Money Bull:
An Exploration of Durham’s
Digital Tech Startup Financial Ecosystem

By

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A Masters Project submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of City and Regional Planning in the Department of City and Regional Planning

Chapel Hill

2014

Advisor’s Approval:

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Introduction

Venture capital has long been the go-to source of capital for high growth potential technology startups. The striking growth of the tech startup sector over the last decade has drawn a great deal of attention to the venture capital firms that have supported it. Names like Peter Thiel and Sequoia Capital, while not as widely known as the likes of Steve Jobs or Apple, have some national recognition for their investment work as the important supporting role to this thriving industry. In basketball terminology, venture capitalists act as the Toni Kukoc to the tech companies’ Michael Jordan—a highly important support without the star power. At times, it feels like venture capital sprouted out of Silicon Valley alongside the first semiconductors, and in a sense, it did. The uncertainty and newness of innovative tech startup business models necessitates capital with a higher level of risk tolerance than traditional financial sources. Most observers understand that to grow tech clusters, an entrepreneur needs access to venture capital and plenty of it.

However, venture capital is only one of several important financial actors within the startup ecosystem. Angel investors, crowdsourcing, non-profit grants, and competitive accelerator programs all serve to fill the need for early and growth stage startup capital for tech entrepreneurs. Venture capital has long been the staple of tech startup companies, but that capital has largely been concentrated in recognizable tech
states like California, New York, Massachusetts, and Washington. California, for example, accrued $3.83 billion in venture capital investment in Q4 of 2013 alone (PricewaterhouseCoopers, 2014). That amounts to 46% of all the venture capital invested in the nation for Q4 2013! Other sources of financial support than venture capital provide steps to obtaining venture capital and in some locations fill a venture capital void. Even in venture capital heavy San Francisco and Boston, angel investors and grant making accelerator programs help entrepreneurs get on their feet and maintain their trajectory.

For all its potential mobility, venture capital has remained a largely local affair. For most tech startup entrepreneurs, their goal is to grow their companies quickly and efficiently so that they can eventually sell the company for a large exit sum. Unfortunately, for those living outside of strong venture capital hubs, the typical seed and series-a companies looking for investments take 10% more time raising funds than similar companies inside of California, New York, and Boston (Wessell, 2013). This means entrepreneurs in smaller venture capital markets start at a disadvantage solely based on their geography. For municipalities trying to grow these tech sector clusters, the persistent, magnetic draw of Silicon Valley venture capital and angel investment should concern community and business leaders working to grow local startup clusters.

This project will focus on the financial ecosystem of the digital startup sector emerging in Durham, NC (nicknamed Bull City for those wondering about this work’s
title) in order to explore issues facing startup hubs outside of the traditional venture capital geographies. As home to the Research Triangle Park, Durham hosts giants of international research in biotech and computing technology such as IBM, GlaxoSmithKline, and CISCO. These companies came to RTP in the latter half of the 20th century and helped North Carolina revolutionize its economy from tobacco and furniture to biotechnology and pharmaceuticals (Link, 2004). In recent years, Durham has also begun to engage with smaller, tech-based entrepreneurial firms. The founders of these digital startups in Durham tend to be characteristic of the startup industry as a whole—young, well-educated individuals raised on Napster and AOL armed with a laptop and (occasionally) an MBA degree. The growth of this sector in Durham did not happen accidentally and has intentionally been clustered around the downtown area. According to local Durham industry insiders, there could be almost 150 startups located in downtown Durham alone and it’s likely still expanding (Klein, 2014).

However, as these firms have grown, many have felt a lack of later stage startup capital to be a hindrance to the continued growth of these companies in Durham. Due to this cluster’s location outside of the regions with the largest availabilities of startup capital, Durham has experienced unique challenges in growing this sector relative to other national startup leaders. Attracting larger later stage capital from substantial startup finance hubs has been one of the area’s growing concerns as its prosperous early stage companies have begun to need larger investments than are readily available in the Durham area. Understanding how Durham has both benefitted from and
struggled with growing a digital tech cluster with limited growth capital will help to understand how other cities may grow and support their own fledgling startup clusters. Furthermore, understanding Durham’s current state of venture, angel, and grant financing for startups will provide valuable insight into how it might increase its prospects within this industry relative to both state and national competitors.

This work will answer two main questions: how does Durham compare to other emerging tech startup centers around the country and who are the major financial actors that have invested in this growing startup ecosystem in Durham. Additionally, this research hopes to provide a clear picture of the options available to startups looking for funding as well as recommend ways for Durham to strengthen its current levels of investment. By exploring the variety of financial options available within Durham, this research will provide both a helpful insight into the myriad web of tech startup funding and a useful tool for those hoping to better understand how capital flows in this rapidly moving industry.

Durham has an incredible capacity for tech startup innovation compared to other cities in North Carolina and the nation. Strong investments in R&D, the co-location of a variety of leading technology companies, an increasingly high quality of life, and the presence of three top-tier research universities have afforded Durham’s entrepreneurial community with an enviable amount of resources to grow their tech startup sector. However, Durham faces competition for both financial and talent resources from other
emerging tech startup hotbeds. Durham currently has much lower levels of capital available for tech startups than its national competitors. Durham’s levels of startup capital are especially low for those companies who have grown past their early stages and hope to continue to grow. Durham has done well at early stage financing but now is the time for the city to either attract more capital, better leverage its existing resources, or prepare to see its early stage companies leave for regions with larger capital resources.

**Methodology**

This paper will explore trends in digital tech startup financing in Durham, NC. In order to understand more fully Durham’s relative position in the world of startup investment and creation, this study will also explore comparison cities both across the nation and within the state. In the national and occasionally local data sources, Durham is considered part of the Raleigh-Durham area. Depending on who makes the distinction, the Raleigh-Durham area consists of 3, 8, or even 16 counties surrounding the Research Triangle Park (RTP). While this oversimplification of multiple counties’ identities to a single regional name upsets many residents, much of the available data summarizes investment information to this regional level. For this study, the Triangle refers to Wake, Durham, and Orange counties. These counties have always been considered the core counties of the Triangle since they are each home to one of the Triangle’s vertex defining universities. These universities are North Carolina State
University in Wake County, University of North Carolina at Chapel Hill in Orange County, and Duke University in Durham County. These counties also include the Research Triangle Park which sits between Durham and Wake and has long been considered the driver of central North Carolina’s modern economy. Because these counties comprise the core startup activity of the Triangle, they have been the focus of the regional comparisons at the national level. While there are certainly other deals that have been undertaken in other counties considered to be a part of the larger Triangle area, these three counties have overwhelming contributed a much greater amount to the startup vitality of the region than any of their neighboring counties.

Nationwide comparisons to other regional tech hubs will illustrate the Triangle’s relative strengths and weaknesses in this industry. Understanding how the Triangle region compares to its national competitors for financing resources will help to understand its potential for continued growth and success in the digital tech startup fields. Durham, the Triangle, and North Carolina as a whole have competed for both financial and talent resources with areas like Austin, Chicago, and Seattle. All of these areas are considered strong tech startup cities outside of the major startup financial hubs of San Francisco, Boston, and New York. In order to understand more about the region’s strengths and weaknesses, it is useful to compare it with its main national competitors. While international competition for startup resources has become increasingly more important to understand, this study does not explore this level of
comparison in much detail other than a cursory exploration of relative investment deals at the regional level worldwide.

