
Market Imperfections

Needs some slight subsection rearrangements in the first section.

In this chapter, we relax the one remaining assumption:

- **We no longer assume perfect markets.**
 - ⇒ We can have differences in opinion, taxes, transaction costs, or big sellers/buyers.
- With this chapter, we are actually completing all basic topics.
Everything else will be (thick) gravy that elaborates on the inputs.

Bring WSJ bond price info: Corporate vs. Treasury Bonds AND taxable vs. tax-exempt AND money market rates (for inflation) AND Ratings guide.

Perfect Markets Recap

10-1A

- Information — Everyone has the same opinion.

Q1: what if not?

- Market Depth — Many buyers or sellers.

Q2: what if not?

(Together, these two assumptions make everyone be the same. No investor plays a different role. Investors are substitutable for one another. Or, there are plenty of each type.)

- Transaction Costs — None.

Q3: what if not?

- Taxes — None.

Q4: what if not?

These assumptions may be overkill, but they are definitely sufficient. We sometimes lean heavily on one or all of them; sometimes we don't need to lean on one or the other—or even most of them—very heavily.

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Q5: How perfect is the market for PepsiCo shares?

Consequences

- Consequence 1: Borrowing and lending rates are equal in perfect markets. *This difference is about expected rates, not promised rates.*

IMPORTANT: In an imperfect market:

Borrowing cost of capital > Savings interest rate.

- Consequence 2:

Example: Project costs \$950 and returns \$1,000.

– ■ **Q6:** What is the project's expected rate of return?

– ■ **Q7:** If the market were perfect, what would you do if the economy-wide $\mathcal{E}(r)$ were 10%?

– ■ **Q8:** If the market were perfect, what would you do if the economy-wide $\mathcal{E}(r)$ were 1%?

Q9: What should you do if your project costs \$950 and returns \$1,000; and if your alternative investment rate of return $\mathcal{E}(r)$ is 1% and your cost of capital is 10%?

Q10: What is the value of this project?

The Plague (Consequence #2)

10-1C

(If you have no money, the project is worth $\$1,000/1.10 \approx \909 ; if you have a ton of money, the project is worth $\$1,000/1.01 \approx \990 ; if you have between \$0 and \$950 in wealth, the project is worth somewhere between \$909 and \$990.)

The project value is no longer unique. It depends on whether you have money or not—**i.e., who you are**. Dependence of project value on who owns it is what we tried to avoid like the plague.

What Perfect Markets Bought Us!

10-1C,1E

IMPORTANT:

- **Identical interest rates (perfect markets) mean that project values do not depend on how much wealth the project owners have.**
- **Identical interest rates (perfect market) guarantee that there is a unique project value, at which the project can be bought or sold. Otherwise, projects can take on a range of feasible values.**
- **Strictly speaking, with one exception (tax-adjustment formulas), every formula in finance has been derived and is known to work, only in perfect markets.**

Think of it as the equivalent of acceleration in freefall at a rate of 9.81 m/s^2 . Actually, this is never actually true, either—it is just an approximation. For some purposes, it is good enough. For others, it is not. You must be the judge in your own application.

(Market Imperfections are at the core of *Entrepreneurial Finance*. Small, privately held firms do not face near-perfect financial markets, the same way that large, publicly traded firms do.)

Is Value Equal Price?

10-1E

• **Q11:** What is one key underlying in determining how much you can trust a valuation? What should you ask yourself?

Q12: Are the following markets perfect? How unique is the project value to its holder?

- Municipal Securities?
- Houses?
- Jewelry?
- – Airline Tickets?
- Funeral Services?
- Children?
- Marriage?
- Suicide?
- Schizophrenic Choices?



Perfect Market Consequences

10-1C

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Q13: Is one deal better than another?

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Q14: If there is no deal, isn't this bad news for buyers and sellers?

10-1F: Social value and surplus are *not* zero.

Opinions and Disagreements

10-2A,2B

- Without uncertainty, there are no information differences.
- With uncertainty, there need not be information differences.
For example, roulette has no information differences, but high uncertainty.
- Opinions = Differences in information or information interpretation.
 - Irrational differences of opinion.
 - Rational differences: Inside Information or knowledge of own behavior. (agency, customer, etc.)
- With uncertainty, in the real world, firms with a lot of uncertainty tend to suffer
 - higher default premium (not expected! perfect mkt)
 - payment of more risk premium (though mild for bonds). (perfect mkt)
 - imperfect market premia: information premium here.
 - imperfect market premia: X-costs and liquidity premium
 - (maybe even specific skills/buyers: market premium.)

