CHAPTER 6

# Angels and Venture Capitalists Invest in Commercialization



## The Stages of Start-Up Financing

Let's pause and take a waypoint—a waypoint is a stopping place on a journey. We will use Figure 1.1 in Chapter 1 as our map, as it illustrates the translation process that investment must go through to deliver innovation. The translation process has macro and micro processes and outputs within it. The previous chapters defined the major macro processes of research, development, and commercialization. The outputs of these processes are invention, patents, and trade secrets, which result in technology. Examining the procedure of cardiac stenting illustrated how it took at least three major technologies to create the product. This demonstrated the cycle of R&D leading into technology and the realization that technology is an input into the New Product Development and commercialization processes.

However, it all begins with investment, as the translation process cannot occur without it. Chapter 3 utilized gross domestic product (GDP) as a global yardstick of economic value. The National Science Board's SEI data on R&D allowed us to appreciate how much the United States invests in R&D as compared to other nations. R&D funding was detailed into its components of basic research, applied research, and development dollars. Each of those components was further broken down into the source of the funding, such as government, industry, and academia.

Next came our first discussion associated with the investment journey specifically associated with start-ups. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs are specifically designed to assist small companies to conduct their R&D.

We will now complete our investment discussion by exploring how start-ups get funded and where they go to achieve their return to investors—this is called the *liquidity event*. Figure 6.1 provides an overview of the typical investment journey for a start-up company.

The top of Figure 6.1 differentiates the various phases of start-up financing: *Seed*, *Early Stage*, *Growth Stage*, *Later Stage*, and *Exit*. It is important to note that you will hear different terms but these are the most widely used terms. Let's start by defining the various phases:

*Seed* is the first stage of financing and the amount needed is generally modest. The goal of this stage is to demonstrate the viability of the business. The definition of viability could be a demonstration that the product could or can work, a demonstration that the market exists, or the hiring of management talent. At this point, there is no commercial operation. The monies are focused on the specific fundable milestones that the company must demonstrate to obtain more funding such as demonstrating a proof of concept, validating the market size and competitors, filing a patent, and so on.

*Early Stage* is when companies are ready to begin operations but are not yet ready to generate sales. In many life science start-up product categories, such as the pharmaceutical and medical device segments, this phase can be lengthy due to regulatory requirements for clinical evidence demonstrating safety and efficacy prior to market approval. With this funding, the company completes their clinical trial, builds out their key management, and finalizes their manufacturing processes. This phase can take 2 to 5 years, depending upon the product category.

The *Growth-Stage* transition from *Early Stage* can be a little fuzzy, as capital required to scale commercial manufacturing could come from the last early-stage funding or the first growth-stage funding. The reason for this is that the company's pilot manufacturing capacity may be sufficient to cover early commercial sales. The transition point generally starts with passing regulatory requirements, or having clinical or economic evidence to support the commercial sale of the product. This phase also includes scaling the sales force and building commercial capabilities.

