
Basic Introduction

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 - Course ID: Economics 1720, Spring 2008
 - Course Website: <http://welch.econ.brown.edu/>
— contains these lecture notes.
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- Syllabus + Questions.
 - Introductory Notes. (This handout.)

Questions

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What is the point of finance? What is the point of a finance course?

Method and Language: How do corporations, investment banks, consulting firms, and academic financial economists think?

- What is the language that they speak? For example, what do they mean by NPV, WACC, and a thousand other impenetrable phrases?
- What is all this stuff in the WSJ?

Decisions: How do corporations, investment banks, consulting firms, and academic financial economists decide?

- How can you convince your boss to fund a project?
- How can you convince an employer to hire you, i.e., that you are worth the money?
- How can you/corporations get money from investors and elsewhere? What is the price of such investments? What is a financial claim and how should you think of them?
- Should you/corporations get money? For what kind of projects?
- (Investments for Corporate Finance: Where should you invest your money? What is a good reward for risk?)
- How do you add value? What exactly is value?

Until you learn how to estimate value, you cannot answer the preceding questions.

Course Prerequisites

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Mathematics:

- Finance uses a lot of arithmetic, because the questions are often about dollars and cents.
- Algebraic formulas are just translated arithmetic.
- **Mathematical sophistication** does not help. There is no higher math in this course: 99.9% of what we do is 10th-grade high school level. The remaining 0.1% is a few logarithms, and perhaps one or two derivatives. (There are no integrals, no linear algebra, vectors, and matrices, much less real algebra.)
- **Mathematical aptitude** does help, and tremendously so. The reason is that it makes working with numbers and formulas easier. If you have little mathematical aptitude, you have to work three times as hard. With good attitude and work, everyone can do well. Without it, you will fail.

Statistics:

- Means and variances.
- Basic covariances, correlations, line-fitting (linear regression).

Economics:

- Preferences. Demand and Supply.
- Incremental (Marginal) Analysis.
- Economic Rents. (Zero Competitive Rents.)

Computers:

- Very basic use of Excel.
- Web access. (Course website and *Yahoo!Finance*.)

This Finance Course

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Philosophy:

- This is **not** a vocational course. Still, if you want to get a job in investment banking, corporate consulting, or a corporate finance department, you have to know the material of Economics 1720 “cold.”
- It is more important to know the basics well and be able to apply it to new situations, than it is to know everything there is to know.
- Institutional details are often better taught on-the-job.
- The goal of Economics 1720 is ambitious: it is not only for you to learn corporate finance, but also for you to learn how to approach financial and economic problems.
- I am here to help you learn *applying the basic concepts well*.

Course Capstone: Pro-Forma:

- At the end of the course, you will be asked to integrate all your knowledge. I will force this by asking you to produce a so-called *pro forma analysis* of a business or business opportunity.
- Creating a pro forma requires understanding everything: capital budgeting, financial statements, the cost of capital, financing and capital structure, governance, etc.
- Such pro formas are the bread and butter of all business presentations.

Your Commitment:

- You have to supplement the material taught in this course with your own research and external information.
- Count on a solid 15 hours per week (including lectures, homeworks, readings) for this course.
- The main 3-step method:
 1. Always have read topical chapter before class.
 2. Come to class. Always bring calculator and printout of handout.
 3. Always read topical chapter after class again.

If you always do this, you should be able to do well in this course. I am only here to help you if you want to learn. I cannot make you learn.

Jargon, Math, and Ways of Thinking ¹⁻³

The nature of our questions means finance requires a great deal of quantitative computation. It is not just “is this project good?,” but “what is the value of this project” aka “how good is this project”?

However, perhaps even more importantly, finance also requires that you acquire the “finance mode of thinking” and the “finance jargon.” It is *the standard* for conversation in the world out there. And, of course, you still need to learn finance first before this makes sense to you.

IMPORTANT:

- **You must learn how to reason in financial terms.**
- **You must also learn the language of finance (Jargon).**

Please **stop me** if I use jargon that you do not know. Financial jargon is natural to me, so I often do not realize when I speak jargon. Financial jargon can be viewed as a method of a generally accepted method of conversing about business projects.

This course will give you a hammer, which you can then use smartly or stupidly—in real life, a little knowledge can be a dangerous thing.¹ You need one important filter for everything you do:

IMPORTANT: Understand what you are doing on an intuitive common-sense level! Nothing, including finance or strict rules, will ever replace common sense.

¹Not just Dilbert. Originally, this quote is from Alexander Pope, *An Essay on Criticism*, 1709. —but, then, so is a lot is a modifier by Albert Einstein.

