Chapter 20 Entrepreneurial Finance and Venture Capital

Chapter Overview

Any new firm with great ideas often lacks the money to implement these ideas. The *What Companies Do* opening feature looks at Amazon.com's emergence as a prototypical 'new economy' company from the perspective of the funds it utilised to fuel its growth. Amazon creatively financed itself with only a $10,000 cash investment and $15,000 loan from founder Jeff Bezos. The firm received private equity financing from a venture capital firm. This was followed by an initial public offering. Less than four years later, the firm had annual revenues of $175 million and a market capitalisation of $7 billion. Investors who purchased at the IPO price of $18 received a one-year return of 1,500%, while the private equity investors received a 50,000% return on their 56 cent a share investment. Before the market decline in 2000, Amazon's share price peaked at $107. By September 2001 its share price had fallen to $5.51, but by May 2011 had risen back to over $200 per share. This translates into a market capitalisation of over $90 billion.

What Companies Do Discussion Questions

1. What are some examples of unconventional financing used by Amazon.com in its early days? Why was it forced to use this kind of financing?
2. What level of return would you expect if you were an early investor in Amazon.com?

This chapter discusses:

20-1. The Challenges of Financing Entrepreneurial Growth Companies
20-2. Venture Capital and Private Equity Financing in the United States
20-3. The Organisation and Operations of Venture Capital Firms and Private Equity Companies
20-4. International Markets for Venture Capital and Private Equity

Technology

1. **Smart Video**. Greg Udell of Indiana University talks about the kinds of firms that use venture capital – those with more intangible and fewer tangible assets that could serve as collateral for lenders.

2. **Smart Video**. Manju Puri of Duke University notes that venture capital benefits companies with new innovative products, helping them bring their ideas to market.

3. **Smart Video**. Steve Kaplan of the University of Chicago looks at how venture capital investments are structured.

4. **Smart Video**. Antoinette Schoar of MIT discusses the potential returns from venture capital investments.

5. **Smart Practices Video**. David Haeberle, CEO of the Command Equity Group, talks about the high failure rate among venture capital investments, and their very high risk.

After studying this chapter you should be able to:

- describe how the financing of entrepreneurial growth companies differs from the financing techniques used by more mature, publicly traded corporations
- discuss the main types of institutional venture capital funds in operation today, and explain how these differ in terms of organisation, financing and investment objectives

- explain how venture capitalists structure their investments, and why they use staged financing and generally use convertible preferred shares as their investment vehicle. Review how venture capitalists price their investments and the principal methods they use to exit an investment
- describe the international markets for venture capital, particularly those in Australia, the US, Western Europe, Canada, Israel, China and Japan.

Lecture Guide

Venture capital financing is often more difficult to obtain and more costly than regular financing. After the initial public offering, entrepreneurial firms rely heavily on external funding.

20-1 The Challenges of Financing Entrepreneurial Growth Companies

Entrepreneurial firms' assets are more likely to be intangible, such as patents or intellectual property rights. By definition it is harder to obtain external financing for these assets. Information asymmetry is a bigger problem for entrepreneurial firms, which are often trying new technologies and ideas. Most firms start out small, with personal equity financing and institutional loans as their most important sources of financing.

Venture capitalists provide both risk capital and critical advice to help companies grow. For example, venture capitalists may figure out how to properly manage a firm in a poorly managed sector, or could advise on the acquisition of new properties. Venture capitalists create value by evaluating and originating deals and through syndication – spreading out the risk of deals and improving access to capital – through developed venture funds.

Table 20.1 Sources of Start-up Capital for a Sample of 132 Small Companies

Note that the largest source of financing is personal capital. The entrepreneur must invest a great deal of his personal capital – expertise and savings – into a new venture. An even larger source of financing is institutional loans. The entrepreneur tends to rely on bank financing, backed by his/her personal creditworthiness in order to obtain needed start-up funds.

20-2 Venture Capital and Private Equity Financing

Venture capital was historically supplied by institutional venture capital funds and angel capitalists – wealthy investors willing to risk some of their capital on high risk, high reward ventures. Venture capital needs quickly outpaced the ability of wealthy investors to provide sufficient capital, leading to financial venture capital funds, corporate venture capital funds and venture capital limited partnerships.

Venture capital is often referred to as originating in the US, where the industry changed starting in 1978 because of the lowering of the capital gains tax rate and the relaxation of the 'prudent man rule' which allowed pension fund managers to invest some of their funds in private equity. Outside of the US, Australia is one of the largest private equity markets, as shown by Table 20.2.

