Part 1: Value

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Nemo

Contents

1 Goals and Governance of the Firm

1.1 Basics

Concepts Involved:

- **Tangible assets**: Assets that have physical substance, e.g. plant and machinery.
- **Intangible assets**: Assets that have physical substance, e.g. brand names and patents.
- **Opportunity cost of capital**: The potential benefits that an individual, investor, or business misses out on when choosing one alternative over another. To make it simple, it means that if you cannot choose one thing because you have chosen another, the thing you cannot choose is the opportunity cost.

  e.g. The benefits that raising chicken generates is the opportunity cost of the benefits raising pig on the same land generates. What exactly is the cost? Here, I already have the capital, now because I want to raise pigs, so I cannot raise chicken, so I cannot get the reutrn of raising chicken. Suppose that raising chickens have the return rate of 10%, which means in the beginning I invest all my capital, then I get 110% capital in return. Now because I have chosen to raise pigs, so I cannot raise chickens, I cannot get the 10 percent return, so the "cost" is 10% of capital. To make it a sentence, doing sth else cost me not raising chicken, costme 10% of capital.
- **Real assets**: Belongs to Tangible assets, physical assets that have an intrinsic worth due to their substance and properties.

1.2 Intro

Basic goal of the corporation: INCREASE its value!

The financial question the corporation's manager face:

1. What investment should the corporation make?
2. How should the investments be paid for? Borrow, retain or reinvestment?

Three main themes of the chapter:

1. Maximizing value
2. The opportunity cost of capital
3. The curcial importance of incentives and governance

1.3 Corporate Investment and Financing Decisions

***Definition* 1: Financial assets**
A financial asset is a non-physical asset whose value is derived from a contractual claim, such as bank deposits, bonds, and participations in companies' share capital.

***Definition* 2: Security**
A security is a tradable financial asset.

Note: Security

The term commonly refers to any form of financial instrument, but its legal definition varies by jurisdiction. In some countries and languages people commonly use the term "security" to refer to any form of financial instrument, even though the underlying legal and regulatory regime may not have such a broad definition. In some jurisdictions the term specifically excludes financial instruments other than equities and fixed income instruments. In some jurisdictions it includes some instruments that are close to equities and fixed income, e.g., equity warrants.

In the United Kingdom, the Financial Conduct Authority functions as the national competent authority for the regulation of financial markets; the definition in its Handbook of the term "security"[1] applies only to equities, debentures, alternative debentures, government and public securities, warrants, certificates representing certain securities, units, stakeholder pension schemes, personal pension schemes, rights to or interests in investments, and anything that may be admitted to the Official List.

In the United States, a "security" is a tradable financial asset of any kind.[2] Securities can be broadly categorized into:

To carry on business, a corporation needs all kinds of real assets, which need to be paid for.And to pay for these, corporation sells claims on the assets and on the cash flow they will generate, which are called financial assets and securitys.

e.g. Bank loan: The bank provide corporation with cash, and the corporation promises(claims) to pay back with interest.

So what mentioned above suggests (roughly) the following:
1. Investment decision = management of real assets
2. Financing decision = trade of financial assets

