74</sup> The venture capitalist’s two-pronged compensation structure – carry that increases proportionate to start-up success and management fees that increase with the ability to attract more risk capital – highly incentivizes the venture capitalist to find and develop the best start-ups. Bureaucrats, on the other hand, may have more incentive to select start-ups for political reasons,<sup>75</sup> including immediate (if unsustainable) job creation, but not the highest profit potential.<sup>76</sup>

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<sup>71</sup> See Kenney & Florida, *supra* note 61, at 122 (quoting Don Valentine, the founder of leading venture capital firm Sequoia Capital, for the proposition that outside of Silicon Valley, Boston is the only other consistent source of good deal flow).

<sup>72</sup> McGuire, *supra* note 50, at 420.

<sup>73</sup> See *id.* at 427 (noting that the Massachusetts and Michigan funds “are widely regarded as the premier programs in the state venture capital field”).

<sup>74</sup> See Gilson, *supra* note 6, at 1094-1096 (attributing Germany’s failure to build a venture capital community to factors including a lack of incentives to select and monitor portfolio investments).

<sup>75</sup> See McGuire, *supra* note 50, at 446-447 (noting that political considerations have caused problems with state-sponsored funds in Virginia and Alaska); Merrill F. Hoopengardner, *Note, Nontraditional Venture Capital: An Economic Development Strategy for Alaska*, 20 ALASKA L. REV. 357, 371 (2003) (observing that political pressures pushes state fund managers to make non-optimal investments).

<sup>76</sup> See McGuire, *supra* note 50, at 435 (unlike venture capitalists, states may focus on local benefits such as job creation at the expense of rates of return); Hoopengardner, *supra* note 75, at 369-370 (associating lower rates of return with an attempt to serve a “double bottom line”).

Bureaucrats also lack the venture capitalist's expertise that is necessary to select the most promising start-ups ex ante and provide them with value-added services ex post. Ex ante, venture capitalists have the expertise to evaluate entrepreneurs and the market potential of their ideas. Venture capitalists are increasingly focusing on one sector, which furthers their informational advantage over general investors.<sup>77</sup> Ex post, venture capitalists are value-added investors that offer expert advice on growth and exit strategies, large rolodexes of professional managers, customers, suppliers, and investment banks, and the discipline to improve start-up governance.<sup>78</sup> Untrained bureaucrats pale in comparison in their ability to select the best start-ups for funding or add value post-investment. Of course state-sponsored funds could try to measure up by hiring qualified fund managers from the private sector, but it is unlikely they could match the compensation levels found in private funds, leaving a market for lemons among the fund managers who would accept state positions.<sup>79</sup>

The discussion so far has assumed a state-sponsored fund making direct investments in portfolio companies. A better alternative is for states to provide matching funds to venture capitalists. The hypothesis is that private venture capitalists will be enticed to enter the state for the promise of risk capital, and that the state's deficiencies in incentives and expertise are cured by allowing knowledgeable investors to select and mold the portfolio companies.<sup>80</sup> This structure recognizes the inability of states to both provide risk capital and invest it and confines their role to the former.

This structure, while preferable to direct state investments, is still problematic for several reasons. First, putting the venture-capitalist buffer between states and start-ups does not mean that the venture capitalist's investment decisions will be free from state influence. States may put indirect pressure on venture capitalists to select politically agreeable start-ups, and venture capitalists who incur sunk costs in moving to the state

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<sup>77</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 149.

<sup>78</sup> See D. Gordon Smith, *Venture Capital Contracting in the Information Age*, 2. J. SMALL & EMERGING BUS. L. 133, 139-140 (1998) (discussing the venture capitalist's value-added services); Joshua Lerner, *Venture Capitalists and the Decision to Go Public*, 35 J. FIN. ECON. 293, 314 (1994) (on the ability of venture capitalists to offer advice on the most profitable time for exit); Hellman & Puri (on the improved governance of venture-backed start-ups).

<sup>79</sup> McGuire, *supra* note 50, at 445 ("Existing state programs presently offer compensation well below that offered by comparable private firms, and boosting compensation to a competitive level is likely to be difficult given limited state resources.").

<sup>80</sup> See Gilson, *supra* note 6, at 1097 (arguing that Israel's attempt to build a venture capital community was admirable in part because the government fund invested in a venture capital intermediary rather than directly in portfolio investments, and did not help to select those investments).

may cave in to the pressure to keep state funds coming.<sup>81</sup> Also, government investments involve more red tape than private investments, and could expose notoriously secret venture capitalists to public disclosure of their investments and returns.<sup>82</sup> Finally, it is unlikely that the best venture capitalists, now awash in private investments, will avail themselves of state funds, leaving a market for lemons among the venture capitalists who will accept state funds. The relatively small size of state funds, resulting in lower venture capitalist compensation, exacerbates the lemons problem.<sup>83</sup>

[add short paragraph on SBIR program]

### III

#### INDIVIDUAL ANGEL INVESTORS AND THE FUNDING OF INNOVATION

The prior Part started broadly with the key elements of Silicon Valley before narrowing its focus to one of the most important elements, venture capital markets, and in particular funding for innovation. It assumed that while many regions suffer from a shortage of high-quality entrepreneurs, the larger obstacle could in some regions lie in securing local funding for the entrepreneurs that are found in those regions. Anecdotal evidence suggests that a lack of local funding will prompt entrepreneurs in non-tech regions to relocate to existing high-tech communities rather than remain in place and help to build new ones. Therefore, proper funding for local start-ups is something that more regions must get right to have a chance at creating a Silicon Valley “lite” and broadening the distributional gains of tech-driven growth. For the reasons discussed, however, neither private venture capital nor state-sponsored alternatives have successfully filled the funding void.

This Part, along with the next, sets forth my thesis that there is an overlooked source of innovation funding, available in all regions, that effectively serves both the risk capital and financial intermediary functions necessary to create new venture capital markets. That source of funding is the angel investor. This Part begins with a brief explanation of individual angel investing followed by an historical look at the role of individual

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<sup>81</sup> *Id.* at 1100 (in an indirect set-up, “government still might try to influence the selection of portfolio companies (and the interaction between the venture capital fund and the portfolio company) informally through the implicit promise of future government funding”).

<sup>82</sup> For example, public pension funds are facing calls in some states to disclose information about their venture fund investments under public-record disclosure laws and through Freedom of Information Act requests. See Pamela A. MacLean, *Seeking a View into Venture Capital Funds, Public Pensions, Schools Want Data*, 28 NATL. L. J. 1 (Jan. 16, 2006).

<sup>83</sup> See McGuire, *supra* note 50, at 445.

angels in creating Silicon Valley and the early venture capital industry. It then details how the best angel investors effectively combine the risk capital and financial intermediary functions that usually require separate parties. It explains why these advantages make angel investing the preferable alternative to private venture capital and state alternatives for funding entrepreneurs in non-tech regions before discussing why, despite these advantages, individual angel investing as it has long been practiced has not spurred more high-tech transformations. Part IV will move on to the rise of angel groups, which are changing the very nature of angel investing.

### A. Individual Angel Investing: The Basics

Angel investors are wealthy individuals, “accredited investors” under the securities laws, who invest personal funds in high-tech start-ups.<sup>84</sup> While there is extremely wide variation in the broad category of “angels” that makes generalizations difficult, scholars have estimated that most angels gained their wealth by being successful entrepreneurs themselves.<sup>85</sup> The ones that did not are probably of the friends and family variety, which are not the angels I wish to focus on. Instead, my attention is trained on the more sophisticated, professional angel investors.