Small firms suffer a full syndrome, not just one symptom ⇒ Difficult to sort out real-world spreads into determinants.
- Market imperfections can create higher/differential expected rates of return, like risk-aversion, too. Default premium does not.

Important: Do not confuse this (imperfect-market) discussion about differences in expected rates with (perfect-market) differences in promised rates.

- For example, almost all entrepreneurs believe that they will succeed—an opinion. But they are also overconfident, and thus objectively often bad risks. The fact that they have to pay higher quoted (promised) costs of capital thus may often reflect default risk, not just market imperfections.
- Most of the yield spread of corporate bonds is due to higher default probability: Boston Celtics = 9.4%, whereas Treasury = 5.6%.
- The 3.8% difference is *not* primarily an expected rate of return that is higher.

Remedies for Disagreements

10-2C

Q15: What mechanisms can mitigate this market imperfection?

Large corporations have credit ratings, too, from AAA (best) to F.

- AAA firms had $\approx 0\%$ probability of default (one non-payment) over 5-10 years.
- B firms had 20% probability of default.
- C firm had a 50% probability of default.

Covenants and Collateral — mechanisms to let each party that is more optimistic take more of each part of the risk.

Market Depth, Transaction Costs

10-3

- Try to think of *roundtrip* transaction costs.

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Q16: What does it cost to sell a house?

Sometimes, this is measured in terms of value-at-risk. For example, in your house, only your 20% downpayment may be value-at-risk, if it is almost certain that house prices cannot fall by more than 20%.

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Q17: What does it cost to sell a \$1 million in PepsiCo shares?

You can think of this \$1 million as just the equity portion.

- Transaction costs are easy to take care of in NPV. Just do everything post-transaction costs—both expected cash flows, and your opportunity cost of capital (return from investing elsewhere).
- **Liquidity Premium:** An extra expected rate of return to induce you to hold something that will be tough to resell.
 - Strangely, the liquidity premium, which should be of second order importance, seems to be very important. Witness for example the Russian crisis or LTCM. The liquidity premium seems to have a strong interaction with economy-wide financial slack and aggregate borrowing.
 - Perhaps most money on WS comes from liquidity provision. (Same for wholesalers and ordinary retail stores.)
 - If you run a fund, make some of your money through liquidity provision—but do not go overboard, or you will end up bankrupt.

The Tax Code

Taxes are a very sad part of life. They are worse if you have to pay them, rather than just argue about them.

Uncle Sam has a very intricate set of tax rules, and these rules become more complex every year. Any details I would teach would surely be outdated within 5 years. Yet, fortunately, the principles have stayed the same for as long as I have been alive, and they are pretty similar in every OECD country.

The most important tax principles are

- Earned Income

Deductions Taxable Income

Rate Tables Taxes and After-Tax Income.

Example: \$50,000 in Ordinary Income. \$10,000 home mortgage deduction.

- Mostly progressivity in rate tables. Rates change every year. For example, assume 15% on \$27,050. 27.5% on next \$38,599.

Q18: With the mortgage deduction, what is the tax on \$40,000 income?

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- **Q19:** If the mortgage were not tax deductible, how much would Uncle Sam get?

- **Q20:** What is the average tax?

The average tax is rarely important in economics.

- **Q21:** What is the marginal tax (applicable on the next dollar)?

The marginal tax is usually important. *It is applicable NOW!*

- Tax Categories: Ordinary Income, Dividends, Interest, Capital Gains. Capital gains have an unusual status: they are easy to defer and relatively easy to “wash.”

- **Q22:** What are the current U.S. tax rates?

- Individuals vs. Corporations: Similar. For detailed differences, please see the chapter in the book.
- Numerous other taxes: AMT, state, local, sales, inheritance, social security, medicare, property, etc.

Pre-Tax and Post-Tax Interest Rates ¹⁰⁻⁴

Q23: What is your tax bracket? What is my tax bracket?