Table 20.2 Private Equity Commitments in 2011

Figure 20.1 Funds Raised by the Australian VC and PE Industry

20-2a Types of Venture Capital Funds

Institutional venture capital funds are formal business entities in which full-time professionals seek out and fund promising ventures, and angel capitalists (or *angels*) are wealthy individuals who make private-equity investments on a more ad hoc basis.

There are a number of categories of institutional venture capital funds:

- financial venture capital funds
- corporate venture capital funds
- venture capital limited partnerships – these dominate the industry

20-2b Investment Patterns of Venture Capital Firms

The venture capital industry helps resolve conflicts between investors and venture capitalists and between entrepreneurs and venture capitalists. Venture capitalists want highly motivated entrepreneurs. The VCs are motivated by potentially high returns. In a way funds with a limited life provide motivation to the investor – if the VC firm does not raise new commitments it will lose its sources of funding and will no longer exist.

Figure 20.2 Sources of Funds Raised by the Australian VC and PE Industry in Financial Year 2012

20-2c Industrial and Geographic Distribution of Venture Capital Investment

California, which has a reputation as a technology incubator, has received more than its proportional share of venture capital.

- *Student Involvement:* Ask students what role local and state governments need to play in order to attract new ventures. Why do new ventures tend to cluster in a particular area? Ask students for examples of economies achieved by location, for example, proximity to a university that can supply talent to the new firms, or tax breaks from municipal authorities.

20-2d Venture Capital and Private Equity Investment by Stage of Company Development

Note how little venture money goes to brand new start-up companies. Even though venture capitalists are willing to take on more risk than the average investor, they are still careful about investing in the riskiest, newest ventures and more willing to give money to firms that need money to expand existing operations.

Table 20.3 Distribution of Investments by Australian VC and PE Funds in Financial Year 2012 (By Investment Stage)

20-2e The Economic Effect of Venture Capital and Private Equity Investment

The fact that well-developed markets exist for venture capitalists to exit the business and get their money back when the venture firm goes public has aided venture funding. There are various arguments that support the positive economic influence of this industry.

20-3 The Organisation and Operations of Venture Capital and Private Equity Companies

20-3a Organisation and Funding of Venture Capital Limited Partnerships

Venture capitalists also help protect their investments through staged financing. Rather than give the firm all the money it needs, additional money is provided only after significant milestones are reached. This means the venture capitalist may have to pay more for each per cent of equity in the new firm as it successfully reaches each milestone, but it also makes it easier for a venture capitalist to minimise losses with an easy way to exit a failing business by simply not providing funds for the next stage. Partnerships are one of the ways some venture capitalists do this. Due to the many agency problems that exist in the venture capital relationship, both sides should be careful to protect their own interests and reputation.

20-3b How Venture Capitalists and Private Equity Managers Structure Their Investments

Venture capitalists and private equity managers protect themselves through covenants that help ensure that the original providers of capital are not diluted through future equity issues and through maintaining access to exiting the firm through an initial public offering. Venture capitalists allocate risk, return and ownership rights between the entrepreneur(s) and the fund. The distribution of the rights and responsibilities depends on 5 key factors:

- The experience and reputation of the entrepreneur
- The attractiveness of the portfolio company as an investment opportunity
- The stage of development
- The negotiating skills of the contracting parties
- The overall state of the market

All of the risks and responsibilities of the investment proposal are listed in a detailed *term sheet*.

- *Student Involvement:* have the students try to brainstorm what type of terms would have been listed in the agreement drawn up when Steve Jobs and Steve Wozniak were attempting to start up Apple.

20-3c Why Venture Capitalists and Private Equity Managers Use Convertible Securities
This section discusses the advantages of using convertible securities in the world of venture capitalism.

20-3d The Pricing of Venture Capital and Private Equity Investments
Like any investment, return is related to risk. A venture is riskiest at its start up, and venture capitalists demand a higher return for start up and seed money than they do for capital provided when the firm is more established. Returns are extraordinarily high, compared, say to investing in NYSE stocks, because of the high probability of failure. Venture capital investors generally expect a few spectacular successes and a large number of business failures. These sections also provide a numerical example of calculating returns on venture investments.

20-3e The Profitability of Venture Capital and Private Equity Investments
This section details returns from the various venture financing and venture fund types. Note that in the US, when expected returns in the early (or, seed) stage were the highest, investors were taking on the greatest risk. Also note that some of these were losing years for the overall stock market, and losing years for venture capitalists as well. Although 'all venture' funding showed higher returns in the good years, much of this was fuelled by the very high returns in the early/seed stage.