After discussing the national position of the Triangle region for digital tech startups, this study then drills down into the finer geographies comprising the Triangle. Understanding the relative contributions to the digital tech startup industry of the Triangle’s cities will help to elucidate the areas in this region creating the largest startup industry impact. This work will also explore statewide comparisons to illustrate the dominant role of the Triangle’s cities to the performance of the digital tech startup fields in other North Carolina cities. While some municipalities in North Carolina have shown highly publicized IPOs or other large fund raising events, the statewide comparisons will help to better clarify the uniqueness of both the Triangle and its major contributors to the state’s overall digital tech startup industry. As the data will help show, Durham has been the major contributor to digital tech startup activity in the Triangle and the state. Statewide and regional comparisons will help provide insight into ways local and state economic developers and policymakers can leverage current growth in Durham to better benefit both local and statewide interests.

The following sections will explore operational definitions, sources of primary and secondary information, and explanations of those sources less commonly understood.
Tech Startups

For the sake of clarity, this paper will be using the term “digital startup” to describe the industry sector of interest throughout. “Tech startups” have traditionally been defined “as young, high-tech companies whose main activity is R&D up to the initial sales stage (usually between 1 and 5 years old)” (Avnimelech & Teubal, 2006, p. 1477). This definition is too broad for the focus of this paper. This definition of startups could include biotechnology, pharmaceutical, aviation, or any number of other high initial investment R&D companies. Instead, this work will focus on companies associated with software, digital media, web development, and online services. The increasingly lower barriers to entry and strong interest in these firms by both investors and the media make these companies fascinating to watch. Whether this industry will maintain itself or become yet another digital bubble, as some have predicted, remains to be seen. Regardless of its sustainability, the current prominence and popularity of these industries necessitates a better understanding of their successes and failures.

Information Sources

This study has relied upon publicly available datasets as well as interviews with local tech startup leaders and experts in Durham. The datasets utilized concentrate on grant funding recipients, venture capital portfolios, and accelerator graduates. While these datasets do not document the full extent of the ebb and flow of capital between these financial actors, they do give some strong indications of the connections forged between them.
This study utilized a variety of data sources in order to draw a more complete picture of the current and historical trends in Durham’s digital tech startup financial ecosystem. These sources included information from a variety of governmental, proprietary, and open source data resources. These resources provided valuable quantitative perspectives on local and national investment trends. The most utilized datasets for this work included PricewaterhouseCoopers’ MoneyTree, Crunchbase, Foundation Directory Online, Kauffman Foundation Entrepreneurship Index, and the SBIR/STTR TechNet.

A major challenge in assessing trends amongst these types of investment deals was the lack of comprehensive databases or recording structures. There are a number of databases cataloguing these transactions in different ways, but no one database effectively tracks all of these deals. This is less a failing of these researchers than an illustration of the difficulty of tracking a quickly moving field like startup investment. Some of these investment transactions are not widely publicized causing many datasets that rely on public information to miss these deals. By employing multiple datasets focused on venture capital and angel investments, this study aimed to fill gaps across the various data resources.

The interviews for this study were conducted with venture capitalists, grant program managers, strategists, and startup founders. Specifically, interviews were held with Durham representatives from a major startup grant making accelerator, a co-
working strategist, a venture capitalist, a tech startup serial entrepreneur, and a non-profit entrepreneurship mentor (See Interviews section for details). This qualitative research added an extra dimension to the datasets and helped to clarify some of the more obfuscated elements of the data.

This study also relied heavily upon secondary sources such as newspaper articles and industry reports. Newspaper sources were used both as a source of information and as a means of validation for the entries in the available data sources in order to ensure the accuracy of the database information. The industry reports used were typically generated from proprietary or private datasets allowing for this study to gain indirect access to a variety of otherwise restricted data sources.

Many of the datasets explored in this study have well-established histories within academic work and further explanations of their contents or collection methodologies is unnecessary. However, one very new dataset—Crunchbase—may not be well-known or well-understood by many readers. Since this resource played an important role in this study, an explanation of its content and methodologies are necessitated.

Crunchbase (http://www.crunchbase.com/), developed by a team from the technology news site TechCrunch (http://techcrunch.com/), acts as a free portal for information on “technology companies, people, and investors.” Crunchbase aims to provide information about the global startup community to everyone for free. The
database encompasses a wide variety of information including company states, investor names, fund raising amounts, exit events, and a variety of other information related to the main activities involved in startup investment.

It is critically important to note that Crunchbase can be edited by anyone. The creators of the database are highly explicit about this fact as is this research. This feature both strengthens and weakens the database. As a strength, crowdsourcing of the database allows Crunchbase to keep very up-to-date information on a variety of funding events and activities. As a weakness, this crowdsourcing introduces a great deal of doubt into the reliability of the database’s information. While Crunchbase does have an approval process for new entries, the data may be intentionally or accidentally misrepresented in the entries and occasionally make it into the database itself.

Throughout this, the results of Crunchbase’s data have been treated by the author as indicative of a certain trend but not necessarily an accurate depiction of all startup activity. It is important for readers of this work to understand the limitations of this type of data and its potential for inaccuracy. While individual entries have the potential for inaccuracy, the overall dataset has proven itself to give a strong impression of the current state of startup activity both nationally and locally. (For more on the Crunchbase dataset see Appendix A.)
Conceptual Framework

This section will explore certain concepts and terminology through an examination of past academic literature. This will help to further the methodology discussed earlier and place this study of Durham and the Triangle within a larger context of the roles of different financing mechanisms for tech startups. First, this section will define the context and literature of the term “financial ecosystem.” Following that discussion, this section will then explore the literature on funding mechanisms traditionally available to these industries of focus. By understanding the background and work on these concepts, this section will serve to define and orient the reader to the terminology used throughout the Findings section.

Financial Ecosystems

This project uses the term “financial ecosystem” to describe the relationships amongst various capital actors in the digital startup realm. This conceptualization is based on a broader idea of a business ecosystem. James Moore popularized the use of ecosystems to describe the characteristics of the business environment in his 1996 book “The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems.” In it, Moore defines a business ecosystem as “an economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world” (Moore, 1996, p.26). Drawing a comparison to natural ecosystems, Moore points out that the biological ecosystems of isolated islands can be heavily disrupted by the introduction of a new predator or pest. More robust ecosystems tend to have constant
interaction with a variety of life forms, which forces evolution and change to create more favorable adaptability.

There has been little literature attempting to define financial ecosystems as a subset of this broader definition of business ecosystems nor much exploration of ecosystems as a model for tech startup finance. Often, the popular media uses the term in articles about tech startups, but there has been little academic examination of it. Since much of the financial capital for startups circulates in a much tighter web than the larger economy, the concept of an ecosystem is apt. Venture capitalists and angels typically fund entrepreneurs who later become venture capitalists or angels themselves. Thus, similar to Moore’s work, there is an interesting biological analogue of growth and re-generation in the startup financial ecosystem as successful entrepreneurs fund new companies with their newly created wealth. Much like the passage of gene pools from parent to child in biological systems, entrepreneurial communities pass resources, financial or otherwise, from parent to child companies. This work will view the financial ecosystem of tech startups as those participants most predominantly involved with the peculiarities of this type of business finance. This work will also map these relationships more concretely for the Durham ecosystem.

Financial Supports

Most traditional small businesses begin with financial backing from a bank loan. However, as demonstrated by Audretsch and Lehmann in their assessment of financial
supports for young, innovative firms in Germany, most tech startups do not receive much financing from the banking system (Audretsch & Lehmann, 2004). Thus, understanding the role of non-traditional financial support systems is critical to understanding how tech startup firms begin, operate, and grow. This work will concentrate on four main areas of financial support for digital startups: venture capital, angel investment, grants, and accelerators. While there are other financial supports, such as crowd funding, there is very little available information on them and their effectiveness.