Angel investors make smaller investments in start-ups than venture capitalists. Until the rise of angel groups, discussed in the next Part, the average angel investment ranged from \$100,000 (excluding the small amounts given by friends and family-type angels) to \$1-\$2 million for some extremely wealthy individuals (such as Microsoft’s Paul Allen).<sup>86</sup> Compensating for the lower individual investments, the number of angels far exceeds the number of venture capitalists, and angels on the whole collectively invest in 30-40 times more start-ups.<sup>87</sup> The result of these

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<sup>84</sup> See Jill E. Fisch, *Can Internet Offerings Bridge the Small Business Capital Barrier?*, 2 J. SMALL & EMERGING BUS. L. 57, 74 (1998) (noting that angels who participate in the SBA’s electronic matching services for entrepreneurs and capital providers, ACE-Net, must meet the SEC’s definition of an accredited investor); MIT Study, *supra* note 63, at 10 (“the term ‘angel’ or ‘business angel’ refers to high net worth individuals, usually ‘accredited’ investors as defined by SEC Rule 501, who invest in and support start-up companies in their early stages of growth”).

<sup>85</sup> See *infra* note 103 and accompanying text.

<sup>86</sup> John Freear et al., *Angels: Personal Investors in the Venture Capital Market*, 7 ENTREPRENEURSHIP & REGIONAL DEV. 85, 87 (1995) (“A typical angel deal is an early-stage round in the US\$100,000 to US\$500,000 range, raised from six or eight investors.”); Jeffrey E. Sohl, *The U.S. Angel and Venture Capital Market: Recent Trends and Developments*, J. OF PRIVATE EQUITY 7, 14 (2003) [hereinafter *Recent Trends and Developments*] (“The typical angel deal is an early-stage round (seed or start-up) in the \$100,000 to \$2 million range”);

<sup>87</sup> VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 69. Angels fund more new firms because there are more angels and because venture capitalists devote more of their

smaller but more numerous investments is an aggregate angels market with an estimated size of \$25 billion per year – roughly the same size as the aggregate venture capital market.<sup>88</sup> If the category of angels is very broadly defined to include friends and family-type angels, statistics suggest that the aggregate angels market may approach \$100 billion.<sup>89</sup>

Angels not only make smaller investments in each start-up, they also invest at an earlier stage, usually during the start-up's first year of operation. A typical angel investment of the more professional variety comes during the period after the entrepreneur's friends and family money runs out but before venture capitalists will invest.<sup>90</sup> Therefore, in terms of both dollar amounts and stage of investment, the angel and venture capitalist markets are highly complementary. Indeed, venture capitalists often refer early stage start-ups to angels, who in turn help start-ups develop and later refer them back to venture capitalists.<sup>91</sup>

## B. Angel Investing and High-Tech Growth: An Historical Look

Individual angel investors helped to build some of the foundational high-tech companies in Silicon Valley and Route 128. As discussed in the next paragraph, the formal venture capital is a relatively new industry, getting its start in the late 1960s and early 1970s. Until that time, individual angels were a common source – and probably the common source – of innovation funding in Silicon Valley and elsewhere (aside

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funds to existing portfolio companies. *See id.* at 67 (“venture capitalists spend around two-thirds of their funds on expansion funding of their existing portfolio firms”); Jeffrey E. Sohl, *The Early-Stage Equity Market in the USA*, 1 VENTURE CAP. 101, 108 (1999) [hereinafter *Early-Stage Equity Market*] (many venture capital financings are for start-ups in which they have previously invested). *See also infra* note 116 and accompanying text (on angels and follow-on investments).

<sup>88</sup> *See The Angel Investor Market in 2006: The Angel Market Continues Steady Growth*, available at [www.unh.edu/cvr](http://www.unh.edu/cvr) (citing total angel investments in 2006 at \$25.6B).

<sup>89</sup> Cite Global Entrepreneurship Monitor statistics. *See also* Ibrahim, *supra* note 58, at n. \_\_ (citing sources); Gibbons, *supra* note 52, at 208 (“It is estimated that in 1997, angel investors in the United States were responsible for a total investment in excess of \$62 billion.”).

<sup>90</sup> *See* Ibrahim, *supra* note 58, at \_\_ (angels build the “financial bridge” from friends and family money to venture capital).

<sup>91</sup> *See* MIT Study, *supra* note 63, at 27-28 (observing that venture capitalists have begun referring more early stage deals to angels as the venture capitalists trend toward later-stage investments); Hellmann, *supra* note 29, at 292 (“The venture capitalists will want to maintain close contact with angels in order to participate in [their] deal flow. The interesting implication of this is that angel investors are not really a substitute to venture capital, but they can frequently become the ones that provide promising leads for venture capital investments.”); *but see* Brent Goldfarb et al., *Are Angels Preferred Venture Investors?*, draft available at <http://www.smith.umd.edu/seminars/Papers/angelsv1.1.1.pdf> (portraying angels as competing with venture capitalists for early stage investments).

from military grants).<sup>92</sup> If we begin Silicon Valley's history with the founding of the Hewlett-Packard Company in 1938, we learn that HP's founders were not only mentored by Frederick Terman, but that he was an angel investor in the company.<sup>93</sup> If we date Silicon Valley's beginnings back even earlier to the founding of Federal Telegraph Company in 1909,<sup>94</sup> we learn that the initial funding for FTC was provided by Stanford president David Starr Jordan and several Stanford faculty members, all angel investors.<sup>95</sup> Later Silicon Valley start-ups continued to receive angel finance, including Intel, which counted the venture capitalist Arthur Rock among its personal investors.<sup>96</sup> Individual angel investors were also an early source of finance in Route 128. Alexander Graham Bell was able to start the Bell Telephone Company in Boston in 1877 after receiving two angel investments.<sup>97</sup>

Individual angels not only helped to create Silicon Valley and Route 128 through their funding of high-tech start-ups, they also played an important role in creating the early venture capital industry. The best summary of how angel investors transformed individual investing into formal financial intermediation comes from Martin Kenney and Richard Florida.<sup>98</sup> Kenney and Florida describe how a group of young angel investors (who unimaginatively called themselves "The Group") began investing together in Silicon Valley start-ups in mid-1950s.<sup>99</sup> These

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<sup>92</sup> Kenney & Florida, *supra* note 61, at 98 ("Until the late 1950s, an entrepreneur in the San Francisco Bay Area depended on informal investors for small-scale funding."); *id.* at 105 ("in the aftermath of World War II the San Francisco Bay Area was the home to a number of promising young electronics companies, and there were individuals willing to invest in new ventures"); Kvamme, *supra* note 44, at 65 (angel investors from the East Coast were still an important source of funding for Silicon Valley companies in the late 1960s before the founding of the venture capital firm Kleiner Perkins in 1972).

<sup>93</sup> See Gibbons, *supra* note 52, at 215-216.

<sup>94</sup> Sturgeon, *supra* note 2, at 19-29 (arguing that the real start of Silicon Valley dates back to the founding of FTC).

<sup>95</sup> *The Evolution of Silicon Valley*, in THE SILICON VALLEY EDGE, *supra* note 25, at 153 ("One might start [the history of Silicon Valley] with the founding of the Federal Telegraph Company, a radio operating company, in 1909 (with David Starr Jordan, the president of Stanford, as, in current terminology, an angel investor); Leslie, *supra* note 2, at 51 (noting that several Stanford faculty members joined Jordan in making angel investments in FTC).