Figure 20.3 US Returns to Venture Capital Investing versus US Public Markets

Table 20.4 The Comparative Performance of Australian Private Equity and Venture Capital to June 2012

20-3f Exit Strategies Employed by Venture Capitalists and Private Equity Managers
There are four main methods of exiting these investments:

1. IPO
2. Trade sale
3. Redemption option
4. Secondary investment

Typically a VC does not exit at the IPO but several months after it.

Table 20.5 Divestments by Australian VC and PE Funds in Financial Year 2012 (By Exit Route)

20-4 International Markets for Venture Capital and Private Equity

20-4a European Venture Capital and Private Equity Fund-Raising and Investment
Venture capital financing has grown dramatically in Europe in the past decade. European companies generally have a greater reliance on financial institutions than US companies. There is a less established exit market. US investors prefer IPOs as an exit strategy, but this only accounted for about a fifth of European venture capital divestments.

20-4b Venture Capital and Private Equity outside US and Western Europe
While the US is the biggest play in the VC funding market, with Europe second, other countries are increasing their venture funding. China and India are two of the most promising private equity markets in the world today. In the What Companies Do Globally Section, student can see where most of the venture capital spending is taking place.

20-4c The Outlook for Venture Capital

Entrepreneurial Finance and Venture Capital Summary

Venture capital financing has increased both in dollar amount and investor base. What once was the province of just a few wealthy investors is now open to smaller investors through venture capital funds. What was once almost solely a US market has spread to other countries and continents, with Australia becoming a major market.

Chapter 20 Resource Articles

'How Long Can VCs Keep the Curtains Closed?' *Business Week*, 21 October 2002. This article notes that VC funds are being pressured to reveal more information about their operations and how their investments are valued.

'Web Startups Hit Cash Crunch,' *Wall Street Journal*, 13 October 2011. This article discusses the decline in venture capital funds that are available due to the large number of firms seeking venture capital funding. It is a case where demand is far exceeding supply.

Enrichment Exercise

The Economic Review, from the Federal Reserve Bank of Atlanta, Fourth Quarter 2002, has a special focus on venture capital. There are numerous other links at the Web site at http://www.frbatlanta.org/.

Answers to Concept Review Questions

1. Entrepreneurial finance differs from 'ordinary' finance in that entrepreneurial growth companies often invest in very high-risk, high-return projects. The most valuable assets on many EGC balance sheets are intangible and cannot be pledged as collateral for a loan. Special burdens confront financial managers of *EGCs.* Because they are trying to achieve rapid growth, most EGCs do not generate enough cash internally to finance all new investments. As a result, EGCs rely heavily on private equity finance, either from founders or venture capital investors.

2. Firms usually finance intangible assets with equity rather than with debt because lenders are more reluctant to provide debt capital to a firm with intangible assets. Lenders can repossess and resell physical assets. They cannot repossess ideas or human capital. Intangible assets are also more difficult to value, making it harder for capital providers to value financing instruments fairly.

3. An angel capitalist is a wealthy investor who funds risky venture enterprises. While angel investors provide large amounts of capital to new firms, the angel industry is not as structured as the institutional venture capital industry is. Angels invest on a somewhat ad hoc basis and do not routinely involve themselves in the affairs of their 'portfolio companies' to the extent that VCs do.

4. Private limited partnerships have the advantages of being easy to form, providing limited liability to investors, and providing investors with smaller amounts of capital to invest in diversified high risk but high reward ventures. They have the advantage of being free of outside influences, generally focusing on an industry in which the general partners have expertise. One weakness is limited access to capital – the regular capital markets are richer and can offer more total financing to firms.

5. Staged financing is less risky to the venture capitalists. They invest a small amount, see if the firm uses it well, see if the business appears to be successful, and then they can invest more in the venture. Venture capitalists like convertible securities for a number of reasons. Convertible securities give them an ownership interest if the firm is successful. Convertible debt and preferred shares are also senior to common equity, giving venture investors a higher priority claim on the firm's assets

than the common shareholders' claim. Convertibles give them the security of a fixed income security along with the potential to share in a possibly considerable upside gain.

6. Venture capital deals can be very profitable; however, there is a high failure rate. In efficient capital markets investors are appropriately rewarded for risk – higher risk-taking means higher returns. It is true that many times founders are moved out of their firms by venture capitalists that end up owning large stakes in companies they did not found. Capital has a price, and those entrepreneurs who want to use the capital often must pay high prices.

7. European governments and stock exchanges would like to promote a vibrant entrepreneurial sector because of the potential high profits and job creation potential that could be associated with this sector. There is a potential competitive advantage in information – the European markets can look at the history of US ventures, both successful and unsuccessful, and potentially learn from this.