Venture Capital

Gompers & Lerner illustrate the importance of venture capital for young firms with unproven financial histories (Gompers & Lerner, 2001). They identify American Research and Development as the “first true venture capital firm” (146). Established in 1946 by MIT President Karl Compton, General Georges F. Doriot, and local business leaders, this company made the type of high-risk investments into emerging technology companies associated with venture capital today.

Venture capital has been characterized as having cycles or rounds (Gompers & Lerner, 2001). These cycles have been assigned different names, but the ones most commonly used today, in sequential order, are: seed, series-a, series-b, series-c+, and exits (IPO, merger, or acquisition) (See section on series definitions and Table 1 below). This major sequence of capital events correlates with different financial needs and
management milestones of a young firm. Early in their development, most technology firms only need a small amount to cover their initial costs, but as the company grows, larger amounts of capital are required to allow for expansion. The values of these varying levels of financial support can vary based on the industry, but typically, these companies need multi-million dollar investments to push into levels that would prepare them for an acquisition or IPO event.

Because of this new growth potential, often in uncharted business industries or models, many investors shy away from these firms due to information asymmetries, legal uncertainties, or high failure risks. Venture capitalists tend to have higher risk tolerances than most investors which is reflected in their willingness to invest substantially in unproven companies and new technologies. Since these investors have a monetary interest in the company, they often spend a great deal of time working with the entrepreneur as well as raising additional equity for the firm (Gompers & Lerner, 2001). Venture capitalists often serve dual roles as both a financial supporter and business mentor to these younger companies.

Angel Investment

Angel investors differ from venture capitalists in two important ways. First, they can come from either professional or amateur financial contexts. Angel investors can be a part of a professional network, a wealthy individual, or even a family member (Prowse, 1998). This also implies that there can be varying degrees of industry or
business knowledge amongst angel investors. The second way angel investors differ from venture capitalist is that their terms of investment tend to be lower than the venture capitalists, which benefits the entrepreneurs (Prowse, 1998).

Based on previous work by Goldfarb et al. (2007); Shane (2008); Sudek et al. (2008) showing the importance of angel funding to high-growth potential startups, Kerr et al. (2011) set out to answer whether these entrepreneurial financiers positively affect the growth and outcomes of their portfolio companies. Using data from two prominent angel investment groups (Tech Coast Angels and CommonAngels) covering deals pitched to them between 2001-2006, Kerr et al. looked at “the companies who approached [the angel investors], the level of angel interest, the financing decisions made, and the subsequent venture outcomes” (Kerr, Lerner, & Schoar, 2011). To help strengthen any causal relationships between the presence of funding and venture success, the researchers used a regression discontinuity design, which has been widely accepted as an effective quasi-experimental design for demonstrating causality. More information on regression discontinuity design can be found at:


The results of this work showed that firms who received funding from one of the angel investment groups were 20-25% more likely to survive for at least four years. Additionally, these funded ventures were better financed with a 70% higher likelihood of obtaining entrepreneurial finance from better capitalized venture capital firms.
Although these are the base data results, there still exists a strong, though less pronounced, relationship between early angel funding and later performance, particularly regarding survival rates.

Grants

Grants act as an alternative to the typical investment structures of venture capital and angel investment. These funds usually come from government, university, or non-profit sources. An idea of a “Triple Helix” of knowledge production comprised of university-industry-government has emerged as a new model of knowledge and entrepreneurial generation (Etzkowitz & Leydesdorff, 2000). The argument is that these three traditionally siloed areas must and have begun to work more fluidly to produce new models of innovative endeavors (Meyer, 2003). Grants act as a financial glue—or protein—that holds these helices together. Often a grant originates in one of these sectors and funds work in another. Federal and state governments provide funds for research to both universities and private enterprise through NSF, SBIR/STTR, and state-matching grants. Private enterprise also funds this research through organizations such as the Kauffman Foundation. Non-profit economic development has recently become more popular and certain organizations offer grant funding to tech startups with no equity interest for the goal of stimulating local economic development. An organization like this based in Durham will be explored later in the report.
Series/Stage Investments

This work will use the terms seed, series-a, series-b, series-c+ to refer to different stages of company investment needs. A parallel to this terminology is seed, early stage, expansion stage, and later stage financing. In essence, companies receive different amounts of financing based on their growth needs after reaching certain milestones. Seed funding is typically quite small while series-c+ can be a multi-million dollar investment, however, no hard rule exists as to the typical amounts of these investments. These stages can apply to any of the funding mechanisms listed previously. Venture capital, angel investment, and grant funding can all be considered series financing. This is because the definition for a series investment depends on the company’s growth stage and not the capital mechanism used to finance it.

Howell, Trull, and Dibner’s work on European venture capital in the biotechnology industry (2003) provides a good estimation of the typical dollar amount for each series round (Table 1). Most companies, especially in digital tech startup sectors, begin with a modest investment usually sourced from the entrepreneur or friends/family. As the company grows, it will seek small seed investments to help continue its growth, typically in amounts less than $1 million. After reaching milestones set out by the investors and entrepreneur(s), the company will then seek more substantial investments in the form of series-a funding, typically between $1-5 million. This process of funding following milestones will continue until the company goes public with an IPO, sells the company to another, or fails.
Table 1. Stages of Company Financing

<table>
<thead>
<tr>
<th>Funding Round</th>
<th>Description &amp; Use</th>
<th>Typical Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>Initial financing used to validate concepts or begin a company. Comes in many forms from many actors, but much more likely to be angel financing than venture capital.</td>
<td>&lt; $1 million</td>
</tr>
<tr>
<td>Series A</td>
<td>Typically, the first round of VC finance and involves a substantial dilution of founders’ shares.</td>
<td>$1-5 million</td>
</tr>
<tr>
<td>Series B</td>
<td>After reaching milestones set out in series-a, companies then receive a more substantial follow on investment in this form. This also typically involves dilution of the founders’ shares.</td>
<td>$6-10 million</td>
</tr>
<tr>
<td>Series C+</td>
<td>This round serves to take companies from well-established startup to the IPO or merger &amp; acquisition phase.</td>
<td>$15-50 million</td>
</tr>
</tbody>
</table>

Adapted from Howell, Trull, and Dibner, “The rise of European venture capital for biotechnology” (2003)

This conceptual framework has served to clarify both the terminology and the academic understanding of tech startup finance. Many of these terms and conceptualizations will be used prominently throughout the Findings section that follows. This section helps to illustrate the differences between traditional business
finance and digital tech startup finance. It has also demonstrated the impact that these types of funds can have on young firms looking to reach high capitalization.

**Findings**

The results of this research break down into three main categories. The first section will explore how the Triangle compares with similar cities across the United States in terms of local startup financing characteristics and trends including connections to outside capital sources. Recall that the Triangle refers here as Wake, Durham, and Orange counties located at the center of the Raleigh-Durham combined metropolitan statistical area. The term “similar” to describe the regions in this section is based on their perceived and real strengths in high-tech employment, education levels, quality of life, population size, rankings based on startup financing and economic prosperity as well as the availability of comparable information. While the focus of this work is on Durham based startups, an exploration of the Triangle region will give a better sense of how well Durham’s region performs nationally. The following section will drill down into the Triangle to explore the major geographies contributing to the regions national reputation as well as explore the relative impact Durham and other Triangle cities have had statewide. The final section will then identify and explore the major financial actors within the Durham startup ecosystem focusing on the major sources of funding for these entrepreneurs.
National Comparisons

In order to better understand Durham’s trends in tech startup financing, this study explored data on comparison regions. These regions, Austin, Seattle, Chicago, and San Francisco, were selected as major drivers of digital tech startup ecosystems. One region, the San Francisco Bay, was taken as an upper bound to illustrate the gulf that exists between the Bay Area and any other region in the world regarding startup financing. Many cities aim to develop a Silicon Valley-style knowledge economy but often don’t realize how unlikely the realization of that goal is. Another city, Austin, TX, acts as a more comparable and somewhat aspirational region to the Triangle. Both Austin and the Triangle have strong research universities, proximity to state political centers, high qualities of life, and right-to-work laws. Austin and the Triangle have both produced high numbers of tech startups in recent years and have competed for the relocation of large companies in the past. Seattle and Chicago were explored as a result of past work undertaken by the Committee for Economic Development (CED), a Triangle-focused entrepreneurial development non-profit and network based in Durham. The CED study compared these locales to the Triangle on a variety of metrics available from both public and proprietary data sources. Seattle and Chicago also serve as aspirations for the Triangle (though less likely in the immediate future than Austin) based on much of the same criteria as Austin. Of course, all three of these cities have a variety of nuance and originality that make them less than exact juxtapositions. These comparisons are not exhaustive but serve to help further elucidate the Triangle’s
startup trends within a larger national context by utilizing these comparison areas. Later sections will explore the size of Durham’s impact in the Triangle for the financing of digital tech startups.

