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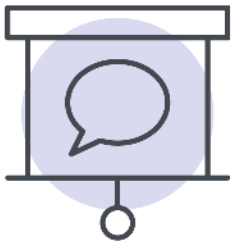
ECON 3960
Final EXAM
STUDY GUIDE



Lecture Notes

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Lecture 1

Tuesday, December 12, 2017
9:55 PM

The economics of banks as a business

Business case 7%
- Apply to take part
- 9 groups of 3 → 27 people.
- top 3 go on to final (2-4:30 Jan 27)
- Test January 27 on case. (5pm)

Weekly quizzes mon / fri 8%

⟹ Notes
↳ use coloured pens for graphing.

Review from theory of finance

(Net) Present Value - discounting

1) Lump Sum = $\frac{FV}{1+i}$

i = interest rate
↳ sometimes r

Fisher equation

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$i = r + \pi^e$ ← inflation

↑ real interest rate

↗ nominal interest rate

2) Perpetuity – reoccuring cash flow forever

$$= \frac{\text{cash flow}}{i}$$

$$\text{growing perpetuity} = \frac{\text{cash}}{i - g}$$

g ← growth rate

3) Annuity – Bonds, Mortgages,

$$= \frac{C}{i} - \frac{C}{i}\left(\frac{1}{(1+i)^t}\right)$$

two perpetuities subtracted from one another where the second one has a discount rate multiplied to it.

$$= \frac{C}{i}\left(1 - \frac{1}{(1+i)^t}\right) \Leftarrow \text{simplified.}$$

* Memorize these equations *

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Effective Rates

$$\left(1 + \frac{\text{posted rate}}{k}\right)^k - 1 = \text{effective annual rate}$$

example 1:

20%

1	compound:	$\left(1 + \frac{.20}{1}\right)^1 - 1$	$= .20$	20%
2	"	$\left(1 + \frac{.20}{2}\right)^2 - 1$	$= .21$	21%
12	monthly "	$\left(1 + \frac{.20}{12}\right)^{12} - 1$	$= .2194$	21.94%
365	daily "	$\left(1 + \frac{.20}{365}\right)^{365} - 1$	$= .2213$	22.13%

On quizzes: do not worry about effective rates when doing multiple NPV calculations.

example 2: scholarship fund $PV = 200\,000$

$i = 2\% = .02$

$$PV = \frac{C}{i}$$

$$200\,000 = \frac{C}{i}$$

$C = 200000 \times .02$

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$C = \$4000$ ⇐ amount of money given out every year for scholarship.
↳ they do not give out principle

example 3: In a divorce — monthly payments or house (half)

Say monthly payment continue for 10 yrs

$$PV = \underbrace{\frac{C}{i}\left(1 - \frac{1}{(1+i)^t}\right)}_{\text{payments}}$$

PV: value of house

— what annual cash flow equals value of house.

$$100\,000 = \frac{C}{.04}\left(1 - \frac{1}{(1.04)^{10}}\right)$$ ⇐ annual calculation.

→ solve for C.

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Lecture 2

Wednesday, January 10, 2018
8:02 AM

Movie: Inside Job

BONDS & BOND PRICING

T-bill → treasury bill Federal

Face value = $1000

Often called "the face" or "par"

How do you value a T-bill?

example: you will get $1000 1 year from now

lump sum $PV = \frac{Face}{1+i}$

canadianfixedincome.ca

↳ value of a T-bill used to be $100 vs $1000 now so prices are relative to that.

High coupon generally means a higher price

Coupons are given every 6 months

$1000	50
	50

10%

0	6m	1yr	1.5yr	...	End
price	50	50	50	...	50 + 1000 (Face)

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These kinds of bonds:

annuity + lump sum
↳ always $1000 aka Face.

$$\frac{\text{coupon}}{i}\left[1-\frac{1}{(1+i)^t}\right]+\frac{1000}{(1+i)^t}=\text{price of bond}$$

Example: yield = 6% coupon = 8%
→ FIND PRICE!

SEMI-ANNUAL COMPOUNDING IRL

Coupon = $1000 × .08 = $80

$$P=\frac{80}{.06}\left(1-\frac{1}{(1.06)^{10}}\right)+\frac{1000}{(1.06)^{10}}$$ Annual

$$P=\frac{40}{.03}\left[1-\frac{1}{(1.03)^{20}}\right]+\frac{1000}{(1.03)^{20}}$$ Semi-Annual

Annual is recommended!

Remember Price ≡ Present Value (for bonds)

Annual P = 1148.78
Semi-Annual P = 1147.19

In a midterm don't worry about this difference, just do the annual method. The difference is quite small since interest rates are so low

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HOWEVER know the difference between the two methods!

If coupon rate = interest rate

↳ The bond will sell at par

If coupon rate > interest rate

↳ The bond will sell at a premium (more than the par)

If coupon rate < interest rate

↳ the bond will sell at a discount (less than the par)

Yield to maturity = Internal Rate of Return

YTM = IRR

$$P \text{ or } PV = \frac{\text{Face}}{(1+i)^t} + \frac{\text{Coupon}}{i}\left[1 - \frac{1}{(1+i)^t}\right]$$

If you need to solve for i:

$$i = \frac{\text{coupon} + \frac{\text{face} - P \text{ or } PV}{\#\text{ of years left to maturity}}}{\frac{\text{Face} + P \text{ or } PV}{2}}$$

} approx cash flow

} avg. of face $ price

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* THIS IS NOT EXACT *

↳ this is an estimation used because you would need a financial calculator otherwise.

example: coupon = 100 Face = $1000 ALWAYS
P = 900 years to Maturity = 20

$$i = \frac{100 + \frac{1000-900}{20}}{\frac{1000+900}{2}} = 0.1105$$

CHECK*

$$P = \frac{100}{.1105}\left[1 - \frac{1}{(1.1105)^{20}}\right] + \frac{1000}{(1.1105)^{20}}$$

$= 916.66$ ← should be 900
∴ calculated i is slightly too low

Annual Interest Rate for different bond lengths:

$$i = \frac{\text{par} - \text{price}}{\text{price}} \times \frac{365}{\text{time}} \leftarrow \text{days}$$

time = 7yr $i = \frac{1000-900}{900} \times \frac{365}{365}$

time = 3m $i = \frac{1000-900}{900} \times \frac{365}{91}$

↓PV = cash flow ; ↓Price ; ↑Discount

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* If you increase discount rate, price goes down

ie. If you raise interest rates, bond, stock, etc. values will decrease

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Lecture 3

Friday, January 12, 2018
8:24 AM

Chapter 4 continued.

① lump sum 1yr FV: $1100 10% discount rate

$$PV = \frac{1100}{1.10} = \$1000$$

② 5yr Coupon bond

Coupon = $100 Coupon rate = 10%
discount rate = 10%

$$PV = \frac{100}{.10}\left(1 - \frac{1}{(1.1)^5}\right) + \frac{1000}{(1.1)^5}$$

PV = P = $1000

③ 20 yr Bond coupon rate = 10% coupon = $100
discount rate = 10%

$$P = \frac{100}{.10}\left(1 - \frac{1}{(1.1)^{20}}\right) + \frac{1000}{(1.1)^{20}}$$

= $1000

④ Perpetuity $P = \frac{100}{.10} = \$1000$

All sell at par => coupon rate = discount rate

WHAT IF i incr to 15%

-> when interest rate rises, PV goes down?

① lump sum 1yr

$$P = \frac{1100}{1.15} = \$956.52$$

② 5yr $P = \frac{100}{.15}\left(1 - \frac{1}{(1.15)^5}\right) + \frac{1000}{(1.15)^5}$

$= \$832.40$

③ 20yr $P = \frac{100}{.15}\left(1 - \frac{1}{(1.15)^{20}}\right) + \frac{1000}{(1.15)^{20}}$

$= 687.03$

④ Perpetuity $P = \frac{100}{.15} = \$666.67$

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If interest rates rise, longest term bonds fall the most. As an investor or fund manager you would want to invest in short bond or even just keep the $1000 cash → depending how much interest rates rise

* EXAM QUESTION * → this all formulas!

REAL VS. NOMINAL INTEREST RATES

Fisher Equation

$$i \cong r + \pi^e \left[+ \text{risk premium} \right]$$ sometimes

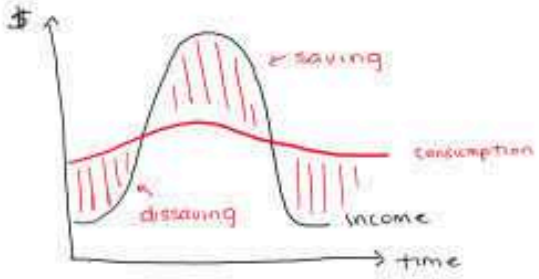
i: nominal rate; r: real rate; π^e: expected inflation

Taxation

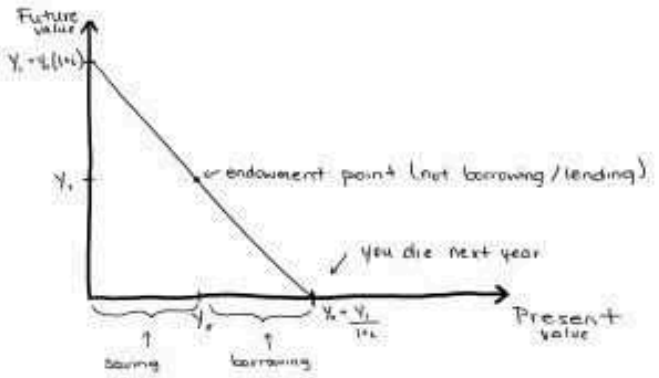
example: nominal return = 10% (4% real, 6% inflation) tax = 50%

$\$10(1-0.5) = \$5$ ← money you make after tax doesn't even compensate you for inflation!!

RRSPs/ Pensions have delayed tax.



New Model (1 year)



Y_0 = income TOTAL BORROWING = TOTAL LENDING

$\frac{1+i}{1}$

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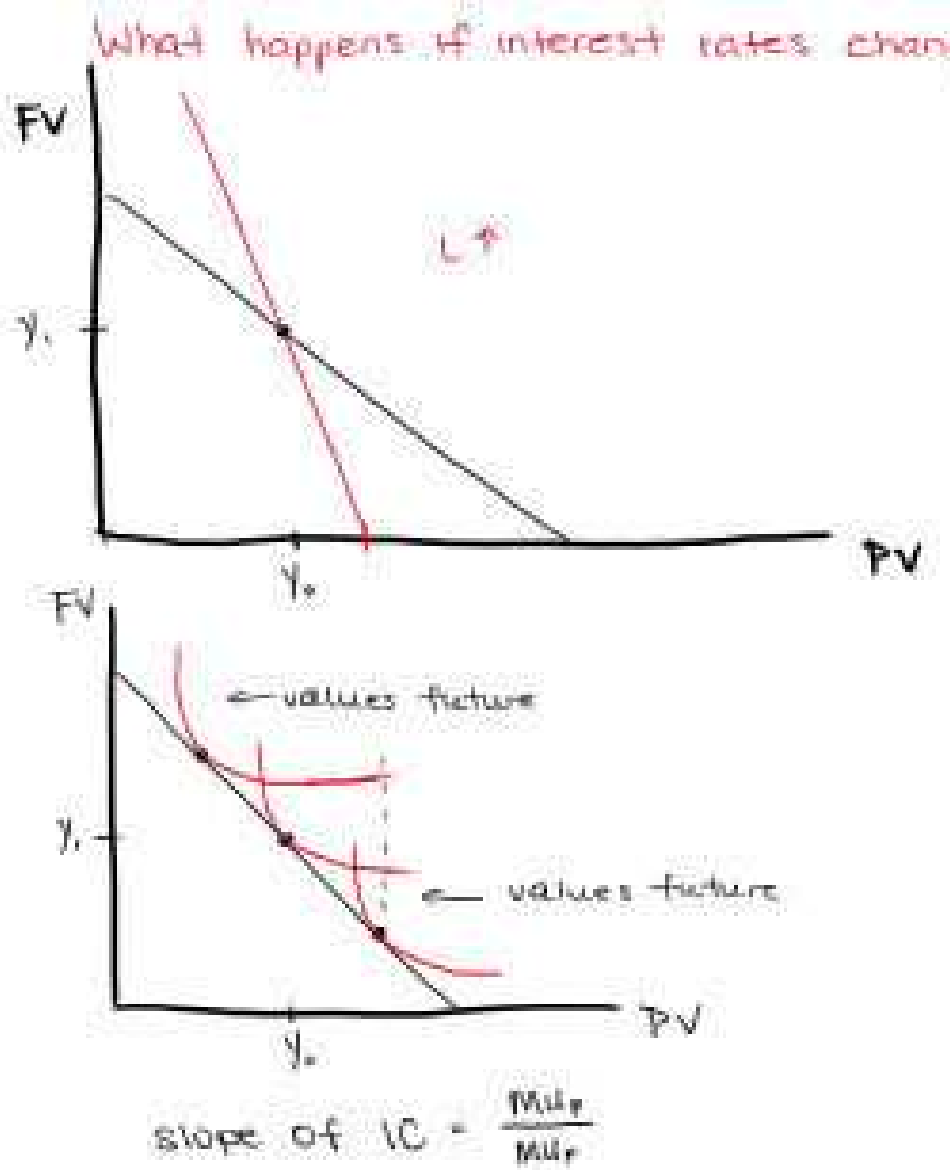

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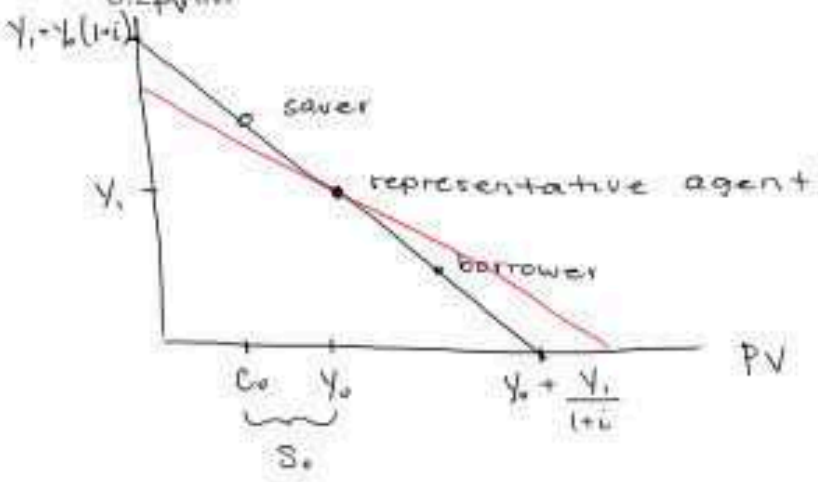
Lecture 4

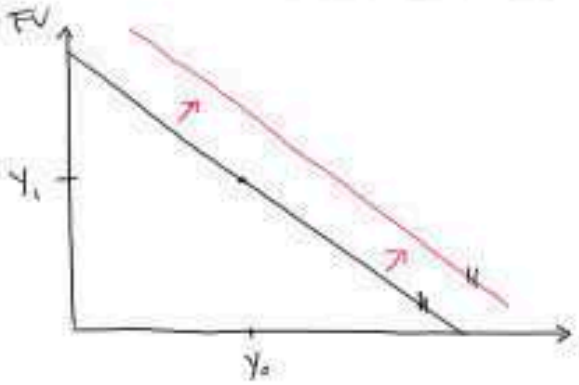
Monday, January 15, 2018
8:28 AM



slope = $\frac{\text{rise}}{\text{run}} = \frac{1+i}{1}$

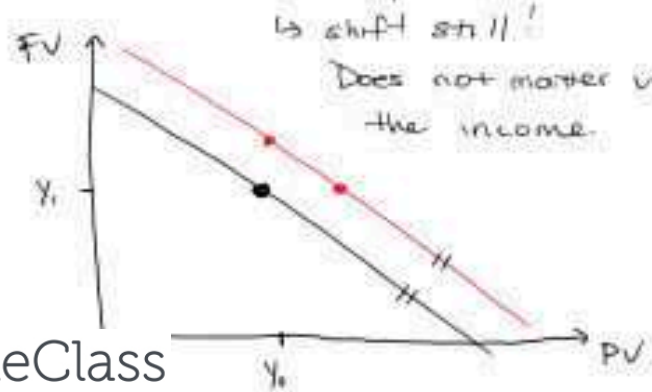
change in interest rate shifts the budget line

Quiz 1: Answer Flatter!



What if income increases? But i stays the same!

What if income increases this year but NOT next year?
Is shift still!
Does not matter when you get the income.



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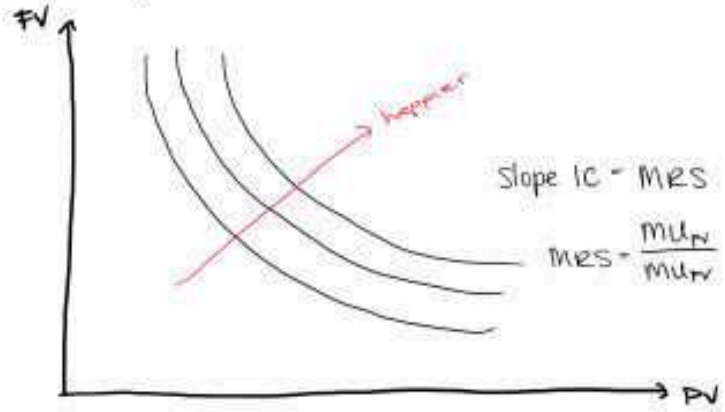
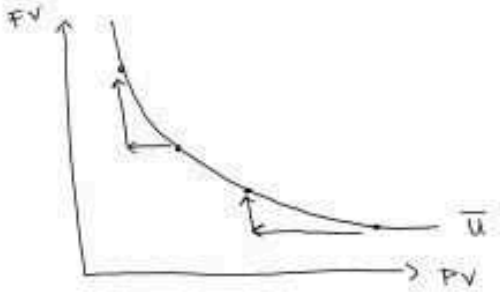
Parallel shift in BL is called an Income Effect when only income is changed



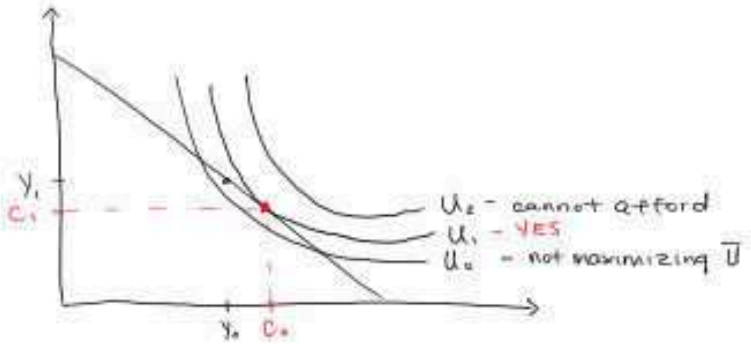
Indifference curves never cross because preferences are consistent!

Right = better.



Marginal utility is diminishing.

Borrowers & Lenders



Want to maximize utility subject to your budget!

U_1 - you are borrowing.

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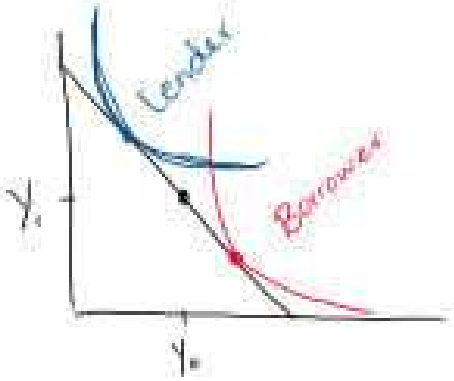
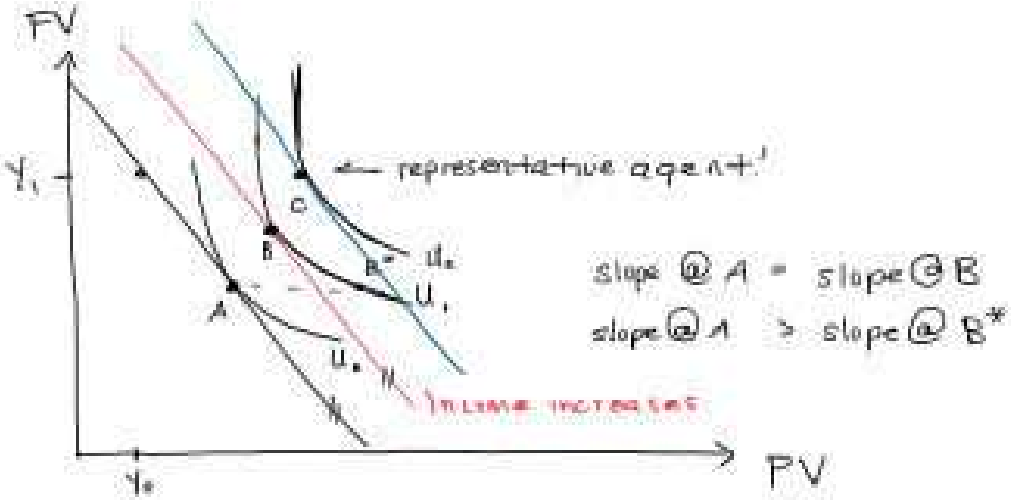
Right of endowment point = borrower



BORROWERS

EXAM QUESTION

- Borrower / Lender / representative agent
- i ↑↓ , income ↑↓
- Show graphically & explain



slope @ A = slope @ B

slope @ A > slope @ B*

* draw ICs last *

A & B are still borrowers

C is a representative agent w/ endowment pt.