<sup>96</sup> Dado P. Banatao & Kevin A. Fong, *The Valley of Deals: How Venture Capital Helped Shaped the Region*, in THE SILICON VALLEY EDGE, *supra* note 25, at 297.

<sup>97</sup> ROSEGRANT & LAMPE, *supra* note 22, at 65 ("When Bell needed money to complete his early experiments, the fathers of two deaf children he had taught to speak – Boston attorney Gardiner Greene Hubbard and Salem leather merchant Thomas Sanders – helped out, and later put up the capital to form the Bell Telephone Company in Boston in August 1877.").

<sup>98</sup> Kenney & Florida, *supra* note 61, at 106.

<sup>99</sup> *Id.*

angels, including Reid Dennis, William Bryan, William Edwards, William Bowes, and Daniel McGanney, soon had more investment opportunities than personal capital.<sup>100</sup> The federal government presented a solution to this problem in 1958 when it created the Small Business Investment Corporation (SBIC), which offered matching federal funds for private investments.<sup>101</sup> The SBIC program caught on with members of The Group, as well as other individuals and financial institutions, for the simple reason that it permitted more investments with less personal risk.<sup>102</sup> Therefore, while Boston's American Research and Development may have been the first venture capital fund, it was the individual angel investors' use of the government's SBIC program that popularized financial intermediation for innovation funding.

### C. Advantages of Individual Angel Investing

The last Section discussed the historical importance of individual angel investors in building our two most important high-tech communities and their financial infrastructures. This Section argues that as a *present-day* source of innovation funding, individual angels of the more professional variety possess a number of theoretical advantages over the two funding sources that garner the most attention: private venture capital and state alternatives. These advantages are particularly acute in non-tech regions. These advantages are, in short, the ability of individual angels to combine Gilson's risk capital and financial intermediary functions, their wide geographic dispersment and preference for local investments, their preference for early stage investments, and their deal-making advantages. Each of these will now be discussed in turn.

First, the key characteristic of individual angel investors that leads to many of their advantages is that they are mostly *ex-entrepreneurs*. After a large-scale study and comprehensive literature review on angel investing, Mark Van Osnabrugge and Robert Robinson estimated that over three-quarters of individual angel investors are prior entrepreneurs, compared to only one-third of venture capitalists.<sup>103</sup> The entrepreneurial

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<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> *Id.* at 106-107; Emilio J. Castilla et al., *Social Networks in Silicon Valley*, in THE SILICON VALLEY EDGE, *supra* note 25, at 235 (observing that former student of Georges Doriot and entrepreneur Frank Chambers pioneered the use of the SBIC in Northern California); ROSEGRANT & LAMPE, *supra* note 22, at 120-121 (noting the use of SBICs by financial institutions).

<sup>103</sup> VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 108 (concluding that 75-83% of angels have prior start-up experience); *id.* at 110 (concluding that the majority of venture capitalists are "financial-investor types"); *see also* John Freear et al., *Angels and Non-Angels: Are There Differences?*, 9 J. BUS. VENTURING 109, 111 (1994) (citing studies for the proposition that a majority of angels "have entrepreneurial experience as owners or

path to angel investing allows angels to combine the provision of risk capital with its knowledgeable investment in ways that state-sponsored venture capital cannot.

On the one hand, a successful exit from a prior start-up means large financial returns to the entrepreneur-turned-angel, who then has the financial means to invest in new start-ups. Thus, angels who are successful entrepreneurs can supply their own risk capital (to a certain extent; they do not have venture capitalist levels of available finance). Further, entrepreneurial experience provides angels with the expertise to act as knowledgeable financial intermediaries. Pre-investment, the technical expertise that often goes hand-in-hand with being a former entrepreneur enables the angel to evaluate the quality of other technical ideas. Post-investment, the process of hands-on start-up operation makes the angel a seasoned expert when it comes to advising other entrepreneurs on how to do the same. Thus angels, like venture capitalists, are value-added investors. Finally, as private actors, angels also possess the venture capitalist's market incentives for success. Although angels invest for non-financial as well as financial reasons, they are first and foremost driven by the desire for profit.<sup>104</sup> Some angels have remarked on their dislike for the "angel" moniker because it suggests an altruistic aim rather than a profit motive.<sup>105</sup>

The second advantage for individual angels as a funding source for innovation is their wide geographic dispersement. Angels are located throughout the country rather than confined to existing high-tech communities like private venture capitalists. Van Osnabrugge and Robinson make the point that "angels can be found everywhere, not just in major financial centers."<sup>106</sup> There are good reasons for the wide geographic dispersement of angels but not venture capitalists. Angels enjoy geographic flexibility because, although angel investing is more than a hobby, it is also less than a full-time job.<sup>107</sup> Angels seek a good return on investment but do not depend on it for their compensation as

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managers"); Sohl, *Early-Stage Equity Market*, *supra* note 87, at 108 (claiming that the majority of angels are "self-made millionaires, first generation money, and are individuals with substantial business and entrepreneurial experience").

<sup>104</sup> Ibrahim, *supra* note 58, at \_\_\_.

<sup>105</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 117.

<sup>106</sup> *Id.* at 65 (citation omitted); *but see* Sohl, *Early-Stage Equity Market*, *supra* note 87, at 113 (arguing that the angel market is more vibrant in some regions than others, including emerging markets in "North Carolina, Colorado, the Pacific Northwest, Austin, Texas, and central Utah").

<sup>107</sup> MIT Study, *supra* note 63, at 14 ("Angels enjoy the adrenaline rush of emerging company volatility, but without the 80-hour workweeks and the burden of ultimate responsibility for the company.").

venture capitalists do. Also, while on the whole angels invest in 30-40 times more start-ups than venture capitalists, each individual angel's portfolio is considerably smaller, with perhaps no more than one investment per year.<sup>108</sup> Therefore, angels can afford to live in regions with less deal flow, and in turn choose to live in places they hail from, earned their degrees, or simply enjoy living.

An important corollary to the angels' wide geographic dispersment is their preference for making investments locally in the regions where they live. Local investment means the flow of angel finance to far more regions than venture capital. This bodes well for high-tech development in those regions. According to Van Osnabrugge and Robinson, the wide range of angel locales "is particularly important for regional development since many angels elect to invest in a firm within a few hours' drive of their homes, thereby helping to retain and recirculate wealth within geographic areas."<sup>109</sup> Angels invest locally for two main reasons. One, local investment permits easy monitoring, the same reason that venture capitalists invest locally.<sup>110</sup> Two, an important, non-financial reason for angel investing is the chance for routine participation in start-up development, which would not be possible without close proximity.<sup>111</sup> It is also telling that when angels syndicate deals, as is common, they mostly syndicate with other local angels.<sup>112</sup> In sum, angel investing, like venture capital, is a regional practice, but angels operate in far more regions.

The angels' third advantage is that they channel most investments to early stage start-ups, which most start-ups are likely to be in non-tech regions. The angel's preference for lesser investment amounts channels them to the early stage start-ups, where they are able to acquire a non-trivial ownership interest<sup>113</sup> for a reasonable sum<sup>114</sup> (and therefore spread out their investments among more start-ups). Of course, the lower start-up

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<sup>108</sup> See Stephen Prowse, *Angel Investors and the Market for Angel Investments*, 22 J. BANKING & FIN. 785, 788 (1998) ("Many angels do not make more than one investment per year, although there are a few full time angels that will make four or more per year.")

<sup>109</sup> VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 66 (citations omitted).