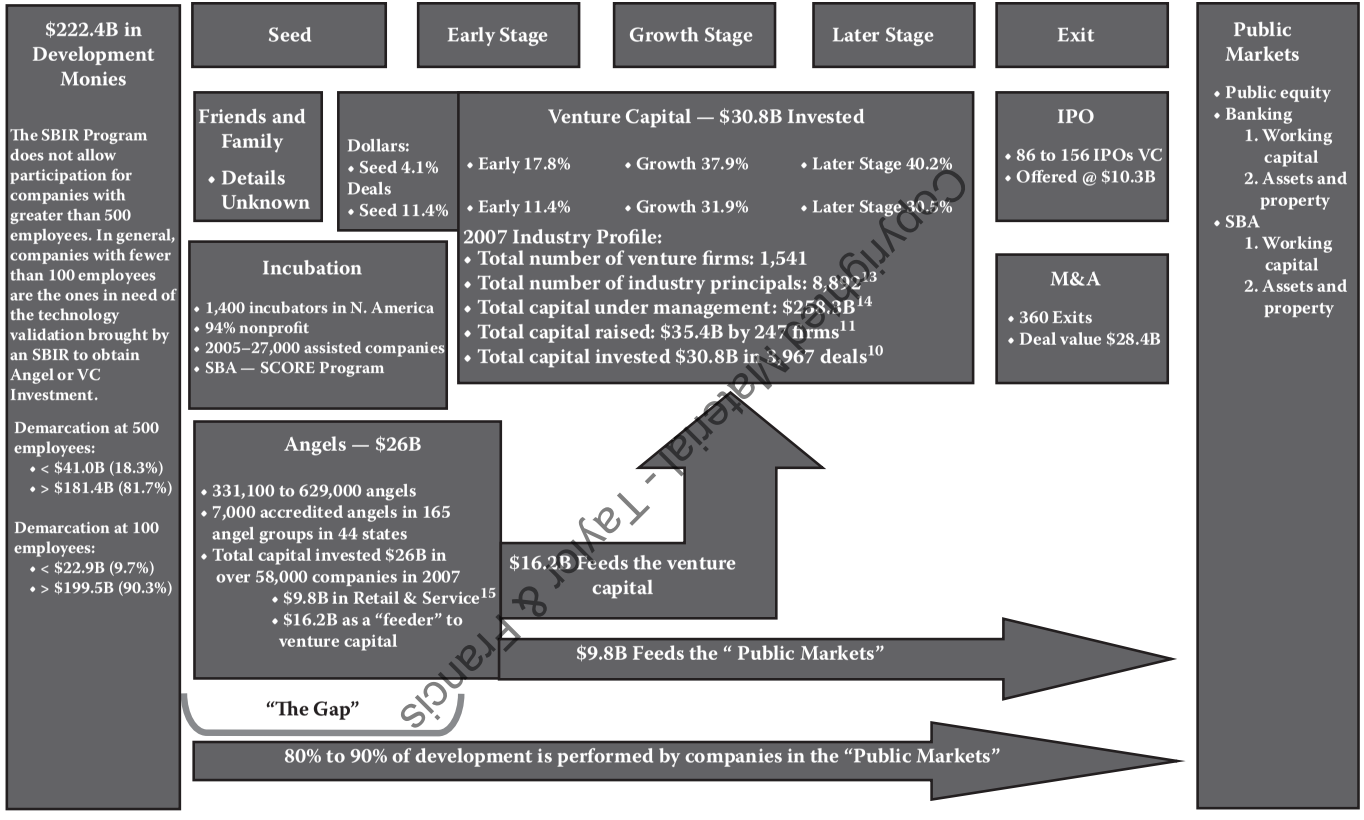


**FIGURE 6.1** The start-up capital flow. (From James F. Jordan, *Sustaining Life—The Role of Small Business Innovation Research Program*, White Paper, 2010, http://www.heinz.cmu.edu/faculty-and-research/faculty-profiles/faculty-details/index.aspx?faculty_id=163.)

*Later-Stage* capital is provided after commercialization and sales but before an exit such as a merger, acquisition, or initial public offering (IPO). The company may be successfully increasing revenues but has yet to achieve a cash-flow positive state—meaning that income exceeds all expenses. The company could also be beyond cash-flow positive, however, the opportunity for an even greater return could be had with additional investment. For example, the return opportunity for expansion into another region or the creation of a new product may exceed the existing positive cash flow and justify raising additional capital for even a greater return than waiting for existing cash flow to fund the expansion. As there can be more than one fund-raising in the later-stage phase, some investment professionals may also refer to these rounds as the *expansion stage*. Others differentiate the anticipated last stage of funding before an exit as a *mezzanine round*.

*Exit* is the last stage of start-up funding, however, in Section II of this book it will be emphasized that the exit should be one of the first thoughts during company formation. An exit is about creating a liquidity event for stockholders: the goal being to find a mechanism for stockholders to turn their investment into cash. This can be achieved with an IPO, an acquisition of the company, or a merger. An exit is also about creating a return on the investment for stockholders. Let's pause again and take another waypoint. The reason for the waypoint is that after this discussion, Figure 6.1 reviews the types of investors. The reader needs to understand how to calculate the differing return formulas and, as importantly, know which investor type to use them with. The three predominant methods are *return on investment* (ROI), *return on multiples,* or *internal rate of return* (IRR).

ROI is one of the simplest expressions and is calculated as ([total return less cost of investment]/cost of investment). *Multiples of return*, or simply, *multiples*, is the cumulative returns/investment cost. For example, if an investor received $15,000 for a $5,000 investment, they would calculate this as a 3× return ($15,000/$5,000). The formulas for both ROI and multiples can be criticized for their lack of recognition for time to the return. Time is a critical component in recognizing a return. For example, investing $1 and getting $2 back in 2 years is entirely different than getting $2 back in 5 years. So: why would the simple formulas of ROI or multiples be used?

Venture capital invests into high-potential, high-risk companies that do not have access to public markets or bank loans. A venture capital (VC) fund starts with its *investment charter.* An investment charter communicates to those who invest in the

fund the segments the fund will invest in, the roles, responsibilities and authorities of the various individuals involved, how compensation occurs, how returns will be disbursed, and the expected time frames of those disbursements. A typical venture capital fund's investment charter is for 10 years (with clauses and penalties for extensions). Venture capitalists target to invest the majority of their funds in the first 5 years and provide returns back to investors in years 5 through 10. Let's return back to our question: why would the simple formulas of ROI or multiples be used? As a VC fund typically expects its returns within a standard time frame it allows for an easy comparison between various investments. With time being fixed, its accommodation is not a material factor for performance comparison between investments or funds.