8. Banks provide more European venture capital financing than in the United States. European VC funds are generally organised as investment companies, acting more like US mutual funds than US venture capital funds. European VC funds are less focused on early-stage investments than in the US. European venture investors are less likely to exit with an IPO than in the US. Canadian venture capital relies heavily on labour unions for funding, and Canadian venture funding has been particularly strong in the telecommunications industry. Japan has little true venture funding.

9. There is evidence that venture capital markets in China and India have been growing rapidly in recent years. With the growing importance of worldwide trade, the outlook for venture capital in China and India is positive.

Solutions to Self-Test Problems

ST20-1. You are seeking $1.5 million from a venture capitalist to finance the launch of your online financial search engine. You and the VC agree that your venture is currently worth $3 million, and when the company goes public in an IPO in five years, it is expected to have a market capitalisation of $20 million. Given the company's stage of development, the VC requires a 50% return on investment. What fraction of the company will the VC receive in exchange for its $1.5 million investment in your company?

A: Expected market value in 5 years = $20 million
Required return on investment = 50%

Value of VC investment in 5 years = $\$1{,}500{,}000 \times 1.50^5 = \$1{,}500{,}000 \times 7.594 = \$11{,}390{,}625$

Fraction of equity received = $\$11{,}390{,}625 \div \$20{,}000{,}000 =$ **56.95%**.

ST20-2. An entrepreneur seeks $12 million from a VC fund. The entrepreneur and fund managers agree that the entrepreneur's venture is currently worth $30 million and that the company will likely be ready to go public in four years. At that time, the company is expected to have net income of $6 million and comparable firms are expected to be selling at a price/earnings ratio of 25. Given the company's stage of development, the venture capital fund managers require a 40% compound annual return on their investment. What fraction of the company will the fund receive in exchange for its $12 million investment?

A: Value of the company = Net income × P/E multiple = $6 million × 25 = $150 million

40% return is required on the investment
$12{,}000{,}000 \times (1.40)^4 = \$12{,}000{,}000 \times 3.842 = \$46{,}099{,}200$

$\$46{,}099{,}200 \div \$150{,}000{,}000 = 30.73\%$ of the company

ST20-3. Suppose that 6 out of 10 investments made by a VC fund are a total loss, meaning that the return on each of them is −100%. Of the remaining investments, three break even (earning a 0% return) and one pays off spectacularly by earning a 650% return. What is the realised return on the VC fund's overall portfolio?

A: This solution assumes that each of the 10 investments is for equal dollar amounts. Therefore, each investment gets a portfolio weight of 10%.

6 of 10 earn –100%, so expressed as a fraction of total portfolio (p/f) return:
$(0.6 \times -1.00) = -0.60$

3 of 10 earn 0% return, so expressed as a fraction of total p/f return: $(0.2 \times 0) = 0$

One investment earns 650% as a fraction of total p/f return: $(0.1 \times 6.50) = 0.65$

Portfolio return (R) is thus calculated as:
$R = (0.6 \times -1.00) + (0.3 \times 0) + (0.1 \times 6.50) = -0.60 + 0 + 0.65 = 0.05$

The portfolio's realised return will be 5.0 per cent.

Answers to End-of-Chapter Questions

Q20-1. List and describe the key financial differences between entrepreneurial growth companies (EGCs) and large publicly traded companies.

A20-1. Entrepreneurial firms differ from large companies in a number of ways. Entrepreneurial companies have volatile cash flows, and in fact may have negative cash flows at their inception. Entrepreneurial firms often are involved in risky ventures and they tend to give incentives to talented employees in the form of shares and share options. Entrepreneurial firms often have few tangible assets.

Q20-2. How does the financing of entrepreneurial growth companies differ from that of most companies in mature industries? Under what circumstances can EGCs obtain debt financing from banks or other financial institutions?

A20-2. Entrepreneurial firm financing differs from large company financing in that entrepreneurial companies rely first on personal equity financing and then on outside private equity. After the firm does an initial public offering, its financing choices broaden considerably. By comparison, large firms with more stable cash flows will be better able to obtain low cost financing, particularly debt financing. ECGs can receive debt financing from banks and other financial institutions, but will generally have to provide personal guarantees to repay the loan rather than having the firm liable for the loan.

Q20-3. What is an *angel capitalist?* How do the financing techniques used by angels differ from those employed by professional venture capitalists?

A20-3. An angel capitalist is a wealthy investor who funds risky ventures. Angel investors are generally not as active in overseeing the firm as VC firms are. Though not entirely passive investors, angel investors tend to be less aggressive in dealing with management than VC firms are.