1.3.1 Investment Decisions

Company (revenue in billions for 2008)	Recent Investment Decision	Recent Financing Decision
Boeing ($61 billion)	Began production of its 787 Dreamliner aircraft, at a forecasted cost of more than $10 billion.	The cash flow from Boeing's operations allowed it to repay some of its debt and repurchase $2.8 billion of stock.
Royal Dutch Shell ($458 billion)	Invested in a $1.5 billion deepwater oil and gas field in the Gulf of Mexico.	In 2008 returned $13.1 billion of cash to its stockholders by buying back their shares.
Toyota (¥26,289 billion)	In 2008 opened new engineering and safety testing facilities in Michigan.	Returned ¥431 billion to shareholders in the form of dividends.
GlaxoSmithKline (£24 billion)	Spent £3.7 billion in 2008 on research and development of new drugs.	Financed R&D expenditures largely with reinvested cash flow generated by sales of pharmaceutical products.
Wal-Mart ($406 billion)	In 2008 announced plans to invest over a billion dollars in 90 new stores in Brazil.	In 2008 raised $2.5 billion by an issue of 5-year and 30-year bonds.
Union Pacific ($18 billion)	Acquired 315 new locomotives in 2007.	Largely financed its investment in locomotives by long-term leases.
Wells Fargo ($52 billion)	Acquired Wachovia Bank in 2008 for $15.1 billion.	Financed the acquisition by an exchange of shares.
LVMH (€17 billion)	Acquired the Spanish winery Bodega Numanthia Termes.	Issued a six-year bond in 2007, raising 300 million Swiss francs.
Lenovo ($16 billion)	Expanded its chain of retail stores to cover over 2,000 cities.	Borrowed $400 million for 5 years from a group of banks.

TABLE 1.1 Examples of recent investment and financing decisions by major public corporations.

The investment decisions are often referred to as capital budgeting or capital expenditure (CAPEX) decisions.

1.3.2 Financing Decisions

***Prerequisite* 1: Stock** *really fucking complicated ...*

Stocks (also capital stock, or sometimes interchangeably, shares) consist of all the shares by which ownership of a corporation or company is divided. A single share of the stock means fractional ownership of the corporation in proportion to the total number of shares. This typically entitles the shareholder (stockholder) to that fraction of the company's earnings, proceeds from liquidation of assets (after discharge of all senior claims such as secured and unsecured debt), or voting power, often dividing these up in proportion to the amount of money each stockholder has invested. Not all stock is necessarily equal, as certain classes of stock may be issued, for example, without voting rights, with enhanced voting rights, or with a certain priority to receive profits or liquidation proceeds before or after other classes of shareholders.

Stock can be bought and sold privately or on stock exchanges. Such transactions are closely overseen by governments and regulatory bodies to prevent fraud, protect investors, and benefit the larger economy. The stocks are deposited with the depositories in the electronic format also known as Demat account. As new shares are issued by a company, the ownership and rights of existing shareholders are diluted in return for cash to sustain or grow the business. Companies can also buy back stock, which often lets investors recoup the initial investment plus capital gains from subsequent rises in stock price. Stock options issued by many companies as part of employee compensation do not represent ownership, but represent the right to buy ownership at a future time at a specified price. This would represent a windfall to the employees if the option is exercised when the market price is higher than the promised price, since if they immediately sold the stock they would keep the difference (minus taxes).

Stock bought and sold in private markets fall within the private equity realm of finance.

As shown in Table 1.1, a corporation can raise money from lenders or from shareholders. A corporation can issue bonds or borrow from bank to raise money from lenders or get the cash from shareholders. The choice between debt and equity financing is called capital structure decision.

1.3.3 What is a Corporation?

In brief, a corporation is a legal entity. In the view of law, it is a legal person that is owned by its shareholders. (This concept seems not important?)

Following is some intro form wikipedia:

Note: Corporation

A corporation is an organization—usually a group of people or a company—authorized by the state to act as a single entity (a legal entity recognized by private and public law as "born out of statute"; a legal person in a legal context) and recognized as such in law for certain purposes.[1]: 10 Early incorporated entities were established by charter (i.e., by an ad hoc act granted by a monarch or passed by a parliament or legislature). Most jurisdictions now allow the creation of new corporations through registration. Corporations come in many different types but are usually divided by the law of the jurisdiction where they are chartered based on two aspects: whether they can issue stock, or whether they are formed to make a profit.[2] Depending on the number of owners, a corporation can be classified as aggregate (the subject of this article) or sole (a legal entity consisting of a single incorporated office occupied by a single natural person).

