

# The Power of Microeconomics

Lecture Ten:  
The Capital Market, Interest, and Profits



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## Factors of Production: Capital

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- This is one of the most important and useful areas of microeconomics that we can master.
- By understanding the nature of **capital markets**, we can answer questions that have enormous application to both our personal and professional lives.



## On A Personal Level

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- Should I rent or buy a home now?
- Should I quit my job to go back to school for a business or law degree?
- Should I buy that expensive, energy-efficient refrigerator or pop for the cheaper model?
- Should I invest in a portfolio of high-risk, high-technology stocks or settle for some safer, tax-free municipal bonds?

## **At A Professional Level**

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- Capital analysis can help business executives answer questions like:
  - Should I invest in new plant and equipment?
  - Should I expand my firm?
  - How much inventory should I maintain?

## Real and Financial Capital

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- Provides a framework for evaluating new capital investments over time.
- Let's start by distinguishing between **real capital** – the bricks and mortar and machines.
- **Financial capital** – the stocks and bonds and other loanable funds -- used to finance real capital.



## Three Categories of Capital Goods

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- **Structures** such as factories and homes.
- Consumer **durable goods** such as automobiles and producer durable **equipment** like machine tools and computers.
- **Inventories** and includes things like cars in dealers' lots.

## Three Categories of Capital Goods

- All three categories of capital are bought and sold in capital goods markets.
- **Example:** IBM sells computers to businesses
- The computers are used to improve the efficiency of payroll systems or production management.



## Allocating Capital

- Should a country devote its investment resources to heavy manufacturing like steel or to information technologies like the Internet?



## What Should They Do?

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- Should Intel build a \$4 billion factory to produce the next generation of microprocessors?
- Should Farmer Jones, hoping to improve his record-keeping, buy a customized accounting program or make do with one of the popular varieties available for around \$100?
- This is where interest rates and the rate of return to capital comes in.

## Capital Investment



- When we invest in capital, we are laying out money today to obtain a return in the future.
- In deciding upon the best investment to make, we need to know how much the money we will use is going to cost us -- that's the **interest rate**.
- We also need to know how much the investment will earn – that's the **rate of return**.

## The Interest Rate



- The price paid for the use of **loanable funds**, where the term loanable funds is used to describe funds that are available for borrowing.

### Key Definition

The **interest rate** is the amount of money that must be paid for the use of one dollar of loanable funds for a year.

## Typically A Percent



- Because it is paid in kind, interest is typically stated as a percentage of the amount of money borrowed rather than as an absolute amount.
- It is less clumsy to say that interest is 12 percent annually than that interest is "\$120 per year per \$1000."

## An Easy Comparison



- Stating interest as a percentage makes it easy to compare interest paid on loans of different absolute amounts.
- **Example:** By expressing interest as a percentage, we can immediately compare an interest payment of, say, \$432 per year per \$2880 and one of \$1800 per year per \$12,000.
- Both interest payments are 15% -- which is not obvious from the absolute figures.



## The Rate of Return on Capital

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- Is the additional revenue that a firm can earn from its employment of new capital.
- This additional revenue is usually measured as a percentage rate per unit of time -- the annual net return per dollar of invested capital -- which is why it is called the **rate of return on capital**.

## **Example: Calculate the Rate of Return**

- Say the company buys a used Ford for \$10,000 and then rents it out for \$2,500 per year.
- After calculating all the expenses associated with owning the car such as maintenance, insurance, and appreciation, and ignoring any changing car prices, Ugly Duckling earns a net rental of \$1200 each year.
- So what is the rate of return?

**Pause the presentation now if you want to do this exercise.**

## **Answer: 12%!**

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- We calculate that simply by dividing the net rental of \$1200 per year by the initial investment outlay for the Ford of \$10,000.
- And note that the rate of return is a pure number per unit of time.
- That is, it has the following form: dollars per period divided by dollars.

## Another Example



- Suppose I buy a bottle of grape juice for \$10 and then sell it a year later as wine for \$11.
- What is my rate of return on this investment assuming that I have no other expenses?

**Pause the presentation now if  
you want to do this exercise.**

## That's Right

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■ Answer: 10% per year or \$1/\$10.



## LECTURE TEN - PART TWO



## Let's Understand "Depreciation"

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- A very important concept in the analysis of capital.
- Both investment and depreciation are **flow** concepts, meaning that they are measured per unit of time.
- This is in contrast to capital which is a **stock** concept, meaning that capital is measured at a given point in time.