Q20-4. Distinguish between the four basic types of venture capital funds. Which type has emerged as the dominant organisational form? Why?

A20-4. Financial venture capital funds are subsidiaries of financial institutions, particularly commercial banks. Corporate venture capital funds are subsidiaries of stand-alone firms

established by nonfinancial corporations who wanted to gain access to emerging technologies by making early-stage investments in high tech firms. Venture capital limited partnerships are funds established by professional venture capital firms. These act as general partners organising, investing, managing and ultimately liquidating capital raised from limited partners. Limited partnerships are the dominant form partly because they make their investment decisions free from outside influences.

Q20-5. What are some of the common characteristics of those entrepreneurial growth companies that are able to attract venture capital investment? In which industries and states is the majority of venture capital invested?

A20-5. Entrepreneurial ventures tend to be high-growth, high-tech companies. Venture capitalists look for industries where they have some competitive advantage and where their brand of active involvement can create economic value. Most investments flow into information technology companies, including communications and computers. Internet companies in particular received a great deal of venture financing in the 1990s. A great deal of venture financing has gone to California-based companies, almost half of the funding in early 2007.

Q20-6. What is meant by early-stage and later-stage venture capital investment? What proportions of venture capital have been allocated between the two in recent years? Which stage requires a higher expected return? Why?

A20-6. In the US, early stage financing accounted for about fourteen per cent of venture capital financing at the beginning of 2007. Seed capital, the very earliest stages of venture capital financing receives a very small amount of total venture capital financing. A more generous definition of early stage financing, including some expansion financing, would encompass 20-40% of total venture capital disbursements. Later stage investment in the US involved about 43% of venture financing in early 2007. This includes funding for marketing programs, major production plant expansions and financing made in preparation for accessing public capital markets. Early stage ventures are the riskiest and require the highest returns.

Q20-7. What are the responsibilities and typical payoff for a general partner in a venture capital limited partnership?

A20-7. The general partner is responsible for seeking out investment opportunities, negotiating the terms under which investments will be made, monitoring the performance of the ventures, providing additional funding and expertise, finding an attractive exit opportunity and distributing the realised cash returns from these exit opportunities to the limited partners and then terminating the fund. A typical payoff is a percentage of the realised return, almost always 20%, and an annual management fee of 1-3% of the fund's total committed capital.

Q20-8. Define *staged financing.* Why is this an efficient risk-minimising mechanism for venture capitalists?

A20-8. Staged financing minimises risk for the venture capital investors. In staged financing, the investors provide only a small percentage of the financing needed at first, just enough for the company to reach the next development stage. If the company succeeds in reaching mutually agreed upon goals, then more funding is provided. This gives the venture fund the option to deny or delay additional financing. This cancellation option places the maximum feasible risk on the entrepreneur. Staged financing provides the entrepreneur with incentives to create value because at each new funding stage, the VC provides capital on more attractive terms to the entrepreneur.

Q20-9. List and briefly describe some of the more popular covenants included in venture capital investment contracts. What is their general purpose?

A20-9. Many VC contracts specify maximum acceptable leverage and dividend payout ratios, require the firm to carry insurance, restrict the firm's ability to acquire other firms or sell assets without prior permission from investors. Ownership right agreements specify the distribution of ownership, allocate board seats and voting rights. Ratchet provisions protect the venture group's ownership rights if the firm sells new equity under duress. These provisions allow for the venture group's share value to increase at the expense of founders' equity value if new shares are issued. Demand registration rights, participation rights and repurchase rights preserve exit opportunities for venture investors. Demand registration rights give the venture fund the right to compel the firm to register shares for a public offering. Participation rights give the venture capitalist the right to participate in private share sales the firm's managers arrange.

Q20-10. What is the most popular form of financing (or security type) required by venture capitalists in return for their investment? Why is this form of financing optimal for both the entrepreneur and the venture capitalist?

A20-10. The most popular financing type is convertible preferred equity. Venture capitalists like convertible securities for a number of reasons. Convertible securities give them an ownership interest if the firm is successful. Convertible debt and preferred equity are also senior to common equity, giving venture investors a higher priority claim on the firm's assets than the ordinary shareholders' claims. Convertibles give them the security of a fixed income security along with the potential to share in a possibly considerable upside gain. Convertible securities are also good for the firm by providing them with low interest or preferred dividends – lower than nonconvertible financing rates.

Q20-11. List the major differences between venture capital financing in the United States and Western Europe. What major changes have been occurring recently in the European venture capital industry?