<sup>110</sup> See Prowse, *supra* note 108, at 789 & n.5 (1998).

<sup>111</sup> See Ibrahim, *supra* note 58, at \_\_ (discussing participation in the start-up's development as one of the main non-financial motivations for angel investment).

<sup>112</sup> Andrew Wong, *Angel Finance: The Other Venture Capital* (2002), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=941228&high=%20andrew%20wong](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=941228&high=%20andrew%20wong), at 24.

<sup>113</sup> Twenty percent is common. See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 183.

<sup>114</sup> See *id.* at 154 (noting angels' preference for early stage deals because it is the only time "they can get a piece of the action before being priced out of the market"); see *supra* note 114 and accompanying text (on the average size of an angel investment).

valuation is directly related to the severe uncertainty that exists in the early stages and the extraordinary risk of start-up failure. For those start-ups that do continue to impress, venture capitalists invest under slightly less risky circumstances and therefore fund start-ups with higher valuations.<sup>115</sup> Most angels do not plan to re-invest in later rounds, instead preferring to hand-off the start-up to waiting venture capitalists.<sup>116</sup> Besides being priced out of later-stage investments (not necessarily because of a lack of means, but instead because of a preference for a certain risk/reward ratio), individual angels might lose their advantages as value-added investors as the start-up matures. In the early stages, angels can offer seasoned advice on initial development strategies, empathy on growing pains, and assistance on obtaining future funding. In the later stages, venture capitalists are better able to advise on the most profitable exit strategy or use their connections to recruit professional managerial talent.

Finally, individual angel investing in its traditional form enjoys a comparative advantage over venture capital in the deal-making process. Pre-investment, individual angels perform less due diligence than venture capitalists.<sup>117</sup> Individual angels are sometimes able to conduct less diligence because they are highly selective in their deals, usually funding only entrepreneurs previously known to them or innovations within their field of expertise.<sup>118</sup> Other angels unwisely shorthand what should be a more intensive process.<sup>119</sup> Either way, a quicker time to funding can be important for start-ups seeking first-mover advantages in a particular market segment.<sup>120</sup> When it comes time to invest, individual angels use

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<sup>115</sup> [Robert Cooter on law and the poverty of nations on relationship between the diffusion of information and share price]

<sup>116</sup> Wong, *supra* note 112, at 18. A 2007 empirical study revealed that angels who make follow-on investments obtain lower returns on investment. See Robert Wiltbank & Warren Boeker, *Return to Angel Investors in Groups* (2007), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1028592](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1028592), at 8; Ibrahim, *supra* note 58, at \_\_\_ (suggesting that re-investments are driven by the start-up's inability to find other capital rather than an angel's desire to obtain a larger piece of the pie); see also *infra* notes 143-145 (angel groups fund on average 7.3 deals per year comprised of 4.5 new companies and 2.8 follow-on investments).

<sup>117</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 173 (on the shorter length of angel due diligence compared to venture capital due diligence); GOMPERS & LERNER, *supra* note 57, at 5 (“It is not unusual for a venture team to complete 100 or more reference checks before deciding to invest in a firm”).

<sup>118</sup> See Prowse, *supra* note 108, at 789 (the number one reason angels reject funding proposals is lack of “knowledge or comfort about the entrepreneur”).

<sup>119</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 157 (“Many of the business angels who admitted to us that they did very little research greatly regretted not doing more.”).

<sup>120</sup> See Johnathan M. Barnett, *Private Protection of Patentable Goods*, 25 CARDOZO L. REV. 1251 1257 & n 18 (2004) (“A substantial body of empirical work suggests that a pioneer's first-mover advantages are effective in a variety of industries at raising barriers

simpler investment contracts, devoid of the venture capitalist's elaborate protections, for a variety of financial and non-financial reasons.<sup>121</sup> In the rare cases when angels and venture capitalists compete for an investment, some scholars have argued that the angels can win the competition because of these deal-making advantages.<sup>122</sup> On the other hand, the angels that do the least due diligence and use the simplest investment contracts are also probably the least sophisticated of angels.

#### D. Disadvantages of Individual Angel Investing

At this point, a logical question presents itself: If individual angels possess the aforementioned advantages over private venture capital and state-sponsored alternatives, why has individual angel finance – the only kind of angel finance that existed until the last decade – not sprouted more entrepreneurial communities in places like Toledo or Tucson? It could be that regions still underperform on the entrepreneurial side (in either attracting or keeping entrepreneurial talent), or, even if regions have the makings of a venture capital market, that the right history, institutions, culture, or legal infrastructure does not exist. It could also be, however, problems with the traditional form of angel investing itself as a funding mechanism. This Section reveals that despite its many advantages, individual angel investing suffers from two major disadvantages that have prevented it from creating new venture capital markets.

First, individual angel investing has long been characterized by high transaction costs, and in particular, high search costs.<sup>123</sup> Individual angels operate informally due to a preference for anonymity, which shields them from a barrage of business plans from cash-starved entrepreneurs. They do not advertise or list themselves in formal directories or on Web pages,<sup>124</sup> instead preferring to learn of potential

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to entry and preserving a pioneer's long-term market share despite entrants' product improvement and pricing strategies.”)

<sup>121</sup> Ibrahim, *supra* note 58, at \_\_\_.

<sup>122</sup> Goldfarb et al., *supra* note 91, at \_\_\_.

<sup>123</sup> See Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976); Stephen M. Bainbridge, *Insider Trading Under the Restatement of the Law Governing Lawyers*, 19 IOWA J. CORP. L. 1, 28 (1993) (three major transaction costs in private contracting as search costs, negotiation costs, and enforcement costs).

<sup>124</sup> See Freer et al., *supra* note 86, at 86 (“There are no directories of business angels and no public records of their investment transactions.”). By way of contrast, *Pratt's Guide to Private Equity* gives information on all venture capital firms, and venture capital firms of any repute boast glossy websites. See Orcutt, *supra* note 63, at 890 (“From the entrepreneur's standpoint, formal VC funds are not very difficult to find. Numerous sources exist that identify the formal VC funds and provide their contact information.”) (citation omitted).

investments through family members or business associates.<sup>125</sup> This informal, back-channel mode of operation has led to the description of individual angel investing as an “invisible” market.<sup>126</sup> Several scholars have argued that the individual angel’s preference for anonymity leads to a haphazard process in terms of which entrepreneurs receive funding and which do not, which renders the early stage capital market highly inefficient.<sup>127</sup> As a result, while individual angel finance is theoretically more available to entrepreneurs in underserved regions than private venture capital, in practice this may not be the case.

On the other hand, once the entrepreneur is on the angel’s radar screen, transaction costs are actually reduced because of the individual angel’s lesser due diligence and simpler contracting practices. But this is only a benefit to those select entrepreneurs who make it that far. Because most entrepreneurs do not, search costs are the more important transaction cost in this context.

The second disadvantage of individual angel investing is the wide variation in the quality of angels.<sup>128</sup> With an estimated two million active angels in the U.S.,<sup>129</sup> some low quality angels are inevitable. The variation in quality comes in numerous forms. For example, some angels are financially sophisticated, while others are not.<sup>130</sup> Some angels invest in their fields of technical expertise, while others branch out to fields that they do not understand.<sup>131</sup> Also, while most angels are ex-entrepreneurs, others are lawyers, accountants, or investors of inherited wealth.<sup>132</sup> Perhaps most problematically, friends and family members who invest a few thousand dollars in their cousin’s business may be counted among the class of angel investors.

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<sup>125</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 144.