For nonventure capital investors, time is a material factor, as individual investment returns may occur within different time frames. For these investors, the formula of IRR is preferred as time is considered and allows for comparison between different types of investments. The IRR is calculated by using the net present value (NPV) formula and guessing the interest rate that makes NPV equal zero. Revisiting our previous example above of investing $1 and receiving $2 back in 2 years versus 5 years looks very different through the eyes of time. Take a moment and review Figure 6.2, and observe the differences in expressing a return via multiples and internal rate of return (IRR). IRR is referred to as the *Interest Rate* in Figure 6.2.

Notice that the IRR for 2 years equals a 100% return versus an IRR for 5 years equaling a 14.75% return. These are very different: yet, in the venture capital world, ROI or return multiple could suffice for comparison, as the time factor for each venture fund is somewhat standard. It is important to note that some VC funds use all three measures.



## The Players in Start-Up Financing

With an understanding of the stages of start-up financing, let's now deepen our discussion on Figure 6.1 to identify the players within each stage, what their motivations are, the risks they assume, and how they make a return.

Seed is the first stage of financing recognized by the private equity community. In Figure 6.1, beneath the heading *Seed*, are three groups of players: friends and family, crowdfunding, and incubators and angels. We need to deviate for a moment

| | Return on Investment |
|---|---|
| Total Return | 2 |
| Less: Investment Cost | 1 |
| Net Profit | 1 |
| Net Profit/Investment Cost | 100% |

| | Return Multiple | Return Multiple |
|---|---|---|
| Cumulative Returns | 2 | 15,000 |
| Divide by Investment Cost | 1 | 5,000 |
| Multiple Express in "x" | 2 | 3 |

| Interest Rate | 100.00% | 14.75% |
|---|---|---|
| Initial Investment | −1 | −1 |
| Return: Yr 1 | | 0 |
| Return: Yr 2 | 2 | 0 |
| Return: Yr 3 | | 0 |
| Return: Yr 4 | | 0 |
| Return: Yr 5 | | 2 |
| NPV | $0.00 | $0.00 |



**FIGURE 6.2** Multiples versus IRR.

to recognize that in many cases in life sciences there may be a pre-seed stage phase. The reason for discussing this topic here, as opposed to including it in our discussion on stages of start-up financing, is that private equity tends not to participate in pre-seed funding; however, some of the seed players may also be involved in some pre-seed activities.

Pre-seed activities are those required to achieve the fundable milestone for entry into seed stage. In our Chapter 1 discussion of a company named Medrobotics, Inc., we noted that the company was formed out of a Carnegie Mellon University research program focused on snake robotics. Unless there was a personal relationship with an angel or venture capitalist, these investors would not invest in the vision of turning snake robotic technology into a flexible surgical robotic instrument. It is not that they would not like the idea; it is simply that there is too much risk to warrant an investment. Instead, they would monitor the concept and wait for the company to move into a more advanced funding stage, thus de-risking the investment.

So where does pre-seed money for creating that proof come from? Let's return to Figure 1.1 in Chapter 1 and recall that it

**Research Grants**

- R01 NIH Research Grant Program
- R03 NIH Small Grant Program
- R13 NIH Support for Conferences and Scientific Meetings (Rl3 and U13)
- R15 Academic Research Enhancement Award
- R21 Exploratory/Development Research Grant Award
- R34 Clinical Trial Planning Grant
- R41/R42 Small Business Technology Transfer
- R43/R44 Small Business Innovative Research
- R56 High Priority, Short-Term Project Awards
- U01 Research Project Cooperative Agreement
- K99/R00 Pathway to Independence Award

**Resource Grants**

- R24 Resource-Related Research Projects
- R25 Educational Projects
- X01 Resource Access Program

**Program Project/Center Grants (P Series)**

- P01 Research Program Project Grant
- P20 Exploratory Grants
- P30 Center Core Grants
- P50 Specialized Center

**Trans-NIH Programs**

- BISTI — Biomedical Information Science and Technology Initiative
- Blueprint — Neuroscience Research
- Diversity Supplements — Existing NIH Grants and Cooperative Agreements
- ESI — New and Early Stage Investigators Policies
- GWAS — Genome-Wide Association Studies
- NIH Common Fund — Roadmap for Medical Research
- OppNet — Behavioral and Social Science Research Opportunity Network
- PECASE — Early Career Awards for Scientists and Engineers
- Stem Cells — Stem Cell Information