Q24: If on \$100 of investment, you/I earn \$10 in interest, how much do you have in post-tax interest? (Or use current rates)

Q25: If you/I can buy bonds that pay tax-exempt interest, what interest rate would those have to pay to leave you indifferent?

Q26: What is the current tax-exempt interest rate?

The Marginal Investor (Tax Rate)

10-5

Q27: Tax-exempt municipals pay 5% per year. Taxables pay 10% per year. What do we know about the “marginal investor”?

Q28: Municipals pay 5% per year. Taxables pay 5% per year. What do we know about the “marginal investor”?

Q29: Municipals pay 5% per year. Taxables pay 7.5% per year. What do we know about the “marginal investor”?

Q30: Which bond is better for you if your tax rate is higher than the marginal investor? Lower than the marginal investor?

Q31: What is today’s marginal investor’s tax rate?

- The marginal investor is a useful construct, because it allows you to directly extract the tax rate that is used in the market’s pricing of taxable bonds.
- If there are many tax-exempt institutions, this marginal tax rate in the economy is low.
- If there are few tax-exempt institutions and many highly taxed investors, this marginal tax rate may approach the highest personal tax rate.
- The marginal tax rate is useful for you personally when you decide where to put your money—taxables or munis.

IMPORTANT: Myth: Companies pay corporate taxes.

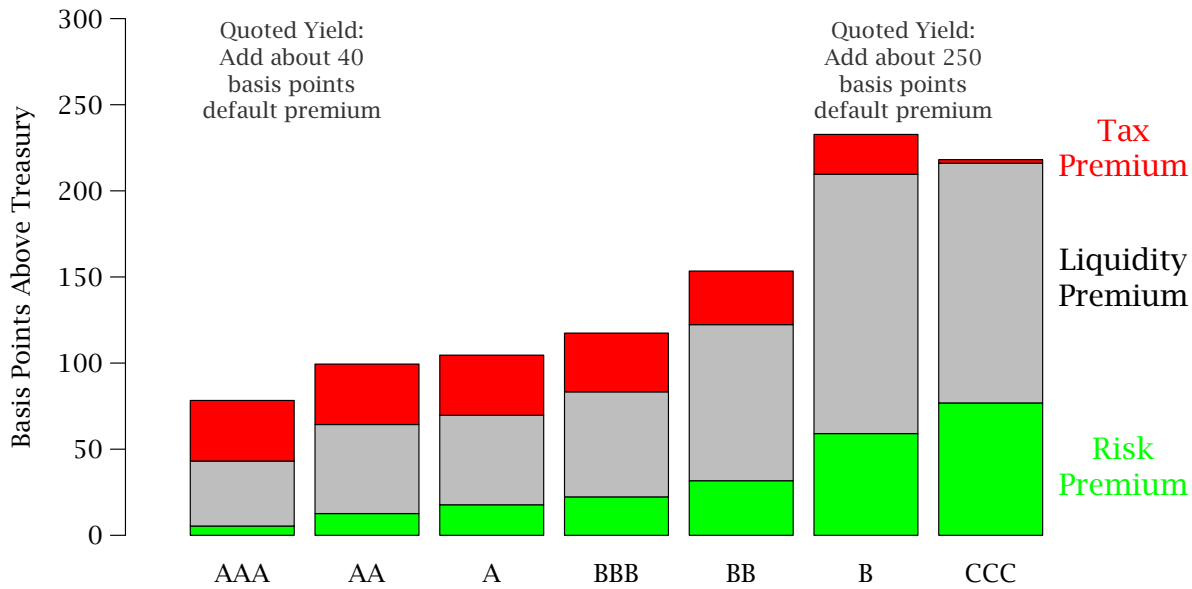
Reality: Does your house pay taxes?

Q32: Does it make sense to have a home mortgage and money in bonds?



Typical Market Imperfections

10-6



Q33: Can you speculate about premia for equity?

Working With Taxes: Inflation and Taxes Today

10-7

Q34: Can the nominal rate of return on a bond be negative?

Q35: Can the real rate of return on a bond be negative?

Q36: Can the real after-tax rate of return on a bond be negative?

Q37: What is the real after-tax rate of return on treasury bills today?

Homework Assignment

1. Reread Chapter 10.
2. Read Chapter 11.
3. Hand in all Chapter 10 end-of-chapter problems, due in 7 days.