**Startup Financing Trends**

From 2005-2013, the top funding regions for tech startups in the world were largely located within the United States (Chart 1). The San Francisco Bay companies raised more startup capital than the combined efforts of Boston, New York, Los Angeles, San Diego, London, Washington, DC, and Seattle during this period. Clearly, the Bay Area has and will continue to remain dominant in the realm of tech startup financing. From 2005 to 2013, the San Francisco Bay area raised $89 billion in startup investment. Boston, the world’s second largest startup funder, only raised $24 billion. Raleigh-Durham and Austin had close investment amounts at $3 and $5 billion, respectively. This amount puts Raleigh-Durham at 16th in the world for startup investment. Seattle raised $7 billion placing it at 8th globally while Chicago raised $6 billion placing it at 9th.
As seen in Chart 2, the Raleigh-Durham region ranked 22nd for number of funding rounds from 2005 to 2013. Even though the area is known for biotech and medical innovations, after removing companies listed as “biotech”, “medical”, and “health”, the region only drops from 16th to 22nd for total investments raised. This indicates that the area has substantial investment in both its more established industries as well as tech startup sectors. These numbers likely do not account for every startup investment undertaken by the region during this period but it does help to give a sense of both the volume and relative amounts of investment taking place in each of these locations. Austin with 694 investment rounds showed about twice as many funding rounds in this period as Raleigh-Durham with 362. Austin’s number of funding rounds placed it at 10th globally. Seattle with 1,150 investments had about twice as
many funding rounds as Austin placing it at 6th globally. Chicago had only a few less funding round events than Austin at 663 placing it at 11th globally. Still Chicago’s number of investments are almost twice as high as the Raleigh-Durham area.

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**Venture Capital**

The Triangle, comprised of Wake, Durham, and Orange counties, had fewer VC funded deals than Austin, Chicago, or Seattle between 2010 and 2013 (Chart 3). This is in keeping with the data on worldwide rankings for the number of investments in startups explored earlier. The Triangle only produced 103 series-a/b investments while Austin produced three times as many. All of these cities had relatively small numbers of series-c+ funding, but the Triangle stands out as being particularly low at only 22 deals. In total, the Triangle only had 186 seed, series a/b, or series c+ deals combined during this period which is less than just the series a and b investments for both Austin and...
Seattle. While the Triangle had fewer VC deals in almost every category amongst these comparison cities, it did exceed Chicago for its total seed funding rounds.

As explored earlier, much of the available venture capital finance resides in a select few locations around the country. While endogenous funding sources would surely be preferred to outside funding sources, most municipalities have to attract outside venture capital in order to grow their tech startup communities. Many of the deals undertaken in Austin, Seattle, and Chicago have come from a mix of local and outside sources. The Triangle has fared much worse in this regard. The importance of attracting outside venture capital to a region will be explored in the next section.

Connections to Venture Capital Out of Region

The ability to draw outside venture capital indicates both a robust innovation sector and a strong understanding of the skills needed to raise that capital. Most of the venture capital dollars tend to circulate around the San Francisco Bay Area and to a
lesser extent Boston. Attracting those resources to a region allows for locally grown companies to continue to grow without having to move to the source of financing. Often, a stipulation of outside venture capital investment is relocation of the company to the venture capitalists home city. For example, when the founder of Appia, a Durham-based mobile app platform startup, looked for later stage funding in Silicon Valley, many of his offers had clauses stipulating that Appia must relocate to Silicon Valley (Madrigal, 2011). For entrepreneurs, investors, and community leaders trying to generate a local startup culture, relocation means the loss of the local initial investments to the benefit of other regions. In many ways, this means that early stage investors are subsidizing the economic growth of San Francisco more than their own locales. Since most areas trying to grow startup cultures do not have nearly as much access to venture capital at home as Silicon Valley, Boston, and New York, learning how to successfully attract it is key to development goals.

As indicated in Table 2, the Triangle receives very little venture funding from Silicon Valley relative to Austin, Chicago, and Seattle. Figure 1 below helps to visualize this relationship a bit more clearly. The width of the lines indicates the relative number of deals coming from the investor locations on the right to the comparison cities on the left. The areas of the regional rectangles receiving venture capital indicate the relative number of total deals undertaken for companies located in that region. Clearly, Austin has outperformed all of the other comparison cities over the last three years in terms of total deals undertaken. Austin’s largest venture capital regional connection is its own
with the Southwest accounting for 175 deals in Austin during this time period. In fact, Figure 1 illustrates how localized venture capital tends to be for each of these cities. Each of these four cities shows its strongest connections to its home region. For all but the Triangle though, the second major regional source of capital is Silicon Valley. Unlike

<table>
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<tr>
<th>Table 2. 2010-3 VC INVESTMENTS IN REGION BY INVESTOR LOCATION</th>
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<tbody>
<tr>
<td>Austin</td>
</tr>
<tr>
<td># investments</td>
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</tr>
<tr>
<td>East Coast</td>
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<td>Mid-Atlantic</td>
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<td>Midwest</td>
</tr>
<tr>
<td>Northwest</td>
</tr>
<tr>
<td>Silicon Valley/CA</td>
</tr>
<tr>
<td>Southeast</td>
</tr>
<tr>
<td>Southwest</td>
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<tr>
<td>International</td>
</tr>
</tbody>
</table>

Source: CED Benchmark Study (2013); The Deal
these other three cities, the Triangle does not have strong venture capital ties to
Silicon Valley. While the other three areas during this period each performed around
30% of their venture capital deals with Silicon Valley funds, the Triangle only performed
10% with it. Considering the lack of connections out of region, the Triangle will need to
strengthen and grow its endogenous sources of regional venture capital. However,
considering the gulf that exists between the Triangle’s funding levels and that of regions
like Silicon Valley, the region might be better served by fostering connections with
Silicon Valley venture sources.
Figure 1. Venture Capital Investments in Region by Investor Location Visualization, 2010-2013

Venture Capital Investments in Region by Investor Location, 2010-2013

*Width of connections refers to relative number of deals made.

*Area of rectangles indicate relative number of total deals made within location.

Source: CED; The Deal
**Angel Investment**

From 2005 to 2013, the Triangle posted about 46 angel investments while Austin had about 77 deals funded by angel investors. Chicago and Seattle both did much better with 156 and 203 deals, respectively. Of these four cities, the Triangle shows the weakest performance in angel investment. While Austin has 14 venture capital firms compared to 6 operating in the Triangle, Austin only lists about 4 or 5 angel investing groups to the 7 operating in and around the Triangle. This means that with fewer numbers of angel investing groups, Austin has historically done twice as many deals as the Triangle.