Consumption increases in present & future!

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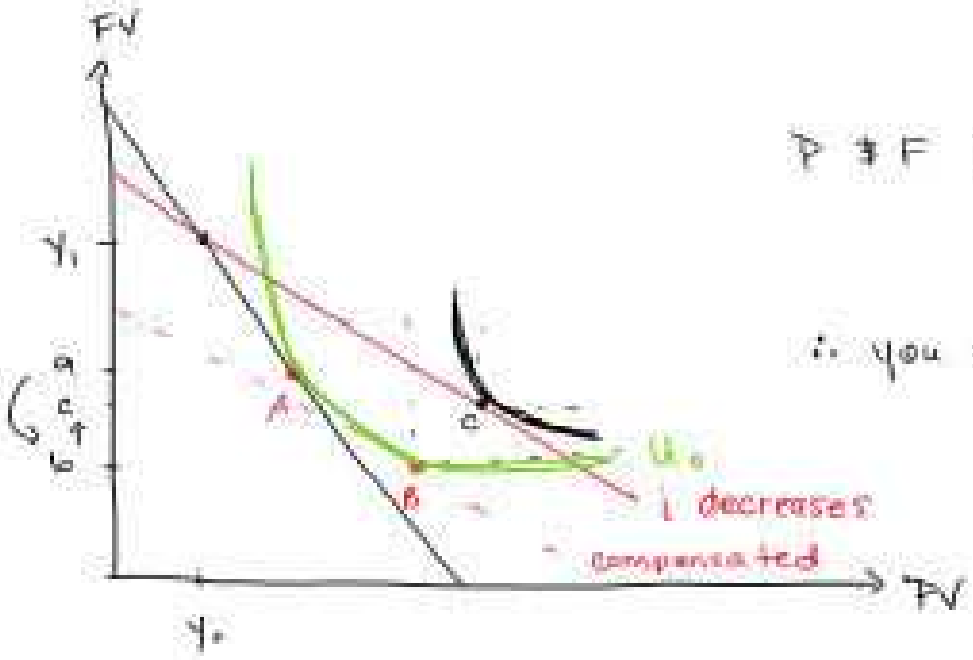
Change Interest Rates



P & F both normal

∴ you will borrow more

↓ decreases

- compensated

A → B → C

substitution effect

income effect

Compensating variation – "get me back to where I used to be"

"get me back to my old IC"

Equivalent variation

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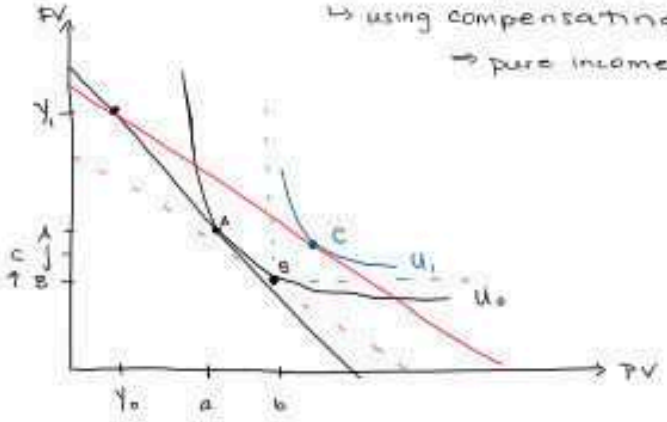
Lecture 5

Wednesday, January 17, 2018
8:22 AM

Interest Rates Fall — Person is a borrower
↳ using compensating variation --
→ pure income



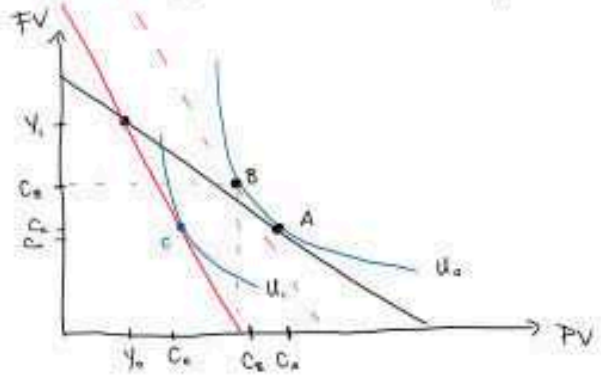
A → B : substitution effect
C is at a right angle from B ie - 45° line through BC
Normal good : consume more in present & future
↳ ie consumption is normal
↳ when income ↑ you buy more in present & future

WHY will you borrow more?
→ It's cheaper to borrow

Substitution & income effect are moving against each other in the future ∴ future consumption is uncertain!

∴ Happiness increased (utility)
Present consumption increased
Future consumption is uncertain

Interest rates increase → Person is a borrower



A → B substitution effect
income effect

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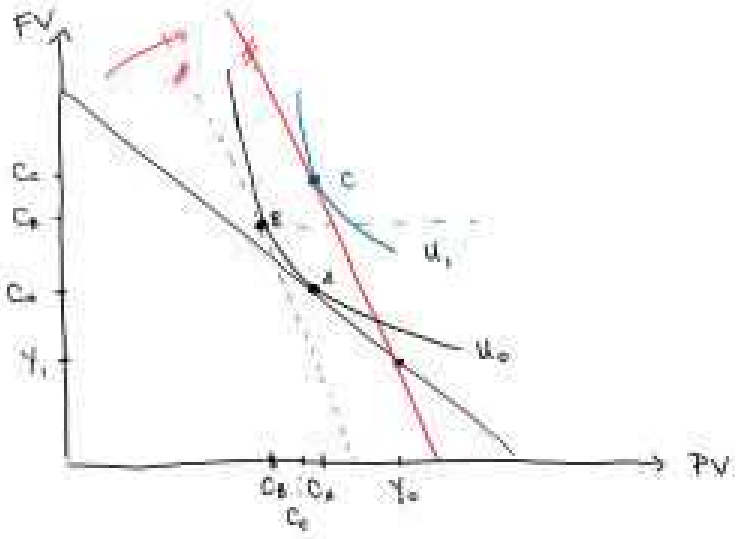
∴ Present consumption decreases
Future consumption is unknown
Utility goes down

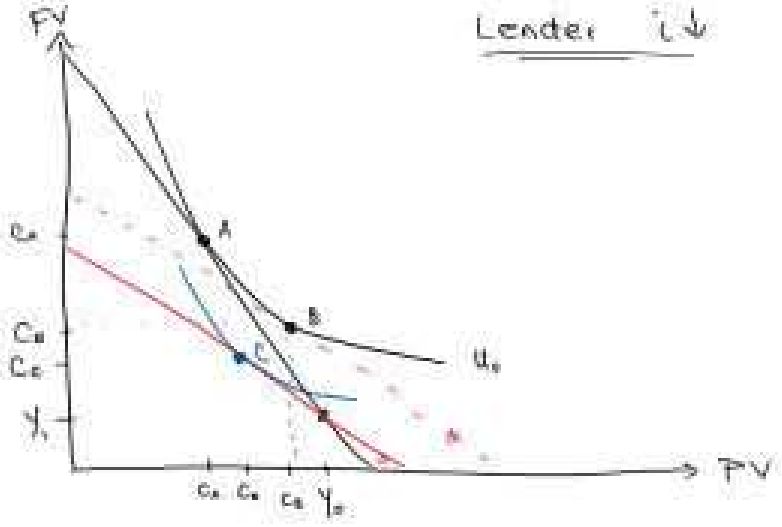
Lender, $i \uparrow$



A → B Substitution effect
B → C Income effect

∴ Happiness increases (utility)
Present Consumption unknown
Future Consumption increases

Lender $i \downarrow$



substitution

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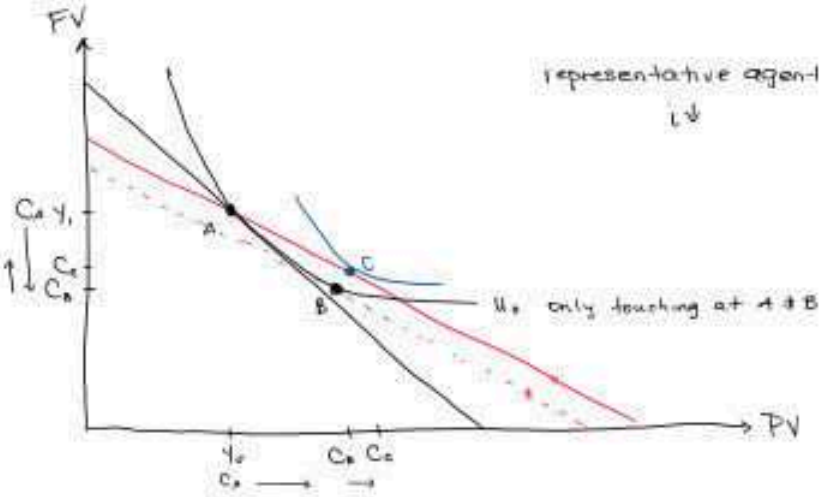
B→C income

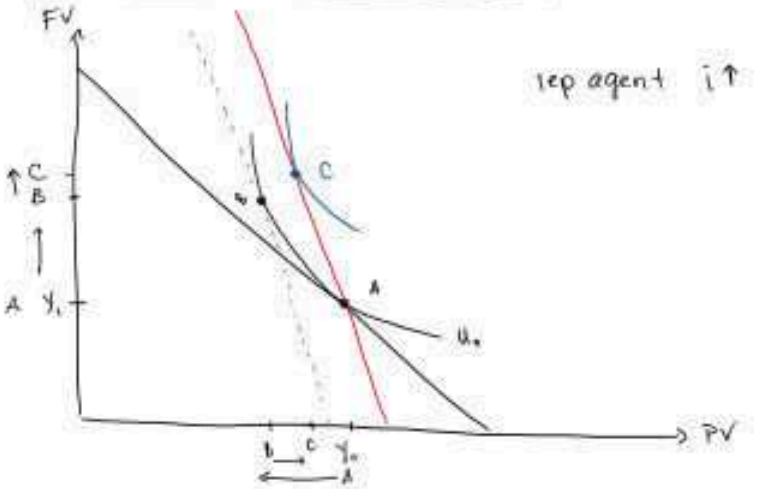
∴ Happiness goes down (utility)
Present consumption unknown
Future consumption decreases



Guess: since i ↓ you will start borrowing

AB → substitution effect BC → income effect

∴ Happiness ↑
Present consumption ↑
Future consumption ↓



Guess: i ↑ ⇒ probably going to become a lender

∴ Happiness ↑
Present consumption ↓
Future consumption ↑

FRIDAY ⇒ Quiz

Martin Castelan (case comp.)

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Lecture 6

Friday, January 19, 2018
8:23 AM

Skyline Presentation

Martin Castilan ?

founded by Martin & brother Jason
& other jason ashton ?

⇒ Bought a house after 1st year ≈ dad

Chicken catching friend, Dave

Bought a house on their own

Used commission to put down payments

⇒ at the time they liked interest rates under 10%

First time buyer ⇒ went different places to stay in 1st time buyer down payment

* The Bank Doesn't Care *

↳ you have to pay the bank whether or not you get paid

→ don't get cocky

→ teamwork is very important

Property Management / Realestate

"Piss bucket" award

→ real estate is very slow to start because you NEED equity

You need focus when building a business

- value over time

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"best thing that could have happened"
↳ when their "get rich quick" scheme failed

→ they had many "distractions" ie secondary business ventures

Office #2 had a washroom!!

Buying apartments
↳ more scaleable business

Real Estate Investment Trust Strategy
→ each $ invested buys a portion of all current & future properties

You are a Securities Dealer (2011)
↳ investigation by ontario securities commission
↳ 11 months
↳ zero shades of grey: investments from blood relatives & employees ONLY
↳ Lead to some restructuring

- New investments
→ solar power — solar farms

3 Reits: - Apartment
- Retail
- Commercial → predominantly industrial

IFRS: International Financial Reporting Standards

CASE IS RETAIL *

Debt ÷ Value Ratio

Commercial/Retail — Big Box
long lease
examples: LCBO Shoppers Dollarama

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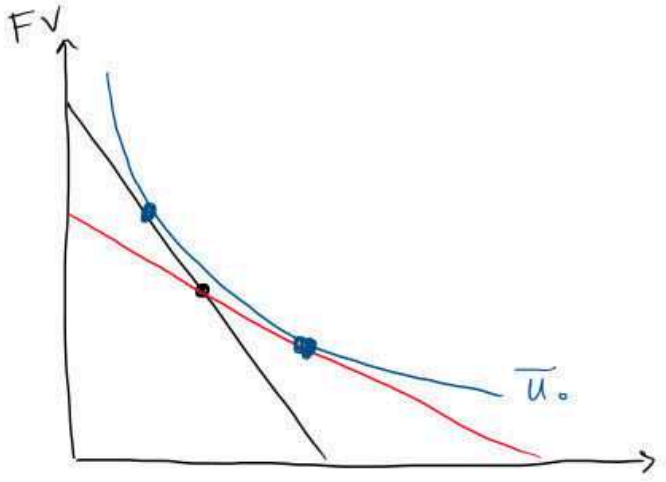
Lecture 7

Monday, January 22, 2018
8:24 AM

Quiz # 3 : What is the topic of the essay for Midterm 1

Essay for midterm 1

- US & Canadian banking system
- compare & contrast
- Make sure you outline in intro
- 5 paragraphs
  1. intro — be specific & introduce points & thesis
  2, 3, 4. 3 points
  5. conclusions.
- 10 points — 2 point thesis
  6 point proof of thesis
  2 point for spelling / grammar / layout



Is it possible to change interest rates but keep utility constant

→ start as a lender, become a borrower.

Start with rep. agent & give them more income. How do we keep them @ endowment point?

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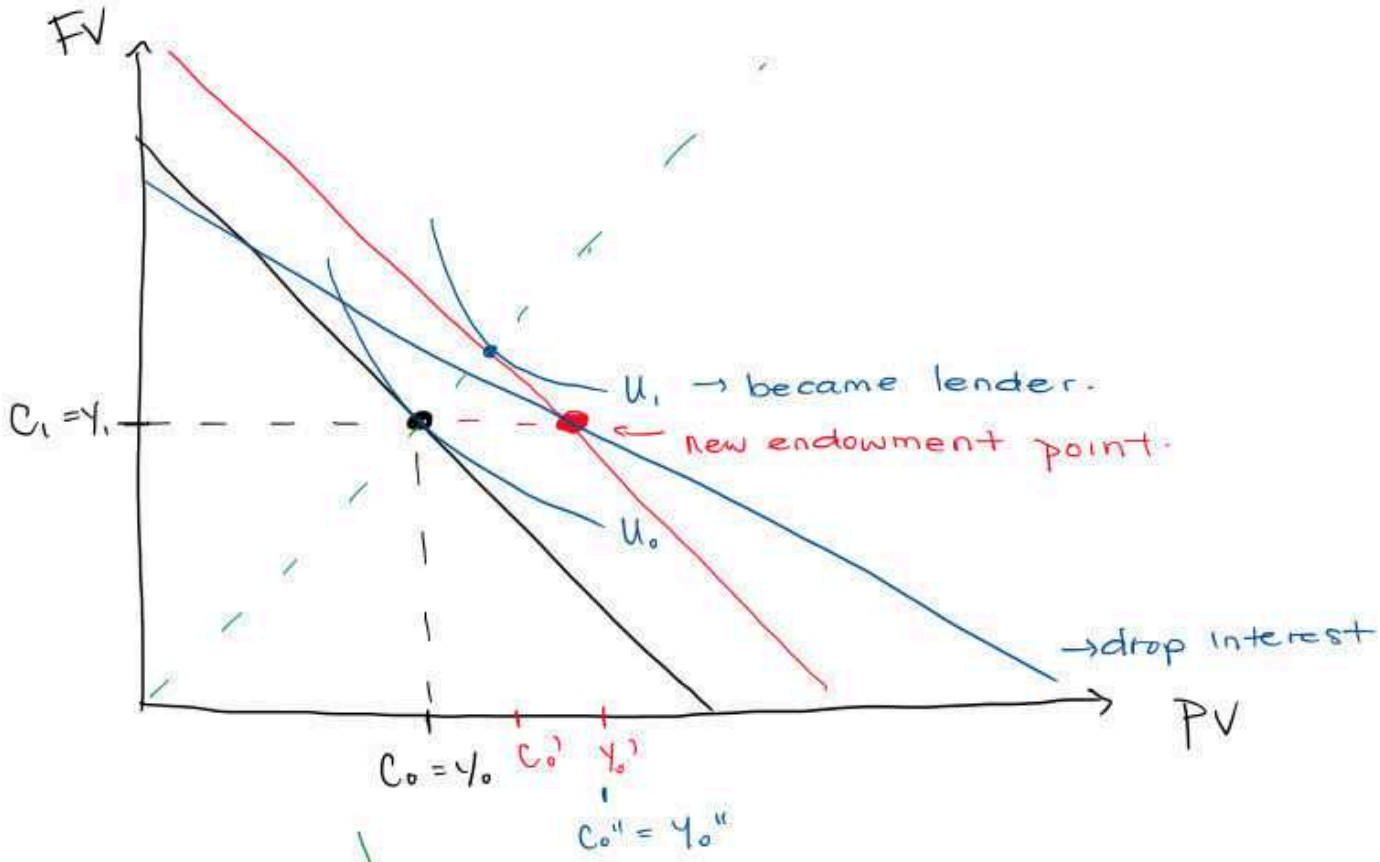