## Depreciation

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- An estimate of the loss in the dollar value of a capital good due to obsolescence or wear and tear during a period of time.
- Corporations are allowed to treat depreciation as an expense on their taxes just like other expenses like labor costs and raw materials.

## **Depreciation and Investment**

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- When depreciation over a period of time exceeds investment over the same period of time, the capital stock will decrease whereas if investment exceeds depreciation, the capital stock will increase.

## Question!

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- Suppose the firm ends its fiscal year with a capital stock of \$1,000,000.
- Over the course of the current year, the firm invests \$100,000 in new plant and equipment.
- At the same time, it incurs depreciation of \$200,000.

### Question

What is its capital stock at the end of the current year?

### Answer

\$900,000

## Interacting Variables

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- Now that we understand both the interest rate and the rate of return, let's next come to understand how the **interaction of these two variables** determine investment decisions in a market economy.

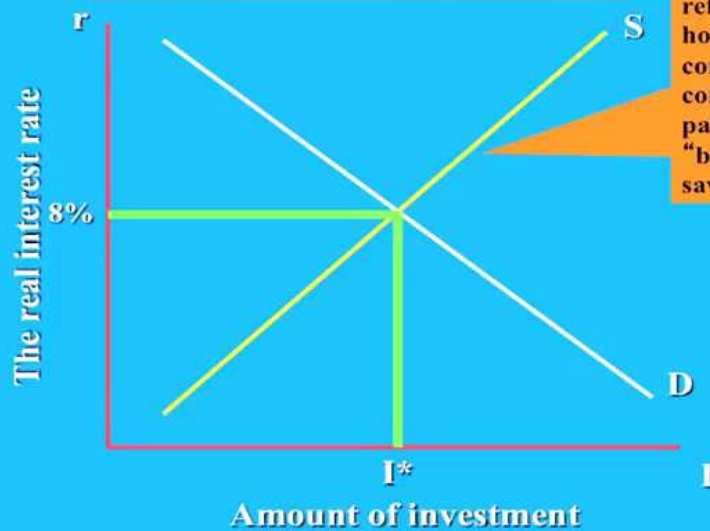
## The Theory of Loanable Funds

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- Firms will demand **loanable funds** to invest in new projects so long as the rate of return on capital is greater than or equal to the interest rate paid on funds borrowed!
- Let me demonstrate this for you by first introducing the **theory of loanable funds**.

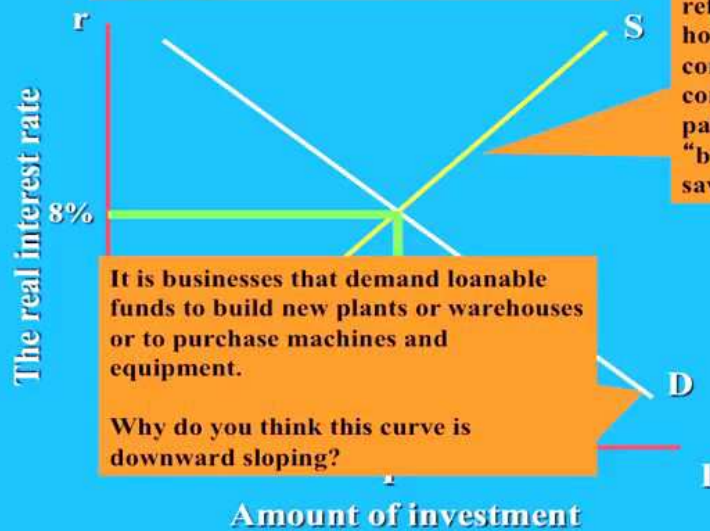


The theory of loanable funds is based on the assumption that households supply funds for investment by abstaining from consumption and accumulating savings over time.



The upward sloping supply curve of loanable funds reflects the idea that households prefer present consumption to future consumption and must be paid an interest rate "bribe" to induce them to save rather than consume.

The theory of loanable funds is based on the assumption that households supply funds for investment by abstaining from consumption and accumulating savings over time.



The upward sloping supply curve of loanable funds reflects the idea that households prefer present consumption to future consumption and must be paid an interest rate "bribe" to induce them to save rather than consume.

It is businesses that demand loanable funds to build new plants or warehouses or to purchase machines and equipment.