A20-11. Banks provide more European venture capital financing than in the US. European VC funds are generally organised as investment companies, acting more like US mutual funds than US venture capital funds. European VC funds are less focused on early-stage investments than in the US. European venture investors are less likely to exit with an IPO than in the US. The venture capital industry in Europe has grown a great deal in recent years. In particular, technology investments have grown, potentially making its markets more competitive. The downturn in world markets starting in 2000 had an adverse impact on European venture capital funding, but this has since been reversed.

Q20-12. Why is a vibrant IPO market considered vital to the success of a nation's venture capital industry? What impact did the collapse of Germany's Neuer Markt have on the European venture capital industry?

A20-12. European governments and stock exchanges would like to promote a vibrant entrepreneurial sector because of the potential high profits accruing from this sector. European IPO markets increased in volume and European companies increased in value and number. The collapse of the German Neuer Markt caused an abrupt halt to the IPO expansion. There were a series of accounting scandals and disharmony among entrepreneurs, exchange officials and investors. The European IPO market has since reopened for well-established and profitable companies.

Solutions to End-of-Chapter Problems

P20-1. Access the National Venture Capital Association Web site at http://www.nvca.org, and update Figure 20.3, using the most recent data available from this website and its links. What general trend do you see in the returns to venture capital investing versus returns in the public markets?

A20-1. Internet exercise – answers will vary.

P20-2. An entrepreneur seeks $4 million from a venture capitalist. They agree that the entrepreneur's venture is currently worth $12 million and that, when the company goes public in an IPO three years hence, it will have an expected market capitalisation of $70 million. Given the company's stage of development, the VC requires a 40% return on investment. What fraction of the firm will the VC receive in exchange for its $4 million investment?

A20-2. Expected market value in 3 years = $70 million
Required return on investment = 40%

Value of VC investment in 3 years = $\$4{,}000{,}000 \times 1.40^3 = \$4{,}000{,}000 \times 2.744 = \$10{,}976{,}000$

Fraction equity received = $\$10{,}976{,}000 \div \$70{,}000{,}000 = 15.68\%$

P20-3. An entrepreneur seeks $10 million from a VC fund. The entrepreneur and fund managers agree that the entrepreneur's venture is currently worth $25 million and that the company is likely to be ready to go public in five years. At that time, the company is expected to have net income of $7.5 million, and comparable companies are expected to be selling at a price/earnings ratio of 30. Given the company's stage of development, the venture capital fund managers require a 50% compound annual return on their investment. What fraction of the company will the fund receive in exchange for its $10 million investment?

A20-3. Value of the company = Net income × P/E multiple = 7.5 × 30 = $225 million
50% return is required on the investment

$10{,}000{,}000 \times (1.5)^5 = \$75{,}937{,}500$

$75,937,500/225,000,000 = 33.75% of the company.

P20-4. The venture capital fund Techno Fund II made a $4 million investment in Optical Fibres Corporation five years ago and, in return, received 1 million shares representing 20% of Optical Fibres' equity. Optical Fibres is now planning an initial public offering in which it will sell 1 million newly created shares for $50 per share. Techno has chosen to exercise its demand registration rights and will sell its shares – alongside the newly created shares – in Optical Fibres' IPO. The investment banks underwriting Optical Fibres' IPO will charge a 7% underwriting spread, so both the firm and Techno Fund II will receive 93% of the $50 per-share offer price. Assuming the IPO is successful, calculate the compound annual return that Techno will have earned on its investment.

A20-4. Amount received by Optical Fibres IPO = 0.93 × $50 = $46.50
Value of offering = $46.50 × 1,000,000 new shares = $46,500,000

If the IPO is successful, what is the return received by investors?
Initial investment = $4,000,000
Return = $46,000,000
Number of years = 5

Solve for yield on the investment:

4,000,000 = 46,500,000/(1 + Return)^5
Return = 63.3%.

P20-5. High-Tech Fund III made a $3 million investment in Internet Printing Company (IPC) six years ago and received 2 million shares of series A convertible preferred shares. Each of these shares is convertible into two shares of IPC ordinary shares. Three years later, High-Tech III participated in a second round of financing for IPC and received 3 million shares of series B convertible preferred shares in exchange for a $15 million investment. Each series B share is convertible into one share of IPC ordinary shares. Internet Printing Company is now planning an IPO, but it must convert all its outstanding convertible preferred shares into ordinary shares before the offering. After conversion, IPC will have 20 million ordinary shares outstanding and will create another 2 million ordinary shares for sale in the IPO. The underwriter handling IPC's initial offering expects to sell these new shares for $45 each but has prohibited existing shareholders from selling any of their shares in the IPO. The underwriter will keep 7% of the offer as an underwriting discount. Assume that the IPO is successful and that IPC shares sell for $60 each immediately after the offering.