<sup>126</sup> See Freer et al., *supra* note 86, at 86 (angels “are a nearly invisible segment of the venture capital markets”).

<sup>127</sup> See *id.* (citing comments to this effect by the first scholar to study angels, William Wetzel); William K. Sjostrom, Jr., *Relaxing the Ban: It’s Time to Allow General Solicitation and Advertising in Exempt Offerings*, 32 FLA. ST. L. REV. 1, 3-4 (2004) (suggesting that early stage markets are inefficient because of high information asymmetries).

<sup>128</sup> See Hellmann, *supra* note 29, at 291 (“There is much heterogeneity among angel investors”).

<sup>129</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 68 (two million angels estimate from early 1990s).

<sup>130</sup> See Orcutt, *supra* note 63, at 879 (“One issue that is striking when considering angels is the diversity of financial and investment sophistication between them.”).

<sup>131</sup> See VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 156 (venture capitalists are most sector-specific investors than angels).

<sup>132</sup> *Id.* at 108 (up to 25% of angels may not have had entrepreneurial experience).

These differences in the quality of individual angels have several negative ramifications. Ex ante, low quality angels may lack the expertise necessary to select the most promising start-ups. This market failure can be particularly pronounced when angels are quasi-friends and family members of the entrepreneur and decide to invest as a favor rather than on a critical evaluation of the start-up's prospects. Ex post, those entrepreneurs funded by low quality angels will not receive the same value-added services as those funded by high quality angels. Because value-added services can be more important than money in determining a start-up's success,<sup>133</sup> the failure to obtain value-added services could result in the failure of even good entrepreneurs.

Not only do low quality angels complicate the picture for entrepreneurs, the negative ramifications also spill over to the venture capitalists that might later fund the same start-ups. In many cases, angel finance is best thought of as a bridge to venture capital rather than a sufficient funding source to bring a start-up to exit.<sup>134</sup> Therefore, often angels must be able to attract follow-on venture capital for either they or the entrepreneur to profit. While the vast majority of venture capitalists view even individual angels as a positive source of early stage funding, they also complain that low quality angels who overvalue start-ups and the like can dissuade them from later funding that start-up.<sup>135</sup> The problem with individual angel investing is that the wide variation in angel quality coupled with the invisibility of the angels market means that venture capitalists cannot use the decisions of individual angels to fund a given start-up as a "signal" of the start-up's quality when making their own investment decisions. As discussed in the next Part, signaling theory is a much better fit for the newer angel groups than for individual angels.

#### IV

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<sup>133</sup> Carol Sands, *The Angels' Forum and The Halo Fund: The Rise of the Professional Angel*, in STATE OF THE ART, *supra* note 44, at 39 (angel group members "believe that the time they have invested in our portfolio companies is a much more important asset than our dollars"); VAN OSNABRUGGE & ROBINSON, *supra* note 59, at 65 (angels' value-added services are "priceless for young entrepreneurs starting out and would not normally be affordable by other means").

<sup>134</sup> Ibrahim, *supra* note 58, at \_\_\_.

<sup>135</sup> See Tony Stanco and Uto Akah, *The Relationship Between Angels and Venture Capitalists in the Venture Industry* 3 (2005), available at <http://lab2ipo.org/A2VCSurvey/VC%20Angel%20Survey%20v.final.pdf> (94% of venture capitalists considered angel investment a positive); *but see id.* at 11 (78% of venture capitalists believed that angels overvalued start-ups, while 44% believed that they contracted for unnecessarily complex deal terms); Sands, *supra* note 133, at 34 (describing how in Silicon Valley before the advent of angel groups the term "angel investor" had come to be viewed pejoratively by venture capitalists because of overvaluing start-ups and incompetent boards of directors).

## THE RISE OF ANGEL GROUPS

The Part examines a recent sea change in angel investing – the rise of angel investment groups. It begins with the basics of angel groups, followed by their advantages over the funding sources that have been discussed so far (private venture capitalists, state alternatives, and individual angel investors) for funding local innovation. These advantages fall into two broad categories: angel group funding itself, and the potential for angel groups to attract co- or follow-on funding from venture capitalists. This Part concludes with some concerns about angel group funding as a high-tech catalyst in new regions, but on balance advances the thesis that angel groups represent the best funding alternative to date for creating new venture capital markets.

### A. Angel Groups: The Basics

Angel groups are collections of regional angels under a professional umbrella. The first prominent angel group was Silicon Valley’s Band of Angels, founded in 1994.<sup>136</sup> The largest is Southern California’s Tech Coast Angels, which boasts close to 300 members.<sup>137</sup> The Angel Capital Association (ACA), the professional alliance of angel groups, counts 145 full-member groups as of April, 2008.<sup>138</sup> Each of the 50 states houses at least one group, and most states multiple groups. Collectively, the ACA full-member groups include 6,760 member angels.<sup>139</sup> In terms of investments, some angel groups invest in start-ups as an entity, but most do not, instead allowing individual group members to make their own investment decisions.<sup>140</sup> Angel group members still invest personal funds, although some of the larger groups have also established sidecar funds to co-invest in the group’s most attractive

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<sup>136</sup> <http://www.bandangels.com/>.

<sup>137</sup> <http://www.techcoastangels.com/Public/content.aspx?ID=EA6BF3BF-964F-11D4-AD7900A0C95C1653>.

<sup>138</sup> These and other figures in this paragraph are from the statistics of the professional alliance for angel groups, the Angel Capital Association (“ACA”), and were prepared for ACA’s Annual Summit held May 7-9, 2008, in San Diego, California (hereinafter “ACA Statistics”) (on file with author).

<sup>139</sup> ACA Statistics, *supra* note 138.

<sup>140</sup> See VAN OSNABRUGGE AND ROBINSON, *supra* note 59, at 45 (typical practice is that “[e]ach member can decide individually whether to participate in a particular deal that the syndicate decides to undertake and how much he or she wants to be involved in each investment they make”); Hans Severiens, *The Band of Angels: The Origins of Collaboration*, in STATE OF THE ART, *supra* note 44, at 23 (“Right from the start, it was decided that [Band of Angels] would not pool our funds. Not everyone is interested in the deals some of us invest in, so we leave it to the individual members to invest according to their tastes, interests, and risk profiles.”).

deals.<sup>141</sup> One benefit of sidecar funds is the potential for group members to enjoy greater diversification in their investments. That is, an angel in the group might invest in two start-ups individually, but if part of the sidecar fund, have a small sliver of ten other investments through that vehicle.

Angel groups present an interesting comparison with individual angels in terms of both size and stage of investment. Thanks to the ACA and the cooperation of angel group members in data collection, we can make more reliable statements about angel group investments than about individual angel investments. In terms of size of investment, while individual angels (again of the non-friends and family variety) invest anywhere from \$100,000 to \$1-2M in a particular start-up,<sup>142</sup> ACA data reveals that reporting angel groups on average invested \$265,926 in 2007.<sup>143</sup> Also, while individual angels invest in anywhere from one to four start-ups per year (and probably closer to one),<sup>144</sup> reporting angel groups on average invested in 7.3 start-ups in 2007.<sup>145</sup> Because only some members of the group may have invested in these deals, the number of investments per individual angel group member will be lower.