Why do you think this curve is downward sloping?

## Other Things Equal



- There will be more potential investments that will be profitable at lower interest rates than at higher interest rates.
- In the Ugly Duckling example, the company bought a used Ford for \$10,000, earned a net rental of \$1,200, and wound up with a 12% rate of return on its investment.

## Example



- Suppose the company wants to borrow some money from the market for loanable funds to buy an identical used Ford and it projects an identical rate of return on its investment.
- If the interest rate is 10 percent, it will surely borrow the money because the rate of return that it can earn using the funds exceeds that.
- However, suppose the interest rate is 15%.
- What will it do?

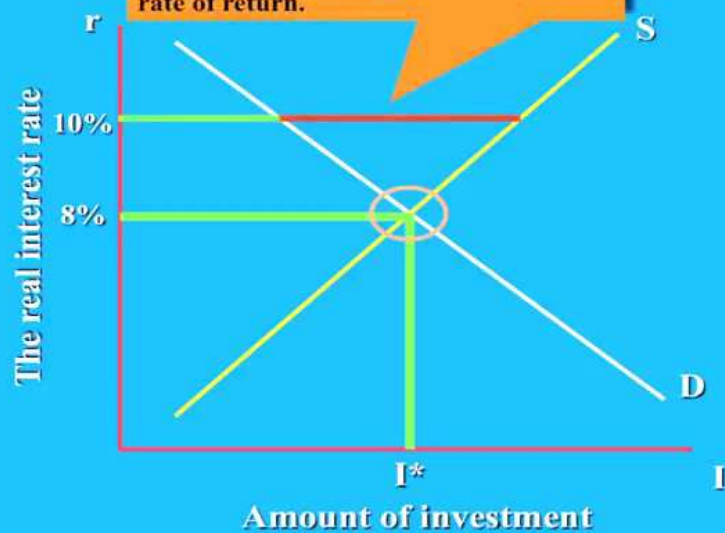
**Pause the presentation now to answer this question.**

## **It Won't Borrow Money**

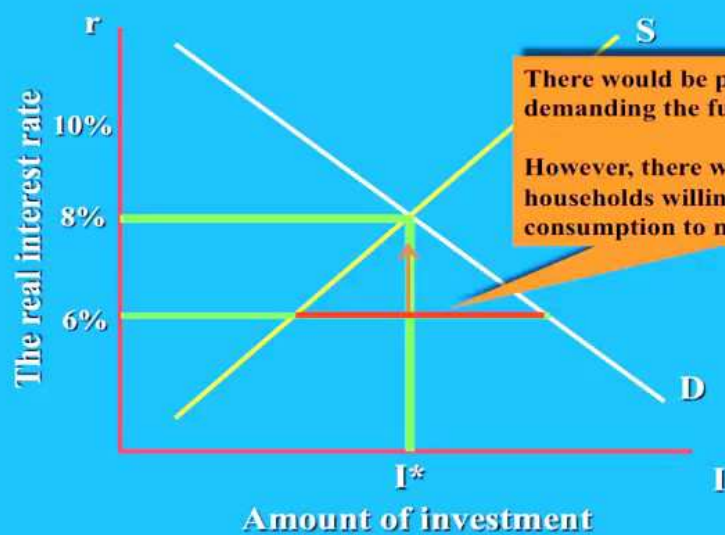
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- It therefore won't make the new investment.
- This example not only shows us why the demand curve for loanable funds is downward sloping.
- It also helps explain equilibrium in the market where the supply of funds equals the demand for funds.

The supply of funds would exceed the demand for funds because not enough businesses could find investments capable of generating at least a 10% rate of return.







There would be plenty of businesses demanding the funds.

However, there wouldn't be enough households willing to forego present consumption to meet the demand.

## Two Interest Rate Functions



- It rations out society's scarce supply of capital goods for the uses that have the highest rates of return.
- It induces people to sacrifice current consumption in order to increase the stock of capital.



## **LECTURE TEN - PART THREE**

## **Shifts in Demand and Supply**

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- How might events in the real world cause the demand and supply curves to shift and thereby change the interest rate and the economy's level of investment?