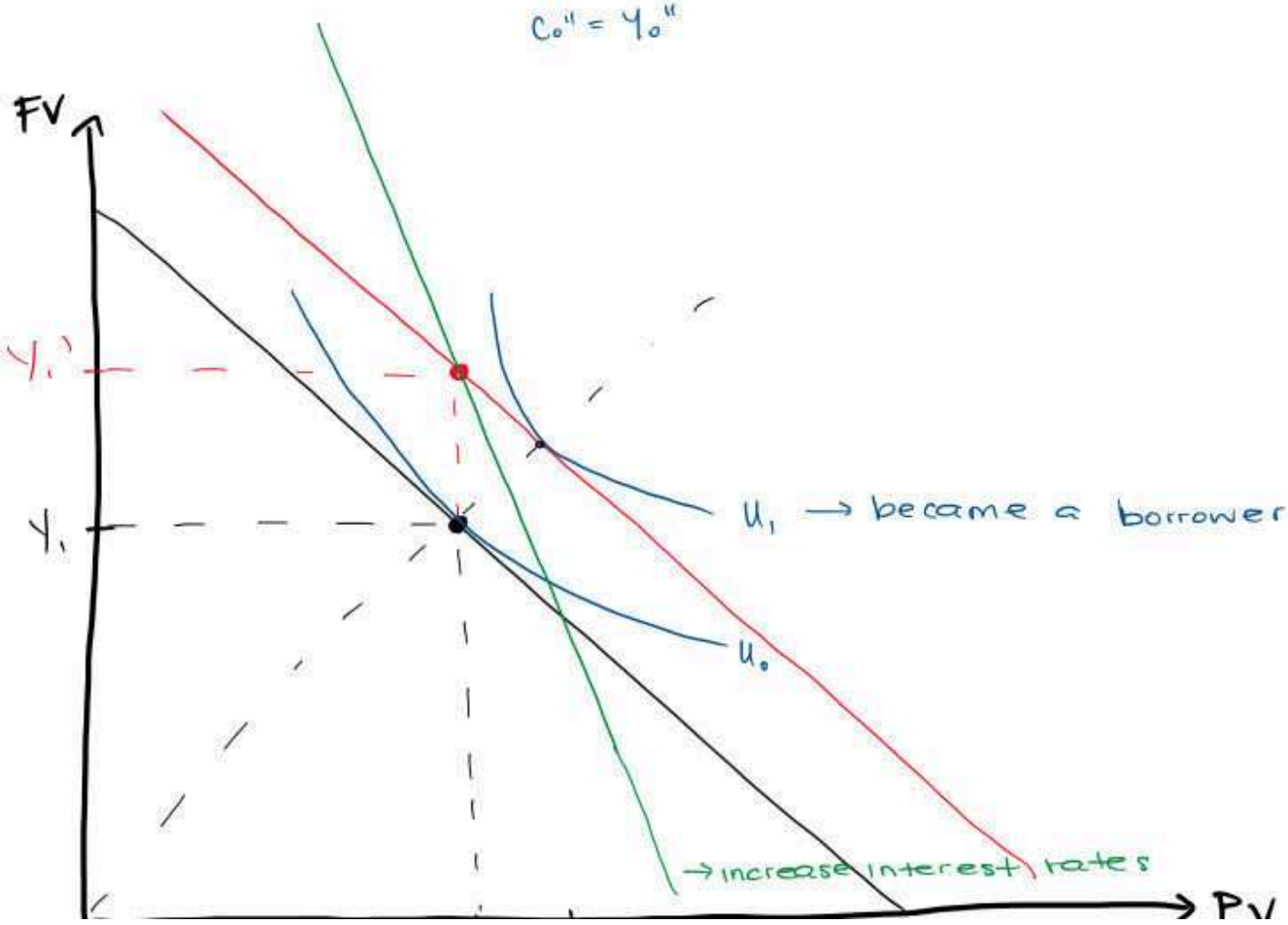

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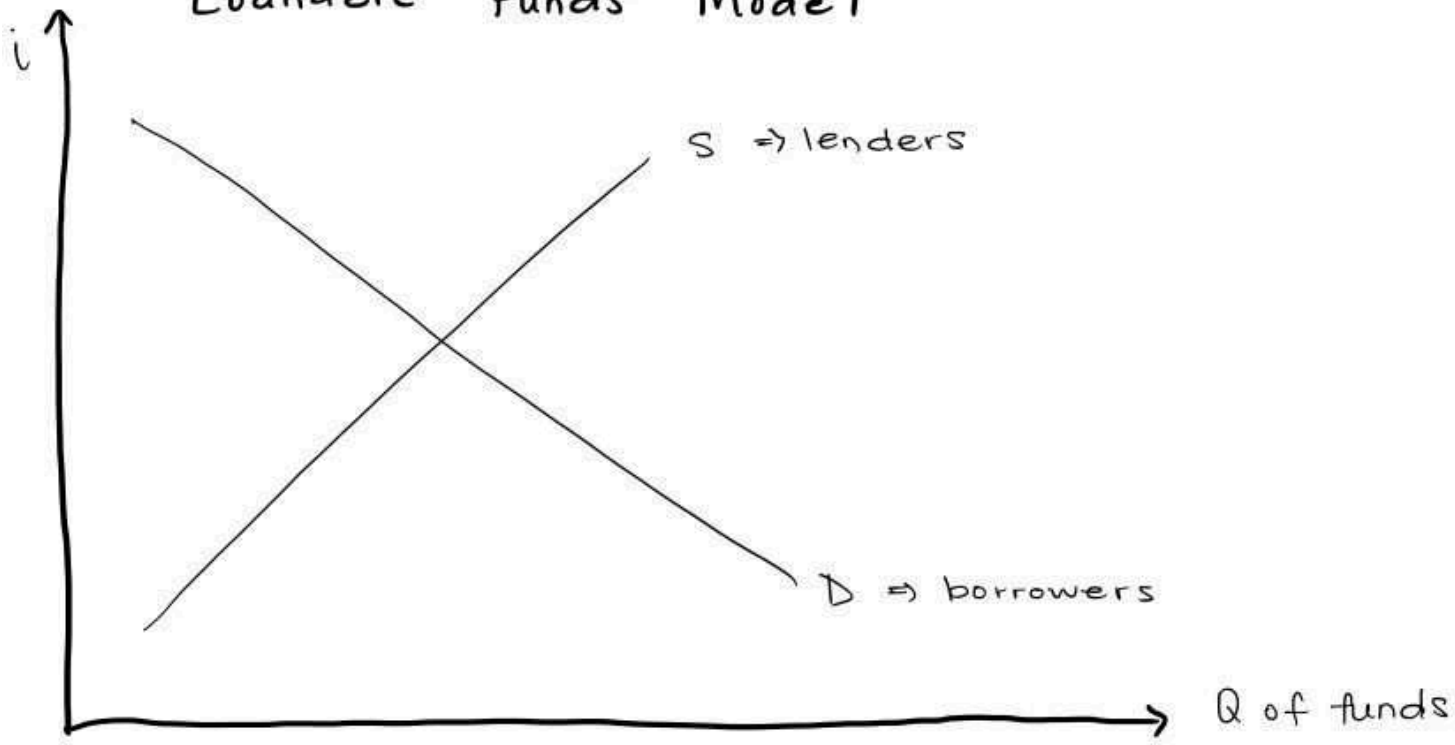
expansion → expect i to go up

recession → expect i to go down

Loanable Funds Model



Deriving the demand curve

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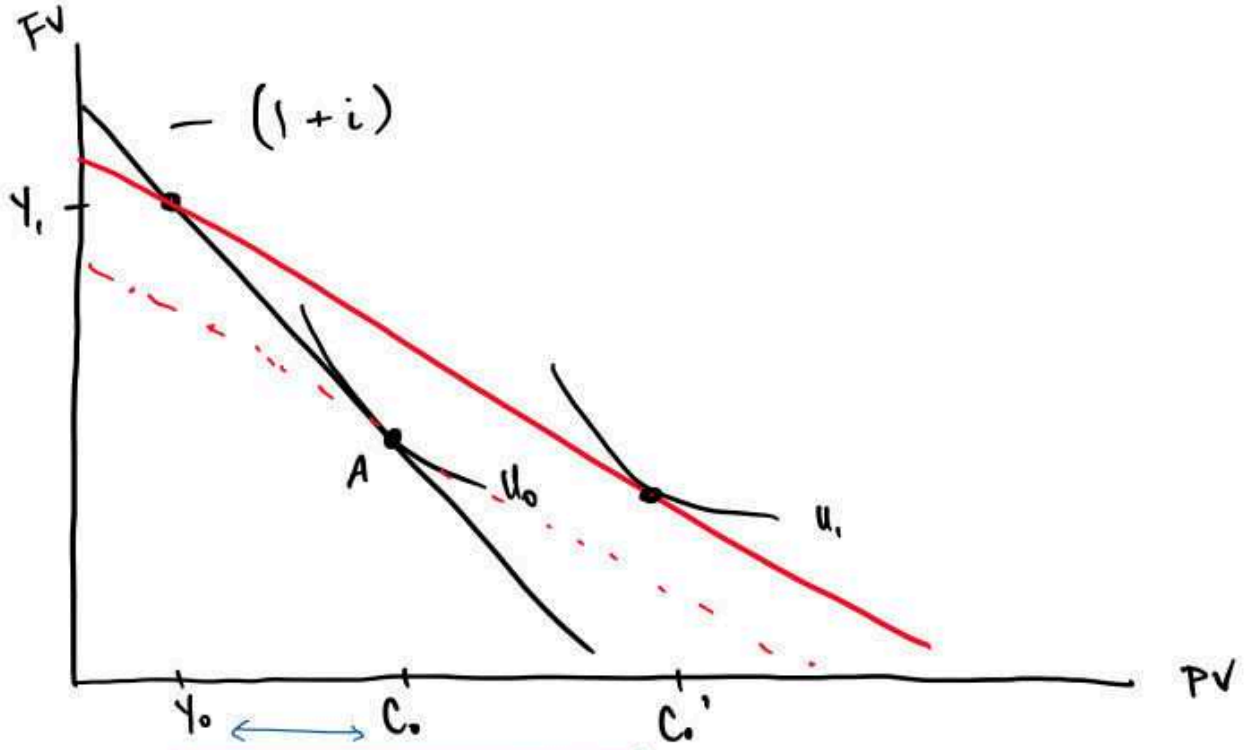

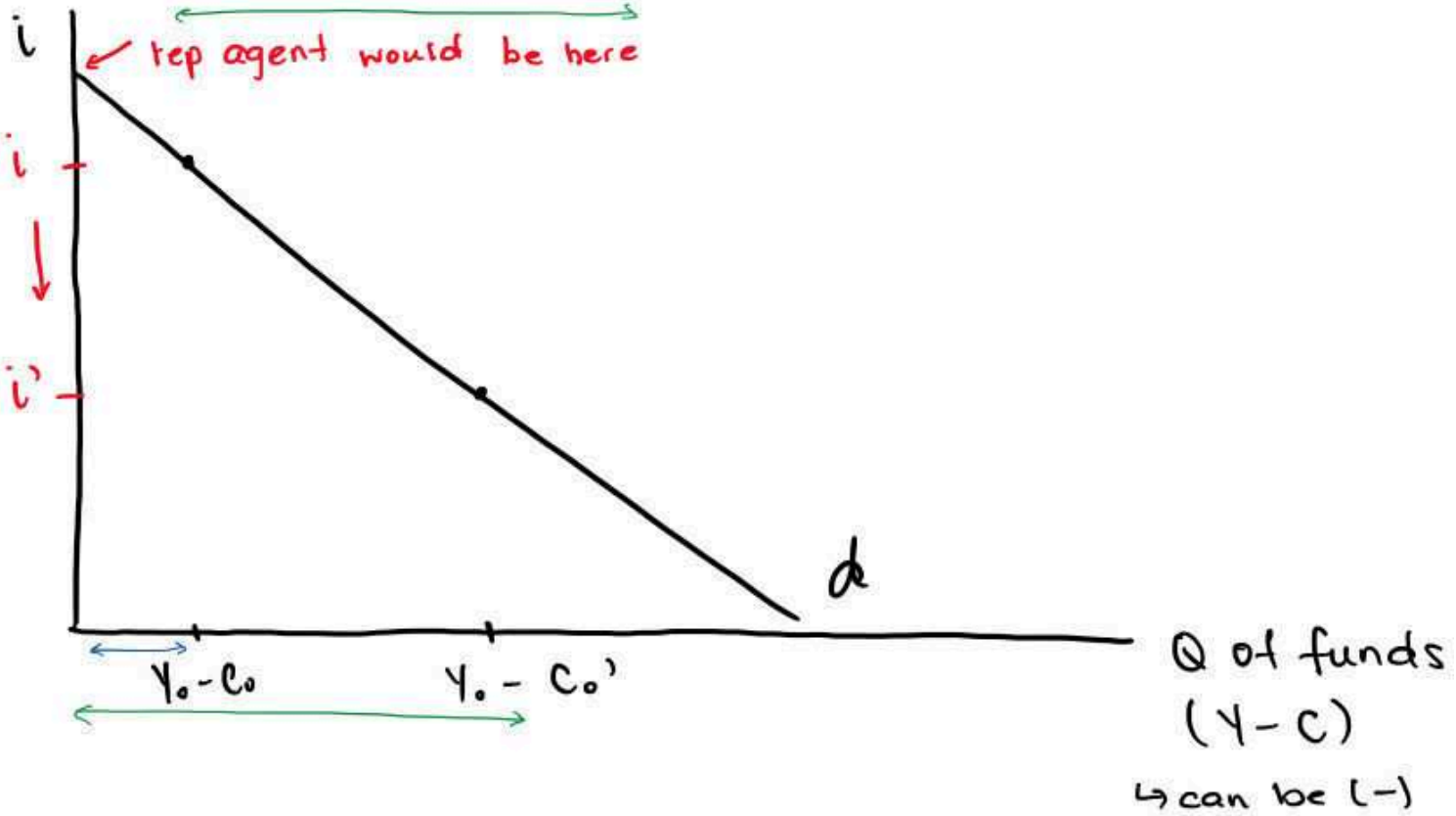

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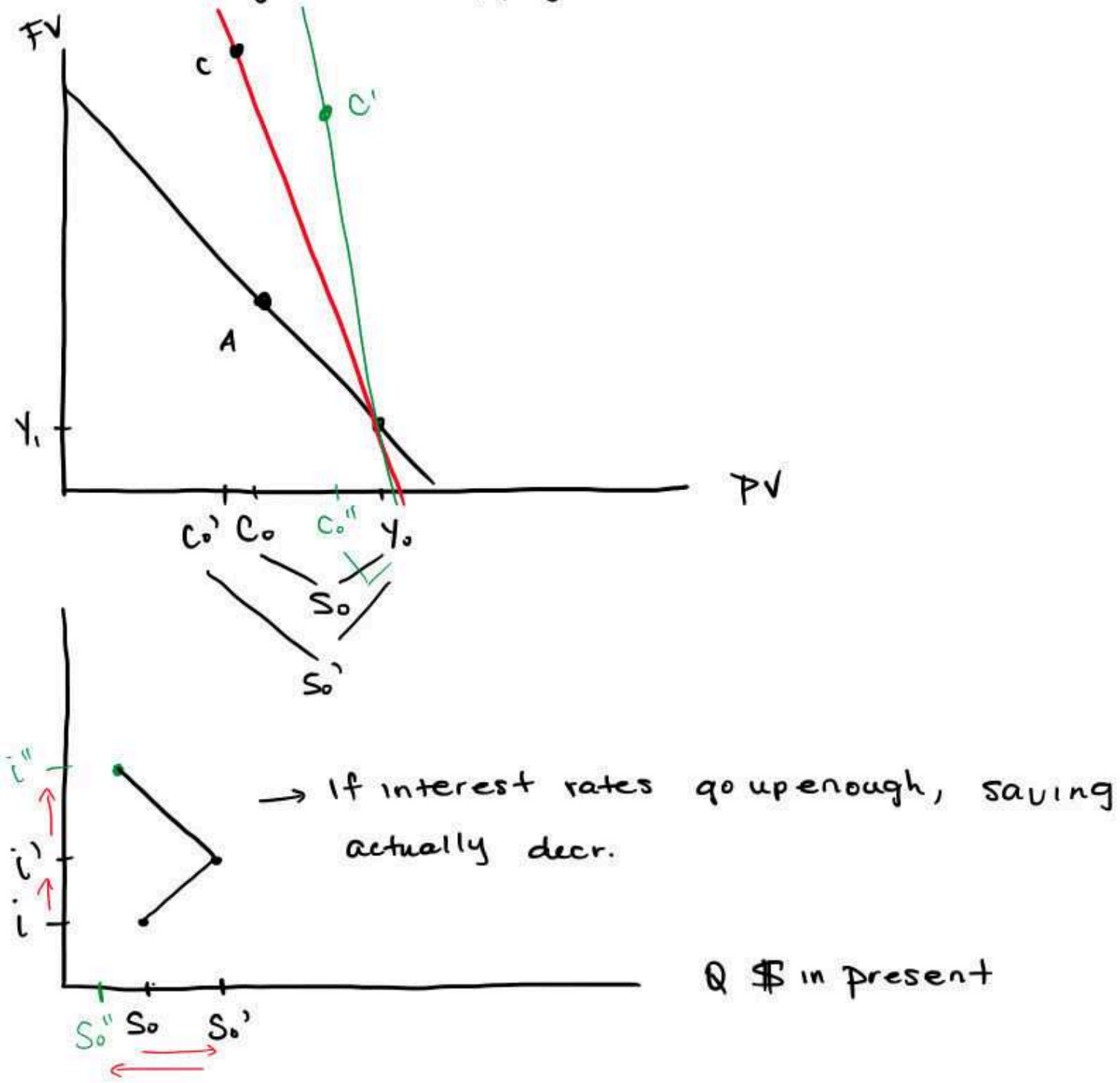
Deriving the Supply Curve



→ If interest rates go up enough, saving actually decr.

Q $ in present

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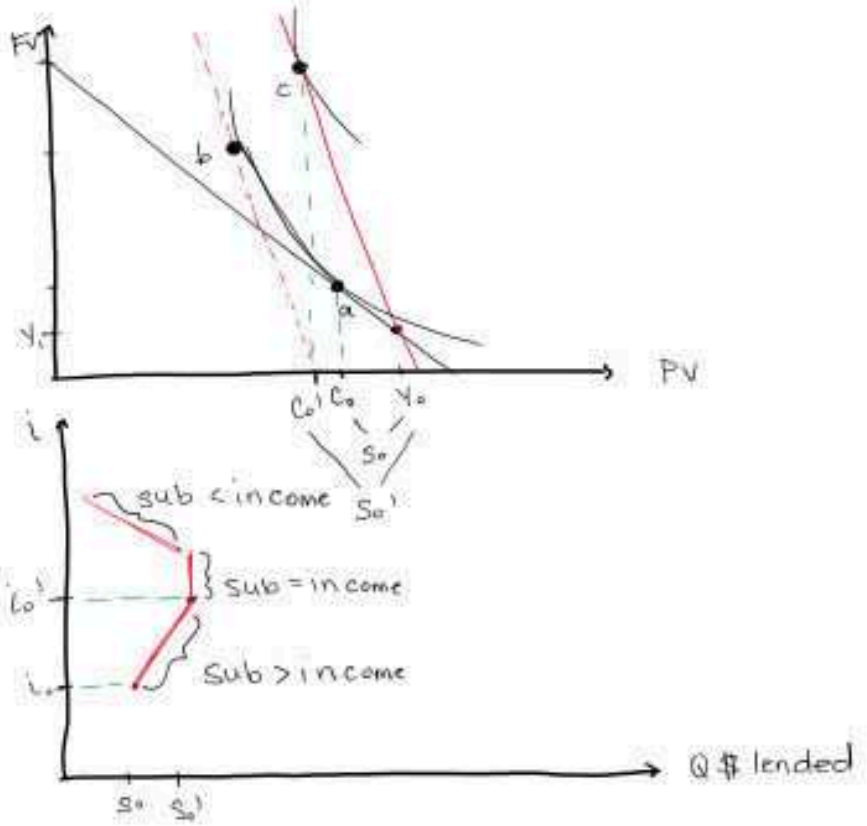
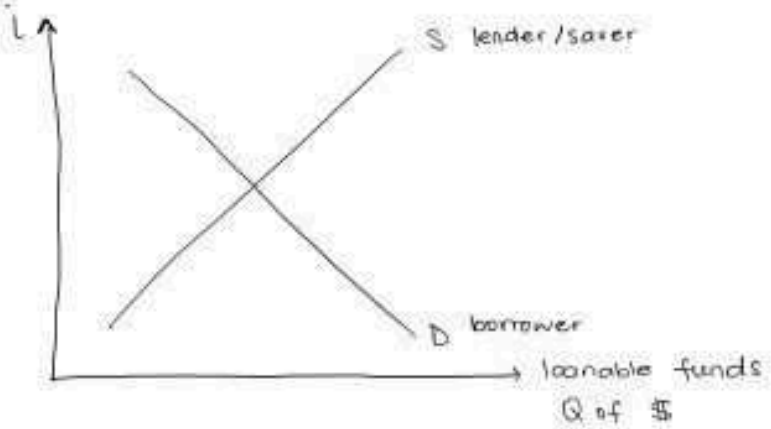
Lecture 8

Wednesday, January 24, 2018
8:25 AM

Case competition: Saturday @ 2pm ROZH103
→ for quiz, bring calculator & look @ case



We now know for entire economy



* In our economy we will assume that we never reach the part of the supply curve that bends backwards