a. Calculate the total number of IPC common shares that High-Tech III will own after the IPO. What fraction of IPC's total outstanding ordinary shares does this represent?
b. Using the post-issue market price for IPC shares, calculate the (unrealised) compound annual return that High-Tech III earned on its original and subsequent investments in IPC shares.
c. Now assume that the second-round IPC financing had been made under much less favourable conditions and that High-Tech III paid only $1 million instead of $15 million for the 3 million series B shares. Assuming that all the other features of IPC's initial offering described above hold true, calculate the (unrealised) compound annual return High-Tech III earned on this second investment in IPC shares.

A20-5. a. High Tech III will own 4 million shares from its initial investment, and 3 million from its second round investment, a total of 7 million shares. There are 20 + 2 = 22 million shares in total, so High Tech III will own 7/22 = 31.8% of Internet Printing Company.

b. The first, six-year investment turned $3 million into $240 million (4 million shares x $60 = $240 million). The return is:

3,000,000 = 240,000,000/(1 + return)^6
Return = 107.6%

The second, three year investment turned $15 million into $180 million (3 million shares × $60 = $180 million). The return is:

15,000,000 = 180,000,000/(1 + return)^3
Return = 129%

c. Assume that the second round investment was only $1,000,000 with the same number of shares offered in return. Now, a $1,000,000 investment is turned into $180,000,000 in 3 years. The return is:

1,000,000 = 180,000,000/(1 + return)^3
Return = 465%

P20-6. Suppose that five out of ten investments made by a VC fund are a total loss, meaning that the return on each of them is −100%. Of the ten investments, three break even, earning a 0 per cent return. If the VC fund's expected return equals 50%, what rate of return must it earn on the two most successful deals to achieve a portfolio return equal to expectations?

A20-6. This solution assumes that each of the 10 investments is for equal dollar amounts. Therefore, each investment gets a portfolio weight of 10%.

Five of 10 earn −100%, so expressed as a fraction of total portfolio return: $(0.5 \times -1.00) = -0.50$

Three of 10 earn 0% return, so expressed as a fraction of total p/f return: $(0.3 \times 0) = 0$

Two of 10 investments must earn sufficiently high return (R) to make the following equation hold:
$0.50 = (0.2 \times R) + (0.5 \times -1.00) + (0.3 \times 0) = 0.2R - 0.50$
$0.2R = 1.00$

R = 5.00, so these two investments **must earn 500%** each to yield a portfolio average return of 50%

Verify: $0.50 = (0.20 \times 5.00) + (0.50 \times -1.00) + (0.30 \times 0) = 1.0 - 0.50 = 0.50$

Answer to MiniCase

Entrepreneurial Finance and Venture Capital
Through your financial services company, Vestin Capital, you have raised a pool of money from clients. You intend to invest it in new business opportunities. To prepare for this endeavour, you decide to answer the following questions.

Assignment
1. What are some of the challenges of financing entrepreneurial growth companies?
2. What are the different types of venture capital funds?
3. What are some choices for organising a venture capital company?
4. In what ways should a venture capital company structure its investments?
5. Should venture capital companies use convertible securities?
6. What are some of the exit strategies that may be available to a venture capital company?

Answers
1. There are many challenges that are inherent with financing entrepreneurial growth companies. These types of companies grow very rapidly and usually consume more cash than they generate because growth requires ongoing investments in fixed assets and working capital. The most valuable assets of many of these firms are often patents and other (intangible) intellectual property rights, which are highly illiquid and are therefore inherently difficult to finance externally. Many of these entrepreneurial growth companies seek to commercialise highly promising but untested technologies, and this inevitably means that both the risk of failure and the potential payoff from success are extremely high. In addition, these entrepreneurial growth companies must attract, motivate, compensate, and retain highly skilled technical and entrepreneurial talent in a way that minimises cash outflow, since entrepreneurial growth companies are often severely cash constrained. Not surprisingly, these companies rely very heavily on share option grants for compensation.

2. There are three categories of institutional venture capital funds; (a) financial venture capital funds, (b) corporate venture capital funds, and (c) venture capital limited partnerships. Financial venture capital funds are subsidiaries of financial institutions, most commonly commercial banks. These are generally set up both to nurture portfolio companies that will ultimately become profitable customers of the corporate parent and to earn high investment returns by leveraging the financial expertise and contacts of existing corporate staff. Corporate venture capital funds are subsidiaries or stand-alone firms established by nonfinancial corporations eager to gain access to emerging technologies by making early-stage investments in high-tech firms. Venture capital limited partnerships are funds established by professional venture capital firms. These firms act as the general partners who

organise, invest, manage, and ultimately liquidate the capital raised from the limited partners. Most limited partnerships have a single-industry focus determined by the expertise of the general partners.