Austin had $51 million in angel investments from 2005 to 2013 while the Triangle had only $19.5 million. On both number of investments and total amount of investment, the Triangle falls short of Austin’s numbers. Furthermore, Austin’s angel deals on average equaled more than twice as much as those in the Triangle. The average angel investment in Austin from 2005 to 2013 equaled $662,389.00 while the average for the Triangle equaled $253,246.00. Austin’s average looks much more like San Francisco’s average angel investment, which equaled $637,423.00 for this period. Seattle acquired an impressive $125 million in angel investment during this period. Chicago also did quite well with its angel investors at $80 million for the period. These equate to an average deal amount of roughly $615,000 for Seattle and $512,000 for Chicago. These average deal amounts also look much closer to the averages seen in Silicon Valley than the Triangle.
Some have indicated that angels have begun to take the place of retraction venture capitalists especially in software and internet startups across the country (Koetsier, 2013; Price, 2011; Sohl, 2012). According to The Halo Report produced by Silicon Valley Bank and CB Insights, 69% of angel deals are done outside of California and New England (Silicon Valley Bank, 2013). This bodes well for places like the Triangle looking to plug gaps in their venture capital funding capabilities. However, with a lack of competitive angel investments relative to other competing cities like Austin, companies may have little reason to remain in the Triangle as they begin their company. Some may find it more appealing to begin their operation in a stronger angel market like one of the three explored in this section.

Grants

One of the few national sources of potential grant financing for tech startups comes from the SBIR/STTR federal grant programs. Firms receiving SBIR/STTR grants tend to survive and grow at rates exceeding those of firms that do not receive these funds (Audretsch, 2003). While most digital tech startup companies do not receive this type of funding, the presence of large companies receiving SBIR/STTR grants allows for greater potential private R&D spillovers by both attracting new knowledge workers to innovative firms as well as maintaining current knowledge workers. The SBIR/STTR also incentivizes scientists to pursue entrepreneurial paths. This combined with a strong university research environment creates the potential for a great deal of endogenous
growth by promoting the creation of companies to fully realize innovative technologies and processes.

The Triangle has performed relatively well with SBIR/STTR grant acquisition as indicated in Chart 4. Austin and the Triangle have both outpaced Seattle and Chicago for these grants. Austin has shown better acquisition of these grants than the Triangle, but often not by much. From 2005 to 2013, Austin received 770, the Triangle received 649, Seattle received 279, and Chicago received 145 of these SBIR/STTR grants.

Since 2005, the Triangle has accrued $284 million in these types of funds, the most of any of these cities. Austin comes close with $252 million, but Seattle and Chicago have much lower levels at $150 and $62 million, respectively. These figures equate to roughly the same average per award for each region at between $312,000 and $428,000 per grant.
While the Triangle has struggled to draw private investment to the area, it has attracted larger numbers of SBIR/STTR grants for its tech base companies. Previous sections illustrated the lack of venture capital and angel investment in the Triangle relative to these other regions. However, as this SBIR/STTR data suggests, not only does the region have a strong financial pipeline to federal innovation funds but also enough innovative companies to necessitate this level of investment.

Summary of Comparisons: The Triangle’s Financial Strengths and Weaknesses

The Triangle shows a mix of strengths and weaknesses when compared to other tech startup leaders across the nation. On a global level, the Triangle ranks amongst some much larger regions in terms of tech startup financing performance. However, relative to its major aspirational competitors-Austin, Chicago, and Seattle-the Triangle performs only modestly well in venture capital and angel finance. It also lacks as strong of a connection to Silicon Valley’s large startup capital pools as these competitors.

The Triangle clearly has some financial strengths regarding the acquisition of SBIR/STTR grants. This level of federal investment combined with its three large research universities and several large corporate R&D employers illustrates some of the financial strengths that have driven the performance of the Triangle’s startup sector. While federal funds will likely not maintain a tech startup culture in the Triangle, the utilization of these funds helps to plug gaps in venture and angel financing.
The next section will drill down into the Triangle and explore the major geographic contributors to the success of the Triangle region’s global standing amongst digital tech startup hubs. While the Triangle may have lower levels of private investment in its tech startups than Seattle, Chicago, and Austin, the region still sees substantial amounts of venture and angel finance compared with many tech hubs. As the next section will show, the major driver of the Triangle’s performance in digital tech startups has been Durham County. The previous section has served to validate the region on a global scale, but the following section will illustrate how the region’s recent growth in tech startups has been largely built on the strength of Durham-based companies.

Tech Startup Leaders in the Triangle and North Carolina

Amongst North Carolina cities, the Raleigh-Durham area is the only to appear on the worldwide list discussed in the above National Comparisons section (Charts 1 & 2). This ranking could be due to a relatively even showing of several cities or the disproportionate strength of one or two cities. As Chart 5 shows in total amounts raised, only a few cities in the state have raised substantial capital from 2005-2013. The information breaks down into several categories depicting the type of funds raised in each locale. Charlotte has outperformed all of North Carolina’s major cities with over $2.2 billion raised in IPO. This is solely due to the IPO of Extended Stay America Hotels (Yu, 2013). Morrisville also shows impressive amounts of funding for its startups just outpacing Durham’s total amount raised. Based on this information, Durham’s influence on the state’s startup investments appears quite modest compared to other cities.
within the state.

Chart 6 gives a slightly different perspective on Durham’s startup financing.

Clearly, Durham dominates the state when it comes to its number of funding rounds. From 2005 to 2013, Durham had at least 140 funding events. Morrisville, the second closest to Durham for number of funding rounds, had less than 100. Charlotte’s influence appears limited to a few large investment events that give it impressive raised totals but clearly little additional investment activity. Seen here, Durham has much more series-a and angel investment than the combined series-a and angel investments of the rest of these cities. Interestingly, Morrisville has a great deal more series-c+ investment than Durham with 49 deals as compared to Durham’s 12.
As seen here, Durham accounts for the majority of digital tech startup investment deals in the Triangle and the state of North Carolina. From 2005-2013, Durham had 50 series-a, 30 angel, and 23 series-b investment events with only 13 series-c events. The series-a investments totaled $141.5 million while the series-b investments totaled $533.9 million (Chart 7). Angel investing was only $11.6 million. These levels of investment and numbers of investment activity indicate that Durham acts as the major locus for tech startup activity in both the Triangle and North Carolina. While Durham has fewer series-c+ and total startup investment than other cities, the number of deals undertaken within the county indicate a high level of startup activity
During the interviews with Durham tech startup insiders, many expressed their concern with this lack of later stage capital funding for tech startups. As this data has shown, Durham has raised more seed, series-a, and series-b funding rounds for digital tech startups than any other area in the Triangle or North Carolina. A lack of later stage capital creates a wall for companies looking to grow in the area. As the CEO of local startup grant competition NC IDEA puts it, “this is the crux of the problem in [the Durham startup] community.” Durham entrepreneurs want to grow but do not yet have the connections to outside capital that would allow for that. This is in keeping with the findings from the previous section on the Triangle’s lack of connection to out-of-region funding sources. Durham, as the main hub of digital startup entrepreneurial activity in the Triangle will need to explore ways to increase its ability to attract startup finance or
find ways to increase its local financial base. The former pursuit is a more realistic option for Durham until it grows its ecosystem to a level that will allow for more substantial endogenous funding.