For Bonds

- Holds the bond is the lender
- Issues the bond is the borrower

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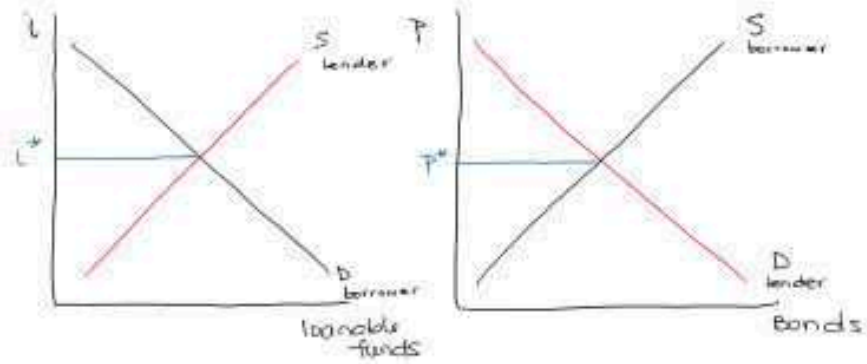


Coupon Bonds → sell around $1000

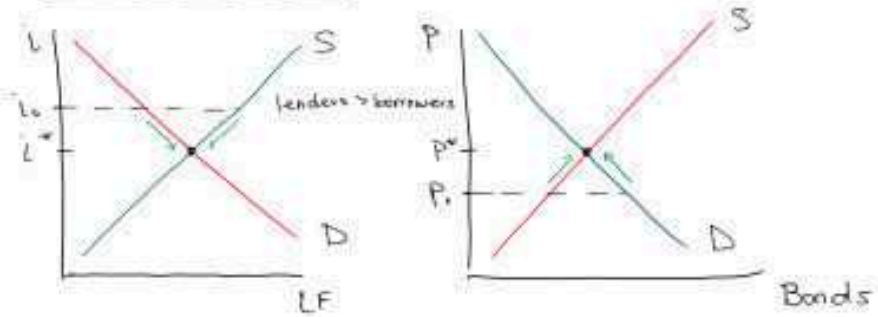
$$P = \frac{\text{Coupon}}{i}\left(1 - \frac{1}{(1+i)^t}\right) + \frac{\text{Face}}{(1+i)^t}$$

When $i \uparrow$ → price of bond goes down.

$$P^* = \frac{1}{i^*}\left(1 - \frac{1}{(1+i^*)^t}\right) + \frac{1000}{(1+i^*)^t}$$

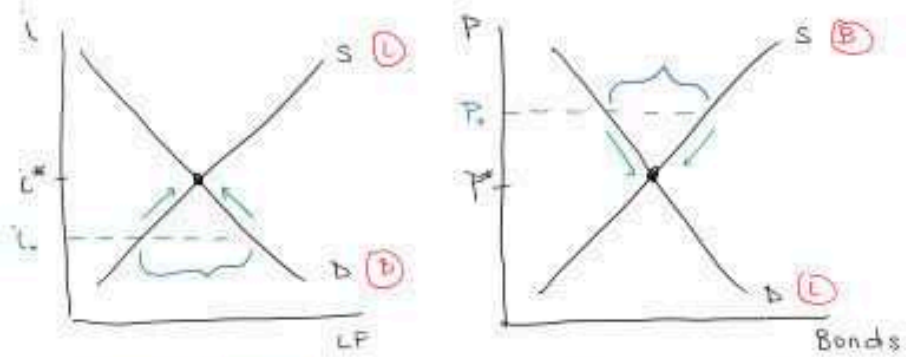
↳ market in eqm / clearing

Disequilibrium



M = borrowers M = lenders

offer to pay more, yields go down.



excess demand for loanable funds

excess supply of bonds

price, interest rates start to rise

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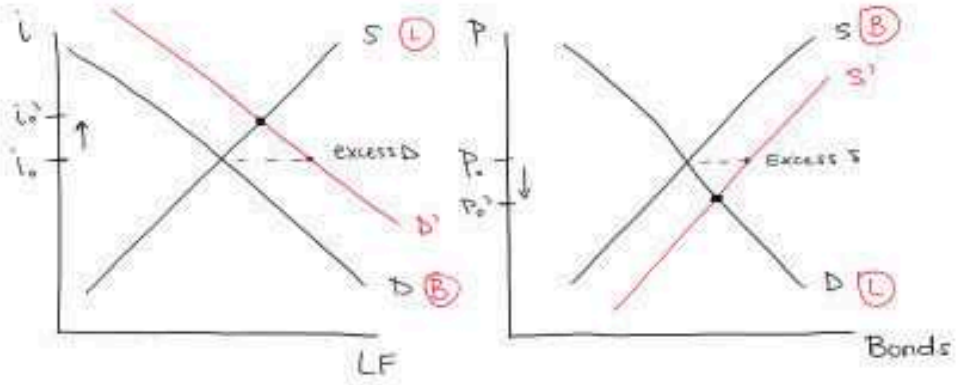
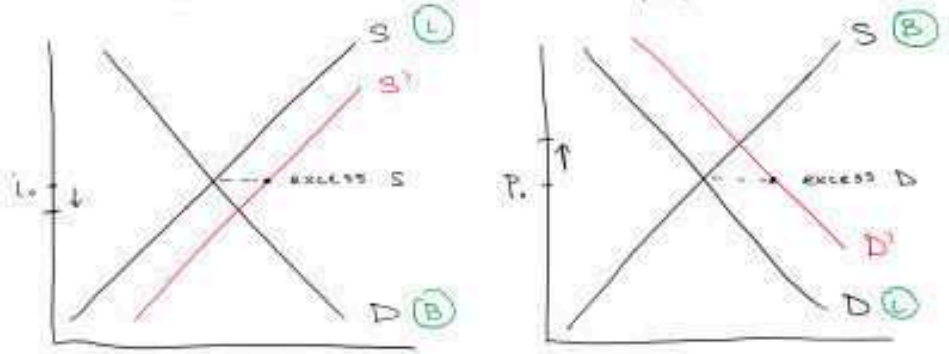
SHIFTS



Demand for LF → Supply of bonds
incr. incr.



Supply of LF → Demand of bonds
incr incr

⇒ inverse relationship between interest rates and prices of bonds

---

Increase in Lending (increase in demand for bonds)

1. Wealth ↑
2. expected returns ↓ — prices go up, i goes down
3. Relative riskyness ↓
4. Liquidity ↑
5. Inflation ↓

liquid bond is US treasury bills.

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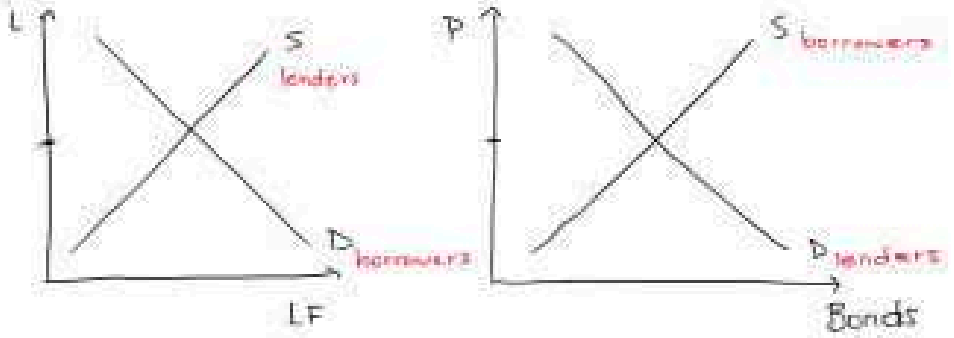
Lecture 9

Friday, January 26, 2018
8:24 AM



SHIFTERS – lenders
→ increase in supply in loanable funds
↳ leads to higher demand of bonds
↳ leads to higher bond prices and an increase in the yield.

T-Bills

$P = \frac{1000}{1+i}$

5 things that cause a shift in loanable funds

① liquidity increases prices of bonds
↳ very liquid stocks not liquid real estate

② Wealth

③ decrease risk

④ decrease real return (r)

⑤ decrease expected inflation (π^e)

Components of interest rate

$i = r + \pi^e + risk$

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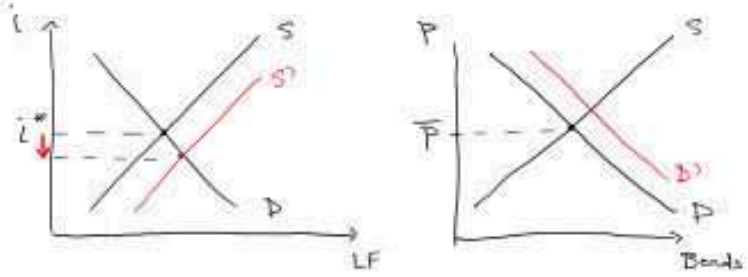
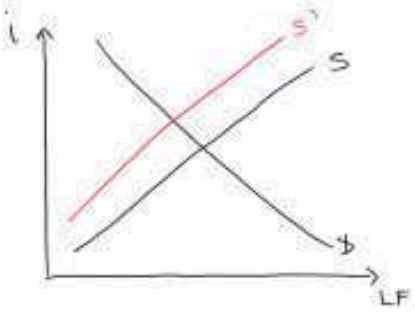
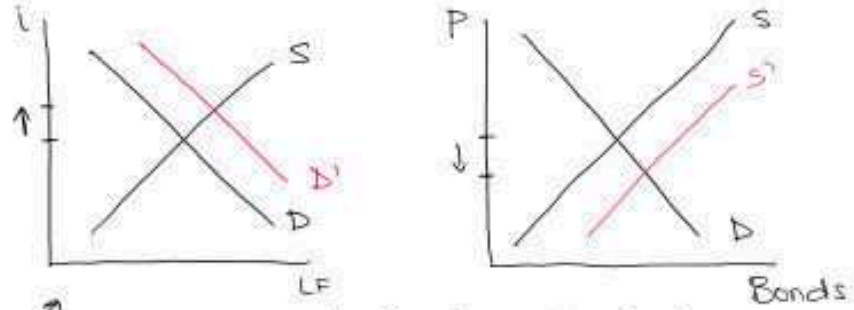
Expected inflation goes down



Expected inflation goes up



SHIFTERS — Borrowers



↑ Increase demand for loanable funds

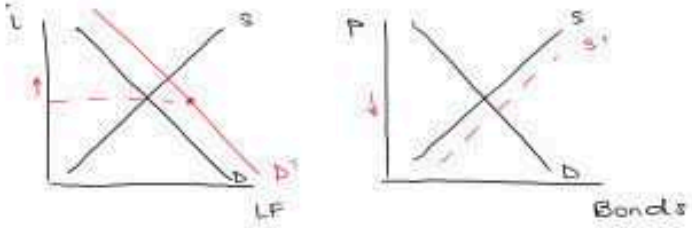
3 Shifters

① increase in profits — INCr demand for LF, incr supply of Bonds

② increase in government deficit — same as above
↳ government borrows by printing bonds

③ increase in inflation

$i = r + \pi^e$ if $\pi^e \uparrow$, $r \downarrow$



Guess: if inflation ↑ interest rates ↑

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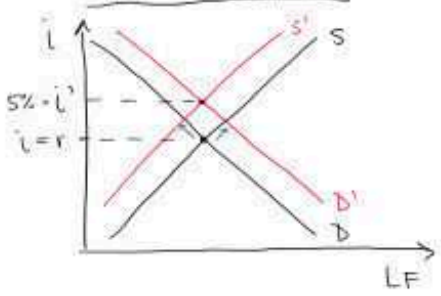
Fisher Effect



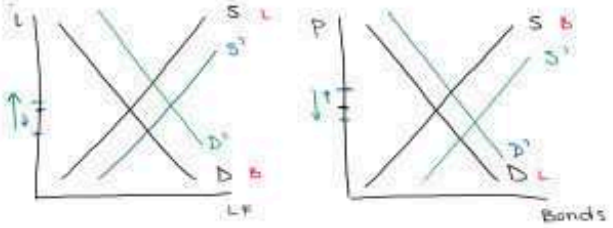
$\pi^e = 0$
$i - r = 3\%$

$\pi^e = 2\%$ → lenders want to lend less
→ borrowers want to borrow more

$i = r + \pi^e = 3\% + 2\% = 5\%$

Stylized Facts

As the economy grows, interest rates increase.

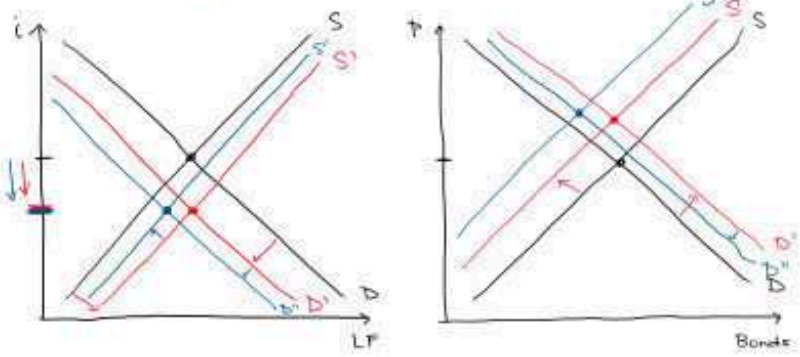


- increase in wealth
- profits are up

- overall, i rates are up and prices are down

EXAMPLE

Japan
- deflation
- recession



① $i = \uparrow r + \downarrow \pi^e$ deflation

② recession

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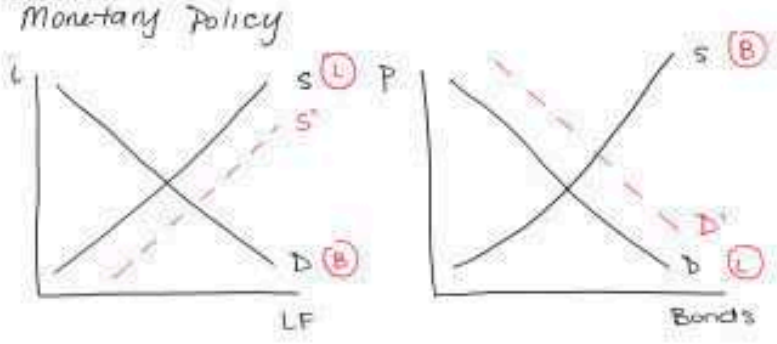
Lecture 10

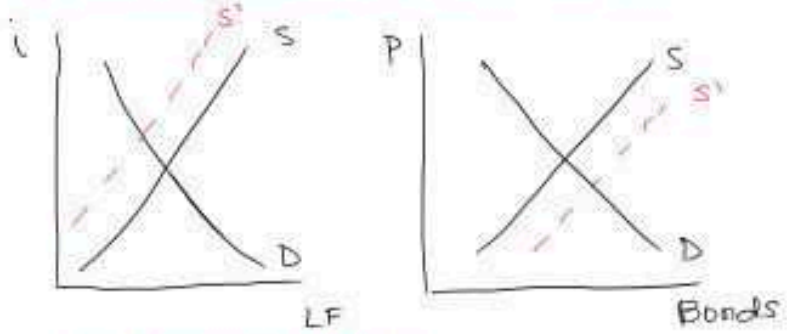
Monday, January 29, 2018
8:25 AM

Monetary Policy



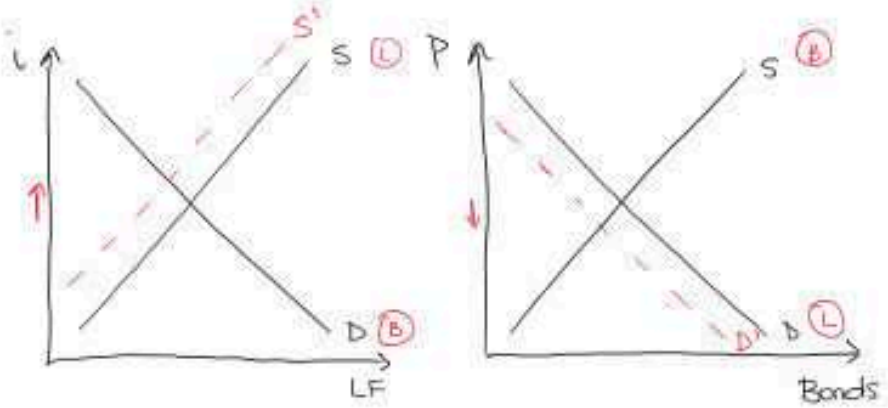
(1) Bank of Canada Buys Bonds
↳ ↑ Demand of Bonds
↑ Supply of LF
Overnight i ↓

(2) Bank of Canada Sells Bonds * Special Case *



↳ ↑ supply of Bonds
↓ Supply of LF
↑ overnight i

* The Bank of Canada does not become a borrower.



S = mpsave ↓

Keynesian Model of Liquidity Preferences

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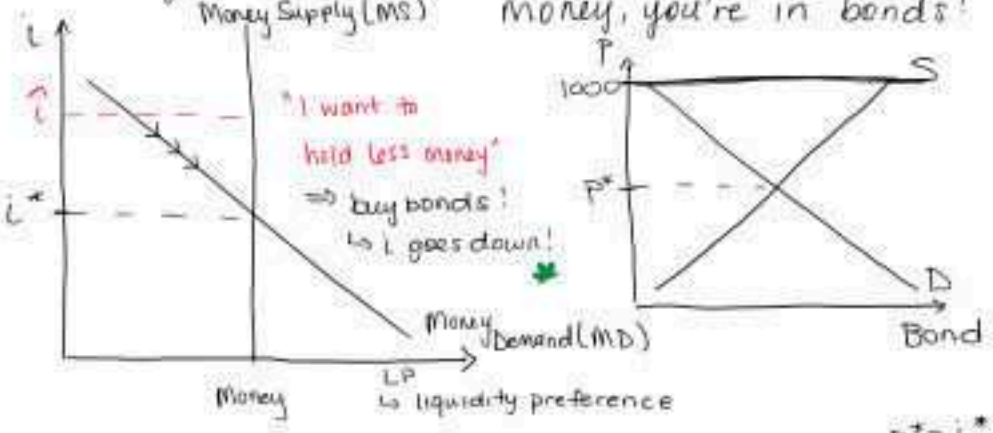
Money & Bonds → assume if you're not in money, you're in bonds!



P* ~ i*

OC of Bond = liquidity forgone

OC of Cash = interest forgone

* Quantity of money stays the same!

cost of 1 treasury bill = $1000

$$P = \frac{1000}{(1+i)}$$

Money

1. Allows you to buy & sell
   ↳ it is a medium of exchange
2. Allows you to keep books/account
3. Store of value
   ↳ medium of exchange over time

Inflation – makes money worthless

Where is your money? ⇒ THE BANK

Credit Card → Short term debt
↳ NOT money

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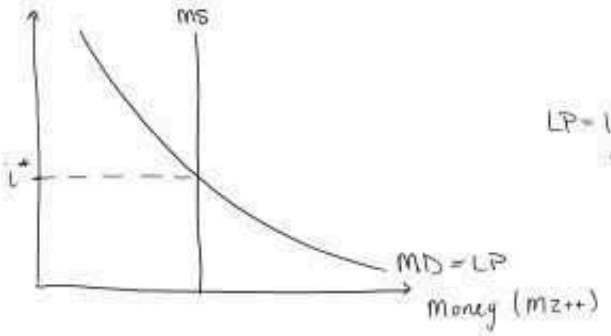
Lecture 11

Wednesday, January 31, 2018
8:25 AM

Keynesian Model of Liquidity

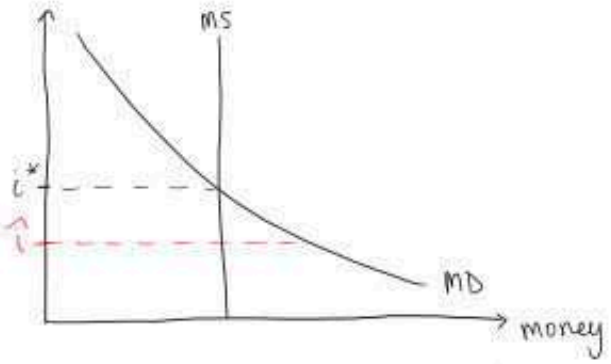


LP = liquidity preference

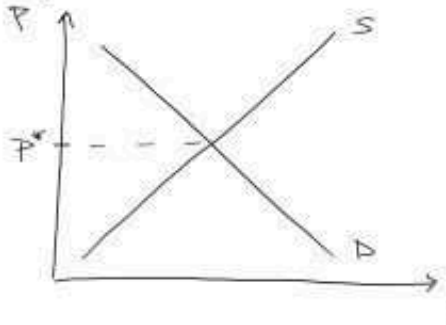
Banks are a huge player in the money supply

Hold money OR bonds

What if interest rates are low ?



→ you will sell bonds to hold cash



NOTE: $P^* = i^*$

WHAT CHANGES MONEY DEMAND / SUPPLY

Why hold money ?

