

***Entrepreneurship and Technology Transfer
in Greater Philadelphia***

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INTRODUCTION

Technology Transfer, Regional Economic Growth, and Entrepreneurship

Innovative ideas discovered through a process of research and development (R&D) are often transferred to the world of practical application and successfully commercialized for the public good and the gain of private firms. Since World War II innovation in great part has been technological, with significant advances made in microprocessing, biotechnology and communications. Across the nation the private sector has fed off this process commonly referred to as technology transfer, which in turn has contributed significantly to economic growth, most notably in the form of highly-skilled, technical jobs. Regions with strong research capacities benefited in particular from technology transfer, as some of the commercialization of the technology took place within their economies. While technological innovation has made technology itself less constrained by physical location, technological innovation has proven to be a great stimulant of and contributor to regional economic growth.

Purists believe that the invisible hand of the market spurs on the commercialization of the most viable technological innovation. Pursuing technological innovation itself, however, is a risky undertaking. The uncertain nature, long time frame, and resource-intensiveness of R&D do not necessarily present themselves as desirable to rational players in the marketplace. Private firms have responded to the inherent riskiness of R&D by focusing much of their resources on what they know and what they are fairly confident will yield acceptable returns. Even though the vast majority of technology transfer is business to business or industry-sponsored, the research interests of larger, established companies tend to be narrowly focused on their niche in the market, yielding patentable technology that only they themselves or similar businesses are likely to have interest in licensing. Little incentive exists for large, established companies to pursue radical technological innovation -- while it might have the potential for broad-sweeping application and substantial payoffs, it comes with a great deal of uncertainty and risk.

With the private sector tending to focus its resources on comparatively safe R&D efforts, universities, hospitals, and non-profit research institutions in great part have stepped in to fill the gap in R&D.¹ While the private sector also funds university R&D, funding from the federal government, foundations, and other sources have freed up universities' research agendas, placing them in a position to pursue radical technological innovation that has great potential for broad-sweeping application, with less concern for the risks that are assumed. Entrepreneurial ventures historically have embraced radical technological innovation and, as such, have especially benefited from university technology transfer.

While all types of companies commercialize technology -- large and small, established and recently formed -- strides toward technological innovation, particularly radical technological innovation, spur on entrepreneurial activity of usually small companies, with some of this activity taking place in the region where the R&D was conducted. As such, the resources present in a region -- the funds distributed for R&D and the universities that conduct R&D -- influence the degree of technological innovation in the region and the resulting entrepreneurial activity. Assessing university technology transfer, therefore, sheds some light on the level and characteristics of entrepreneurship within a region's economy, which theoretically benefits from the presence and expenditure of resources on university technology transfer. The assessment of university technology transfer is particularly insightful for entrepreneurship in Greater Philadelphia, a

¹ Technology transfer carried out by this group of non-profit institutions -- universities, hospitals, and research institutions -- will be referred to as "university technology transfer" throughout the rest of this report. The group itself will be referred to as "universities."

region that finds itself in a paradoxical situation -- while it has a strong and well regarded academic research capacity, it is perceived by some to be lacking a climate conducive to entrepreneurship.²

University Technology Transfer

Universities engage in technology transfer for a number of reasons. Some see technology transfer -- the commercialization of research for the public good -- as an excellent way to satisfy the public service component of their missions. Some universities are motivated by the prestige and income that they earn through technology transfer, while others use technology transfer to attract, retain and reward faculty researchers. Engaging in technology transfer to promote economic development and spur on entrepreneurial activity is more likely to be a primary motivation for tax-supported universities and institutions.