One of the attractive early advantages business corporations offered to their investors, compared to earlier business entities like sole proprietorships and joint partnerships, was limited liability.[clarification needed] Limited liability means that a passive shareholder in a corporation will not be personally liable either for contractually agreed obligations of the corporation, or for torts (involuntary harms) committed by the corporation against a third party. Limited liability in a contract is uncontroversial because the parties to the contract could have agreed to it and could agree to waive it by contract. However, limited liability in tort remains controversial because third parties do not agree to waive the right to pursue shareholders. There is significant evidence that limited liability in tort may lead to excessive corporate risk taking and more harm by corporations to third parties.[3][4]

Where local law distinguishes corporations by their ability to issue stock, corporations allowed to do so are referred to as stock corporations; one type of investment in the corporation is through stock, and owners of stock are referred to as stockholders or shareholders. Corporations not allowed to issue stock are referred to as non-stock corporations; i.e. those who are considered the owners of a non-stock corporation are persons (or other entities) who have obtained membership in the corporation and are referred to as a member of the corporation. Corporations chartered in regions where they are distinguished by whether they are allowed to be for-profit are referred to as for-profit and not-for-profit corporations, respectively.

There is some overlap between stock/non-stock and for-profit/not-for-profit in that not-for-profit corporations are nearly always non-stock as well. A for-profit corporation is almost always a stock corporation, but some for-profit corporations may choose to be non-stock. To simplify the explanation, whenever "stockholder" or "shareholder" is used in the rest of this article to refer to a stock corporation, it is presumed to mean the same as "member" for a non-profit corporation or for a profit, non-stock corporation. Registered corporations have legal personality recognized by local authorities and their shares are owned by shareholders[5][6] whose liability is generally limited to their investment.

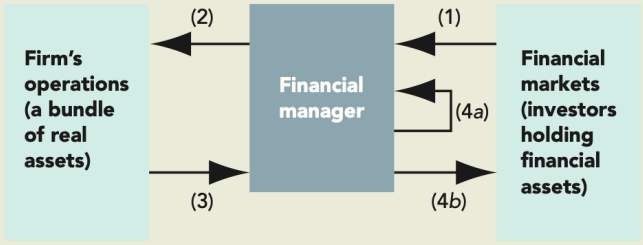
Shareholders do not typically actively manage a corporation; shareholders instead elect or appoint a board of directors to control the corporation in a fiduciary capacity. In most circumstances, a shareholder may also serve as a director or officer of a corporation. Countries with co-determination employ the practice of workers of an enterprise having the right to vote for representatives on the board of directors in a company.

In American English, the word corporation is most often used to describe large business corporations.[7][8] In British English and in the Commonwealth countries, the term company is more widely used to describe the same sort of entity while the word corporation encompasses all incorporated entities.[7] In American English, the word company can include entities such as partnerships that would not be referred to as companies in British English as they are not a separate legal entity. Late in the 19th century, a new form of the company having the limited liability protections of a corporation, and the more favorable tax treatment of either a sole proprietorship or partnership was developed. While not a corporation, this new type of entity became very attractive as an alternative for corporations not needing to issue stock. In Germany, the organization was referred to as Gesellschaft mit beschränkter Haftung or GmbH. In the last quarter of the 20th century, this new form of non-corporate organization became available in the United States and other countries, and was known as the limited liability company or LLC. Since the GmbH and LLC forms of organization are technically not corporations (even though they have many of the same features), they will not be discussed in this article.

1.4 The Role of the Financial Manager and the Opportunity Cost of Capital

FIGURE 1.1

Flow of cash between financial markets and the firm's operations. Key: (1) Cash raised by selling financial assets to investors; (2) cash invested in the firm's operations and used to purchase real assets; (3) cash generated by the firm's operations; (4*a*) cash reinvested; (4*b*) cash returned to investors.