**FIGURE 6.3** Government funding mechanisms.

takes many *applied research* chapters or the process of *translational research* to bridge research to development. A major funding mechanism for pre-seed activities is the National Institutes of Health (NIH) and the NIH's National Center for Advancing Translational Sciences. Figure 6.3 demonstrates the variety of the programs available to fund research and validate individual technologies. The details of each program are beyond the focus of this book and can be found at the NIH's Grant and Funding Web site.[27]

To understand the differences between pre-seed and seed investing, one should think about pre-seed as being about the individual technology and seed being about the product—the pulling together of multiple technologies. The start-up entrepreneur that understands this difference is the one that maximizes their non-dilutive grants. They do so by breaking down the product into as many individual technologies as can receive grants. As importantly, a grant requires formal scoring via a *peer review process*. A peer review process consists of a committee of scientific thought leaders who are expert assessors and score the proposal for its potential impact for the grant authority. Next, the grant authority ranks all of the projects during its assessment period and funds the projects in order of ranking to the extent of their budget.[28] Start-up companies that source their technology and collaborate with academia have the highest potential for non-dilutive funding. However, even those that do not source their technology from academia can use the SBIR

program. Utilizing pre-seed funding for independent technology validation not only yields the benefit for entry into the seed stage, it can also be used as a validation point until a patent is issued. Imagine a seed stage company requesting funding from an investor. It is natural for an investor to be concerned that the technology approach may not work or that it is not important or protectable. Until you can afford a patent opinion or actually receive a patent, a grant can be a powerful independent validation source for an investor.

*Friends and Family* (F&F) refers to investors that are associated with the founders or the management of the start-up company. They are frequently the first investors and an investment return may not be their primary motivator. These investors may be more interested in helping their F&F member get the company started, and as a result, will participate in both pre-seed and seed funding. F&F can also be excited to gain access into this class of stock, as there is not a consolidation point, such as a stockbroker firm, to gain access to seed stage life science companies. For example, in one investment with which the author is associated, the owner of multiple car washes was excited to invest into a life science start-up as he did not know where to find them and was comforted by the fact that his friend knew the industry.



Other motivations for an F&F investor could simply be tax purposes, such as the case of a parent of the start-up founder who was primarily interested in giving his child a start-up experience. Although he hoped for a return, he was equally happy to give his child "a shot" and if it did not work out, he would be pleased to have the tax write-off.

What does gaining access to this class of stock mean? Life science start-up companies require an investment of tens of millions of dollars. Start-up management desires the fewest stockholders with the highest ability to invest to simplify investor relations. As a result of a life science start-up's high capital needs, lack of a consolidated market and desire for the fewest stockholders possible, it is difficult for the F&F-type investor to find and/or be invited to invest in a life sciences start-up unless one has access through a relationship. Getting access to a life science start-up company also has the added benefit of the F&F investor having the right to continue their pro-rata investment for the remainder of the project. Pro-rata literally means proportional, meaning that the stockholder has the right to buy their share of future rounds. For example, if an investor bought 5% of the company during the first round, they would have the right to buy 5% of the next round. F&F investors are frequently

excited by this prospect. Although the concept of pro-rata share is generally embraced, it is not always the case. In some cases, if you do not always take your pro-rata in a subsequent round of financing, you lose the right to participate in future rounds. In more draconian settings, if you do not participate in your pro-rata share you could lose your preferred stock and be converted into common stock. In other cases, a large investor may ask for the entire subsequent round and demand the cessation of pro-rata; if the current stockholders are unable to continue to fund themselves, the company will compromise its pro-rata policy to gain access to the funding.

*Crowdfunding* or *sourcing* is another funding mechanism that raises many small amounts via the Internet. This technique has historically been widely used for activities such as disaster relief, nonprofit efforts, and political campaigns. On April 5, 2012, President Obama signed the JOBS Act into law and a component of that law made it legal for private businesses to offer equity to investors via crowdfunding. As this is a relatively new technique for start-up equity, it has not yet proved to be a significant funding mechanism for life science start-ups.[29] As the space is new, there are many small Web services that offer crowdfunding services. In August of 2013, Kate Taylor of *Forbes* posted an article identifying Kickstarter, Indiegogo, RocketHub, FundRazr, GoGetFunding, and Crowdfunder as the top six sites, with StartSomeGood receiving an honorable mention.[30]

*Incubators* are a critical mechanism assisting start-up companies and they can participate in both pre-seed and seed funding. Business incubators are designed to offer programs, resources and, frequently, capital, to help companies successfully develop their products and obtain capital. The National Business Incubator Association (NBIA) is a good source for specific detailed information and can be found at www.nbia.org. Additionally, your local incubators most likely are also well connected to local angel investors. According to the NBIA, there are roughly 1,400 business incubators in North America and in 2011 they assisted approximately 49,000 start-up companies.[31] The details for incubator types, sponsors, and results are noted in Figure 6.4.