As explored earlier, the Triangle has historically attracted a great deal of exogenous funds from the federal government through SBIR/STTR grants. Compared with Seattle and Chicago, the Triangle attracts much more of this funding than the other two combined. Within the Triangle, the largest recipient of SBIR/STTR grants from 2005 to 2013 was Durham with 192 (Chart 4). Research Triangle Park and Raleigh received 139 and 111 grants, respectively. It might be assumed that due to its location in Durham County, Research Triangle Park grants might be inflating the Durham numbers, but as Chart 4 indicates, SBIR databases account for RTP separately.
Since SBIR/STTR grants typically do not go towards digital tech startups, these figures indicate that Durham also attracts funding for other innovation industries. This co-location of digital startups with other innovative companies in the life sciences and defense engineering fields helps Durham’s financial ecosystem to weather any industrial shocks one of its local industries may experience. By drawing in both digital and other types of tech based funds, Durham’s financial ecosystem has grown to allow for investors versed in one industry group to invest into other areas creating a churn of local funds across industry lines.

Identifying Durham’s Major Startup Financing Actors

This section will identify Durham’s main startup investors and beneficiaries, explore general trends amongst them, and explore ways some of these actors work to address some of the financial weaknesses identified in the previous sections. This section will explore venture capital, angel investment, and grants having the largest impact on Durham’s startup community. Some of these actors are local Durham firms and some are located in cities throughout North Carolina.

In general, the overall financial ecosystem for Durham’s digital tech startups looks much like Figure 2 below. Tech entrepreneurs in Durham have a few main options available to them for financing their business. As the map shows, venture, angel, and grant financing all flow directly to the entrepreneur while venture bank loans can either go directly to the entrepreneur or through a venture capital firm. Firms like RTP Capital
and Aurora Funds invest in Durham’s companies directly with varying return expectations. Grant programs like NC IDEA expect no return or equity interest, but accelerators like The Startup Factory do expect a percentage of equity. Governmental funds also find their way to tech entrepreneurs in Durham though typically they go through grant or fund programs. Both federal and local programs have funds intended to make their way to entrepreneurs through intermediaries. For example, North Carolina’s Innovation Fund invests state employee retirement funds in venture firms who then invest in tech entrepreneurs. Often these governmental funds are managed by venture firms to ensure stronger investment portfolios and strategies. This map could have also included flows from tech entrepreneurs back to the venture and angel categories. Often a successful tech entrepreneur becomes an angel or venture investor using the wealth accrued in her company’s success to invest in new companies. Durham’s tech entrepreneurs largely want to create an ecosystem whereby successful business owners recycle their wealth into the local economy. Thus, tech entrepreneurs, angels, and venture capitalists can often be the same actors.
Venture Capital

The major venture capitalists operating in Durham are listed in Table 3. The major venture capital firms investing in Durham tend to be located in Durham or the surrounding Triangle region. Most of these firms consist of teams between 6 and 11 investors. These investors come from a variety of backgrounds, but most tend to have past experience in their portfolio industries and hold an M.B.A.
<table>
<thead>
<tr>
<th>Organization</th>
<th>Founded</th>
<th>Location</th>
<th>Size</th>
<th>Portfolio Industries</th>
<th>Notable Portfolio Digital Tech Startup Companies in Durham</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersouth Partners</td>
<td>1985</td>
<td>Durham</td>
<td>6 investors</td>
<td>Life science and technology</td>
<td>Overture Networks; OpenSite; Semprius; Integrated Silicon Systems; Zenph</td>
</tr>
<tr>
<td>IDEA Venture Funds</td>
<td>2004</td>
<td>Durham</td>
<td>9 investors</td>
<td>healthcare IT &amp; medical devices; internet &amp; digital media; semiconductor &amp; materials technologies; software</td>
<td>Argyle Social; Automated Insights; Sarda Technologies; Windsor Circle</td>
</tr>
<tr>
<td>Aurora Funds</td>
<td>1994</td>
<td>Durham</td>
<td>6 investors</td>
<td>healthcare and IT</td>
<td>Digitalsmiths; Unitive</td>
</tr>
<tr>
<td>Southern Capitol Ventures</td>
<td>2000</td>
<td>Raleigh</td>
<td>6 investors</td>
<td>software, e-commerce, digital media, mobile and healthcare IT</td>
<td>ReverbNation; Synthematix; Zift Solutions; FullSeven Technologies</td>
</tr>
<tr>
<td>River Cities Capital Funds</td>
<td>1994</td>
<td>Raleigh and Cincinnati</td>
<td>11 member team between 2 locations</td>
<td>IT and healthcare</td>
<td>SciQuest</td>
</tr>
<tr>
<td>Bull City Venture</td>
<td>2013</td>
<td>Durham</td>
<td>2 investors</td>
<td>early stage software, ecommerce, digital media, health it, mobile, internet</td>
<td>ReverbNation; ArtusLabs; Zift Solutions</td>
</tr>
<tr>
<td>SJF Ventures</td>
<td>1999</td>
<td>Durham</td>
<td>6 investors in offices in Durham, New York, and SF</td>
<td>sustainable/resource efficiency and technology-enhanced services</td>
<td>None</td>
</tr>
</tbody>
</table>
Many of these firms setup in Durham in order to gain better access to the healthcare and life science industries strongly represented in the Triangle. Most of Durham’s earliest venture investors began in life science, but as digital tech startups began to emerge, existing venture capitalists invested in the new opportunity and new venture capitalists emerged solely for this endeavor. These firms have substantial investments in software, internet, e-commerce, and digital media companies. Some of the Durham companies receiving investments from these venture capitalists include ReverbNation, Argyle Social, Digitalsmiths, Unitive, Windsor Circle, and Zift Solutions.

One of the earliest venture capital groups in Durham, Intersouth Partners, began its investment endeavors in the mid-80s. Initially, the company only invested in life science companies, but as the region grew, it found itself drawn towards some of the emerging digital tech startup sector firms. Many of Durham’s venture capitalists’ portfolios have grown in this way. One notable exception has been Hatteras Venture Partners (not listed in the above table). While this group have been a large venture investor in the area, they concentrate their efforts exclusively on pharmaceutical, medical device, and biotech companies. They have not, as of yet, invested in digital tech startups. However, as will be explored earlier, they have invested funds provided by the North Carolina Innovations Fund to invest in, among other sectors, software and IT.
Angel Investors

The major angel investors operating in Durham can be split into two main categories: individuals/family offices and official angel networks. Individual/family office angel investors can be seen as simply wealthy individuals or family wealth managers looking to invest in early stage companies. Sometimes these investments are based on a sense of community contribution or a prior relationship with the entrepreneur. In Durham, the trend leans more towards wealthy individuals than family offices. Because of the nature of these types of investors, they are much more difficult to track and analyze. Durham has a few individuals who could be considered prolific individual angel investors, but this study will not explore these financing participants in great detail.

Official angel networks, on the other hand, are easier to assess. Because these outfits typically involve accredited investors, the actions and investments of these organizations tend to be more publicized.

Table 4 below lists those angel networks prominently operating in Durham. The angel networks investing in Durham-based companies tend to operate in the Triangle themselves. Of the six angel groups identified, only Piedmont Angel Network operates outside of the Triangle though it’s just down the road in Greensboro, NC. While not all of these organizations strictly invest in Durham-based companies, many have explicit statements regarding their intention to create local wealth through local high-growth companies. Most of these organizations make investments between $25k and $150k.
One group, The Atlantis Group, makes investments at a minimum of $150k, but there is no indication that this group remains particularly active in the area.