1.4.1 The Investment Trade-off

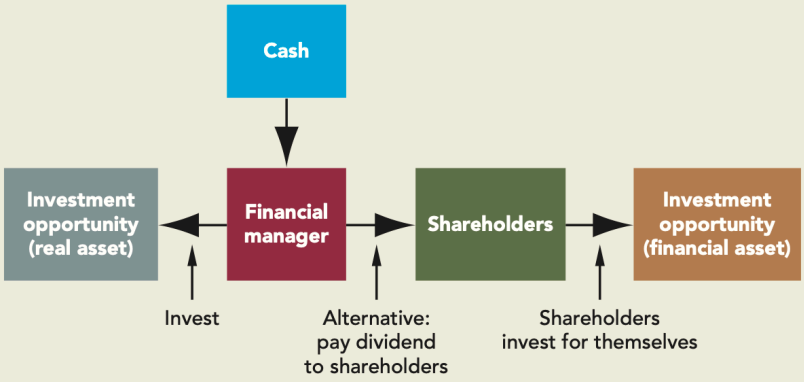


FIGURE 1.2

The firm can either keep and reinvest cash or return it to investors. (Arrows represent possible cash flows or transfers.) If cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.

Given the figure above, where should the cash go?

From the view of the owner of the corporation, the shareholders, the answer should depend which way produces more benefit. If the investment is considered to produce more interest than the shareholders invest themselves, then the cash should be used in the investment, if not, then the cash should be given back to the shareholders.

e.g. Wal-Mart has cash set aside to build 10 new stores. It could go ahead with the new stores, or it could choose to cancel the investment project and instead pay the cash out to its stockholders. If it pays out cash, the stockholders can invest for themselves.
Suppose that Wal-Mart's new-store project is just about as risty as the U.S. stock market and that investment in tho stock market offers a 10% expected rate of return. If the new stores offer a superior rate of return, say 20%, then Wal-Mart's stockholders would be happy.If the new stores offer only a 5% return, then the stockholders are better off with the cash and without the new stores; in that case, the financial manager should turn down the investment project.

In the example above, the minimum acceptable rate of return of the investment is 10%, which is called the *hurdle rate* or *cost of capital*. Actually, it's an ***opportunity cost of capital***, for it requires the investment opportunity available to investors in the market.

Note that the opportunity cost of capital is not just any expected return rate, it should be the expected return rate of the investment that shares the same level of risk with the current one (and it only make sence under this cricumstance).

1.5 Goals of the Corporation

1.5.1 Shareholders Want Managers to Maximize Market Value

A large corporation may consist of both risk-averse and risk-tolerant investors, but regardless of the difference between them, maximizing market value is never wrong.

1.5.2 A Fundamental Result

1.5.3 ! ! Several Topcis Remained Uncovered ... (not that important, seems so)

2 How to Calculate Present Values

2.1 Future Values and Present Values

2.1.1 Calculate Future Values

Money can be invested to earn interest. A dollar today is worth more than a dollar tomorrow.

Suppose you have \$100 in bank that pays interest $r = 7\%$, it's easy to get that you will get $\$100 \times (1 + r) = \$107$ the next year. Similarly, we can get what the number will reach in 2, 3, 4, ... years, which is the *future value* of the \$100.

Future value of $\$100 = \$100 \times (1 + r)^t$ (at a compound rate)

2.1.2 Calculate Present Value

Calculating the present value is actually the reverse of the calculating future value, we want to figure out how much a cashflow in the future is equivalent to the cashflow now.

Present value(PV)=$\frac{C_t}{(1+r)^t} = C_t \times \mathrm{DF}_t$, where the discount fator(DF)=$\frac{1}{(1+r)^t}$

2.1.3 Calculate the Present Value of an Investment Opportunity

Suppose that you are considering constracting a office block, which requires you to invest \$370000 initially and is expceted to produce a cash flow of \$420000 a year later. Assume that the rate of interest on the U.S. government securities is $r = 5\%$ pre year. Here comes 2 questions:

1. Is the opportunity worth investing?
2. If you want to sell the project after investing, at what price should you sell it?