Over the past decade, university technology transfer has boomed, in great part due to the passage of the Bayh-Dole Act of 1980.³ This law simplified the patenting process by creating a uniform policy among all the federal agencies that fund the research of non-profit institutions. Congress also voted to give non-profit institutions and small businesses the right to retain title to innovations developed using federal dollars, effectively further reducing the risk associated with early-stage technological innovation by allowing for earning potential. Most important from the standpoint of entrepreneurship, this law directed non-profit institutions to give licensing preferences to small businesses. The number of patents generated by universities, which prior to the passage of the Bayh-Dole Act averaged about 250 annually, has grown to almost 1,500 annually.⁴

While the Bayh-Dole Act has had a profound effect on university technology transfer, the gains in great part have been achieved through the traditional approach to technology transfer -- licensing technology that, while certainly innovative, tends to solve a specific problem or address a particular need. These technological improvements and enhancements tend to be snapped up (if they were not sponsored) by established and usually large companies in exchange for royalty payments. The comparatively steady flow of income generated by royalty-bearing licenses, which are usually based on the volume of sales, forms a strong incentive for universities to continue down a less cutting-edge and radical path of technological innovation. In recent years, however, the fast and substantial growth experienced by small companies that commercialized cutting-edge, radical technology has caught the attention of university technology transfer programs. The earnings that could be had by taking an equity stake in start-up companies, as opposed to earning royalties, has redirected the focus of a number of university technology transfer programs, including ones in Greater Philadelphia.

While only an estimated 1 to 2 percent of invention disclosures are thought to be appropriate for start-up companies,⁵ this trend of redirecting a greater amount of university technology transfer resources toward licensing to start-up companies has broader implications from the standpoint of regional economic development. For Greater Philadelphia, which is perceived by some to be lacking a climate conducive to entrepreneurship, stepped-up university technology transfer with early-stage companies could provide a much needed boost to entrepreneurship in the region. The purpose of this analysis is to assess the degree to which university technology transfer contributes to entrepreneurship in Greater Philadelphia and the potential for this relationship to grow.

² A variety of anecdotal and statistical evidence suggests this. Most recently, the region was recently ranked 43rd out of 50 regions in entrepreneurial climate by Massachusetts business consultant David Birch.

³ P.L. 96-517

⁴ As reported by the Association of University Technology Managers (www.crpc.rice.edu/autm/survey/facts.html).

⁵ As reported by the North Carolina Biotechnology Center in *Technology Transfer: Working for Collaboration, Commerce, and Competitiveness* (September 1994).

TECHNOLOGY TRANSFER AND ENTREPRENEURSHIP IN GREATER PHILADELPHIA

University technology transfer finds itself at an interesting point of development. Mindful of the fast growth being experienced by many small, entrepreneurial ventures in technology industries and the windfall profits being reaped by their investors, universities are starting to look more favorably upon licensing radical technology that has potential for broad-sweeping application. Licensing this radical technology to early-stage, small companies has even more appeal if equity stakes are taken in place of royalty payments. This trend has surely had some impact on entrepreneurship, though the degree to which this has happened and where it has happened (within a region or outside) are not known. This appears to be the case in Greater Philadelphia -- perhaps because the region is perceived to have a low level of entrepreneurial activity to begin with, the catalytic effect of university technology transfer has been overlooked.

This analysis attempts to shed light on university technology transfer in Greater Philadelphia and its contribution to regional entrepreneurship. Key questions asked in the analysis are:

- **Input:** What resources go into regional university technology transfer? What is the activity of university researchers and administrative staff? How does Greater Philadelphia compare to other regions in these aspects?
- **Output:** Is regional university technology transfer resulting in increased entrepreneurial activity? If so, what form is this increased activity taking? Is it taking place in the region?
- **Regional Competitive Advantages and Disadvantages:** Is entrepreneurial activity resulting from university technology transfer in Greater Philadelphia markedly different from other regions? If so, can regional competitive advantages or disadvantages explain these differences?

To gain a better understanding of university technology transfer in the region, Greater Philadelphia is compared to three other metropolitan areas: San Francisco-San Jose, CA; Raleigh-Durham, NC; and Chicago, IL.⁶ The first metropolitan area of comparison, San Francisco-San Jose, was chosen for the obvious reason that it contains Silicon Valley, unquestionably the most active region in the country in terms of entrepreneurship. Many attribute the active entrepreneurial climate of Silicon Valley to the symbiotic relationship between business and academia, which includes highly regarded research institutions such as Stanford University. Raleigh-Durham also was chosen as a comparison area because of its research capacity -- Research Triangle Park, Duke University, and UNC-Chapel Hill, among other universities. Lastly, the Chicago metropolitan area was chosen because of its resemblance to Greater Philadelphia -- both are older cities struggling to move beyond their old manufacturing base and stake their ground in the "new" economy. Entrepreneurship in Chicago is believed by many to be on the upswing, in great part thanks to the strong presence of the financing community. All three metropolitan areas -- an entrepreneurial hotbed, a heavily funded research capacity, and an urban area looking to jump-start technology-driven economic growth -- offer interesting comparisons for university technology transfer in Greater Philadelphia.