As an example, the author is associated with an incubator called the Pittsburgh Life Sciences Greenhouse (PLSG). The PLSG is regionally focused on Western Pennsylvania and specifically on Life Sciences, which includes the biotechnology, pharmaceutical, diagnostics, medical devices, and technology and health care information verticals. Its success is measured on job growth and wealth creation. Job growth and wealth

| Incubator Types | |
|---|---|
| 94% | Nonprofits |
| 54% | Mix Use |
| 39% | Technology |
| 4% | Service/Specialty |
| 3% | Manufacturing |

| Incubator Sponsors | |
|---|---|
| 31% | Economic Development |
| 21% | Government |
| 20% | Academic Institutions |
| 4% | For Profit |
| 8% | No Sponsors |
| 8% | Combination |
| 8% | Other |

| Incubator Results | |
|---|---|
| 1,400 | North American Incubators |
| 49,000 | Start-Ups |
| 200,000 | Workers |
| $15 B | Revenue |
| 87% | Still in Business 10 Years Postgraduation |

**FIGURE 6.4** Incubator industry overview. (From the National Business Incubator Association, State of the Business Incubation Industry, Reporting Years 2006 and 2012, http://www.nbia.org/resource_library/review_archive/1012_02a.php.)



| | Need | Solution Strategy |
|---|---|---|
| **Capital:** | Insufficient (local) capital at all stages of life sciences company development. | Increase available capital from multiple sources to accommodate all stages of development, including loans and nondilutive grants. |
| **Connectivity:** | Difficulty making critical connections to key resources. | Serve as a conduit to capital, contract research organizations, policy makers, and business development opportunities specific to life sciences. |
| **People:** | Lack of experienced life sciences talent, including company executives, managers, and entrepreneurs. | Attract and retain top-caliber technical and managerial talent to support innovation and company formation. Create a pool of serial entrepreneurs. |
| **Space:** | Growth hampered by insufficient space, including wet lab space and incubator office space. | Meet the demand for world-class laboratory and office facilities to support the region's life sciences industry. |

**FIGURE 6.5** PLSG strategies. (From Pittsburgh Life Sciences Greenhouse, Pittsburgh, PA.)

creation are outcome measurements and the incubator has identified the four strategies (Figure 6.5) to deliver on its promise of job growth and wealth creation.

The incubator provides various domain-experienced personnel that offer services, programs, and investment money to achieve its mission. The graphic in Figure 6.6 shows how this incubator's efforts flow. The incubator sources its innovation

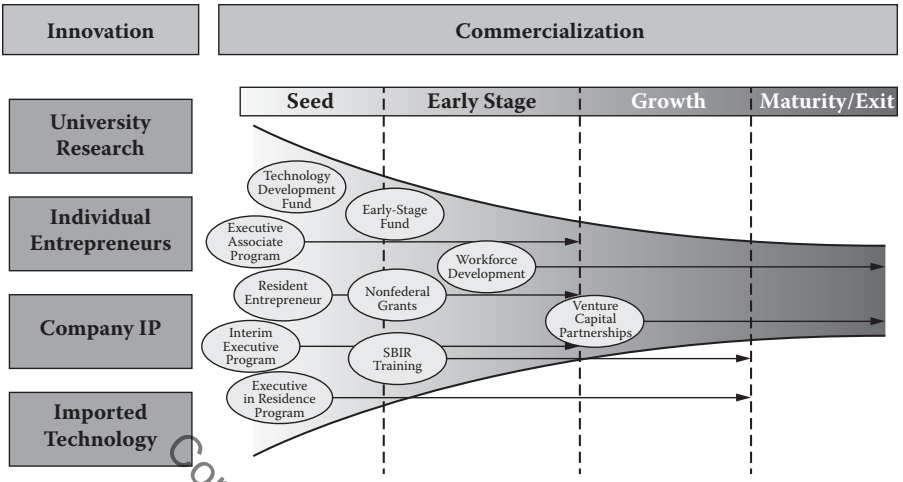


**FIGURE 6.6** PLSG investment pipeline programs. (From Pittsburgh Life Sciences Greenhouse, Pittsburgh, PA.)



in four different ways. Innovation can be sourced from local universities or entrepreneurs. Technology can also come from larger life science companies that possess IP that they are no longer using or IP that they have maintained for defensive purposes. These companies are motivated to turn these nonproductive assets into cash-generating assets. Last, technology can be imported into the region from any of the three sources discussed; university, entrepreneurs, or company IP (Figure 6.6). The motivation for these companies to relocate is to get the support of an incubator in their commercialization efforts that they could not receive in their regions.