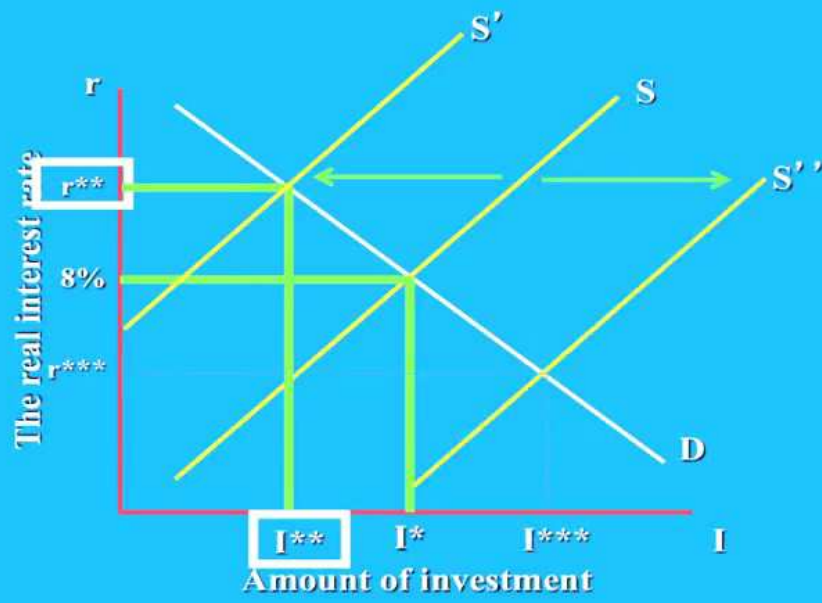
## A Supply Shift Example

- Suppose the federal government significantly expands the social security retirement program.

### Question

What is this likely to do to the supply curve for loanable funds and the market rate of interest?

**Pause presentation to answer this.**





## What About the Supply Side?

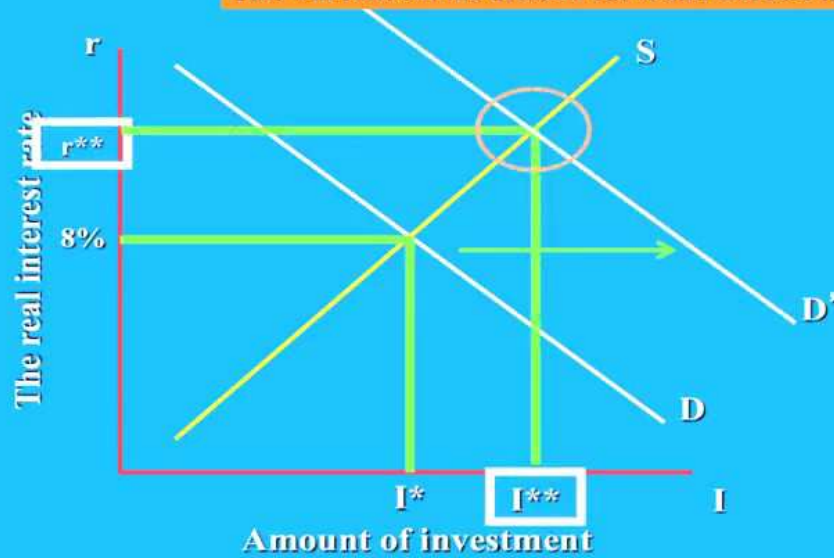


- Suppose the economy had been in a deep recession, but now is moving towards full employment.
- What do you think will happen to the interest rate and why?

**Pause presentation to think about this.**

As the economy improves, more businesses are likely to increase their investment in new plant and equipment.

This will shift out the demand curve and increase the interest rate.



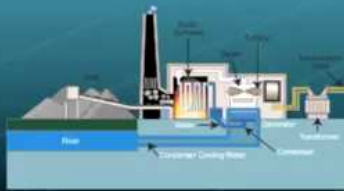
## The Investment Decision



- In the example above, we made it easy to evaluate the firm's investment decision.
- We made it easy by limiting the investment horizon to only one year.
- That is, we invested in something at the beginning of the year and got our return at the end of the year.

## Investment Analysis Over Time

- That's a pretty artificial example.
- Most investments last more than one year.
- From a few years for a new computer or some office furniture to 30 to 40 years for an electric power plant and more than 50 years for a big skyscraper.



## Key Question

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- How do you evaluate an investment when your capital outlay occurs today but the benefits from that investment come in the form of a revenue stream over many years?