Method of Approaching New Problems

- We will first solve numerical examples, and then translate them into formulas. We will try to think in the simplest possible examples first, and then complicate up.

I want you to learn how to use this as a method of thinking about all sorts of new problems and subjects, not just those that are financial in nature.

- Any complex method **must** also work in a simple setting, where it is easiest to understand. Otherwise, the complex method is flawed.

More formally, you can call this “the bullshit test.” Or the “Emperor’s New Clothes” test.

- Often, but not always, subsequent generalization is straightforward.
- The opposite is not necessarily the case. (A simple method may be inapplicable in a more complex environment.)

Groundrules To Doing Well

NA

It is no secret how you can be sure to do well in this course:

- Always bring a \$5 Calculator to class.
- Always bring the printed class lecture notes—for the current and the next class sessions (I may proceed on).
- Always read the relevant book chapter before class. (Having at least a basic roadmap makes it much simpler to follow what is happening during class.)
- Always look over the relevant class lecture notes before class.
- Never use a computer (or wireless device) during class. *Verboten.*
- Always read the relevant book chapter after class. This time it should make a lot of sense.
- Always reread the filled-out lecture notes after class to make sure you are with the program.
- Do the homeworks. Hand them in. See how you are doing on them. Learn from your mistakes.
- Don't fall behind. If you do, go see the TA as soon as possible. Don't wait until the midterm comes around.
- Read other financial newspapers and magazines. (You might also want to subscribe to the WSJ.) Have an idea of what is going on in the world. It helps you navigate this course, too.

My experience tells me that few students religiously follow these rules. However, if you do this, you really cannot do too badly this course.

Introduction

- This is Chapter 1.
- AGAIN, In the future,
 1. Read the relevant chapter ahead of time.
 2. Print the posted class notes from the website.
 3. Scan over the class notes so that you have an idea where we will be going. You do not need to answer them.
 4. **Always bring your printed copy of the notes to class.**
 5. Always bring a *working* calculator. A \$5 one is ok.
 6. No computers, no cell phones, no blackberries.
 7. Come to class, where we will solve them.
 8. Read the relevant chapter again.
 9. Solve the homeworks and problems.

Finance

The integrating theme of finance is **Valuation**.

We want to cover (at least) three important questions:

Capital Budgeting Should you take a particular project? What is this project worth?

Investments Where should you put your investment dollars among many projects? How should an investor choose an investment portfolio?

Capital Structure To undertake project investments, should you borrow money or sell a share to partners or finance it yourself (if you can)? How can/should a manager finance projects and disperse funds?

The borders between these areas are gray, because they are all interrelated and connected—through the issue of valuation!

To answer these questions, Finance is a hybrid of

1. Economics (the science of choosing among tradeoffs),
2. Statistics (the science of dealing with uncertainty), and
3. Accounting (the language of business).

The relative importance is probably in this order, too.

Valuation

1-1

- Valuation is forward looking, not backward looking.

Value today depends on (cash) flows from here on to eternity. These cash flows can in turn depend on the “stock” of your assets today.

- Finance cannot estimate philosophical or moral value.

However, finance *can* deal with such values *if you* can translate them into a monetary value. For example, if you value your being honest at \$1 million, you can then use financial tools to analyze decisions. Attaching such values is obviously subjective, not objective.

Relative vs. Absolute Valuation: The Law of One Price

1-1

- *All financial valuation is relative to alternatives.*
- The “Law of One Price:” Same things should cost the same.
- A natural extension: Similar things should cost similarly.
- Relative valuation can be easy or hard, depending on the closeness to alternatives.

For example, it is easy to value a condominium if an equivalent one next door sold three weeks ago. It would be very hard to value the White House.

- More “easy” valuation:
 - One share of IBM vs. another share of IBM.
 - One option of IBM vs. one share of IBM.
 - One share of PepsiCo vs. one share of Coca Cola.
 - One share of PepsiCo vs. one share of IBM.
 - One 5 BR, 4 BT 4,000 sqft house on Benefit St vs. a 4 BR, 4 BT 4,500 sqft house on Benevolent St.
- More “hard” valuation:
 - One house on Benefit Street vs. one house on Fifth Avenue.
 - A Nuclear Power Plant vs. Vacation Time.
 - Mars Exploration vs. Treasury Bonds.
 - The value of religious charity vs. the value of proving Fermat’s last theorem.
 - The value of religious charity vs. one share of IBM.
 - The value of leaving Antarctica undisturbed vs. ... ?