① Income effect Y = income
Y↑ - more transactions

Y↑ - precautionary

Y↑ - more wealth ; store of value in a portfolio

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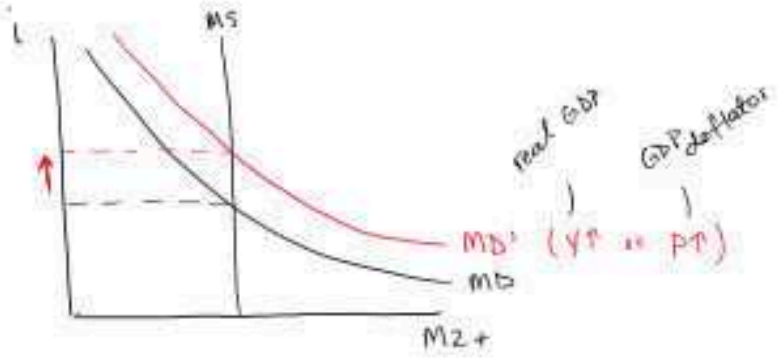
$MD = f(Y)$ – positive relationship

② Price Level Effect P- prices

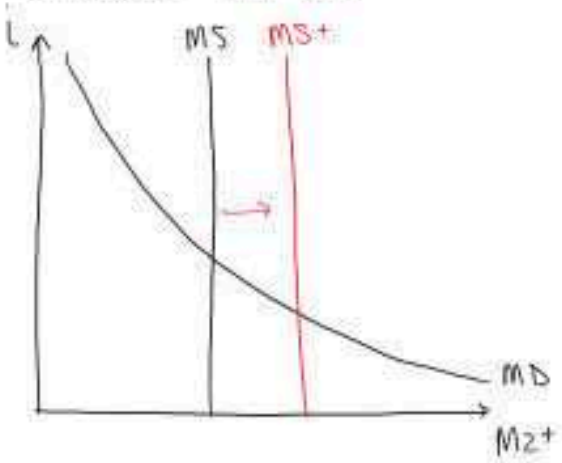
P↑ – real money balances are down

$MD = f(P)$ – positive relationship



real GDP × GDP deflator = nominal GDP

CHANGE IN MS



↯The Bank of Canada buys bonds

↳ money supply increases

Question: Does monetary policy work?

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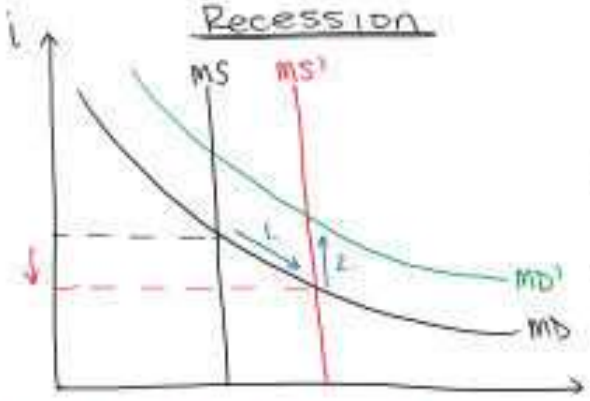
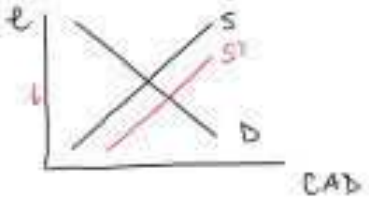


• MS↑ • i↓ • Consumer Borrowing ↑ [C(i)] (real)

• Business Investment ↑ [I(i)] (real) • NX(e)↑ real net exports

L↓ → international savers
capital outflow

$\uparrow Y = \uparrow C + \uparrow I + \uparrow G + \uparrow NX$



1. liquidity effect

2. income price effect

Textbook — gives you this picture
pg 114

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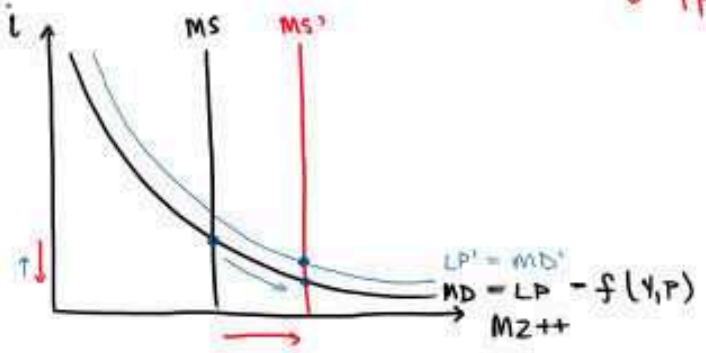
Lecture 12

Friday, February 2, 2018
8:24 AM

Liquidity premium > price level

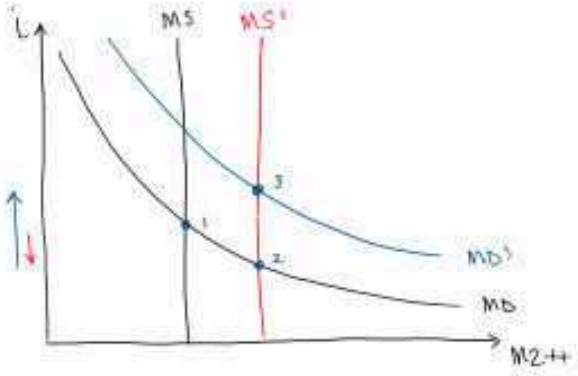
$MS\uparrow \rightarrow i\downarrow \rightarrow I\uparrow\ C\uparrow\ NX\uparrow(e\downarrow)$ } $\uparrow Y$ $\uparrow P$



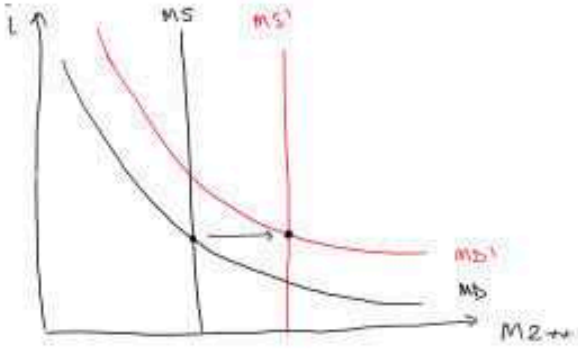
π^e → expected prices

You do not have inflation unless you have continuous increases in money supply and money demand.

Expected inflation is felt immediately



It is possible to increase interest rates with monetary policy.



MS & MD happens simultaneously

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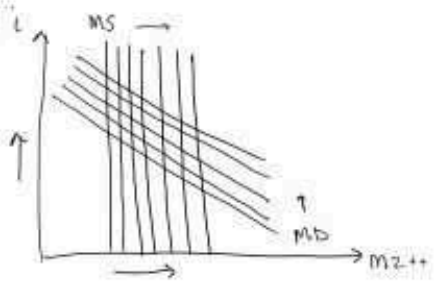

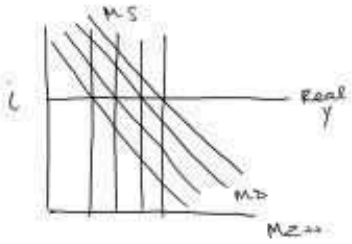

Real World
→ both stories right at a certain point in time

→ when interest rates are higher, i and M2 move more together (80's)

→ when interest rates are lower, i and M2 move opposite to one another (now)

Chapter 2

The money market = short-term debt
T-bills - the gov. issues ST debt
commercial paper - when companies do this

Most important category of debt - Mortgages & loans
↳ Banks play the largest role in Mortgages & loans

Table 2-3 Primary Assets & Liabilities of Financial Intermediaries

Value: Table 2-4

Regulation: Table 2-5
→ OSFI * Test question *
↳ concerned with systemic risk
→ securities commission
↳ provincial

You don't want to have to think about banking
↳ dissolving lines of credit
↳ your money not being there.

MIDTERM 1 : Chapters 2-6 + Additional In-Class Stuff

Chapter 6

looking at figure 6-1
→ looking at bond yields from 2 dimensions

tual # a bond makes

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Spread - # compaired to some benchmark

- corporate bonds have highest yields
  - default risk → Gov. canada will NEVER default
  -

Dimension 1: default risk

Dimension 2: liquidity risk
↳ looking at time.

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Lecture 13

Monday, February 5, 2018
8:33 AM

Long term usually has higher yield

Crazy times:
- 2008
- 80's

Current yields
→ increasing
→ flattening past the 8 year mark

Central Bank rate - 1.25%
10yr is 2.?%

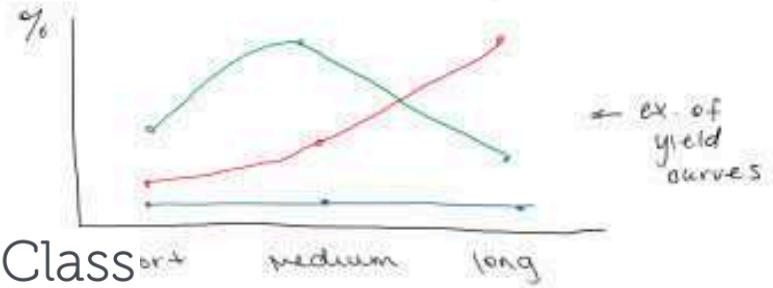
Midterm
1. Compare/Contrast canadian/US banking system
   → ultra specific thesis
   → 3 points + proof
   → intro/conclusion
2. interpreting curves
3. NPV
4. Draw yield curves given bonds rates + times

MOST LIQUID BOND IN WORLD
→ US T-bill

US municipal bond is tax exempt
↳ not exempt in canada

Real return bonds ⇒ CFA QUESTION
- principle gets adjusted for inflation
- less liquid

Yield Curves
→ Term Structure of Interest Rates



← ex. of yield curves

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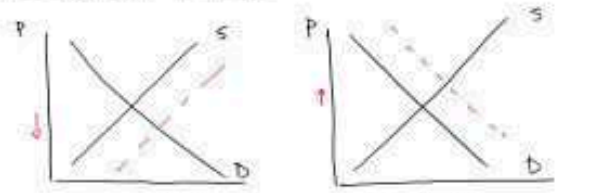
Default Risk



corporate bond market | default free Canada bond market

- looming crisis
  - ↳ sell off corporate bonds
  - ↳ buy t-bills

yield ↑ yield ↓

spread ↑

⇒ what causes yield curve shifts?

STYLIZED FACTS
1) yield curves are generally upward sloping
2) yield curves shift over time
3) slope of the yield curve tends to predict future economic activity

4 Theories to explain the term structure of interest rates
1. expectations hypothesis
2. liquidity premium theory
3. market segmentation
4. preferred habitat

The Expectations Hypothesis
⇒ bonds are perfect substitutes for eachother

1yr bond + 1yr bond (future) = 2 yr bond

$1.00 today ⟶ $1.10 (in 1 yr) ⟶ $1.21 (2yrs) 2yr

$1 ⟶ $1.15 ⟶ $? = 1yr w renewal

$(1.15)(1+i) = 1.21$

$1+i = \frac{1.21}{1.15} = 1.05$

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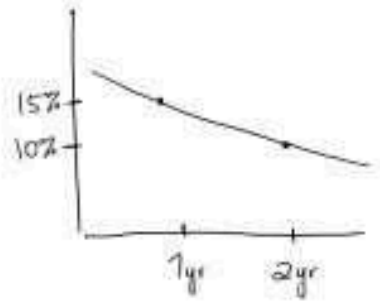
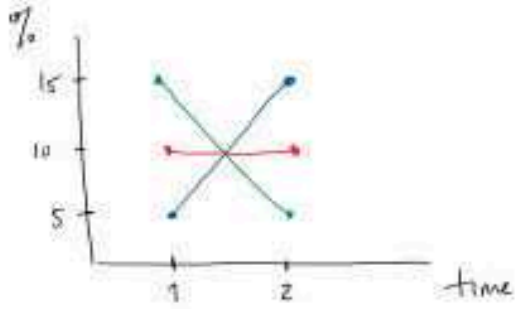


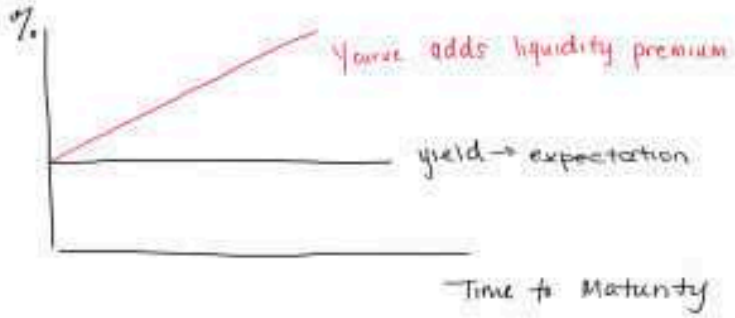
expect next years' to be lower (5% in this example)

	R_1	+ E_1	=	R_2
	5%	15%		10% × 2
	10%	10%		10% × 2
	15%	5%		10% × 2



According to today's yield curve
→ we expect short run incr. in interest rate
→ not in long run

Liquidity Premium Theory



·ket Segmentation

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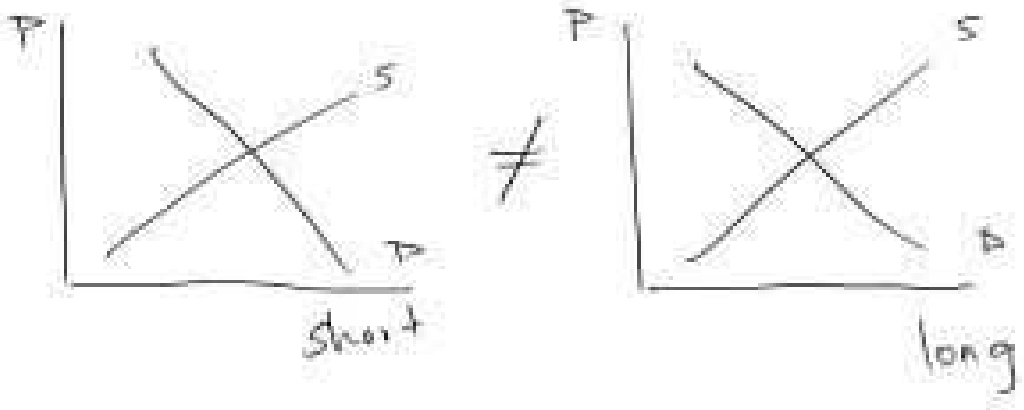
Short term bonds & long term bonds are NOT substitutes!



→ two separate markets

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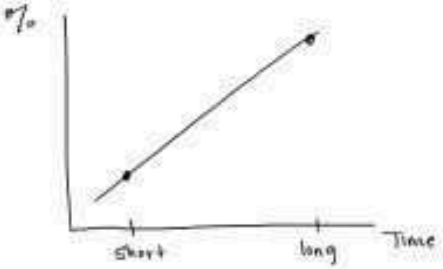
Lecture 14

Wednesday, February 7, 2018
8:31 AM



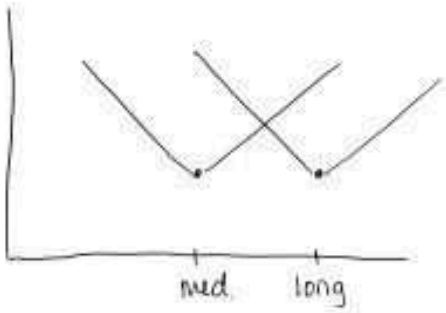
① Expectations Hypothesis - perfect substitution

② Liquidity Premium

③ Market Segmentation - seperate markets

④ Preferred Habitat

Preferred Habitat



- some substitutability
- premium required for a switch from "preferred habitat"

ESSAY
- opening paragraph should be precise & clear
- do not choose a broad topic !!!
- should only take 10-12 minutes during exam!!

Content in Textbook
- ch 2&3 KNOW vocabulary
- features of bonds *
- ch 4 NPV
- Loanable Funds
- Keynesian Curves

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Not in Textbook
- Indifference curves
- interest rates

NPV

T-bill – NPV is its price = Lump Sum
- cash flow of t-bill
  - no coupons

$P = \frac{1000}{(1+i)^1}$ ← face, ← $t = 1$ year

Given: i + t → find P
or P → find yield

Coupon Bond

$P = NPV = \frac{\text{coupon}}{i}\left(1 - \frac{1}{(1+i)^t}\right) + \frac{1000}{(1+i)^t}$

Shortcut if given P + coupon to find i

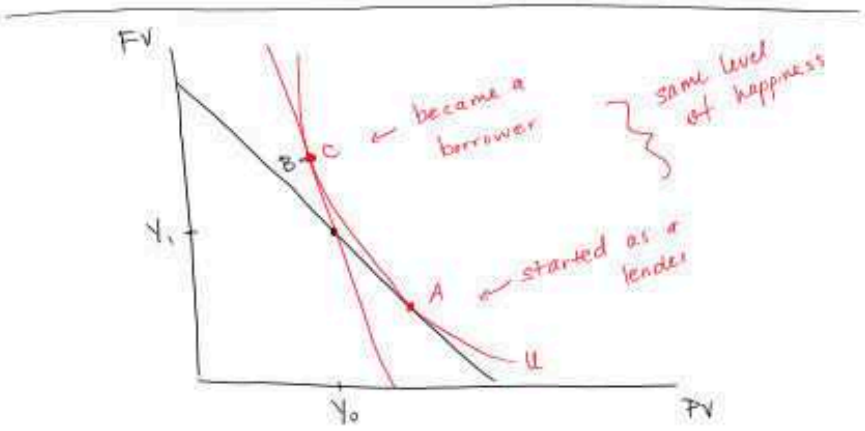
Strip Bond
→ broken up coupon bond

Perpetuity

$P = \frac{\text{coupon}}{i}$

⇒ Which will react more to i change?