The source of the data used in the analysis is the *Association for University Technology Managers* (AUTM), which surveys its members on an annual basis. **All AUTM data cited in this report is presented as a share of the national total for fiscal year 1995.** This data set, like all data sets, has drawbacks. First, it is not comprehensive. The AUTM survey is filled out by only a sample of universities and research institutions, however AUTM believes that the major players in university technology transfer are AUTM members and respond to its survey. Second, all survey respondents are AUTM members, so the

⁶ Greater Philadelphia is defined by Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties in Pennsylvania; and Burlington, Camden, Gloucester, and Salem Counties in New Jersey. The San Francisco-San Jose metropolitan area is defined by Marin, San Francisco, San Mateo, and Santa Clara Counties. The Raleigh-Durham metropolitan area is defined by Chatham, Durham, Franklin, Johnston, Orange, and Wake Counties. The Chicago metropolitan area is defined by Cook, DeKalb, DuPage, Grundy, Kane, Lake, McHenry, and Will Counties.

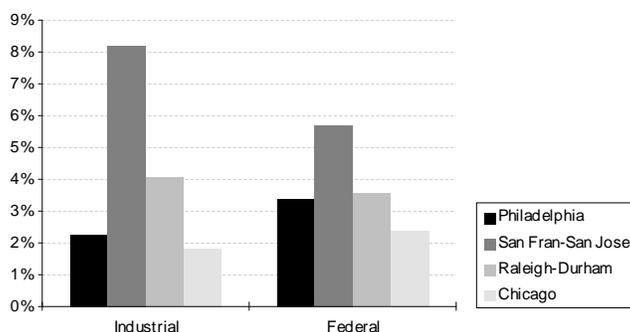
sample is somewhat self-selected. And third, the data is self-reported. In the end, however, the AUTM survey results still provide a remarkable degree of insight into university technology transfer, and the organization is to be commended for its thoroughness and consistency in collecting the data. Interviews with regional university technology transfer managers and other experts also were conducted to gain more insight into the field and its relationship to entrepreneurship. Their feedback was used to supplement the quantitative analysis of the AUTM data. (Interviewees are listed in Appendix A.)

Input

Resources are the fuel that drives university technology transfer, and the most important resources a university technology transfer program can have are funding, researchers, and administrative staff who facilitate the patenting and licensing processes. R&D funding, the bulk of which comes from the federal government and industrial sources, is an indication of the research capacity of regional institutions and a reflection of the reputation their technology transfer programs have earned. Funding, however, is no good without qualified, creative, productive researchers -- academics who can actualize an idea into viable technology with commercial potential in a timely manner. The staff of the technology transfer office itself -- professional and support staff -- carries the technology to commercial fruition. The three together set against a backdrop of the comparison metropolitan areas say a lot about the university technology transfer community in Greater Philadelphia.

What do they say? The measures suggest that in 1995 the resources going into the region's university technology transfer community -- R&D funding, researchers and administrative staff -- were fairly average. As seen in Figure 1, Greater Philadelphia did not command a disproportionately large share of national R&D funding (2.3 percent of industrial R&D funding and 3.4 percent of federal funding), unlike San Francisco-San Jose, which drew in substantial industrial (8.2 percent) and federal R&D funding (5.7 percent) in 1995. Still, Greater Philadelphia was not far behind Raleigh-Durham in terms of federal R&D funding and fared better than Chicago in both federal and industrial R&D funding.