A Project

A project is anything that generates a series of cash flows.

- A repair shop. Cost: \$500. Expected earnings: \$1,000 per month, starting next month, for 24 months.
- A company's environmental spill cleanup project.
Cash flows: $-\$20,000$ per year for 5 years.
- An investor purchases a Certificate of Deposit (CD) from a bank for \$10,000. The bank will repay \$12,000 in two years.
- An education. It costs \$40,000, foregoes salary for two years, and pays off (an additional) \$20,000 in salary for 30 more years.
- A lottery ticket that costs \$1, and pays \$14,000,000 with some prob.

Projects can range from true physical investments (the bicycle repair shop), to pure monetary investments (the CD), to gambles (the lottery ticket).

Whatever the source of the funds, finance concerns itself primarily with the actual cash flows coming in and going out. The inside of the “black box” that both eats cash and produces cash is the domain of “more boring” disciplines (e.g., production or marketing).

Bonds (Debt) and Stocks (Equity) ¹⁻²

- Particular Projects: Stocks and Bonds.
- From the perspective of finance and valuation, these two kinds of claims are (primarily) a set of cash flow streams that the firm pays to the holders of these claims.
- Bonds (usually) promise a given fixed payment at a given fixed point in time. They are often called “fixed income.”
- Stocks get what is left over after bonds are paid off. Stock is sometimes called “equity” or “levered equity.”

Jargon: Bonds (Debt)

- A **Bond** is a contractual obligation by a borrower to pay certain amounts of cash in the future to a lender.

A 30-year fixed mortgage loan is a good example of a bond: the homeowner borrower promises the bank lender to pay a fixed amount of cash every month. The homeowner issues a bond to the bank. There is no difference between a bond and a loan.

Important: A Bond is a particular type of Loan.

- Bonds were traditionally and many bonds still are fixed-rate loans (“fixed income” instruments): they have future payments which are fixed and thus do not change with the interest rate.

- **Q1:** How often can the interest rate in your bank savings deposit change?

- **Q2:** What kind of bond (from the bank to you) is a deposit into a bank account?

Just be aware that we often think of bonds as something with fixed promised payments in the future—a special kind of loan.

A Firm

A firm is a collection of projects, financed by claims, that provide the inflows that eventually should generate outflows.

- A firm or company invests in various projects.

- These projects generate expenses and produce revenues.

Firms are much simpler in finance than they are in other disciplines! In a sense, they are a block box. Do not worry: the situation will quickly become more than complex enough.

- Revenues in excess of expenses go either to new investments or to the firm's claimants. Holders of debt and equity are often called financial security holders. Other claimants can be suppliers who sold product on credit, or Uncle Sam who is owed income tax or sales tax.

The name *security* in this context is a misnomer, but so common, we may as well use it, too. Security comes from the 1933 Securities Act, and our classification also applies to unregistered and privately held claims.

- The sum of the value of all claims is, virtually by definition, the value of the firm.

Firm

$$\begin{aligned} &= \text{“Debt (Loans)”} + \text{“Other Liabilities”} + \text{“(Levered) Equity (Owners)”} \\ &= \text{“All Future Payouts”} \end{aligned}$$

If you own all claims, you own the firm!

Aside, if the value of the firm's assets (and future opportunities) were not equal to the value of all its securities, you could get rich easily, at least if the market is close to perfect, a concept we will explain soon.

Corporate Accounting Identities

1-2

- If you purchase all claims of the projects today, you own the project,
firm value = value of all current claims (debt and equity).
- The firm is also all future discounted net flows.
- If you own the project, you own all net earnings of the project,
firm value = value of all future net cash flows
= PV of all future project generated net cash
- If you own the project, you receive all net payouts of the project,
firm value = value of all future net payouts
= PV of all future dividend, interest, and other payments.
- The time distribution of future inflows or outflows can be shifted neutrally in a perfect market, properly accounting for discount factors.

For example, you can pay out D in dividends today, or $D \cdot (1 + r)$ in dividends tomorrow—the project value remains the same. Whether the cash flows (or earnings) grow or shrink, or whether dividends are zero today or zero next year or growing or shrinking is all irrelevant. All that matters are the projects' total PV of all future net cash flows. You can easily reduce cash flows today in order to jack them up tomorrow (i.e., by reinvesting them). You can easily increase dividends today at the expense of dividends tomorrow. It ain't make no difference.

Homework Assignment

1. Reread Chapter 1.
2. Read Chapter 2.
3. Hand in all Chapter 1 end-of-chapter problems, due in 7 days.