⇒



How do you make a borrower a lender?
raise i

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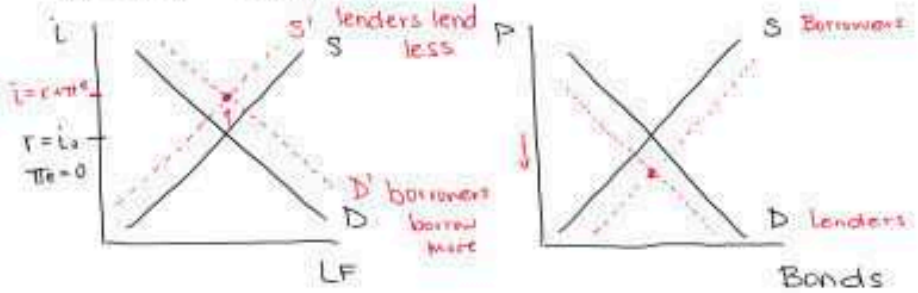
If utility stays the same, there is no income effect

Substitution effect ⇒ same utility

Income effect is compensation for lower utility

Fischer Effect



expected inflation $\overline{i} = r + \pi^e$

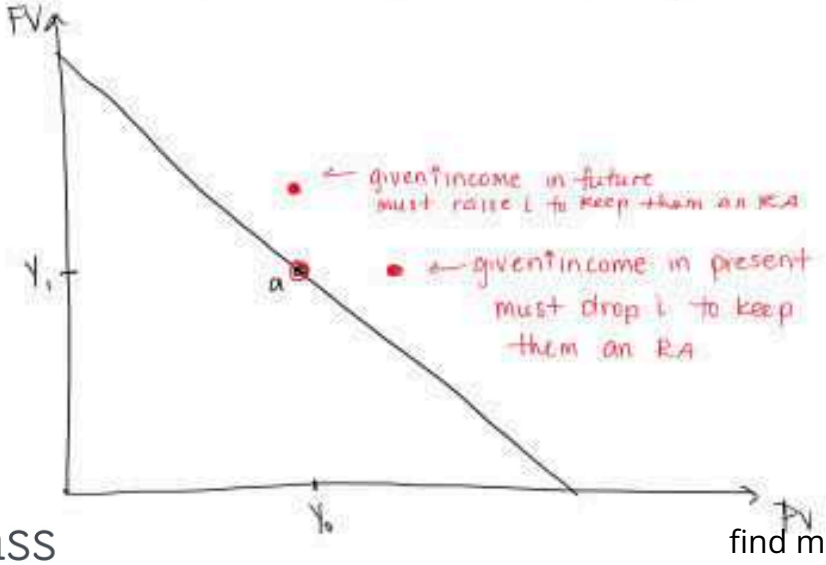
result → $i = \overline{r} + \pi^e$

Shown using t-bills

$P = \frac{1000}{1+r}$ $\downarrow P = \frac{1000}{1+i}$

⇒ Bond prices go down

Representative Agent Stays a Rep. Agent



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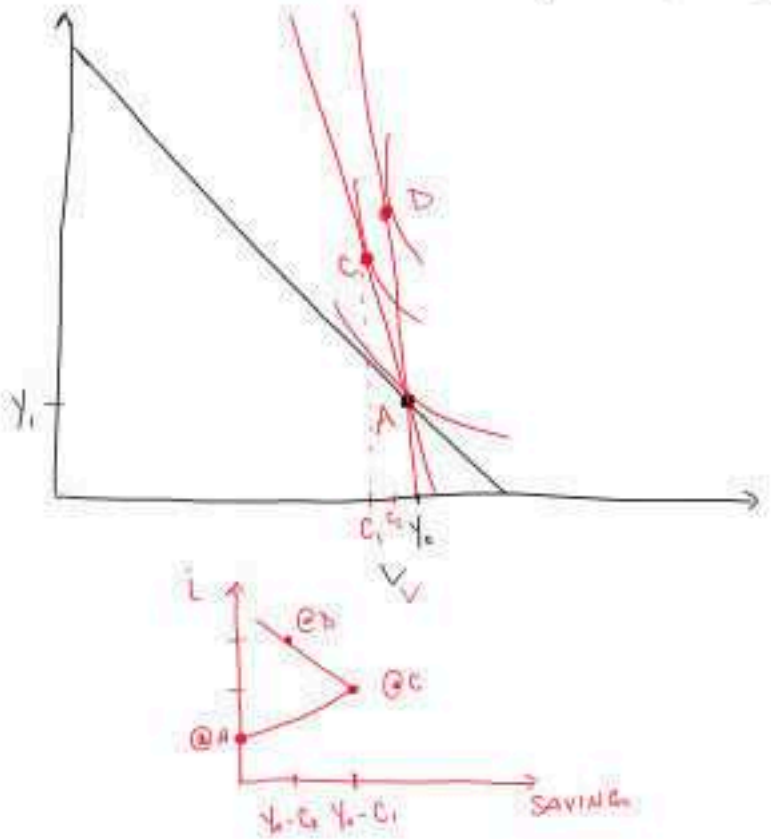
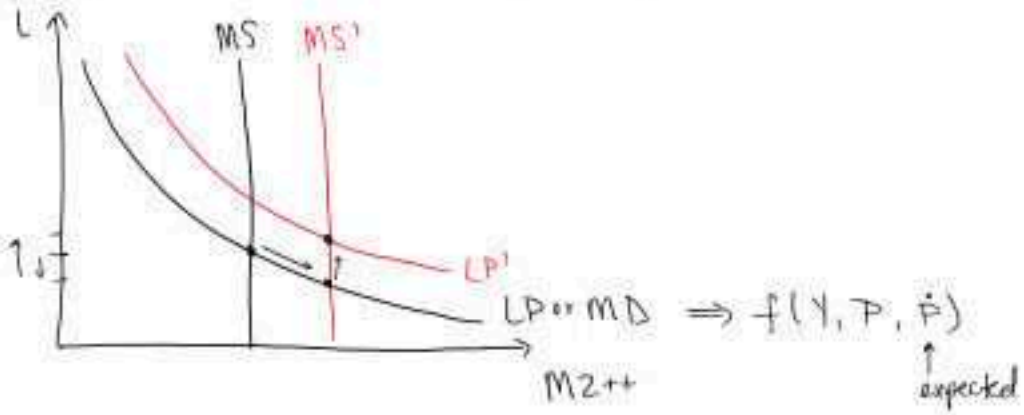
Backward Bending Supply



Keynesian Model – liquidity



$\Rightarrow f(Y, P, \dot{P})$

↑ expected

monetary policy → MS↑

↳ ↓i, I↑

C↑

↳ e → NX↑

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Lecture 16

Monday, February 12, 2018
8:30 AM

Using the term structure to forecast

2 year $(1+i_{2t})^2$

1 year $(1+i_{1t})\underbrace{(1+i^e_{1t+1})}_{\text{reinvestment}}$

$$(1+i_{1t})(1+i^e_{1t+1})-1=(1+i_{2t})(1+i_{2t})-1$$

$$1+i^e_{1t+1}=\frac{(1+i_{2t})^2}{(1+i_{1t})}$$

$$\boxed{i^e_{1t+1}=\frac{(1+i_{2t})^2}{(1+i_{1t})}-1}$$

3 yr by extension

$$\underbrace{(1+i_{1t})(1+i^e_{1t+1})}_{\text{this = 2year}}(1+i^e_{1t+2})-1=(1+i_{3t})^3-1$$

$$(1+i_{2t})^2(1+i^e_{1t+2})=(1+i_{3t})^3$$

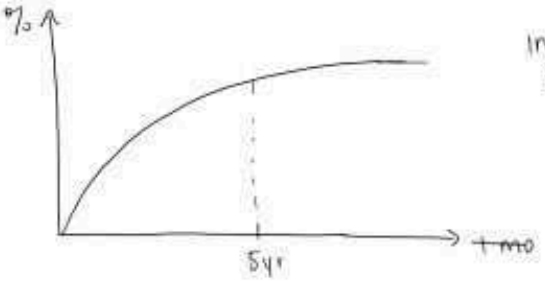
$$\boxed{i^e_{1t+2}=\frac{(1+i_{3t})^3}{(1+i_{2t})^2}}$$

General Formula

$$\boxed{i^e_{t+n}=\frac{(1+i_{t-n+1})^{n+1}}{(1+i_{t-nt})^n}-1}$$

↑ forecast

Actual yield rate



Example

$i_{1y}=5\%$ $i_{2y}=5.75\%$ $lp=0.25\%$

lp ↑ liquidity premium

What is next year's expected 1 year rate??

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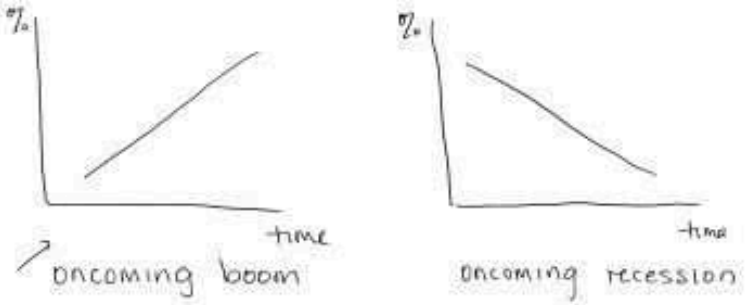
$$i^e_{11} = \frac{(1 + 0.0575 - 0.0025)^2}{(1 + 0.05)} - 1$$

$$= 6\%$$

Quiz 8

$$i^e_3 = \frac{(1 + i_3)^3}{(1 + i_2)^2} - 1$$

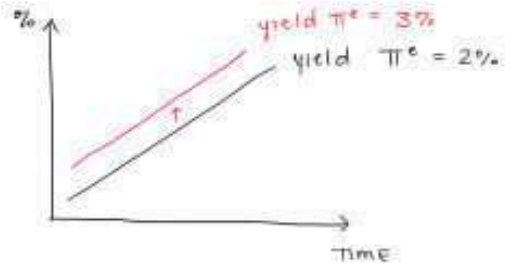
Stylized facts – revisited



oncoming boom — oncoming recession

yield curve spread = difference between short & long bonds } can be thought of as yield curve slope

Why does an upward-sloping yield curve predict an economic boom?



Fisher eq.

$i = r + \pi^e$

Economic benefits of intermediation

1. facilitates the acquisition of payments for goods and services
2. allow for pooling & portfolio creation
   - → economies of scale: buying shares in bulk
   - → economies of scope: # of products offered (loans, savings, credit cards, etc) cost of each goes down

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Lecture 17

Wednesday, February 14, 2018
8:30 AM

Continued from Monday.

3. They provide liquidity

4. Insurance companies manage risk
   ↳ low admin costs

5. Deal with information issues

Problems with asymmetric information

- Adverse selection → the wrong people come forward.
  ↳ intensive screening solves it. → people who are sick buy life insurance

- Moral hazard → taking more risks since you're insured.
  ↳ suicide clause
  ↳ clauses in contracts to prevent risky behaviour solves it

Market for lemons – used car markets

→ good cars vs "lemons" (ie. bad cars)

→ AVG price since you cannot tell which is which

→ drives out good cars from market

- to sell a good car: certification

⇒ screening process OR warranty

TRANSFORMATION

1) payments intermediation

2) denomination intermediation
   ↳ take a big # and split it up

3) default intermediation
   ↳ pooling vs individual

4) maturity intermediation
   ↳ create long-term assets with [illegible]-term ones.

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5) Interest rate intermediation
↳ lender who wants guaranteed rates ↳ borrower who wants variable rates
or vice-versa

6) capital value intermediation
↳ portfolios

7) liquidity intermediation
↳ physical asset —lines of credit→ money

Markets are clanfied

1) type of transaction → is there a middle-man?

indirect → bank → manager — commercial lending

direct → brokered — real estate

2) Selling or reselling
— primary → IPO or seasoned offering → need investment bank

— secondary → stock market → any capital account

3) Duration 1yr or less
— short → "Money Market" → t-bills, Commercial paper
— medium → 1-5 yrs → bond market
— long → >10 yrs → Mortgage market

4) Size
a) Retail
b) wholesale (bigger)

5) Style
a) open market → auction (public)
b) face to face (private)

6) Sectoral
Consumer, Businesses, Foreign
C I NX

7) Complexity
a) deposit
b) ABS - asset backed security

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8) Time
   a) spot market
   b) futures / forward market
      ↳ i rates ↳ exchange rates

9) Regulated vs Unregulated
   a) OFSI → regulator
   b) private placements → unregulated → buyer beware

Conflict of Interest

→ Real estate agent who represents both buyer & seller
→ Senator who is receiving donations from oil companies (USA)

⇒ In the financial market (Chapter 8)

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Lecture 18

Friday, February 16, 2018
8:26 AM

Chapter 2 / 8

8 FACTS

1. Stocks are a small fraction of external funding

2. Marketable assets are NOT the primary way to finance

3. Most marketable assets are sold to financial intermediaries rather than directly to the public

4. Financial intermediaries are the most important source of funds

5. The financial system is the MOST heavily regulated.

6. Only well-established corporations have easy access to the securities market

7. Collateral is a prevalent feature of debt contracts

8. Debt contracts are complicated with restrictive covenants.

Asymmetric information problems relating to the 8 facts.

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⇒ Adverse selection
- risky people wanting loans

Small businesses
→ hard to do an IPO b/c not enough cash!

tools to solve adverse selection:
- private production & sale of information
- Gov regulation to incr. information
- Financial intermediation
- Collateral & net worth

Small business in the US wants to issue shares
↳ venture capital

Moral Hazard in equity contracts
→ you become more risky b/c you now have insurance (for example)

Solution? - production of information: monitoring
- Gov. regulation (decr. white collar crime) (share underpricing)
- Financial intermediation
- Debt contracts

Moral Hazard in debt contracts

Solution - collateral & net worth
- monitoring & enforcement of restrictive covenants
- financial intermediation

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Financial Crisis – Chapter 9

EXAM ESSAY ✳ Something about the financial crisis
→ what happened
→ what continues to happen

Moral Hazard in Banks

→ what happened in the financial crisis

- no incentive for screening b/c they were bundling loans & selling to someone else
- incentive to write up loans ⟹ getting commission

Regulations on banks so the financial crisis doesn't happen again:

- In Canada: The Basil Accords
  → 1, 2, 3
  → currently in 2
  → banks must reveal off-balance sheet
  → banks must set aside capital for every loan, size of capital is based on risk

- OSFI: monitors & screens banks

Scheduled Banks

Schedule I – accept deposits (the big 5)

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Schedule II - accept deposits
can be subsideary of foreign banks

Schedule III - foreign banks
CANNOT accept deposits

Domestic vs. Foreign Banks

(Table 11-1 in textbook)

→ of banks, 97% of deposits are with the big 6 (chartered banks)

Big 6 have oligopolistic power

Few banks in canada is why our system is so stable.

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Lecture 19

Monday, February 26, 2018
8:21 AM

EXAMS GIVEN BACK

MIDTERM ON FRIDAY *

In Canada: Banks are hard to open

Run on the bank
- ↳ everyone goes in and takes their money out
- → causing the bank to fail (banknupt)
- → happened during the great depression

BASIL ACCORDS (Basil II)
- ↳ created capital requirements for banks
- ↳ 8%

Loans are risk-weighted

Cash & equivalents	— 0%
Residential Mort.	— 35%
Credit & auto loans	— 75%
commercial realestate	— 100%
Gov. security	— By rating

Monitored using stress testing

of the superintendent of financials ?

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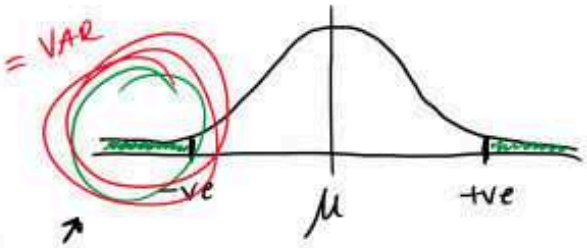
CAMELS rating

Capital adequacy
Asset quality
Management
Earnings
Liquidity
Sensitivity to market risk (beta of banks)

Assessing risk:
- Stress testing
  - simulations
  - self-assessment in us

- VAR → Value at Risk
  - statistical method
  - If a downturn happened, how much money would we lose?



" What are the odds we end up here?"

Book about financial crisis
" Black Swan"

- Simulations
  - "what would happen if..."

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- Regulations of disclosures

Quiz 10

Solution to adverse selection

$ moral hazzard

screening $ monitoring.

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Lecture 20

Wednesday, February 28, 2018
8:16 AM

Midterm 2 info posted on courselink

Right now, we're in chapter 10.

BASIL ACCORDS

- 3 pillars:
  - minimum capital requirements
    - → quantity & quality
    - → for banks, ↑ capital requirements decreases earnings per share.
  - supervisory review
    - → monitoring
    - → most important regulator in Canada: OSFI
  -

- assess risks
  - credit risk →
  - operational risk → Fraud (external ie. hacking)
  - market risk → volatility of stock/bond markets

measured by ratings,

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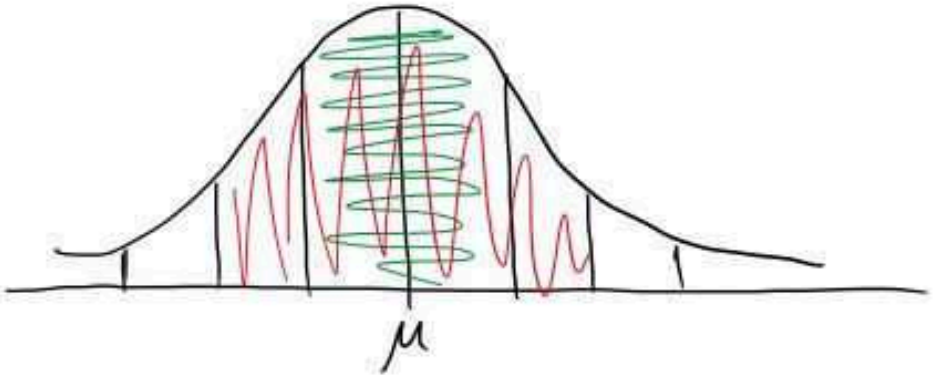
Financial Crisis 2008 – lots of buyouts of banks
– TV show "too big to fail"

Canadian Banking System – Oligopoly
– less competition

VAR (value at risk) Assessment



$\sim \mu \pm 1\sigma x$ 68%

$\sim \mu \pm 2\sigma x$ 95%

$\sim \mu \pm 3\sigma x$ 100%

↑
St. Dev.

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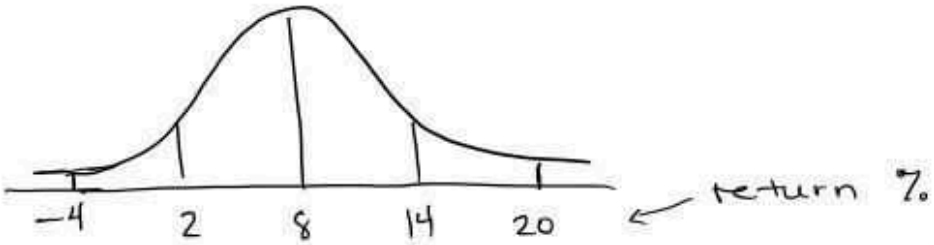
98%

mean = 8%
STD = 6%



Z factor = 2.33

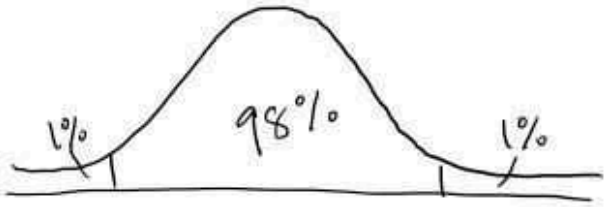
$8 + [-6(2.33)] \longrightarrow 8 \longrightarrow 8 + [6(2.33)]$

loss Profit

$8 - 6(2.33) = -5.98\% \cong -6\% = VAR$

1% of the time, return will be approx. -6%

⇒ 1% because we used 98% and it's 1% above and 1% below



= 100%

In Canada we have a lot of regulators.

- Bank of Canada
- OSFI

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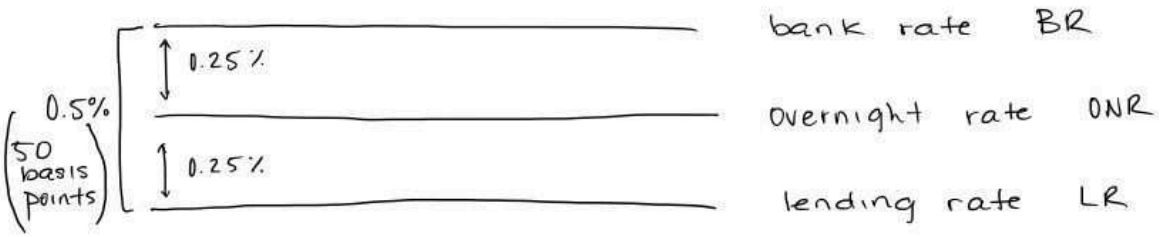
- Deposit Insurance Corp.
- Provincial securities $ exchange commission(s)

DONE CH 10 → done everything for Midterm 2.

LVTS - large value transfer system

→ computer algorithm that balances banks' books $ calculates how much the owe / are owed to / from other banks.

Operating Band



Bank of Canada uses Tbills to announce ONR

LVTS is very exclusive
→ to be part you have to put up collateral (no defaults)
→ collateral = assets → reduced in value depending on risk of asset.

Banks bid on Gov. deposits (like bonds)

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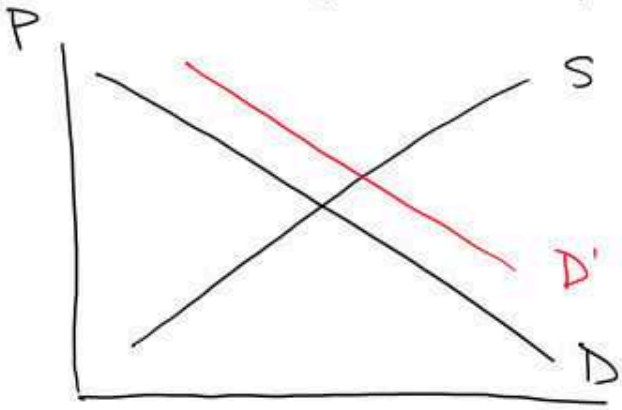
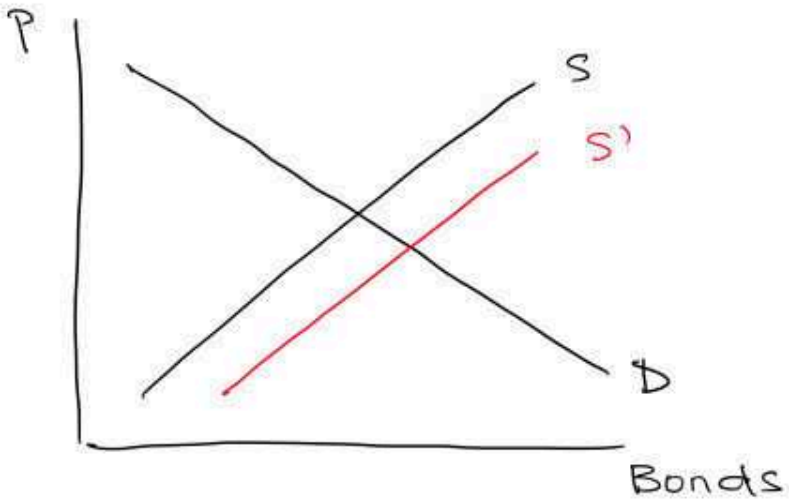
Overnight Market

SPRA — purchase — demand
special purchase & resale agreements

SRA — sale — supply
sale & repurchase agreements



SPRA → prices of bonds ↑
i ↓



SRA → bond prices ↓
i ↑

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Lecture 22

Monday, March 5, 2018
8:17 AM

QUIZ WEDNESDAY & FRIDAY!