Ans:

1. As said before, *A dollar today is worth more than a dollar tomorrow*, to figure out the problem, we need to calculate the present value of the futrue cash flow. (To simplify, we assume that the \$420000 is a sure thing.) So the $\mathrm{PV} = \$\frac{420000}{1+5\%} = \$400000 > \$370000$, the answer is yes.
2. The project will produce a cash inflow of \$420000, which equals to \$400000 now (the PV), so the answer is obvious: \$400000.

> **Note**:
>
> Here we choose the $r = 5\%$ as the r in the discount factor. The reason why this is valid isbecause that we think the \$420000 inflow is sure to happen, and we also think the U.S. government securities are safe, so they have the same risk.
>
> Here I also want to stress the logic here. It's a little complicated. The present value of the investment opportunity here means that the present value of the cashflow of the investment (which is \$420000 in a year) in a equally risky investment (here the U.S. government securities). And since the present value of the cashflow investing government securities is greater

than the investment I now only need to invest \$370000 to get the same return with the same risk, so I choose invest building the office rather than put my money on the government securities.

However, with that said in the textbook, I do think in real-life situations, the PV should be calculated with the highest discount rate that the buyer have access to. So if I raise the question that "what is the PV of the project to ME?", I believe that the answer should be \$370000. But again, if one ask, I'm pretty sure he don't mean that.

2.1.4 Net Present Value

The office building is worth \$400000 now, but it doesn't mean that you have earned \$400000 because you invested \$370000 before. So we need the *Net Present Value*.

$$\text{NPV} = \text{PV} - \text{investment}$$

To expand the equation, NPV can be derived from

$$\text{NPV} = C_0 + C_1 \cdot \text{DF}_1 + C_2 \cdot \text{DF}_2 + ... + C_n \cdot \text{DF}_n$$

2.1.5 Risk and Present Value

A safe dollar is worth more than a risky dollar. Most investors avoid risk when they can do so without sacrificing return.

In the example above, we assume that the investment is safe, but it might not be the case IRL, hense the calculation above have defects. How to correct it then? Well, we need to find the return rate of a similarly risky investment to be the discount rate, and with the updated discount factor, we can correct the calculation.

e.g. If you think it is as risky as investing in the stock market and the stoct market off a return rate of 12%, then $\text{DF}_t = \frac{1}{(1+12\%)^t}$. And reasonably, the PV and NPV are lower, since there are risks.

2.1.6 Present Value and Rate of Retrun

From the example above, we concluded that constructing the office building is worth doing by calculating what we have to invest in the stock securities (a equivalent-risk investment)to earn the same benefit.

We can see this another way: I invest this opportunity because that it processes a higher return rate, to be complete its rate of return exceeds the opportunity cost of capital.

$$\text{Return} = \frac{\text{profit}}{\text{investment}}$$

In this case, $\text{Return} = \frac{\$420000 - \$370000}{\$370000} = .135$, which exceeds 12%, the rate of return of the equivalent-risk stock market. So we choose to invest in a project that have a higher rate of return.

Now we have two decision rules for capital investment:

1. *Net present value rule.* Accept investment that have positive NPV.
2. *Rate of return rule.* Accept investment that have higher rate of retrun.

Note: Caution

Sometimes there may be multiple results for the rate of return, and these two rules may confilct in some situations.

2.1.7 Calculating Present Value When There Are Multiple Cash Flows

Actually it's quite simple and easy to understand — the following forumla is called the **discounted cash flow** (or **DCF**) formula:

$$\mathrm{PV} = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t} \left(= \sum_{t=1}^{T} C_t \cdot \mathrm{DF}_t \right)$$

and

$$\mathrm{NPV} = C_0 + \mathrm{PV} = C_0 + \sum_{t=1}^{T} \frac{C_t}{(1+r)^t}$$

3 Valuing Bonds

4 The Value of Common Stocks

5 Net Present Value and Other Investment Criteria

6 Making Investment Decisions with the Net Present Value Rule