Figure 1. Federal and industrial R&D funding
Share of national total, 1995

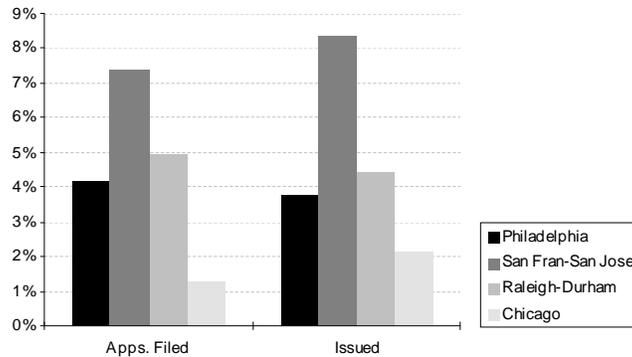


The activity of researchers and administrative staff, as shown in Figure 2, was measured using proxies -- the number of patent applications that were filed and the number of patents that were issued in 1995.⁷

⁷ A good showing in the number of patent applications filed might reflect the efficiency of the administrative staff, which must identify patentable technology with commercial potential from all the R&D being conducted at the university and then oversee the patenting of this technology, a process that can take as long as two years. A good showing in the number of patents issued might be a favorable reflection on researchers and their ability to actualize an idea into a viable technology with commercial potential in a timely manner. Still, these proxies are not perfect measures of researcher and administrative staff activity. For example, the costliness of patenting a technology might be reflected in a low number of patent applications filed. Interpretation of these proxies was done with these drawbacks in mind.

These measures also suggest an average level of activity on the part of university researchers and administrative staff. Once again San Francisco-San Jose rose above the pack, filing 7.4 percent of patent applications and receiving 8.4 percent of the patents issued. Greater Philadelphia was fairly neck-in-neck with Raleigh-Durham -- both hovered around the 3 to 5 percent mark for patent applications filed and patents issued. Chicago's low share in research and administrative activity was reflective of its comparatively low share of R&D funding.

Figure 2. Patent applications filed and patents issued
Share of national total, 1995

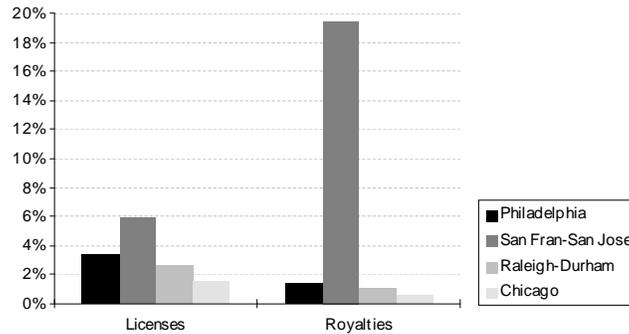


Output

The payment to a university by a private firm in exchange for the rights to commercialize a technology can take shape in several forms, the most traditional form being royalties. As discussed earlier, another form of payment is emerging in university technology transfer -- equity stakes in a company, which can be sold off to another investor (privately or in the public market) at a later time for a profit. Some university technology transfer programs have gone even a step further by lending a hand in starting up the company that will license and commercialize the technology developed by the university. In a discussion of university technology transfer and entrepreneurship the latter two arrangements are particularly important. Licenses that are executed with equity tend to be with small, early-stage entrepreneurial ventures, and start-up companies that commercialize a technology are by definition entrepreneurial. It is in this context of output that the relationship between university technology transfer and entrepreneurship is assessed for Greater Philadelphia.

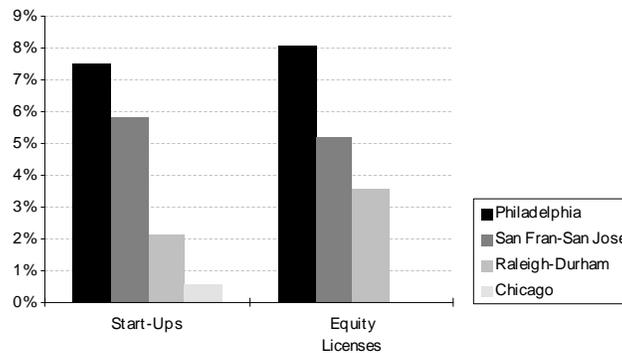
What do the output measures suggest about university technology transfer and entrepreneurship in Greater Philadelphia? Interestingly enough, in spite of the average level of R&D funding coming into the region and the average activity of university researchers and administrative staff, Greater Philadelphia did comparatively well in the output measures related to entrepreneurship (i.e., licenses executed with equity, start-ups formed).