Guest Lectures W & F

Banks cannot own stocks

Banks prefer to borrow from each other than to borrow from the Bank of Canada.

8 times / year – the Bank of Canada discusses & sets i rates

SPRAS → bring down overnight rate

SRAS → bring up the overnight rate.

Banks without a physical building
- Can't open a bank account with cash
- Eliminates screening process

⇒ When customers get in trouble, what does the bank do?

BALANCE SHEET

Bank receives a deposit

ASSET TRANSFORMATION

Bank 1

A	L
R = 100	D = 100

Business 1

A	L
equip 90	loan 90

R = reserve
D = deposit
L = loan

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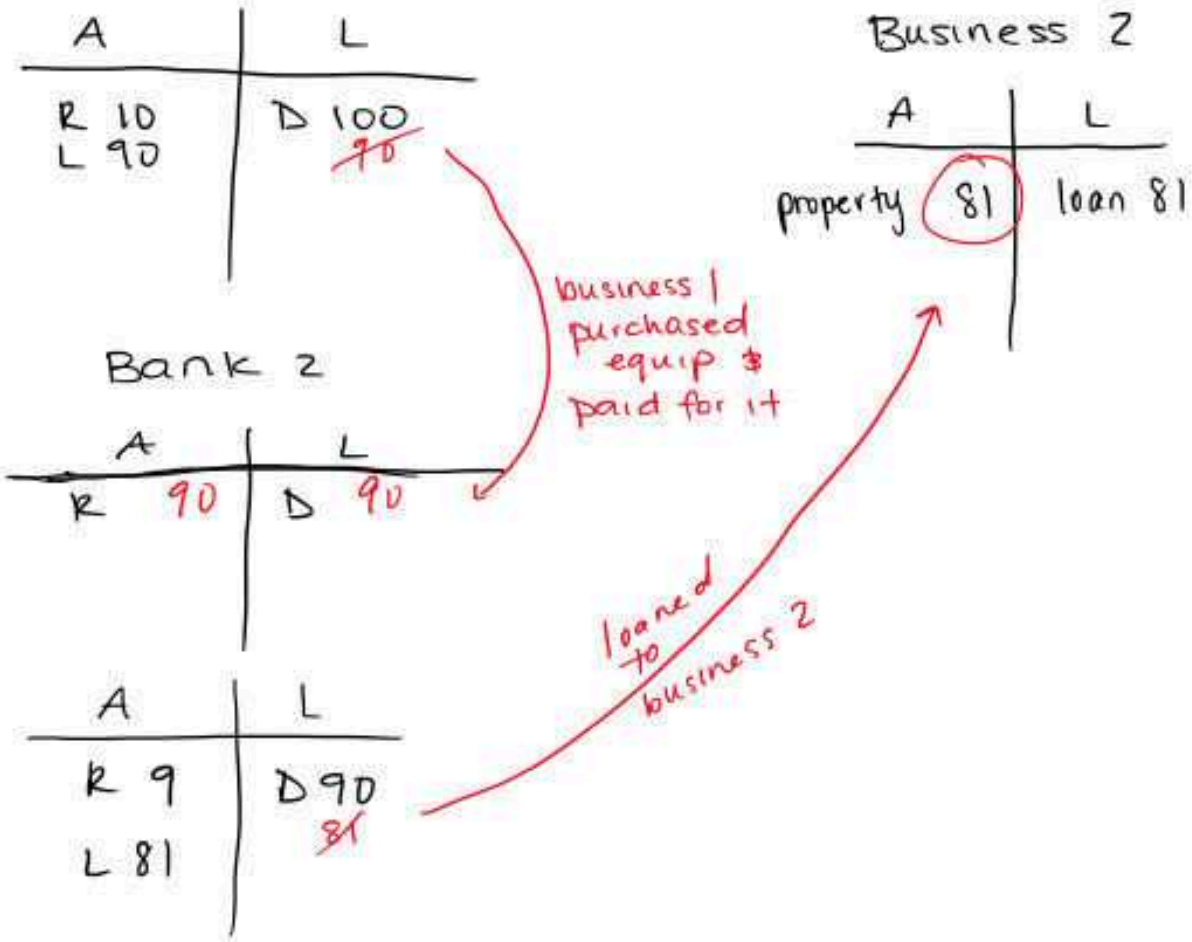

Money Multiplier

$$= \frac{1}{\text{ratio}}$$

ex $\frac{1}{.10} = 10\times$ simple

Benefit to a loan = interest charged

Loan Cost = interest $ fees.

Net Profit = Benefit − cost

profit on assets = $\frac{\text{profit}}{\text{Assets}}$ ← income statement / ← balance sheet

↳ (ROA)
return on assets

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Bank management

EXPLAIN A RISK THAT HITS "both sides" "liability side" "asset side" OF THE BALANCE SHEET.

1) Liquidity management

→ enough cash to pay depositors

2) Asset management

→ low risk of default
→ diversity

3) Liability management

→ low cost of funds

4) Capital Adequacy Management

→ Tier 1 / Tier 2 – Capital Bassel

LIQUIDITY MANAGEMENT

ASSETS		LIABILITIES	
Reserve	20	Dep.	100
Loans	80	Bank cap.	10
Securities	10		

what's wrong? – holding too much cash (20% of deposits should be 10%)

↳ buy securities *faster*

↳ increase loans

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Someone takes out 20:

ASSETS		LIABILITIES		
Reserve	~~20~~ ~~0~~	Dep.	~~100~~	80
Loans	80	Bank Cap.	10	
Securities	10			

PROBLEM- No reserve

SOLUTION - sell securities * transaction fees

- borrow from another bank
- borrow from bank of canada
- "call in" a loan * betrays customer loyalty

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Lecture 23

Wednesday, March 7, 2018
8:19 AM

GUEST LECTURE CIBC commercial banking

Greg Windle & Matt Little

Commercial Lending and Asymmetric Information

- one party has more or better information than the other, creating an imbalance of power.

Adverse selection & Moral Hazard

- creates problems when dealing w new clients
- Trust w existing clients = less asymmetric info
- Use info asymmetry to overcome "gray" areas

Commercial Banking

- comprehensive financial services for Canadian and US-based, privately-held companies w annual sales from 1m – 500m
- Senior debt → debt that is security-backed

Risk Profile of Lending

low ← Asset-Based → Traditional → Leveraged → high

Asset-Based	Traditional	Leveraged
• Inventory-based companies (or highly seasonal)	• based on business asset value or entreprise value	• company w a lot of "goodwill" on Balance sheet
• specialized team	• risk proportional to borrower's equity	• separate team in bank
• more monitoring		

The 4 C's of Credit

- Character *
- Collateral
- Capital
- Coverage

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The best bankers are the best at reading people and asking questions

- curiousity

Knowing own "risk tolerance" to get loans passed through risk management

Reputation is everything ★

Character

↳ we bank people not numbers

you are who you associate with

What is the biggest red flag?

⇒ who a company associates with

↳ commercial bankers HAVE TO know people

CANLII — database of legal judgements
— public legal database

JOBS

- online applications
- Associate programs
- MBAs becomming LESS popular.

certifications — Do it for yourself

commercial banking — you apply everything you've learned
— case studies.

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Lecture 24

Friday, March 9, 2018
8:35 AM

Guest Lecture — Paul Redman
Chief Economist
@ OSC
Ontario Securities
Commission

GFCI — global financial centres index
— Toronto is #7

TSX — World's 9th Largest stock exchange
— Mining companies
— Smaller energy companies

TSX — $2.96 T
TSXV — $50.8 B
CSE — mostly shares in cannabis
Aequitas —

49% financial services employment in Ontario

Banking — Federal OSFI
— Provincial

Insurance — Federal
— Provincial (regulations)

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Pensions — Federal
— Provincial (> 70%)

Securities — Provincial
— 13 regulators (1 per province/territory)
— BC, Alberta, ON, Quebec

Self regulated: MFDA
IIROC

Why 13 regulators?
→ constitution: investments are provincial

6 participating provinces + federal goumnt. to come together to create a more country-wide regulatory system.

OSC — enforces securities law in Ontario
↳ securities act
↳ commodity futures act
— makes rules → (laws for firms)
— monitoring compliance
— Investigating / seeking sanctions for breaches of rules
— cannot give money back :(

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Getsmarteraboutmoney.ca

checkbeforeyouinvest.____? - check registration

Economists at the OSC

- economic & statistical analysis
- impact of regulatory change
- analyze risk / trends
- mystery shopping for investment advice *
  - ↳ on the OSC website!!

Corporate Bond Market

- regulations after financial crisis has decreased corporate bond trade
  - ↳ people can't find what they want to sell/buy
- Bid/Ask spread → what you buy for vs. what you can sell for.
- Non-financial bond (liquidity) driven by oil price b/c many of these bonds are issued by energy companies

VIX - volatility index

volatility increased by 163% from January 1st to February 9th. 2018.

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How to get hired at the OSC

→ show interest in where you're applying.
→ do your research
→ relate to YOUR experience
  ↳ school assignments / papers
  ↳ topics you're interested in — go further!

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Lecture 25

Monday, March 12, 2018
8:21 AM

MIDTERM 2 – Handed back & went over answer key

Quiz 14: How do you solve moral hazard?
⇒ Monitor & restrict

– No more guest speakers

TABLE 12-1
P. 284

Liquidity Management (Reserve mgmt) – banks have enough reserves

- Bank rate vs. overnight rate
  similarity: set by the bank of canada
  difference: bank rate is 0.25% higher

– Borrow from the bank of Canada
– Borrow from another bank (cheaper)
– Liquidate securities → downside: transaction costs
– Call in loans → downside: lose a customer
– ALWAYS hold excess reserves → downside: earning NO interest
∴ profits forgone

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EXAM question
→ given balance sheet
→ figure out problem & how to fix it

Asset Management → LOANS *

- Reading people: judging character

Liability Management

- Trying to increase deposits (funds)

Capital Adequacy Management

- prevent bank failure
- Most regulated: must meet basel accord requirement

Primary responsibility: to shareholders

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Exam Notes

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Essay:
Something to do with the 2008 Financial Crisis

10 pairs of terms where you must give a significant similarity and a significant difference

Chapters 2,3,4,6,8,10

Vocabulary:

Chapter 2

- Securities
  - Assets for the person who buys them
  - Liabilities for the individual or firm that sells (issues) them
- Capital
  - Financial or physical wealth that is employed to produce more wealth
- Maturity
  - Of a debt instrument: the number of years (term) until that instrument's expiration date
- Short-term
  - Maturity term is less than a year
- Long-term
  - Maturity term is ten years or longer
- Intermediate-term
  - Maturity term between one and ten years
- Equities
  - Claims to the net income (income after expenses and taxes) and the assets of a business
  - Example: common stock
- Dividends
  - Periodic payments (from equities) to holders
  - Considered long-term securities because they have no maturity date
- Primary market
  - A financial market in which new issues of a security are sold to initial buyers (often takes place behind closed doors)
- Secondary market
  - A financial market in which securities that have been previously issued can be resold
- Investment bank
  - An important financial institution that assists in the initial sale of securities in the primary market
- Underwriting
  - Guarantees a price for a corporation's securities and then sells them to the public
- Brokers
  - Agents of investors who match buyers with sellers of securities
- Dealers
  - Link buyers and sellers by buying and selling securities at stated prices
- Liquidity
  - Makes it easier and quicker to sell these financial instruments to raise cash
- Exchanges
  - Buyers and sellers of securities meet in one central location to conduct trades

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- Over-the-counter (OTC) market
  - Dealers at different locations who have an inventory of securities stand ready to buy and sell securities "over the counter" to anyone who comes to them and is willing to accept their prices
- The money market
  - The market in which longer-term debt instruments and equity instruments are traded
- Default
  - A situation in which the party issuing the debt instrument is unable to make interest payments or pay off the amount owed when the instrument matures
- Currency
  - Paper money or coins
- Certificate of deposit (CD)
  - A debt instrument sold by a bank to depositors that pays annual interest of a given amount and at maturity pays back the original purchase price
- Bearer deposit notes
  - The buyers name is not recorded in either the issuer's books or on the security itself
  - Multiples of $100,000
  - 30-365 days
- Term deposit receipts or term notes
  - CDs issued by chartered banks that cannot be sold to someone else and cannot be redeemed from the bank before maturity without paying a substantial penalty
  - $5,000 - $100,000
  - 1 day - 5 years
- Finance paper
  - Short-term promissory notes from sales finance companies
  - Minimum denomination of $50,000
  - Maturities 30-365 days
- Overnight interest rate
  - A closely watched barometer of the tightness of credit market conditions in the banking system and the stance of monetary policy
  - High: banks are strapped for funds
  - Low: banks' credit needs are low
- Mortgages
  - Loans to households or firms to purchase housing, land, or other real structures, where the structure or land serves as collateral for the loans
- Mortgage-backed securities
  - Bond-like debt instruments backed by a bundle of individual mortgages, whose interest and principal payments are collectively paid to the holders of the security
- Registered bonds
  - The name of the owner appears on the bond certificate and is also recorded at the Bank of Canada
  - Additional call (or redemption) feature of allowing them to be "called" on specified notice (30 - 60 days)
- Provincial bonds or provincials
  - Securities issued by provincial governments
- Municipal bonds or municipals
  - Securities issued by municipal governments
- Canadas

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- Securities issued by the federal government
- Foreign bonds
  - Traditional instruments in the international bond market
  - Sold in a foreign country and denominated in that country's currency
- Eurobond
  - A bond denominated in a currency other than that of the country in which it is sold
  - Over 80% of the new issues in the international bond market are Eurobonds
  - Now larger than the US corporate bond market
- Eurocurrencies
  - Foreign currencies deposited in banks outside the home country
- Eurodollars
  - US dollars deposited in foreign banks outside the United States or in foreign branches of US banks
  - These short-term deposits earn interest, they are similar to Eurobonds
- Financial intermediation
  - The primary route for moving funds from lenders to borrowers
- Transaction costs
  - The time and money spend in carrying out financial transactions
- Economies of scale
  - The reduction in transaction costs per dollar of transactions as the size (scale) of transactions increases
- Liquidity services
  - Services that make it easier for customers to conduct transactions
- Risk
  - Uncertainty about the returns investors will earn on assets
- Risk sharing
  - Financial intermediaries create and sell assets with risk characteristics that people are comfortable with, and the intermediaries then use the funds they acquire by selling these assets to purchase other assets that may have far more risk
  - Low transaction costs allow financial intermediaries to share risk at low cost, enabling them to earn a profit on the spread between the returns they earn on risky assets and the payments they make on the assets they have sold
  - Sometimes referred to as asset transformation because in a sense, risky assets are turned into safer assets for investors
- Diversification
  - Investing in a collection (portfolio) of assets whose returns do not always move together, with the result that overall risk is lower than for individual assets
  - "you shouldn't put all your eggs in one basket"
- Asymmetric information
  - The inequality that occurs when one party does not know enough about the other party to make accurate decisions
- Adverse selection
  - The problem created by asymmetric information before the transaction occurs
- Moral hazard
  - The problem created by asymmetric information after the transaction occurs
- Economies of scope
  - Banks can lower the cost of information production for each service by applying one information resource to many different services

- Conflicts of interest
  - A type of moral hazard problem that arises when a person or institution has multiple objectives (interests), some of which conflict with each other
- Financial panic
  - Asymmetric information can lead to the widespread collapse of financial intermediaries

Chapter 3

- Currency
  - Paper money and coins
- Wealth
  - The total collection of pieces of property that serve to store value
- Income
  - A flow of earnings per unit of time
- Medium of exchange
  - Money in the form of currency or cheques
  - Used to pay for goods and services
- Unit of account
  - The second role of money: it is used to measure value in an economy
- Store of value
  - Another function of money
  - A repository of purchasing power over time
  - Used to save purchasing power from the time income is received until the time it is spent
- Liquidity
  - The relative ease and speed with which an asset can be converted into a medium of exchange
- Hyperinflation
  - Extreme inflation (over 50% per month)
- Payments system
  - The method of conducting transactions in the economy
- Commodity money
  - Money made up of precious metals or another valuable commodity
- Fiat money
  - Paper currency decreed by governments as legal tender but not convertible into coins or precious metals
  - Legally must be accepted as payment for debts
- Cheques
  - A cheque is an instruction from you to your bank used to transfer money from your account to someone else's account when they deposit the cheque
- Electronic money (e-money)
  - Money that exists only in electronic form
  - Debit cards, credit cards
- Smart card
  - A more sophisticated stored-value card
  - Simplest form is purchased for a pre-set dollar amount that the consumer pays un front, like a prepaid phone card
- E-cash
  - Used on the internet to purchase goods or services

    - Obtained by setting up an account with a bank that has links to the internet and then transferring the e-cash to their PC.
- Monetary aggregates
    - The Bank of Canada has modified its measures of money several times and has settled on the following measures of the money supply - also referred to as monetary aggregates
- M1+
    - Currency
        - All paper money and coins in circulation
    - Chequable deposits
        - Deposits at all chartered banks, trust and mortgage loans companies, and credit unions and caisses populaires
- M1++
    - Everything included in M1+
    - Nonchequable deposits at chartered banks, TMLs and CUCPs
- M2
    - Currency
    - Personal deposits at chartered banks
    - Non-personal demand and notice deposits at chartered banks
    - Fixed-term deposits
- M2+
    - Everything in M2
    - Deposits at TMLs
    - Deposits at CUCPs
    - Life insurance company individual annuities
    - Personal deposits at government-owned savings institutions
    - Money market mutual funds
- M2++
    - Broadest definition of the money supply in Canada
    - Everything in M2+
    - Canada savings bonds and other retail debt instruments
    - Non-money market mutual funds
- M3
    - Everything in M2
    - Non-personal term deposits at chartered banks
    - Foreign currency deposits of residents at chartered banks

Chapter 4

- Cash flows
    - Streams of cash payments
- Present value (or present discounted value)
    - Based on the common sense notion that a dollar paid to you one year from now is less valuable than a dollar paid to you today
    - This notion is true because you can deposit a dollar today in a savings account that earns interest and have more than a dollar in one year
- Simple loan
    - Simplest kind of debt instrument

    - The lender provides the borrower with an amount of funds (the principal) that must be repaid to the lender at the maturity date, along with additional payment for the interest
- Four Types of Credit Market Instruments
    - A simple loan
    - A fixed payment loan (fully amortized loan)
        - The lender provides the borrower with an amount of funds that the borrower must repay by making the same payment, consisting of part of the principal and interest, every period, for a set number of years
    - A coupon bond
        - Pays the owner of the bond a fixed-interest payment every year until the maturity date, when a specified final amount (face value or par value) is repaid
        - Identified by 4 pieces of information
        - Bond's face value
        - Corporation or government agency that issues the bond
        - Maturity date of the bond
        - Bond's coupon rate
            - The dollar amount of the yearly coupon payment expressed as a percentage of the face value of the bond
    - A discount bond (zero-coupon bond)
        - Bought at a price below its face value (at a discount), and the face value is repaid at the maturity date
        - Does not make any interest payments, it just pays off the face value
- Yield to maturity
    - The interest rate that equates the present value of cash flow payments received from a debt instrument with its value today
- For simple loans, the simple interest rate equals the yield to maturity
- Consol or perpetuity
    - A perpetual bond with no maturity date and no repayment of principal that makes fixed coupon payments forever
- Current yield
    - The yearly coupon payment divided by the price of the security
- **Current bond prices and interest rates are negatively related: When the interest rate rises, the price of the bond falls, and vice versa**
- Return or rate of return
    - A measure of performance of a security
- The return on a bond will not necessarily equal the yield to maturity on that bond
- Rate of capital gain
    - The change in the bond's price relative to the initial purchase price
- Several Key Findings Generally True of All Bonds
    - The only bonds whose returns will equal their initial yields to maturity are those whose times to maturity are the same as their holding periods
    - A rise in interest rates is associated with a fall in bond prices, resulting in capital losses on bonds whose terms to maturity are longer than their holding periods
    - The more distant a bond's maturity date, the greater the size of the percentage price change associated with an interest rate change
    - The more distant a bond's maturity date, the lower the rate of return that occurs as a result of an increase in the interest rate