The incubator's goal is to move companies from the seed stage to exit and, in doing so, deliver on their mission to generate jobs and wealth. A subset of some of the PLSG incubator programs are detailed in the bubbles under the *Commercialization* bar (Figure 6.6). Note that obtaining domain-experienced people and funding the proof-of-concept is the first priority of the incubator. The executive associate, resident entrepreneur, interim executive, and the executive-in-residence program bubbles are focused on getting domain-specific talent into the company to guide its technology development and go-to-market strategy. The reason domain specific talent is so crucial is that, without it, you run the risk of wasting funds on unnecessary activities or extreme inefficiency due to lack of experience. Possible risks include purchasing unnecessary equipment, wrongly focusing marketing and sales efforts, and making poor decisions due

to lack of clinical or regulatory experience. As you would not expect your plumber to create and deliver the electrical strategy for your home, company founders are ill advised to allow people without domain experience to plot their strategy. In fact, the franchise industry exists to solve this problem. For example, why would you buy a Dunkin Donuts franchise when you could open a coffee shop of your own? Advantages such as association with a well-established brand, guidance on equipment purchase and facility design, and access to established policies and procedures increase the probability of success. So, to complete our analogy, domain-specific knowledge and relationships are equivalent to franchise knowledge. Continuing our discussion, notice the *Technology Development Fund* bubble: this is about providing funding for the company to invest into developing its technology. This investment usually is in the form of convertible debt—debt that is later turned into stock. Incubators can help set up a company's equity structure and methods to align with industry standards. Note the nonfederal grant and SBIR training bubbles: these are about obtaining non-dilutive funding and an independent assessment of the technology.



The PLSG incubator is just one example of how a nonprofit, industry-specific incubator operates. Other examples include the *BioEnterprise* health care incubator in Cleveland, which is recognized nationally for their regional health care success in Ohio although their program does not offer investment dollars. Another health care incubator named OCTANe in California is another highly successful health care incubator that provides services and programs but does not provide investment dollars. These are just a couple of examples of how incubator programs and service content may differ according to the resources available in the region. For example, California has numerous experienced life science executives and angels, whereas Pittsburgh does not. Hence, the need to have an executive program and the ability to invest are critical to meet the common goals of all incubators—achieving a successful exit, creating jobs, and generating wealth. To achieve an exit, incubators focus their member companies on achieving a fundable milestone. A fundable milestone is the entry point into the next class of investor. The incubator and the company need to know the specific fundable milestone for the next class of investor whether it be an angel, corporate venture, or venture capital. Additionally, the incubator must understand that the fundable milestone for each product category differs. For example, in the medical device segment, a proof of mechanical concept may be the entry point for an angel investment and in the pharmaceutical industry a

strong *in vitro* (meaning outside of a living organism) study may be adequate.

Earlier we discussed the fuzzy seed and early-stage transition. For the F&F and incubators, the goal is to progress the company on to the angel, corporate venture, or venture capital investors. These investors have the ability to invest the higher capital levels than F&F and incubators are capable of delivering. Returning to Figure 6.1, note the *Incubator*, *Angel*, and *Venture Capital* boxes. Observe that the *Incubator* box touches the *Venture Capital* box; observe that the *Angel* box extends into the *Venture Capital* box. The reason for the overlap is that much of the time angel capital comes before venture capital. However, there are occasions where companies can move from F&F and/or incubators' investment into corporate or venture capital. As previously stated, this tends to be specific to each vertical. For example, it is highly unlikely for a pharmaceutical start-up to receive enough F&F and incubator investment to obtain a fundable milestone for entry into the corporate or venture capital class. However, health care IT companies, who generally need less funding, could obtain such a fundable milestone and skip over the angel class into corporate or venture capital.



As *angel capital* is generally the next player, we will continue our discussion with this investment class. Angels use their own personal money to fund a company and in general their individual investments range from $50,000 to $500,000. Many angels have prior professional investment experience and considerable entrepreneurial experience. Angels are individuals who are certainly motivated by a return on investment; however, frequently this is not their only motivation. They may enjoy working with entrepreneurs, may be interested in part-time engagements or may simply want to give back to the community. Angels tend to invest regionally and can be difficult to discover because they do not advertise. Your local incubator and university technology transfer offices are good places to go to get connected to this informal network.

Over the decades there has been an increasing number of angel networks or groups that have formed. These are individuals who pool their money and can invest larger amounts. As angel investors come from a vast array of backgrounds, and a network can consist of many members, there is an increase in the probability that someone from the network has domain expertise. As angel networks have more resources, they generally also have a more disciplined due diligence process, which aids in de-risking their investments. Once an investment is made, the network assigns the best individual or individuals

to mentor the company by being board members or advisors. Finding angel networks is easier than finding an individual angel because they advertise their meetings and are members of the various angel associations. The Angel Capital Association has made its member directory public and can be found at http://www.angelcapitalassociation.org/directory/.