In terms of stage of investment, over 80% of angel groups invested in the early stages, although 40% move into venture capital territory by investing in the “expansion” stages, while only five percent invested in the later stages.<sup>146</sup> One advantage of angel groups is that the pooling of capital allows them to sometimes, although not often enough, fill the new funding gap created as venture capitalists move to later and later stages of funding.<sup>147</sup>

## B. Advantages of Angel Group Funding

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<sup>141</sup> See Sands, *supra* note 133, at 39 (Silicon Valley’s Angels’ Forum created “The Halo Fund in 2000 [which] allowed our friends and family members as well as institutional investors to co-invest in the group’s best deals”).

<sup>142</sup> See *supra* note 86 and accompanying text.

<sup>143</sup> See 2008 ACA Angel Group Confidence Survey, available at \_\_\_\_\_ (hereinafter ACA Confidence Survey”).

<sup>144</sup> See Ibrahim, *supra* note 58, at \_\_ (citing sources).

<sup>145</sup> These 7.3 investments were comprised of 4.5 new start-ups and 2.8 follow-on investments in start-ups already in the angel group’s portfolios. ACA Confidence Survey, *supra* note 143.

<sup>146</sup> ACA Confidence Survey, *supra* note 143.

<sup>147</sup> See Ibrahim, *supra* note 58, at \_\_. However, a prominent angel told me that a large funding gap still exists for start-ups seeking \$1-3 million that even the largest groups have trouble filling on a routine basis.

With the basics of angel groups in mind, this Part details the advantages of angel group funding over the other funding sources that have been discussed so far, including individual angels. These advantages fall into two broad categories: advantages of angel group funding itself, and advantages in terms of the potential to attract venture capitalists as co- or follow-on investors by signaling the quality of the start-ups in which they invest.

## 1. Angel Group Funding Itself

To put it succinctly, angel groups retain the most important advantages of the more professional variety of individual angel investing but eliminate its disadvantages. Like individual angel investors, angel groups combine Gilson's risk capital and financial intermediary functions and are widely dispersed geographically with a preference for local, early stage investments. They also have the potential, through the pooling of resources, to constitute a more important funding source for entrepreneurs that require larger cash infusions. In addition, as will now be discussed, angel groups do not suffer from the individual angel's weaknesses of invisibility or wide variation in quality.

First, while individual angels prefer anonymity and do not wish to be known to the broader entrepreneurial community, angel groups are exactly the opposite. As noted, angel groups have a trade association, the ACA, to which they supply data on their operations. Most of them have their own websites, like venture capitalists, and are also easily found through a few clicks on the ACA's website.<sup>148</sup> The websites often contain instructions for entrepreneurs on how to submit business plans for the angel group's consideration.<sup>149</sup> In addition, angel groups hold workshops for entrepreneurs in their various communities to educate them on how to become attractive candidates for funding. As one prominent angel has said, "angel groups attract high-potential companies because entrepreneurs are aware of these groups."<sup>150</sup> For these reasons, angel groups stand in stark contrast to individual angel counterparts and constitute a highly visible market. The visibility of angel groups reduces search costs for entrepreneurs.<sup>151</sup>

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<sup>148</sup> <http://www.angelcapitalassociation.org/>.

<sup>149</sup> For example, the front page of the Tech Coast Angels website has a link for entrepreneurs that reads "**SEND IN YOUR APPLICATION**. You can start by making application, right here. There is no fee to apply, or to present." <http://www.techcoastangels.com/Public/content.aspx?ID=EA6BF3BF-964F-11D4-AD7900A0C95C1653>.

<sup>150</sup> Preston, *supra* note 44, at 68.

<sup>151</sup> See Smith, *supra* note 78, at 162-173 (observing the Web's potential to reduce search costs for entrepreneurs seeking funding).

Second, angel group members are of more uniform quality than individual angels, both on an individual basis and as a collective entity. On an individual basis, angel groups attract the more professional, businesslike angels in a region. Angel groups attract members looking for deal flow, thereby excluding angels who only want to fund friends or family. The latter group represents the low-quality angels who are ill-equipped to select the best start-ups for funding *ex ante* or add value to entrepreneurs *ex post*.<sup>152</sup> Also, some angel groups that specialize by sector limit membership to those angels with expertise in that sector.<sup>153</sup> Some non-sector specific groups exclude lawyers, accountants, and other non-techies.<sup>154</sup>

As – or more – importantly, angel groups are able to offer more uniform quality due to their advantages as a collective. A region’s angels will be diverse in terms of their technical expertise and entrepreneurial experiences. But because angel groups bring all of these members together under one umbrella, angel groups will have advantages in selecting the best start-ups for funding *ex ante* and adding value *ex post*. It is likely that at least some member of the angel group is an expert in the entrepreneur’s technical field and can evaluate the quality of the innovation.<sup>155</sup> In addition, the collective wisdom of the group can be called upon to help entrepreneurs through growing pains after funding.<sup>156</sup> It is likely that some angel in the group has dealt with a similar problem before. Individual angels, even when they invest in syndicates (as they often do), do not possess the same depth or wealth of expertise.

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<sup>152</sup> See *supra* notes 128-133 and accompanying text.

<sup>153</sup> Norm Sokoloff, *Tenex Medical Investors: Niche Investing*, in STATE OF THE ART, *supra* note 44, at 44 (members of Silicon Valley’s Tenex Medical Investors have “substantial life science expertise”).

<sup>154</sup> Severiens, *supra* note 140, at 22 (the Band of Angels’ “organizing committee made it clear right from the start that membership in our group would be limited to those with high-tech credentials, and thus lawyers, bankers, real estate developers, and so on were not the kind of members we were seeking”).

<sup>155</sup> See Severiens, *supra* note 140, at 22 (“We insist that each serious investment opportunity have a sponsor from within the group; if that sponsor is another respected ‘techie,’ those of us unfamiliar with the specifics of a market or a technology trust that it must be an opportunity worth exploring.”); Sokoloff, *supra* note 153, at 45 (“The due diligence investigational process is shared in that the network relies on the expertise of individual members or their contacts.”); William H. Payne, *Tech Coast Angels: An Alliance of Angel Networks*, in STATE OF THE ART, *supra* note 44, at 55 (“When you increase the number of angels in a group, you broaden the breadth of experience among the group’s members and increase deal flow.”).

<sup>156</sup> See Sands, *supra* note 133, at 39 (“If there is a problem [with an investment], the group helps the involved members identify which people to ask for guidance (this is where the broad skills and resources of the group become very important) and what actions to take.”).

## 2. Attracting Venture Capital Through Signaling

Despite the angel groups' advantages as a funding source for innovation, many start-ups will also require venture capital to reach a successful exit. Although angel groups themselves satisfy Gilson's risk capital and financial intermediation functions, in practice not even the pooling of capital permitted by angel groups can at present supply all dollars needed for certain types of innovation. (Software and Web 2.0 companies may be becoming exceptions where angel financing alone is sufficient due to reduced costs in these fields.) Also, while angel group members have deep rolodexes of professional talent and connections themselves, the venture capitalists (and their large cash infusions) are more likely to lure high-priced talent to join their portfolio companies. As a result, angel groups might need to attract venture capital to their regions to develop fully functional venture capital markets and improve the chances for entrepreneurial communities. This Section first builds a theoretical argument, grounded in signaling theory, as to how angel groups that need co- or follow-on venture capital might attract it to their regions. Next, it concedes that theory must translate into practice, and that it is too soon to tell whether that will be the case.