    - Even though a bond may have a substantial initial interest rate, its return can turn out to be negative if interest rates rise
- Prices and returns for long-term bonds are more volatile than those for shorter-term bonds
- Interest rate risk
    - The risk level associated with an asset's return that results from interest-rate changes
- Nominal interest rate
    - No inflation
- Real interest rate
    - The interest rate that is adjusted by subtracting expected changes in the price level (inflation) so that it more accurately reflects the true cost of borrowing
- When the real interest rate is low, there are greater incentives to borrow and fewer incentives to lend

Chapter 6

- Risk structure of interest rates
    - The relationship among the interest rates of bonds with the same term to maturity
    - Described by three factors
    - Default risk
    - Liquidity
    - Income tax treatment of the bond's interest payments
- Term structure of interest rates
    - The relationship among interest rates on bonds with different terms to maturity
- Risk of default
    - An attribute of a bond that influences its interest rate
    - Default occurs when the issuer of the bond is unable or unwilling to make interest payments when promised or to pay off the face value when the bond matures
    - As default risk increases, the risk premium on that bond rises.
- Default-free bonds
    - Bonds with no default risk
- Risk premium
    - The spread between interest rates on bonds with default risk and interest rates on default-free bonds (both of the same maturity)
- A bond with default risk will always have a positive risk premium, and an increase in its default risk will raise the risk premium
- Credit-rating agencies
    - Investment advisory firms that rate the quality of corporate and municipal bonds in terms of the probability of default
- Bond ratings and their definitions (S&P)
    - AAA
        - Prime Maximum Safety
    - AA+, AA, AA-
        - High Grade High Quality
    - A+, A, A-
        - Upper Medium Grade
    - BBB+, BBB, BBB-
        - Lower Medium Grade
    - BB+
        - Noninvestment Grade
    - BB, BB-

        - Speculative
    - B+, B, B-
        - Highly Speculative
    - CCC+
        - Substantial Risk
    - CCC, CCC-
        - In Poor Standing
    - D
- Investment-grade securities
    - Bonds with relatively low risk, and a rating of BBB and above
- Junk bonds
    - Bonds with ratings below BBB
    - Higher default risk
    - Speculative-grade security
- Fallen angels
    - Investment-grade securities whose rating has fallen to junk levels
- Basis points
    - 100 basis points = 1 percentage point
- Liquidity of Canada Bonds
    - Explains why their interest rates are lower than interest rates on less liquid bonds
- Favourable tax treatment of bonds
    - Exemption from taxes leads to lower interest rates
- Yield curve
    - Describes the term structure of interest rates for particular types of bonds
    - A plot of the yields on bonds with differing terms to maturity but the same risk liquidity and tax considerations
- Inverted yield curve
    - A downward sloping yield curve
- Three important empirical facts explained by the term structure of interest rates
    - Interest rates on bonds of different maturities move together over time
    - When short term interest rates are low, yield curves are more likely to have an upward slope; when short term interest rates are high, yield curves are more likely to slope downward and be inverted
    - Yield curves almost always slope upward
- Three theories put forward to explain the term structure of interest rates
    - That is, the relationships among interest rates on bonds of different maturities reflected in yield curve patterns
    - The expectations theory
        - Explains facts 1&2
        - The interest rate on a long-term bond will equal an average of short-term interest rates that people expect to occur over the life of the long-term bond.
        - Bonds of different maturities are perfect substitutes
        - Predicts that the interest rates on bonds of different maturities differ because short-term interest rates are expected to have different values at future dates
        - When the yield curve is upward-sloping:
            - Short-term interest rates are expected to rise
        - When the yield curve is downward-sloping:
            - Short-term interest rates are expected to fall

- When the yield curve is flat;
  - Short-term interest rates are not expected to change
- The segmented markets theory
  - Explains fact 3
  - Sees markets for different-maturity bonds as completely separate and segmented
  - Interest rate of a bond is determined by the supply and demand for that bond and is not affected by expected returns on other bonds with other maturities
  - KEY ASSUMPTION
    - Bonds of different maturities are not substitutes at all
      - The expected return from holding a bond of one maturity has no effect on the demand for a bond of another maturity
      - Why? Investors have very strong preferences for bonds of one maturity but not of another, so they will be concerned with the expected returns only for bonds of the maturity they prefer
      - From chapter 4: if the term to maturity equals the holding period, the return is known for certain because it equals the yield exactly and there is no interest-rate risk
  - Risk averse investors
    - Desire short holding periods
    - Prefer bonds with shorter maturities with less interest-rate risk
- The liquidity premium theory
  - Explains all 3 facts (is a combination of theories 1&2)
  - The interest rate on a long-term bond will equal an average of short-term interest rates expected to occur over the life of the long-term bond plus a liquidity premium that responds to supply and demand conditions for that bond
  - KEY ASSUMPTION
    - Bonds of different maturities are assumed to be substitutes but not perfect substitutes
    - Investors tend to prefer shorter-term bonds because these bonds bear less interest-rate risk - therefore investors must be offered a positive liquidity premium to induce them to hold longer-term bonds
  - The equation for
    - $$i_{nt} = \frac{i_t + i^e_{t+1} + i^e_{t+2} + \cdots + i^e_{t+(n-1)}}{n} + l_{nt}$$

- Preferred habitat theory
  - Similar to liquidity premium theory
  - Assumes that investors have a preference for bonds of one maturity or another, a particular bond maturity (preferred habitat) in which they prefer to invest
  - They are willing to buy bonds outside of their preferred habitat only if those bonds earn a somewhat higher expected return
- Liquidity premium and Preferred habitat theories:
  - Are the most widely accepted theories of the term structure of interest rates because they explain the major empirical facts about term structure so well
  - They combine the features of both the expectations theory and the segmented markets theory by asserting that a long-term interest rate will be the sun of a liquidity premium and

the average of the short-term interest rates that are expected to occur over the life of the bond

- Forward rate
  - The one-period interest rate that the pure expectations theory of the term structure indicates is expected to prevail one period in the future
- Spot rates
  - Actual observed interest rates at time t

Chapter 8

- 8 important facts about our financial structure in Canada:
  1. Stocks are not the most important source of external financing for business
  2. Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations
     - Bonds are more important source of financing in Canada than stocks (15% vs 12%)
     - Together only 27%: less than half of the external funds needed by Canadian corporations to finance their activities
  3. Indirect finance, which involves the activities of financial intermediaries, is many times more important than direct finance, in which businesses raise funds directly from lenders in financial markets
     - Direct finance involves the sale to house-holds of marketable securities, such as stocks and bonds
     - Only a small fraction of newly issued corporate bonds, commercial paper, and stocks are sold directly to Canadian households, the rest are sold to financial intermediaries.
  4. Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses
     - The primary source of external funds for businesses throughout the world is loans made by banks and other nonbank financial intermediaries, such as insurance companies, pension funds, and finance companies (56% in Canada).
     - Banks play an even more important role in the financial system in developing countries than they do in industrialized countries
  5. The financial system is among the most heavily regulated sectors of the economy
     - Governments regulate financial markets primarily to promote the provision of information and to ensure the stability of the financial system
  6. Only large, well-established corporations have easy access to securities markets to finance their activities
     - Individuals and smaller businesses that are not well established are less likely to raise funds by issuing marketable securities, instead, they obtain their financing from banks.
  7. Collateral is a prevalent feature of debt contracts for both households and businesses
     - Credit card debt is the predominant form of household debt and is widely used in business borrowing as well
     - The majority of household debt in Canada consists of collateralized loans:
       - Your car is collateral for your auto loan
       - Your house is collateral for your mortgage
     - Commercial and farm mortgages (property pledged as collateral) make up one-quarter of borrowing by nonfinancial businesses
     - Corporate bonds and other bank loans also often involve pledges of collateral

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8. Debt contracts typically are extremely complicated legal documents that place substantial restrictions on the behaviour of the borrower

- Collateral
  - Property that is pledged to a lender to guarantee payment in the event that the borrower is unable to make debt payments
- Secured debt
  - Collateralized debt
- Unsecured debt
  - Credit card debt (not secured by collateral)
  - Predominant form of household debt
- Restrictive covenants
  - Provisions in legal bond or loan contracts that restrict and specify certain activities that the borrower can and cannot engage in
- Economies of scale
  - The reduction in transaction costs per dollar of investment as the size (scale) of transactions increases
  - Important for lowering the costs of resources needed by financial institutions
    - Computer technology
- Mutual fund
  - Financial intermediary that sells shares to individuals and then invests the proceeds in bonds or stocks
  - Takes advantage of lower transaction costs by buying stocks or bonds in large blocks (bulk)
- Liquidity services
  - Services that make it easier for customers to conduct transactions
- Asymmetric information
  - A situation that arises when one party's insufficient knowledge about the other party involved in a transaction makes it impossible for the first party to make accurate decisions when conducting the transaction
- Adverse selection
  - An asymmetric information problem that occurs **before** a transaction occurs
    - Potential bad credit risks are the ones who most actively seek out loans
  - The parties who are most likely to produce an undesirable outcome are also the ones most likely to want to engage in the transaction
- Moral hazard
  - Arises **after** the transaction occurs
    - The lender runs the risk that the borrower will engage in activities that are undesirable from the lender's point of view because such activities make it less likely that the loan will be paid back
  - Lowers the probability that the loan will be repaid
- Agency theory
  - The analysis of how asymmetric information problems affect economic behaviour
- The Market for Lemons problem
  - Used car market example
- Tools to help solve adverse selection problems
  - Private production and sale of information
    - Free-rider problem
      - Occurs when people who do not pay for information take advantage of the information that other people have paid for

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        - Suggests that the private sale of information is only a partial solution to the lemons problem
        - Prevents the private market from producing enough information to eliminate all the asymmetric information that leads to adverse selection
    - Government regulation to increase information
        - Audits
            - Certification by an accounting firm that the firm adheres to standard accounting principles and discloses information about its sales, assets, and earnings (enforced by government regulation)
    - Financial intermediation
        - Better information about the quality of firms lessens asymmetric information problems, making it easier for firms to issue securities
    - Collateral and net worth
        - Net worth (or equity capital)
            - The difference between a firm's assets and its liabilities
- Summary:
    - Facts 1-4 emphasize the importance of financial intermediaries and the relative unimportance of securities markets with regard to the financing of corporations
    - Fact 5 emphasizes that financial markets are among the most heavily regulated sectors of the economy
    - Fact 6 emphasizes that only large, well-established corporations tend to have access to securities markets
    - Fact 7 emphasizes that collateral is an important feature of debt contracts
- The principal-agent problem
    - A particular type of moral hazard that equity contracts are subject to
    - When a firm's equity is owned mostly by stockholders and not by its managers, the separations of ownership and control can lead to the managers acting in their own interest rather than in the interest of the stockholders because the managers have less incentive to maximize profits than the stockholders do
        - Stockholders are owners
        - Managers are controllers
- Tools to help solve the principal-agent problem (moral hazard)
    - Production of information: monitoring
    - Government regulation to increase information
    - Financial intermediation
    - Debt contracts
- Costly state verification
    - Makes the equity contract less desirable and explains in part why equity is not a more important element in our financial structure
- Venture capital firm
    - Firms that pool the resources of their partners and use the funds to help budding entrepreneurs start new businesses
    - In exchange for supplying venture capital, the firm receives an equity share in the new business
- Tools to help solve moral hazard in debt contracts
    - Net worth and collateral
        - Incentive-compatible
            - Aligns the incentives of the borrower with those of the lender

    - Monitoring and enforcing restrictive covenants
        - Covenants to discourage undesirable behaviour
        - Covenants to encourage desirable behaviour
        - Covenants to keep collateral valuable
        - Covenants to provide information
    - Financial intermediation
- CHAPTER SUMMARY
    - Asymmetric information leads to adverse selection and moral hazard
    - Tools to solve adverse selection and moral hazard include:
        - Private production and sale of information
        - Government regulation to increase information in financial markets
        - The use of collateral and net worth clauses in debt contracts
        - The monitoring and enforcement of restrictive covenants
- Adverse selection
    - Screening
- Moral hazard
    - Monitoring
- State-owned banks
    - Banks in developing and transition countries owned by their governments
    - Have little incentive to allocate their capital to the most productive uses
    - Primary loan customer is often the government itself

Chapter 10

- Bank failure
    - A bank is unable to meet its obligations to pay its depositors and other creditors, and so must go out of business
- Bank panic
    - Many banks fail simultaneously
- Contagion effect
    - The failure of one bank can hasten the failure of others
- CDIC
    - Canada Deposit Insurance Corporation
- Payoff method
    - The CDIC allows the bank to fail and pays off deposits up to the $100,000 insurance limit
    - After the bank has been liquidated, the CDIC lines up with other creditors of the bank and is paid its share of the proceeds from the liquidated assets
- Purchase and assumption method
    - The CDIC reorganizes the bank, typically by finding a willing merger partner who assumes (takes over) all of the failed bank's liabilities so that no depositor or other creditor loses a penny
    - The CDIC will make the offer more attractive by providing subsidized loans or by buying some of the failed bank's weaker loans
- Forms of the government safety net
    - Deposit insurance
    - Lending from the central bank to troubled institutions
        - Bank of Canada did this during the global financial crisis
        - "Lender of Last Resort"

- Funds are provided directly to troubled institutions
  - As done by the government of Canada through the Canada Mortgage and Housing Corporation (CMHC), by the US Treasury, and other governments during the 2008 financial crisis
- Government takeover (nationalization) of troubled institutions
  - Guarantee all creditors' loans will be paid in full

- When financial institutions are very large or highly interconnected with other financial institutions or markets, their failure has the potential to bring down the entire financial system (2008 financial crisis)**
- Too-big-to-fail problem
  - Regulators are reluctant to close down large financial institutions and impose losses on their depositors and creditors because doing so might precipitate a financial crisis
  - The result is that big financial institutions might take on even greater risks, thereby making bank failures more likely
  - Another result is that large or interconnected financial institutions are more likely to engage in highly risky activities, making a financial crisis more likely
- 8 basic types of financial regulation aimed at lessening asymmetric information problems and excessive risk taking
  - Restrictions on asset holdings
  - Capital requirements
    - Leverage ratio
      - The amount of capital divided by the bank's total assets
    - Off-balance-sheet activities
      - Do not appear on bank balance sheets but do expose banks to risk
      - Include:
        - Trading financial instruments
        - Generating income from fees
    - Basel Committee on Bank Supervision
      - So named because it meets under the auspices of the Bank for International Settlements in Basel, Switzerland
      - Implemented the Basel Accord
    - Basel Accord
      - Deals with risk-based capital requirements
      - Banks must hold at least 8% of their risk-weighted assets
      - Assets are allocated into 4 categories

        Zero weight of credit risk - includes items with little default risk (reserves, government securities issued by the Organization for Economic Cooperation and Development (OECD))

        20% weight of credit risk - claims on banks in OECD countries

        50% weight of credit risk - municipal bonds and residential mortgages

        100% weight of credit risk - loans to consumers and corporations
    - Regulatory arbitrage
      - A practice in which banks keep on their books assets that have the same risk-based capital requirement but are relatively risky, such as a loan to a company with a very low credit rating, while taking off their books low-risk assets, such as a loan to a company with a very high credit rating

  Prompt corrective action

  Chartering and examination

- Financial supervision or prudential supervision
  - Overseeing who operates financial institutions and how they are operated
- CAMELS rating
  - Capital adequacy
  - Asset quality
  - Management
  - Earnings
  - Liquidity
  - Sensitivity to market risk
- Assessment of risk management
- 4 elements of risk management assessed to arrive at the risk management rating:
  - The quality of oversight provided by the board of directors and senior management
  - The adequacy of policies and limits for all activities that present significant risks
  - The quality of the risk measurement and monitoring systems
  - The adequacy of internal controls to prevent fraud or unauthorized activities on the part of employees
- Stress tests
  - Calculate losses under fictional dire scenarios and the need for more capital
- Value-at-risk (VaR)
  - Measure the size of the loss on a trading portfolio
- Disclosure requirements
- Sarbanes-Oxley Act (USA)
  - Took disclosure of information even further by increasing the incentives to produce accurate audits of corporate income statements and balance sheets and putting in place regulations to limit conflicts of interest in the financial services industry
- Mark-to-market accounting OR fair-value accounting
  - Assets are valued on the balance sheet at what they could sell for in the market
- Consumer protection
- Restrictions on competition

- SUMMARY
  - Asymmetric information analysis explains what types of financial regulations are needed to reduce moral hazard and adverse selection problems in the financial system
- Coinsurance
  - Only a percentage of a deposit would be covered by insurance

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LECTURE 16 REVIEW

- Forecasting interest rates

$$i^{e}_{t+n} = \frac{\left[1 + i_{t=n+1}\right]^{n+1}}{\left[1 + i_{t=nt}\right]^{n}} - 1$$

example:

$$i^{e}_{3} = \frac{(1 + i_3)^3}{(1 + i_2)^2} - 1$$

yield curve spread

↳ difference between short & long bonds

↳ yield curve slope

Econ benefits of intermediation

1. Facilitates the acquisition of payments for goods and services

2. Allow for pooling & portfolio creation

↳ economies of scale: buying shares in bulk

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↳ economies of scope : number of products offered
→ cost of each decr. the more there are.

LECTURE 17 REVIEW

Econ benefits of intermediation

1. Facilitates the acquisition of payments for goods and services

2. Allow for pooling $ portfolio creation

↳ economies of scale : buying shares in bulk

↳ economies of scope : number of products offered
→ cost of each decr. the more there are.

3. They provide liquidity

4. Insurance companies manage risk

↳ low admin costs

5. Deal with information issues

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Problems with Asymmetric Information:

- Adverse selection → the wrong people come forward
  → sick people buying life insurance

Solved by: intensive screening

- Moral Hazard → taking more risk once you're insured

Solved by: monitoring
ex: suicide clause
clauses in contracts to prevent risky behaviour

Market for Lemons (used car market)

- lemons = bad cars
- 1 price since you can't tell good from bad
- Good cars are driven out of the market b/c prices are too low
- How to sell a good car??
  → certification / warranty
  ie. screening

TRANSFORMATIONS

1. payments intermediation

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2. denomination intermediation
   ↳ take a big number $ split it up

3. default intermediation
   ↳ pooling vs. individual risk

4. maturity intermediation
   ↳ create long-term assets with short-term ones

5. interest rate intermediation
   ↳ lender who wants guaranteed rates or vice-versa
   ↳ borrower who wants variable ones

6. capital value intermediation
   ↳ portfolios

7. liquidity intermediation
   - physical asset → money
     using lines of credit

markets are clarified

1. Type of transaction → is there a middle man?

   indirect → bank → manager - commercial lending

   direct → brokered - realestate

2. Selling or reselling

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- primary → IPO, seasoned offering
  → need investment bank

- secondary → stock market
  → any capital account

3. Duration

- short
  - 1yr or less
  - "money market"
  - t-bills, commercial paper

- medium
  - 1-5 years
  - bond market

- long
  - 10 years
  - mortgage market

4. Size

- Retail

- Wholesale (bigger)

5. Style

- open market → auction (public)

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- face-to-face (private)

6. Sectoral

- Consumers, C
- Businesses, I
- Foreign, NX

7. Complexity

- deposit
- ABS → asset backed security

8. Time

- spot market
- futures / forwards markets
  - ↳ i rates
  - ↳ exchange rates

9. Regulated vs. Unregulated

- OSFI (regulator)

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- private placements
  - ↳ unregulated
  - ↳ buyer beware

Conflict of Interest

examples:

- real estate agent who represents both buyer & seller
- senator who is receiving donations from oil companies (USA)

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