There is another class of angel investor called a *super angel* or *super angels*. Super angels are very high-net-worth individuals who are serial investors. They either operate independently or in a small group. They have a track record of success and are perceived as sophisticated and well connected. Super angels have the ability to invest millions into a company, and if you are fortunate to have one, you most likely will have a higher probability of either exiting without going to venture capital or more easily entering a corporate or venture capital relationship because the super angels have relationships and a track record with downstream investors.



The University of New Hampshire's Center of Venture Research is considered one of the best sources of data on angel capital investment. They have been conducting research on the angel market since 1980. In any given year since 2002, there have been between 200,000 and 300,000 active individual investors. Annual angel investment has fluctuated during this period between $15 billion and $26 billion. In any given year, health care, life sciences, and biotechnology represents between 19% and 45% of angel investment. In 2012, 268,160 angels invested $22.9 billion in 67,030 ventures creating 250,000 jobs in the United States. Twenty-five percent of angel investment in 2012 was in the health care, life sciences, or biotechnology segments. This was down from 45% in 2010 and 32% in 2011. This decrease most likely represents the uncertainty that health care reform has placed on existing business models.[32]

The *venture capital* (VC) industry takes financial capital and provides a return to its partners by owning equity in a novel technology or business model that promises high return. Venture capitalists are investors who are skilled at funding and building young companies and they get their money from high-net-worth individuals, insurance companies, foundations/endowments, and both private and public pension funds. Venture fund investors are limited partners and the venture capitalists that run the fund are general partners. The general partners are authorized to run the fund via the *investment charter*. The investment charter usually identifies the industries in which the fund will invest and the stage of investment.

Venture capital generally participates after the seed round: to validate, in 2013, only 3% of all venture capital dollars focused on seed stage. Of the remaining 97%, 33% of venture capitalist dollars were focused on early-stage investing, 34% were focused on growth-stage investing, and 30% were focused on later-stage investing.

The exact number of venture capital firms can be difficult to determine as funds generally have a 10-plus-year investment charter. Funds typically try to make their initial investments in the first 5 years, and if there are subsequent investments, they are generally follow-on investments into the same companies, rarely adding new ones. In years 5 to 10 of the fund's life, the general partner is typically looking for exits to start returning capital to his investors. When funds are waiting for returns and not investing, they are called *inactive*. However, the fund does legally still exist. So how do you define the number of venture firms active or legally existing? According to a 2010 national venture capital association study, if you captured all firms raising money in the last 8 years, the count in 2010 would be 791 firms.[33] Most people consider active funds, funds that are currently making new investments, as being the better yardstick. This makes sense because if you are looking for a VC investor, funds that are no longer investing, referred to as *closed*, are of no interest to the start-up company seeking funding. There are also varying definitions of active. According to the National Venture Capital Association (NVCA), active is investing at least $5 million into companies and using this definition, there were 462 U.S. venture firms in 2010.[34] CB Insights uses the definition of firms making at least four investments per year and using this yardstick this yields 479 active firms in 2012.[35] The last question that could be asked is how many life science and health care funds are active. This is a challenging number to find in publicly available databases as some firms have multiple segment investment charters; for example, IT and medical devices. In our example, the firm could be listed in only one category, such as IT, or in both. Most analysts use the percentage of invested dollars into life science as a surrogate. In 2013, 23% of all venture capital was invested into life sciences and in 2012, that number was 25%. Using 479 active firms in 2012 multiplied by 25%, it would be reasonable to state that roughly 120 venture firms focused on life sciences exist.

The last category to discuss is *corporate venture capital* (CVC). CVCs participate in funding rounds in a very similar way to traditional venture capital firms. Unlike venture capital firms whose primary motive is profit, CVCs are interested in

| | Company Sold | | |
|---|---|---|---|
| **Class of Investor** | Invested Equity | Acquisition Price — Assume 3× | Profit by Investor Type |
| F&F Investors | 2 | 6 | 4 |
| Angel Investors | 10 | 30 | 20 |
| VC Investors | 15 | 45 | 30 |
| CVC Investors | 15 | 45 | 30 |
| Total Equity | 40 | 120 | 80 |

| | Company Bought by CVC | | |
|---|---|---|---|
| **Class of Investor** | Invested Equity | Acquisition Price — Assume 3× | Profit by Investor Type |
| F&F Investors | 2 | 6 | 4 |
| Angel Investors | 10 | 30 | 20 |
| VC Investors | 15 | 45 | 30 |
| CVC Investors | 15 | 15 | 0 |
| Total Equity | 40 | 90 | 50 |
| | | | |
| CVC Savings | | –30 | |

**FIGURE 6.7** CVC value.



investing in start-ups to explore new innovations in their markets. CVCs are particularly interested in innovation that is not part of the company's existing core business and could represent a disruptive change to the company's business model if successful. Like VCs, CVCs are looking at technologies that offer high revenue growth and a return on investment. Figure 6.7 demonstrates the value of the process to corporate venture capitalists and the companies that fund them.