Signaling is an important concept in the financing of companies because of the information asymmetries that exist between companies and potential investors.<sup>157</sup> Where information asymmetries exist, investors look for signals that help them reduce these asymmetries and make better investment decisions. In the case of high-tech start-ups, where information asymmetries are particularly severe, venture capitalists play a unique, two-sided role in signaling.<sup>158</sup>

On the one hand, venture capitalists send positive signals about the start-ups they fund to later investors, including investment banks and public markets, and to labor markets for high-tech talent.<sup>159</sup> Venture capitalists are able to send credible signals through their investment decisions because, as discussed, they have both the expertise and financial

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<sup>157</sup> See generally Michael Spence, *Job Market Signaling*, Q. J. Econ. 355 (1973); JUDITH DONATH, *SIGNALS, TRUTH & DESIGN* (MIT Press, forthcoming).

<sup>158</sup> See Bernard S. Black, *Information Asymmetry, The Internet, and Securities Offerings*, 2 J. SMALL & EMERGING BUS. L. 91, 94 (1998) ("In what is loosely called the 'high-tech' area, where information asymmetry is especially severe because high-tech companies often have short histories and make highly specialized products, we have developed a correspondingly specialized intermediary, the venture capital fund, that functions partly as a reputational intermediary.").

<sup>159</sup> Davila et al., *Venture-Capital Financing and the Growth of Startup Firms* (ssrn link) at 16 ("The support of venture capital – through the funding event – provides a relevant signal to separate startups with different quality).

incentives to select and develop the most promising start-ups. As repeat players in the entrepreneurial finance market, venture capitalists serve as reputational intermediaries, meaning that if the signals they send are not credible, their reputations will suffer.<sup>160</sup> Finally, venture capital investments are costly, and signaling works better in situations where the signal is costly to send and cannot be easily mimicked.<sup>161</sup> For all of these reasons, venture capitalists are able to, and are enticed to, send credible signals through their investment decisions, and these signals reduce information asymmetries about start-ups for later investors.

To select the best start-ups, venture capitalists will conduct a thorough due diligence review. When conducting due diligence, “the venture capitalist will typically consider numerous factors [including] the entrepreneurial firm’s technology, the managerial ability of the firm’s founders, the dynamics of the market(s) in which the entrepreneurial firm hopes to compete, and the potential responsiveness of the financial markets to a public offering....”<sup>162</sup> Even after these efforts, however, venture capitalists remain subject to information asymmetries with entrepreneurs because the start-up environment is layered with both operational and scientific uncertainties.<sup>163</sup> As a result, venture capitalists will not only send signals through their investment decisions, but will also look to receive signals that will help them make those very investment decisions.<sup>164</sup> I will now advance the argument that angel group financing of a start-up provides a better signal to venture capitalists than either of the signals that venture capitalists currently use: the start-up’s patents and the terms of the venture capitalist-entrepreneur investment contract.

Angel groups send signals precisely the same way that venture capitalists do. First, as discussed earlier, angel groups have share the venture capitalist’s expertise and financial incentives necessary to select and develop the most promising start-ups, which lends credibility to the start-ups they select for investment. Also, like venture capitalists, angel

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<sup>160</sup> Bernard S. Black and Ronald J. Gilson, *Venture Capital and the Structure of Capital Markets: Banks Versus Stock Markets*, 47 J. FIN. ECON. 243 (1998); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 662 (2002) (“Signalers...must be in the market long enough that observers believe them to have the incentive to invest in credible signaling.”).

<sup>161</sup> See F. H. Buckley, *When the Medium is the Message, Corporate Buybacks as Signals*, 65 IND. L.J. 493, 531 (1990) (“cost of adopting the signalling strategy will deter low quality firms from emitting that signal”).

<sup>162</sup> Joel M. Podolny, *Networks as the Pipes and Prisms of the Market*, 107 AM. J. SOCIOLOGY 33, 46 (2001).

<sup>163</sup> Gilson, *supra* note 6, at 1077.

<sup>164</sup> Black, *supra* note 158, at 94 (“The venture capital fund not only gathers information, it also provides it.”).

groups are repeat players in entrepreneurial finance that will suffer reputational sanctions if they vouch for poor start-ups. Finally, angel group signals, like the venture capitalist's signals, are costly to send. Therefore, assuming venture capitalists can credibly signal the quality of their portfolio companies, the same rationale should more or less apply equally to angel groups.

Angel group investments compare favorably to the signals that venture capitalists commonly rely on when making their investment decisions: patents and investment contracts. Venture capitalists look to a start-up's patent portfolio as a proxy for its quality.<sup>165</sup> In an important paper, Clarisa Long has set forth a signaling theory for patents.<sup>166</sup> After questioning the conventional assumption that patents are simply an entrepreneurial tradeoff between the loss of proprietary information in exchange for patent rents, Long argues that patents can serve as signals sent by entrepreneurs to reduce information asymmetries with potential investors.<sup>167</sup> She argues patents can serve as credible signals for several reasons, including because they are costly to obtain, because they indicate the start-up's line of research, and because patentees can suffer penalties if they make misstatements to the Patent and Trademark Office (PTO).<sup>168</sup>

On the other hand, Long concedes that there are problems with patents as signals. First, the *quantity* of patents a start-up owns does not provide much information (other than that the start-up is not sluggish<sup>169</sup>), and for the venture capitalist to analyze the *quality* of patents requires verification from attorneys, consultants, or scientists.<sup>170</sup> When venture capitalists must go behind a signal to determine its credibility, the signal begins to lose its value as such. Second, entrepreneurs can send a patent signal themselves by applying for and obtaining a patent from the PTO.

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<sup>165</sup> See Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1505-06 (2001).

<sup>166</sup> See generally Long, *supra* note 160. Trademarks have also been viewed as sending a signal to consumers. See Stacey L. Dogan & Mark A. Lemley, *Trademarks and Consumer Search Costs on the Internet*, 41 HOUS. L. REV. 777, 778 (2004) ("Trademark law, in theory, fosters the flow of information in markets. By protecting against deceptive uses of trade symbols in commerce, the law enables sellers to create their own reliable shorthand to identify their goods and reduce search costs for consumers.").

<sup>167</sup> Long, *supra* note 160, at 627 ("Patents can serve as a means of reducing informational asymmetries between patentees and observers. The ability to convey information credibly to observers at low cost is a highly valuable function of patents").

<sup>168</sup> *Id.* at 647-50.

<sup>169</sup> *Id.* at 654 ("Nobody associates obtaining patents with sloth and shiftlessness.").

<sup>170</sup> *Id.* at 666 ("Verifying anything beyond [patent] quantity presents higher costs. Observers may employ experts such as attorneys, consultants, or scientists to examine individual patents more closely.").

Although the PTO is a theoretical gatekeeper for patent quality, an increasingly understaffed PTO with examiners subject to tight deadlines does not perform this function well.<sup>171</sup> Finally, Ronald Mann notes that sometimes patent protection is not the sort of thing that investors care about because they might be more interested in first-mover advantages.<sup>172</sup> Because the patent process distracts management from the start-up's business, taking the time to obtain patents could be viewed as a negative signal to these investors.

Angel groups, however, can enhance the accuracy of patent signals. If a patent was obtained pre-angel group investment, the angel group probably reviewed the patent and viewed it positively. Long recognizes the ability of informational intermediaries to pass on a patent's credibility,<sup>173</sup> and in this setting angel groups would be excellent informational intermediaries for reasons given. On the other hand, if a patent was obtained post-angel group investment, venture capitalists might reasonably view obtaining the patent as an angel-approved use of scarce resources. Therefore, whether the angel group investment comes pre- or post-patenting, it can enhance the credibility of the patent signal.