Figure 3. Licenses and options executed and royalties received
Share of national total, 1995



Looking at the traditional output measures shown in Figure 3, which are the number of licenses and options executed (royalty-bearing and equity) and the royalties received for these licenses, Greater Philadelphia’s performance in 1995 was consistent with the average performance it turned in for the input measures. While the region’s share of licenses (3.4 percent) and royalties (1.4 percent) were higher than those of Raleigh-Durham and Chicago, San Francisco-San Jose topped the group with 5.9 percent of the licenses and options executed by universities and a stellar 19.4 percent of royalties that came in as a result of licensing agreements. However, when equity licensing agreements were separated out, Greater Philadelphia commanded the largest share of the four metropolitan regions (8.0 percent) in 1995, as seen in Figure 4. This trend was also borne out in the share of start-ups regional universities had a hand in -- Greater Philadelphia had the largest share of 7.5 percent.

Figure 4. Start-ups formed and licenses executed with equity
Share of national total, 1995



While the inputs to university technology transfer in Greater Philadelphia were average, more of these resources were committed to researching, developing, and licensing technology to early-stage companies -- in 1995 7 percent of licenses executed by Greater Philadelphia universities were executed with equity, compared to 6 percent in Raleigh-Durham, 4 percent in San Francisco-San Jose, and 0 percent in Chicago (not shown). In some of these cases, a start-up company was formed to license the technology. These findings suggest that university technology transfer in Greater Philadelphia had a positive impact on entrepreneurship, at least compared to three other metropolitan regions. Still, whether this entrepreneurial activity took place in this region or elsewhere cannot be determined. The AUTM survey did not ask respondents to specify the location of companies in which there was equity or companies which the respondents helped start up. By the same token, it cannot be gleaned from the data if universities outside this region executed equity licenses with Philadelphia-area companies or were involved in starting up

companies in this region, both of which also would have had a positive impact on entrepreneurial activity in Greater Philadelphia.

Regional Competitive Advantages and Disadvantages

The AUTM data set is limited in that entrepreneurial activity taking place in Greater Philadelphia cannot be separated out from all entrepreneurial activity. However, feedback from various university technology transfer managers in and outside the region confirms that some of this entrepreneurial activity is taking place in the region because of the competitive advantages the enjoys. Several managers offered specific examples of licensing to existing small firms and start-up firms that were located in the region. On the other hand, they offered up an equal number of examples where technology was licensed to existing small firms and start-up firms in other regions. The “exporting” of this activity could be attributed to other regions’ competitive advantages over Greater Philadelphia.

One of the greatest competitive advantages enjoyed by Greater Philadelphia is its strong biotech community, regarded as one of the top four or five in the country. The community is dominated by medical and health biotechnology (as opposed to agricultural and environment biotechnology) and is made up of industry (e.g., pharmaceuticals, medical/health technology firms), academic centers, medical schools, hospitals, and non-profit research institutions. This critical mass of “homegrown medical learning and research infrastructure”⁸ is reflected in university technology transfer -- all the regional university technology transfer officials interviewed for this project reported that their licensing was predominantly in medical and health biotechnology (e.g., medical diagnostics and devices, pharmaceuticals, disease treatment). The region’s research capacity is a vital resource to the biotech industry, a fact emphasized by representatives from industry and academia in a report written to the state: “The long-term health of the biotechnology industry is directly related to strong basic and clinical research programs at the Commonwealth’s education institutions, since development and application...of new technology, upon which the industry depends, are typically generated by these institutions.”⁹