The two charts represent a start-up that needed $40 million to meet its commercialization objectives. The company utilized friends and family investors, angels, venture capital, and corporate venture capital to raise the capital to meet its needs. In both scenarios the company was sold at a 3× multiple to invested equity. On the top example, the corporate venture capital investor experienced the innovation and subsequently the CVC fund's sponsoring company decided not to acquire the company. Upon the company's exit, the CVC got a 3× multiple on their $15 million invested, receiving $45 million in proceeds from the sale, which resulted in a $30 million profit on the deal. In the second scenario, the CVC availed the technology to its sponsoring company, who decided to acquire the company. From the

| | Company Sold | | |
|---|---|---|---|
| **Class of Investor** | Invested Equity | Acquisition Price — Assume 3× | Profit by Investor Type |
| Series A | 2 | 6 | 4 |
| Series B | 5 | 15 | 10 |
| Series C | 15 | 45 | 30 |
| Series D | 20 | 60 | 40 |
| Total Equity | 40 | 120 | 80 |

| | Company Bought by CVC | | |
|---|---|---|---|
| **Class of Investor** | Invested Equity | Acquisition Price — Assume 3× | Profit by Investor Type |
| Series A | 2 | 6 | 4 |
| Series B | 5 | 15 | 10 |
| Series C | 15 | 45 | 30 |
| Series D | 0 | 0 | 0 |
| Total Equity | 20 | 60 | 40 |
| | | | |
| CVC Savings | | –60 | |

**FIGURE 6.8** CVC savings calculator.



perspective of the CVC's sponsoring company, they bought the start-up for $90 million, not the $120 million they would have paid if they had not invested in the company. The sponsoring company gets their $15 million back and spends $30 million less for the acquisition. The previous description is conceptual because in the real world, financial transactions occur within the context of price-earnings (PE) ratios and tax implications.

Another value to the sponsor of the corporate venture fund is the ability to gain privileged information by being an investor or board member. Acquiring a company by being an outsider generally is based upon the start-up attaining certain value or fundable milestones such as demonstration of revenue. For the start-up company, the difference between being bought at Food and Drug Administration (FDA) approval or after demonstration of revenue could be another $10–$20 million in equity. Let's look at the scenario of a company needing $40 million to attain a cash-flow positive status again. However, this time, let's not look at it by investor type, such as angel, but by preferred stock series.

The top section of Figure 6.8 demonstrates the need to invest the total $40 million to achieve the milestones of cash-flow

positive and specific revenue achievement in order to be acquired. Investors having the same expectation of a 3× return would want to sell the company to an acquirer for $120 million. In the second scenario, the CVC avails the company to its sponsoring company. The company determines that they could easily put the product through their own sales force and that the project would be sufficiently de-risked at FDA approval. In this scenario, there is no need for the Series D of $20 million. Sticking with a 3× return, the company could then be acquired for $60 million versus $120 million, saving the sponsoring company $60 million on the transaction. As the company needs another $20 million to achieve its goals, Figure 6.8 speaks to the savings for the CVC by acquiring the company early. Investors have a 3× return expectation and buying the company earlier saves $60 million ($20 million × 3) in acquisition costs. Referring back to Figure 6.7, additional savings is had for the CVC as they will also not have to pay 3× for the money they already placed into the company.

So, how much does corporate venture invest in life sciences? According to the NVCA, in 2012, CVCs invested $2.2 billion into 586 deals. Adding 2012 venture capital and corporate venture capital together, there was a total of $9 billion invested into life sciences with 24% of that being from CVC ($2.2/9.0). Appreciating that most life science companies take several years to obtain regulatory approvals and an exit, looking at multiple years is informative. Between 2006 and 2012, NVCA reports that $15.6 million of corporate venture capital went into life sciences start-ups. The last question would be: how many life science corporate venture capital funds exist in life sciences? There is no one organization that aggregates and publishes this data on an annual basis. However, your start-up's business plan may be the best place to look for CVC. The business plan should identify the potential companies that could acquire the start-up. The start-up entrepreneur should look into those companies to determine if they have a CVC arm: it is most likely they do.