## Net Present Value

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- In order to answer this question we have to introduce one of the most important concepts in economics: **net present value**.
- And before I explain this concept, let me point out that net present value goes by various other names, including **present discounted value** or just plain present value.



## Net Present Value

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- The concept behind NPV is that it provides us with the **time value of money**.
- NPV is defined as the dollar value today of a stream of income over time.
- Measured by calculating how much money invested today would be needed, at the going interest rate, to generate the asset's future stream of receipts.
- Let's give this definition some real world context so we can really wrap our minds around it.

## An NPV Example

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- Suppose you own an apartment building which generates rental payments of \$10,000 per month from your tenants.
- Suppose your tenants are always calling you up in the middle of the night to complain about a leaky faucet or a blocked toilet or a broken waste disposal.

## You Decide To Sell The Building

- **Question:** How much should you sell it for?
- More specifically, what lump sum of money today would make you at least as well off as that stream of rental payments that you would get over the life of the building?

## A Simple NPV Example



- Suppose somebody offers to sell you a bottle of wine that matures in exactly one year and the wine can be sold for \$11 at the end of the year.
- **Question:** Assuming that the market interest rate is 10 percent per year, what is the present value of the wine -- that is, how much would you pay for the wine today?

**Pause the presentation now if you want to do this exercise.**

## The Most You Would Pay



- Is \$10 because 10 dollars invested today at the 10% market rate of interest would yield you \$11 at the end of the year.
- In other words, the present value of next year's eleven-dollar wine today is \$10.

## Present Value for Perpetuities

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- Okay, that's an example for only a one-year investment.
- Now, let's go to the other extreme by examining what's called a **perpetuity**.
- A perpetuity is an asset like land that lasts forever and pays a certain amount of dollars per year from now to eternity.
- So how would you evaluate a perpetuity?



## A Simple Formula



■  $V = N/i$

- V equals the present value of the land.
- N is the permanent annual receipts from the land.
- i is the interest rate in decimal terms.

### Question

if the interest rate is 5% per year and the perpetuity yields \$100 a year, what would be the net present value of the perpetuity?

### Answer

\$2000 or simply \$100 divided by 0.05.

## Selling the Apartment Building

- We can use this formula for a **perpetuity** to determine what the selling price of our hypothetical apartment building should be.
- But first we have to make some further assumptions.

## Assume

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- The prevailing interest rate is 5%.
- After expenses, our monthly rental income of \$10,000 is reduced to \$5,000, or \$60,000 for the year.

### Question

Based on that net rental income and assuming that the building will last forever, what is the least amount of money that we should sell the building for?

**Pause the presentation now if you want to do this exercise.**

## The Selling Price



- Should be at least \$1.2 million, which is found simply by dividing \$60,000 by the interest rate.

### Question

What would the selling price be if the interest rate were 10%?

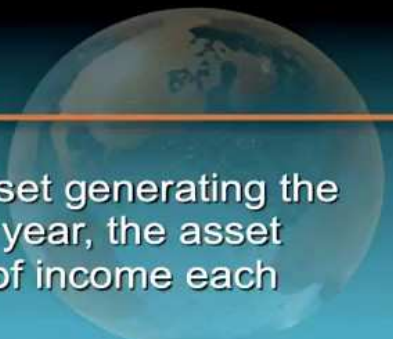
### Answer

It would be only \$600,000.



## LECTURE TEN - PART FOUR

## NPV In the Real World



- Suppose that instead of an asset generating the same amount of income each year, the asset generates a different amount of income each year.
- Instead of generating a stream of income from now to eternity, the asset generates a stream of income over a fixed period of time – maybe 5 years, maybe 10 years, maybe 50 years.



## **You Are a Textile Industry CEO**

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- Your company is considering replacing your old mechanical looms with a set of highly computerized looms.
- But these new machines won't come cheap.

## **The Price Tag: A Cool \$2 Million**

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- Note, however, that your chief economist forecasts that these new machines will increase revenues by \$500,000 for each of the five years of the service life of the looms.
- Also, at the end of five years, the machines will have a salvage value of another \$500,000.

## From This Data

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- It may seem pretty obvious that the company should make the investment.
- After all, while the machines will cost \$2 million, they will generate an even cooler \$3 million in revenues and salvage value over the five-year period.