Biotechnology is an industry in its adolescence and, as such, has benefited greatly from university technology transfer. Shielded to a great extent from inherent risks by funding from the federal government in particular, universities have been freed up to pursue radical innovation in biotechnology, innovation so broad-sweeping that the application of the technology has gone in many directions. In fact, university technology transfer is given a lot of the credit for the growth of the biotech industry thus far: “...the United States biotechnology industry was founded, and is still heavily dependent upon, technology transferred from our nation’s universities, research institutions, and national laboratories.”¹⁰ Early-stage, entrepreneurial ventures historically have embraced radical technological innovation, many founded for the very purpose of commercializing the technology. One official interviewed for the project attributed Greater Philadelphia’s good showing in the output measures to the fact that much of the technology being licensed by universities in the region is in biotechnology and that radical innovation in biotechnology tends to be commercialized by small, early-stage entrepreneurial ventures.

The region’s biotechnology strength not only spurs on entrepreneurial activity, it also keeps some of the entrepreneurial activity in the region. The symbiosis between industry and academia contributes to an entrepreneurial climate by providing a “nesting ground” in which small, early-stage companies are

⁸ Technology 21, “Biotechnology Network: Final Report and Recommendations,” December 1997, p.3. The quote was made in reference to regions throughout the state of Pennsylvania; Greater Philadelphia was cited as part of this group.

⁹ Technology 21, p.6.

¹⁰ North Carolina Biotechnology Center, “Technology Transfer: Working for Collaboration, Commerce, and Competitiveness (Report of the Advisory Committee on Development and Transfer of Biotechnology), September 1994, p.33.

cultivated. This symbiosis exists in other industries elsewhere in the country, Silicon Valley being the best example. A steady flow of technology coming from this academic community fuels the furiously fast-forming and fast-growing high tech firms of Silicon Valley, particularly internet-related companies. Business leaders give back to the academic community (in many cases their alma mater) by sponsoring research efforts and acting as mentors to future entrepreneurs. The concentration of high tech companies in Silicon Valley -- large and small, established and newly formed, many of them competitors and most of them entrepreneurial -- attests to the advantages of clustering in a region where the industry is "hot." While not as developed or hyperkinetic as high tech in Silicon Valley, Greater Philadelphia's biotech community, in which university technology transfer is an important player, has cultivated this symbiosis to some extent and, as a result, some of the entrepreneurial activity stemming from university technology transfer has taken place in the region.

Another tremendous advantage stemming from the region's strong biotech community, at least from the standpoint of entrepreneurship, is a healthy "supply" of workers who are good candidates for launching entrepreneurial ventures. Whether they desire to be their own boss, feel a need to move on, or have experienced some life event, many workers with industry knowledge and contacts leave their jobs at large pharmaceutical or other health-related companies to start their own businesses. The technology being licensed by a university technology transfer program offers a unique opportunity for workers who have industry experience (especially if their former employer had a long-standing relationship with a university technology transfer program) but might not have a specific business idea in mind or a plan in hand. Feedback from regional university technology transfer managers confirms that entrepreneurial ventures, including ones that license technology from universities, are often headed up by workers who have left the industry. In one instance described in the interviews, a university technology transfer office licensed a technology to a worker who had been downsized from the industry. In another, several entrepreneurial ventures had been started by faculty researchers themselves.

The fact that many entrepreneurial ventures are started up by industry workers is good news for Greater Philadelphia because these ventures are likely to stay in the region. Industry-workers-turned-entrepreneurs tend to have years of experience under their belt, perhaps even with the same employer. In some cases they came to the region for school, then found a job and never left. Often they have families, are firmly rooted in community life, and consider the region to have a high quality of life. Once they launch their venture they might continue to look to the university that licensed the technology for guidance. In one case the regional university required the entrepreneur to report back to the university, particularly as funding was sought. With their businesses in the early stages of development, entrepreneurs do not necessarily have compelling reasons to leave the area where they were last employed; in fact, they might have very compelling reasons to stay in the region.

In spite of the competitive advantages enjoyed by the region, advantages that certainly have kept some of the entrepreneurial activity local, competitive disadvantages have resulted in the "exporting" of technological innovation and the entrepreneurial activity that stemmed from it. Most of the managers interviewed for this project agreed that a lack of financing and management talent, particularly managers with experience running fast-growth high tech companies, is the region's greatest competitive disadvantage.