3. Most of the top venture capital firms are organised as general partnerships, which begin the venture financing process by creating a distinct limited partnership fund. Although some venture funds are created by public offerings of limited partnership interests (which can then be freely traded), most are organised and capitalised by private negotiation between the fund's sponsor and a well-established group of institutional investors.

   As general partner, the VC is responsible for (1) seeking out investment opportunities and negotiating the terms on which these investments will be made; (2) monitoring the performance of the portfolio companies and providing additional funding and expertise as necessary; (3) finding an attractive exit opportunity, such as an IPO or a merger, that will allow the fund to liquidate its investments; and (4) distributing the realised cash returns from these exit opportunities to the limited partners and then terminating the fund.

4. Although one should be wary of describing anything as unique as a venture capital investment contract as 'standard,' most agreements between VCs and entrepreneurs share certain characteristics. First and foremost, venture capital contracts allocate risk, return, and ownership rights between the entrepreneur (and other existing owners of a portfolio company) and the fund. The distribution of rights and responsibilities depends on (1) the experience and reputation of the entrepreneur, (2) the attractiveness of the portfolio company as an investment opportunity, (3) the stage of the company's development, (4) the negotiating skills of the contracting parties, and (5) the overall state of the market. Venture capitalists will use staged financing to minimise their risk exposure. Staged financing is not only a very efficient way to minimise risk for the venture capitalist, but it also gives the venture fund an extremely valuable option to deny or delay additional funding. The accompanying cancellation option places the maximum feasible amount of financial risk on the entrepreneur, but in return allows the entrepreneur to obtain funding at a less onerous price than would otherwise be possible. A distinguishing characteristic of venture capital investment contracts is their extensive and sophisticated covenants. These are contract clauses that mandate certain things that the portfolio firm's managers must do (positive covenants) and must not do (negative covenants). Other covenants, including the following types, occur almost exclusively in private equity investment contracts.
   - Ownership right agreements not only specify the distribution ownership, but also allocate board seats and voting rights to the participating VC.
   - Ratchet provisions protect the venture group's ownership rights in the event that the firm sells new equity under duress. Generally, these provisions ensure that the venture capital group's share values adjust so that entrepreneurs bear the penalty of selling low-priced new stock.
   - Demand registration rights, participation rights, and repurchase rights preserve exit opportunities for VCs. Demand registration rights give the venture fund the right to compel the firm to register shares with the SEC for a public offering at the firm's expense. Participation rights give VCs the option to participate in any private share sale the firm's managers arrange for themselves. In the event that a portfolio company does not conduct an IPO or sell out to another firm within a specified time period, repurchase rights give VCs the option to sell their shares back to the firm.
   - Share option plans provide incentives for portfolio-company managers in virtually all venture capital deals. As part of these plans, the firm sets aside a large pool of stock to compensate current managers for superior performance and to attract talented new managers as the company grows.

5. In fact, venture capitalists almost always receive some type of convertible security instead, either convertible debt or, more frequently, convertible preferred shares. There are several reasons for this preference. First, it allows venture capitalists to exercise effective voting control over a portfolio company without having to purchase a majority of that firm's ordinary equity, which would be

extremely expensive and would place far more of the firm's business risk on the venture group than on the entrepreneur.

Second, seniority offers a second reason why venture capitalists generally demand convertible debt or preferred shares rather than ordinary shares. This seniority places the VC ahead of the entrepreneur in the line of claimants on the firm's assets should the firm not succeed. However, preferred equity or subordinated debt leaves the firm the option to issue more senior debt, thereby preserving its borrowing capacity and making it easier for the firm to arrange trade credit or bank loans. The convertible securities held by VCs typically pay a very low dividend, suggesting that VCs use these securities for control reasons rather than to generate steady cash flows.

Most important, convertible securities give VCs the right to participate in the upside, as ordinary shareholders do, when portfolio companies thrive. In fact, VCs usually convert to ordinary equity before venture-backed companies execute initial public offerings to lock in their equity stakes and to present an uncluttered balance sheet to prospective investors.

6. The exit strategies available to a venture capital firm include; (1) an initial public offering (IPO) of shares to outside investors; (2) a sale of the portfolio company directly to another company; or (3) selling the company back to the entrepreneur/founders, which is known as the redemption option; (4) secondary investment sales.