<table>
<thead>
<tr>
<th>Organization</th>
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<th>Portfolio Industries</th>
<th>Notable Portfolio Digital Tech Startup Companies in Durham</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTP Capital</td>
<td>2010</td>
<td>RTP</td>
<td>42 active investors</td>
<td>IT, life science, retail, medical devices</td>
<td>EvoApp</td>
</tr>
<tr>
<td>IMAF-RTP</td>
<td>-</td>
<td>RTP</td>
<td>26 (2012); $3 million fund</td>
<td>High growth potential industries in RTP</td>
<td>None</td>
</tr>
<tr>
<td>Piedmont Angel Network (PAN)</td>
<td>2002</td>
<td>Greensboro</td>
<td>$10 million currently invested</td>
<td>life science, technology, software, and advanced materials fields</td>
<td>Southeast TechInventures</td>
</tr>
<tr>
<td>Investor's Circle</td>
<td>1992 in San Francisco; 2011 in Durham</td>
<td>Durham</td>
<td>N/A</td>
<td>Social and environmental entrepreneurs</td>
<td>None</td>
</tr>
<tr>
<td>Triangle Angel Partners (TAP)</td>
<td>-</td>
<td>RTP</td>
<td>50 members</td>
<td>Early-stage, high growth potential companies in and around RTP</td>
<td>AdZerk, Windsor Circle</td>
</tr>
<tr>
<td>The Atlantis Group</td>
<td>2000</td>
<td>Durham</td>
<td>N/A</td>
<td>Life science, IT</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

All of these organizations focus on a combination portfolio of life science, healthcare, and IT, all industries with high growth potential and several representative
firms in Durham. Given the small funding amounts typically contributed by these angel
groups, most of Durham’s companies cannot rely on them solely for their funding needs.
Many including the low initial cost software companies typically seek additional funding
in concert with these angel funding rounds. The angels are not interested in becoming
the main financial backer of these organizations nor do they have the ability to do so.
Instead, angels want to provide an initial capital spark to allow mainly pre and early
revenue stage companies to survive while they find more capital.

Many of these networks have a great deal more investors than the area venture
capital partners. With angel networks, there is no salary for their time which makes it
easier to include more investors in the process. These investors must be accredited
investors and in most instances have a net worth of at least $1 million. These
organizations tend to have loosely structured investment decision processes. For
example, RTP Capital meets once a month for dinner and drinks while they watch
presentations from one or two companies interested in acquiring investment.
Descriptions like this give some of these organizations the aurora of modern day Civitan
or Kiwanis clubs. While the dedication appears since, these investors do not typically
view this as their primary work or focus like the venture capitalists do. Instead many in
Durham see this as a vehicle for wealthy individuals to give back to their business
communities.
The majority of these angel groups look for some returns on their investment but not nearly as much as the venture capital firms. A newly founded group, Investor’s Circle, operates as a non-profit. The Investor’s Circle office in Durham operates under the umbrella of the national Investor’s Circle network established in San Francisco in 1992. Established in 2011, the Durham office managed by SJF Ventures is considered “the new guy in town” who has an interesting but unproven local investment model (Bigelow, 2014). While their impact to date has been minimal in Durham, there is hope that their national network headquartered in Silicon Valley will create bridges to more substantial capital on the west coast.

While these angel networks operate in the area, very few Durham companies have seen investment from them. Of the companies listed as portfolio companies by these angel networks, only EvoApp, Southeast TechInventures, AdZerk, and Windsor Circle were located in Durham. Typically, angel groups focus on industries in which their investors have some professional experience or expertise. Considering the nascency of the digital tech startup industry in Durham and the higher concentration of wealthy biotech and life science leaders acting as angel investors in the Triangle, this lack of investment from angels into the digital tech startup field is not surprising. This could change as digital tech startups grow and create wealthy entrepreneurs interested in getting involved with angel investing. The groundwork currently being laid by these angel networks may eventually create a more robust tech startup investment network,
but for the time being, angel investment has only had a minor impact on Durham’s digital tech startups.

Grants

Durham entrepreneurs have access to two main categories of local grant funding: statewide governmental and private non-profit. Statewide governmental funding comes in the form of the North Carolina Innovations Fund, while the private grant makers operate in both statewide and local contexts.

In 2010, North Carolina invested $230 million of its $66 billion Retirement System into an innovation fund. Managed by Credit Suisse, this investment aims to create a risk-adjusted rate of return for the Retirement System while also promoting life sciences, technology, and clean energy industries with “significant operations based in North Carolina” (“North Carolina Treasury Jumps into Credit Suisse’s Innovation Fund,” 2010).

Some of these funds have been used to invest into venture capital firms with explicit restrictions that these firms invest in North Carolina based firms in the industries of interest. In 2011, Hatteras Venture Partners, a Durham-based venture capital firm, received a $25 million commitment from the fund. In order to keep the capital from the Innovation Fund cleanly separated from their less restricted venture capital, the firm created a sub-allocation called Hatteras Discovery (Scaggs, 2011).
Since its inception, this fund has been an indirect source of venture capital for Durham digital tech startups. Little information exists on the portfolio of the fund but according to a 2012 presentation by the North Carolina Department of the Treasurer, only about 6.7% of the funds were invested in software/IT. This may increase as 35% of the funds have yet to be allocated.

The private grants available to Durham startups almost all operate within a 2 mile radius of each other. Two of them are located down the hall from one another in the same co-working space. These grant makers—NC IDEA, The Startup Factory, and Bull City Forward—have funded companies in a distinctly different way from the local venture and angel investors. These grant programs exist with the explicit goal of promoting economic development for the startup industry within both North Carolina and Durham by filling gaps in the startup financial ecosystem.

**NC IDEA**

According to CEO Dave Rizzo, NC IDEA’s mission is to invest in “early stage entrepreneurial development in high-growth sectors other than pharmaceuticals or therapeutics.” NC IDEA grew out of MCNC on the RTP campus. MCNC, short for Microelectronics Center of North Carolina, came out of a push by former Governor James Hunt to pursue the emerging microelectronics industry in North Carolina.

Rizzo as CEO of MCNC saw the 50/50 business-academic split begin to eat away at the functionality of the organization over time. A report from consulting firm
McKinsey confirmed that not only were there opposing interests in the organization but there were also conflicts of interest. “It became completely unfunctional,” Rizzo says. Part of McKinsey’s recommendation was to split up the organization and restructure it. NC IDEA walked away from that split with $43 million which was invested in a managed portfolio. $33-34m is invested in very liquid assets and the rest is in more long term investments that are managed by Idea Fund Partners, a local for-profit venture capital firm, and others. The group then takes the earnings from that to grant $50,000 to their winners and pay their employees.

Since its inception, NC IDEA has funded numerous startups in Durham as seen in Chart 6. Over the last seven years, the organization has given almost $3 million in grant funding to 77 companies (Rizzo, 2013). Alumni of NC IDEA include PopUp App, Argyle Social, Archive Social, INRFOOD, Boost Suite, and Motaavi. Of this investment, over a third has gone to Durham startups, many times more than any of the other cities represented in NC IDEA’s portfolio.
The Startup Factory

The Startup Factory exists somewhere in the space between a grant maker and an angel investor. In exchange for 7.5% equity, The Startup Factory will provide companies with $50,000, three months of intensive mentorship, office space, and connections to a wide network of angels and venture capitalists (The Startup Factory, 2014). Companies that successfully complete this process receive a convertible note between $20,000 and $150,000.

Much like NC IDEA, The Startup Factory has two recipient classes per year in the spring and fall. However, unlike NC IDEA, TSF has a strict and focused deadline of three months. The three month acceleration period makes the program feel like it is particularly conducive to young entrepreneurs in college on summer break looking to
explore the world of tech startups. However, this accelerator expects entrepreneurs to commit “100% of their time to the launch of [their] company” (Ohnesorge, 2014).