A gap in the financing world has long existed for entrepreneurial ventures, particularly ones in the very early stages of development. Traditional investors and lenders tend to refuse financing to early-stage companies, which usually do not have much of a proven track record and might be nothing more than an idea on paper. To some extent, venture capital firms have filled the gap in financing for early-stage companies. These firms put together portfolios of investments in high-risk, entrepreneurial companies, their reasoning being that the high payoff of even one of these investments is enough to balance out the losses

resulting from companies that fail. In recent years, however, the large amount of money going into venture capital funds has tipped the scale toward larger and less risky deals, a trend that many feel has reopened the financing gap for early-stage companies. This seems to be the case in Greater Philadelphia. While the region's venture capital community has grown extensively over the past decade, the majority of its investments are in later-stage companies.¹¹

An interesting trend that appears to be growing in university technology transfer is an entrepreneurial model driven by a financing party that specializes in forming fast-growth, high-tech start-ups. According to a university technology transfer manager in the region, financing parties with experience investing in and overseeing the fast-paced growth of entrepreneurial ventures sometimes approach universities themselves, license promising technology and then form a company that will commercialize the technology. Sometimes the companies they form exist only on paper, with the financing party providing additional funding to the university to continue developing the technology. Once the technology is viable the financing party assembles an experienced management team (sometimes one person) and puts it in charge of the company. Entrepreneurial ventures that are formed based on this model tend to be located where the company's management or financing party is. Feedback from technology transfer managers suggests that Greater Philadelphia lacks both these elements and, as a result, entrepreneurial ventures that are driven by the financing party tend to be located outside the region.

Regardless of where the entrepreneurial activity is taking place, managers of university technology transfer programs in Greater Philadelphia are very aware of the tremendous potential of licensing to early-stage companies. One manager reported that his university's policy was officially re-prioritized to give preference to companies in which the university could take an equity stake (i.e., early-stage companies). Another regional program was one of the first in the country to have a full-time person specifically dedicated to licensing to start-up companies. All provided instances where technology was licensed to early-stage companies, and all were at least open to the idea of licensing technology in exchange for equity stakes rather than royalties.

CONCLUSION

The analysis conducted in this report suggests that university technology transfer has had a positive impact on entrepreneurship in Greater Philadelphia. In 1995, the region's universities drew in a decent amount of funding from the federal government and industrial sources and the technology transfer community used the funding to generate a substantial amount of patentable technology. Compared to three other metropolitan areas, the region's performance was fairly average. From the standpoint of entrepreneurship, a decidedly more favorable conclusion could be drawn for Greater Philadelphia -- the region commanded the largest share of licenses executed with an equity stake and the largest share of start-ups formed because of a university-licensed technology. While comparatively fewer resources were flowing into university technology transfer in the region, the expenditure of these resources were resulting in more licensing of technology to early-stage companies, an undetermined portion of which was located in the region.

Most likely entrepreneurial activity in the region will continue to improve as a result of the growing incentive in place for university technology transfer programs to license to early-stage companies in exchange for equity. Changes -- actual and proposed -- at especially the state level are likely to boost this trend in the region's favor. Governor Ridge's 1997-98 state budget includes a research and development tax credit for Pennsylvania businesses, a policy that is likely to strengthen the university technology transfer community by reducing the risks associated with R&D overall. In a report to the state, a task force

¹¹ As reported by the Pennsylvania Economy League in *Venture Capital and Entrepreneurship in Greater Philadelphia: An Assessment of Venture Backing of Early-Stage Companies* (January 1998).

of representatives from industry and academia proposed the formation of a capital fund with a percentage earmarked for early-stage biotech companies. The task force also proposed that state financing organizations, such as the Ben Franklin Technology Center, be authorized to allow equity participation in regional start-up companies.¹² These policies and others in the works will surely boost Greater Philadelphia's research capacity even more and start to address the gap in financing for early-stage companies, improvements which can only continue to have a positive impact on entrepreneurial activity in the region.

¹² As reported by Technology 21.

APPENDIX A: LIST OF INTERVIEWEES

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