The literature also claims that venture capitalists use the terms of their investment contracts with entrepreneurs as signals about the entrepreneur's quality. Venture capitalists stage their investments for several reasons, including the signaling effect of staged financing.<sup>174</sup> When entrepreneurs agree to delay future funding until reaching certain benchmarks, it sends a signal to venture capitalists that this is a high-quality entrepreneur who believes these benchmarks will be reached. The same basic idea applies to preferred stock, the security of choice for venture capitalists. By selling the venture capitalists preferred stock while themselves holding common, entrepreneurs signal to venture capitalists their belief that the value of the start-up will exceed the amount of the venture capitalist's preference.<sup>175</sup> As Michael Klausner and Kate Litvak

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<sup>171</sup> *Id.* at 668 (“Complaints about the PTO’s ability to screen patent applications adequately have been increasing. Under tight budgets and notoriously tight time schedules, the PTO lets patents slip through that contain incredible information.”) (citation omitted).

<sup>172</sup> Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry*, 83 TEX. L. REV. 961, 976-77 (2005).

<sup>173</sup> See Long, *supra* note 160, at 670-71 (discussing the role of “second tier informational intermediaries” like BountyQuest as potential verifiers of a patent’s quality, but noting that such firms must acquire reputations before investors will rely on their judgments).

<sup>174</sup> See Gilson, *supra* note 6, at 1080.

<sup>175</sup> See Michael Klausner and Kate Litvak, *What Economists Have Taught Us About Venture Capital Contracting*, in BRIDGING THE ENTREPRENEURIAL FINANCING GAP 54, 56 (Michael J. Whincop ed., 2001).

observe, however, the signal is only credible if the entrepreneur can accurately gauge the value of his business.<sup>176</sup> (The same would be true of staged financing.) It also assumes, probably unrealistically, that the entrepreneur would pass up the opportunity for venture capital if he did not believe he could back up his signals. It is not a stretch to say that most entrepreneurs would probably take the venture capital and see where it led. Thus, the signals that entrepreneurs send through their investment contracts are of questionable credibility.

For the reasons above, angel group funding can provide a better signal to venture capitalists than either patents alone or investment contracts. Of course, while signaling theory is an attractive fit for angel groups, it remains to be seen whether theory will translate into practice. While empirical data must be collected as angel groups continue to develop past their infancy, at least one piece of available data is encouraging. That is, the ACA reports that in 2007, *two-thirds* of reporting angel groups attracted either co- or follow-on investments from venture capitalists.<sup>177</sup> Although I have not been able to obtain a further breakdown on this data, and while reporting groups probably overrepresent more established regions, the wide dispersment of angel groups suggests that venture capital was indeed attracted to some new regions. Another, less-favorable possibility is discussed below.

### C. Angel Groups: Some Concerns

Despite the theoretical advantages of angel groups described above, there are concerns about their ability to create venture capital markets. These concerns relate to both of the angel groups' advantages: their ability to fund start-ups, and their ability to attract venture capital for these start-ups. In terms of angel group funding itself, the main concern is that angel groups appear to still constitute a very small percentage of all angel investments. Using the ACA's 2007 statistics discussed earlier, only 6,760 of two million estimated angels belong to angel groups. Moreover, multiplying the average angel group investments of \$265,926 times an average of 7.3 investments per group times 145 angel groups yields a total angel group investment figure of under \$282 million – less than 1.2% of the aggregate angels market of \$25 billion.<sup>178</sup> Jeffrey Sohl, who conducts extensive research on angels, attributes a much larger figure – 30% – of angel investments to angel groups, but it is unclear how he arrives at that

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<sup>176</sup> *Id.*

<sup>177</sup> ACA Confidence Survey, *supra* note 143.

<sup>178</sup> [Discuss concerns with this data in terms of extrapolating from the larger groups that are doing the reporting]

figure.<sup>179</sup> At least part of this must be that angel groups are quite new, products of only the past decade, and we might expect them to constitute a larger share of the angels market in time.

Another concern is that angel groups will lose their deal-making advantages over entrepreneurs because they use detailed, venture capital-like investment contracts.<sup>180</sup> Therefore, despite the angel groups' lowering of transaction costs for entrepreneurs by permitting easier search, they raise transaction costs for entrepreneurs through their contracting practices. Angel groups also appear to conduct more extensive diligence on start-ups, sometimes taking longer,<sup>181</sup> but sometimes not due to a deeper pool of angels available to conduct diligence.

Finally, as discussed above, the ACA reports that already, in 2007, two-thirds of reporting angel groups attracted either co- or follow-on investments from venture capitalists. However, my inability to go behind this base statistic makes it difficult to determine how venture capital came to these regions – or whether it came at all. Geographic extension of venture capital could come in the form of branch offices, as venture capital firm Draper Fischer and Jurvetson has done. As Steve Jurvetson has written, “At [DFJ], we find that there is a positive cycle of entrepreneurship that occurs locally....We have opened affiliate VC offices in nine U.S. locations.”<sup>182</sup> I do not have evidence, however, that any venture capital branches were opened to follow angel groups.

As an alternative, venture capitalists in existing high-tech communities could “move” into new regions by syndicating deals with local angel groups. If angel groups are deemed credible enough, venture capitalists could in essence appoint them local monitors for the investment – their eyes and ears in new communities. Lastly, and the worst option for building new venture capital markets, it could be that venture capital did not (and will not) travel at all, but start-ups did (and will). That is, it may be the case that angel groups cannot prevent start-up relocations to existing high-tech communities, but merely delay them. In other words, angel group funding entices entrepreneurs to stay local for a while, but at some point the need for the venture capitalist's cash and connections will still drive a relocation. On the other hand, delaying funding could mean

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<sup>179</sup> See Hannah Clark, *Are Angel Investors Heaven-Sent?*, Forbes.com, May 4, 2006, [http://www.forbes.com/entrepreneurs/2006/05/04/entrepreneurs-finance-angels-cx\\_hc\\_0504angel.html](http://www.forbes.com/entrepreneurs/2006/05/04/entrepreneurs-finance-angels-cx_hc_0504angel.html) (quoting Professor Sohl for the 30% figure).

<sup>180</sup> Ibrahim, *supra* note 58, at \_\_.

<sup>181</sup> See, e.g., Sands, *supra* note 133, at \_\_ (one angel group's typical time to investment is four-to-six months).

<sup>182</sup> Jurvetson, *supra* note 70, at 125.

preventing it, as venture capitalists might not ask a start-up to move that had come to enjoy community-specific advantages.

## CONCLUSION

Silicon Valley's idiosyncratic history and its current status as a highly evolved entrepreneurial ecosystem inevitably leads to a healthy dose of skepticism about the prospects of cloning it elsewhere. This skepticism is well justified, as most cloning efforts have failed. To the disappointment of economic developers, there has been no recipe or blueprint to follow to achieve analogous results.

Do these failures lead to the inevitable conclusion that Silicon Valley cannot be replicated? Perhaps, but may be the case that regions better described as Silicon Valley "lites" could be created if new venture capital markets are formed. New venture capital markets consist of both entrepreneurs and proper funding for their ventures. Whether human capital or financial capital is the larger impediment to local innovation is a region-specific, empirical question. However, this Article has argued that while innovation funding appears problematic for new regions, the rise of angel investment groups present an attractive solution for the future. In short, angel groups combine the best features of private venture capital and state alternatives – the venture capitalist's expertise and market incentives, the state's supply of risk capital and geographic dispersement. Angel groups are quite young, however, and therefore it is too soon to tell whether their theoretical advantages will translate to more high-tech growth in practice.