Since 2012, TSF has funded a number of Durham based startups many of whom have received funding from other grant making and venture capital firms. As Chart 7 illustrates, 13 of the 24 companies in The Startup Factory portfolio operate in Durham. Interestingly, many of these companies share a co-working space in downtown Durham called the American Underground, where both The Startup Factory and NC IDEA operate.

![Chart 7. The Startup Factory Funded Companies, By Company City, 2012-2014](source: The Startup Factory Portfolio, thestartupfactory.co)

*Bull City Forward*

Bull City Forward has a slightly different portfolio focus than these other grant making groups. It explicitly seeks social entrepreneurs looking to develop a business focused around a double or triple bottom line of profit, people, and/or planet. Founded
by local community leaders and entrepreneurs in 2005, Bull City Forward has grown from a conversation on social innovation to a funder of it. Through their Forward Fellows program, social entrepreneurs receive a $5,000 stipend and a six-month intensive process of mentorship and guidance. Although these fellowships do provide some capital resources, Bull City Forward does not aim to be a substantial investor in the social endeavor they fund. Instead, the Fellowships are ways to give some simple financial support while also growing connections and refining plans to help these socially conscious entrepreneurs advance forward.

The Innovation Challenge sponsored by Bull City Forward works to provide much more substantial financial resources to social innovators. The resources allocated to this effort allow for a competition prize pool of at least $60,000 split between 1st, 2nd, and 3rd place winners. The funds for these challenges comes from industry leaders looking for solutions to industry specific problems. For example, in 2012, Blue Cross Blue Shield of North Carolina sought innovations to promote healthy lifestyles across the state. Everything from apps to delivery channels for healthy foods was considered for the competition. Two of the three winners of that competition, INRFOOD and Sqord, were Durham-based tech startups, each receiving $20,000 for their innovation.

Summary

Durham has a number of well-established venture and angel groups investing in and around it in the Triangle region. As a major recipient of this investment, Durham has
benefited more than most area municipalities from these investments. Since many of these investors invest more heavily in healthcare, pharmaceuticals, and biotech than the digital tech startup sectors, the majority of this funding has not accrued to the smaller tech startups. Grant making entities like NC IDEA and The Startup Factory have served an important role in both providing early stage funds as well as promoting the digital tech startup industry. Angels have the potential to add to the early stage funding pools for digital startups, but an increase in venture capital will be key to growing these firms past series-b needs.

Conclusions & Recommendations

This work has revealed many of the strengths and weaknesses of the Triangle’s digital tech startup financial ecosystem. Compared to its national competitors, the region ranks poorly in all tech startup funding areas except for SBIR/STTR grants. On a global scale, the Triangle has been shown to be a major hub of finance for tech entrepreneurs. While Austin, Seattle, and Chicago outpace the Triangle in venture capital and angel investment, the region has the 16th highest number of investments in the world in this realm.

Within the Triangle, Durham has been shown to be the major driver of tech startup finance with more than twice as many series-a investment rounds and series-b investment totals than its closest regional competitors. As the major driver of the
Triangle’s high-ranking global position in tech startup finance, Durham plays an important regional role in promoting and growing this industry.

Durham’s companies have raised a great deal of venture capital and have begun to create an ecosystem of venture capitalists, angel investors, entrepreneurs, and non-profits. While this ecosystem has grown considerably, it must begin to look honestly at its competition. Raleigh and Durham are not competing with each other for venture capital but with Austin, Chicago, and ultimately, the rest of the world. In order to continue to grow and thrive, Durham and the other regional tech cities will need to work jointly to compete on a national and global scale.

Strong private and public research institutions, a highly educated workforce, a culture of innovation, national recognition, and successful early stage venture capital have all contributed to Durham’s overall economic prosperity. They have also allowed for digital tech startups to thrive. In order to continue to support Durham’s growth in tech startups, these supports will have to grow and adapt with the needs of the industry. While Durham’s economy has prospered with life sciences for many years, it behooves the city to not let recent investments in startups go to waste and continue the trend of economic diversification by growing the tech startup sector.

The major financial actors in Durham’s ecosystem have allowed for the digital tech startup sector to grow and maintain itself locally. Grant programs and accelerators have especially contributed to filling gaps at the early stages of entrepreneurial...
development both from a financial and advisory perspective. However, all of these actors need to work to develop and grow the available resources in Durham for tech startups. This will involve outreach to larger venture capital in Silicon Valley and New England. In order to effectively draw this capital, these larger tier venture capitalists must be able to trust the judgment of the organizations that have invested in the early stages of a company. This will involve branding of certain processes such as NC IDEA or The Startup Factory as marks of quality that outside investors can depend upon to reach milestones. Venture capitalists like to have themselves intimately involved in the companies they finance, particularly those with large investments. In order for Durham to retain its larger firms, there must be an assurance process to keep outside investors comfortable. Venture capitalists and angel investors prefer geographic intimacy given their preferred involvement with their funded companies. While many investors do encourage companies to relocate to them, the creation of a reliable regional brand of quality may make outside investors more enthusiastic about investing out of their home region.

Angel investors will continue to play an important role in the financing of digital tech startups in Durham. Many of the active angel groups do not invest enough in local tech startups. As explored earlier, many of the angel investment groups most active in the Triangle only have one or two digital tech startups listed on their portfolios. Whether this is due to unfamiliarity with the industry or risk aversion is uncertain, but either way, these angel investors may be missing an opportunity to stimulate and
diversify their local economy. Durham’s angel groups could add a great deal of liquidity into the early stages of funding for startups. If information asymmetries or risk aversion are at the root of the underperformance of angel investors in the tech sector, local non-profit organizations may be able to provide insight into the tech startup industry to make these investors more comfortable and excited about digital tech startups.

Durham’s transition from a struggling tobacco and hosiery economy to a booming medicine and life science economy seemed almost impossible in the early 20th century. However, due to concerted efforts by public and private sector leaders, Durham has become a global leader in these advanced fields. While Durham has prospered from these industries, increased economic diversification could substantially benefit Durham. The growing digital tech startup sector has the potential to create a new type of wealth in the area. The digital tech startup and biotech industries can complement each other through a variety of applications such as medical diagnostic software or bioinformatics. While resources should not be diverted from healthcare and life sciences to the startup sector, a number of resources in the area could be more effectively leveraged to direct funds to these digital entrepreneurs. At this stage, Durham has made substantial progress in this field and should continue to persevere towards a more robust startup financial ecosystem.
Appendices

Appendix A: Further Examination of Crunchbase Dataset

Crunchbase provides similar information to other large, proprietary datasets such as Thomson Reuters, CB Insight, and Dow Jones Venture Source. As Crunchbase has grown, it has grown to feature more documented exits than these other data sources (Chart 1). This growth in exits shows that Crunchbase’s breadth of coverage has begun to catch that of these proprietary datasets.

Chart 1. Comparison of Exits Tracked by Major VC Databases

Data from CB Insights Venture Capital Exit Data Comparison Report

Analysis provided by Crunchbase
Recently, an independent researcher performed an analysis of the accuracy of Crunchbase’s information with that of ThomsonReuters, Dow Jones, and CB Insight’s proprietary datasets (Goujon, 2013). The comparison showed that while Crunchbase’s data did not match well with the other sources in the early 2000s, by 2010, the data showed 70-80% accuracy with the others. Thus, Crunchbase’s dataset has more reliable information regarding more recent investment activity than historical activity.

Furthermore, as part of this research, I cross-referenced the entries on Crunchbase for funding events with newspaper articles and press releases available through various news agencies. Ultimately, this research indicated that Durham data found within Crunchbase depicts actual funding events with accurate information. However, there were some funding events not captured in Crunchbase. In other words, Crunchbase’s Durham data is accurate for the events it has captured but may not be a complete picture of every funding event that has occurred in Durham.
Interviews

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