## An Important Equation

- Let's not forget about the time value of money.
- And here's the formula you would use to calculate the net present value of this investment.

$$NPV = -(I_0) + \frac{N_1}{1+i} + \frac{N_2}{(1+i)^2} + \dots + \frac{N_t}{(1+i)^t} + \dots$$

$$\text{NPV} = -(I_0) + \frac{N_1}{1+i} + \frac{N_2}{(1+i)^2} + \dots + \frac{N_t}{(1+i)^t} + \dots$$

- $I_0$ : Initial investment at time period zero.
- $i$ : One-period market interest rate (assume at 15%).
- $N_1$ : Net receipts from investment in first period.
- $N_2$ : Net receipts in the second period, and so on.
- The sum of the initial investment and the stream of payments –  $N_1$ ,  $N_2$ , and so on – will have the present value NPV given by the formula.

## Here's The Math

$$\begin{aligned} \text{NPV} &= \boxed{-\$2\text{M}} + \overbrace{\frac{500\text{K}}{1.15} + \frac{500\text{K}}{1.15^2} + \frac{500\text{K}}{1.15^3} + \frac{500\text{K}}{1.15^4} + \frac{500\text{K}}{1.15^5}}^{\text{Income stream}} + \overbrace{\frac{500\text{k}}{1.15^5}}^{\text{Salvage value}} \\ &= -\$2\text{M} + \$1,924,664 \\ &= \boxed{-\$75,336} \end{aligned}$$

## When The NPV Is Negative

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- Your company should not make the investment.
- This is despite the fact that over the life of the investment, the investment will generate an undiscounted sum a full half million dollars greater than the initial investment!!!!



# Investment Is Interest-rate Sensitive!

## Question

What if the interest rate were 5%. Would your company now make the investment?

**Pause the presentation now if you want to try your hand at the math!**

**Yes, You Would Make The Investment!**

$$\text{NPV} = -\$2\text{M} + \frac{500\text{K}}{1.05} + \frac{500\text{K}}{1.05^2} + \frac{500\text{K}}{1.05^3} + \frac{500\text{K}}{1.05^4} + \frac{500\text{K}}{1.05^5} + \frac{500\text{k}}{1.05^5}$$
$$= \$556,501$$

## From An Intuitive Perspective

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- The higher the interest rate, the more one has to discount the revenue stream.
- This, in turn, reduces the present value of the revenue stream and vice versa.



## **LECTURE TEN - PART FIVE**

## **Let's Do Some Real World Examples!**

- Let me show you how you can use these same formulas to solve several of the real world puzzles I posed to you in our very first lecture.

## The Refrigerator Choice



- You have a choice between a new, energy-efficient refrigerator which costs \$750 or the cheaper model at \$500.
- If you buy the energy-efficient refrigerator, your electricity bill will be \$120 a year cheaper over the 5-year life of the refrigerator.

### Question

Assuming an interest rate of 8 percent, which refrigerator should you buy?

**Pause the presentation now if you want to try your hand at the math!**



## The NPV Math

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- Subtract the purchase price of the cheaper refrigerator from the purchase price of the more expensive refrigerator to get the **net additional investment** required to buy the more expensive model.
- This is \$250, which we put a minus sign in front of because it is an investment outlay.

## A Non-Intuitive Outcome

$$\text{NPV} = \boxed{-\$250} + \underbrace{\frac{120}{1.05} + \frac{120}{1.05^2} + \frac{120}{1.05^3} + \frac{120}{1.05^4} + \frac{120}{1.05^5}}_{\$479}$$

Investment  
Outlay

$$= \boxed{\$229}$$

## To MBA or Not to MBA

- Now how about an investment in a different kind of capital, your own human capital.
- To illustrate this, let's recall the dilemma of Priscilla and Phil from our first lecture.



## **An Important Decision**

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- As a family, they are trying to decide whether Phil should quit his job in order to enter a two-year program for his MBA.
- Phil is 45 years old, and he is making good money at his job as a salesman at a medical equipment company -- \$50,000 a year.

## What Are The Benefits And Costs?

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- Phil is stuck in his job and can't really advance without additional education.
- With an MBA degree, Phil could move into the corporate side of the company and make at least \$85,000 a year until retirement at age 55.
- Unfortunately, the MBA program he wants to enroll in will cost him \$80,000 -- \$40,000 a year -- and he will have to borrow money to do it as well as quit his job.

## Fortunately



- Priscilla brings home a decent salary -- one big enough to support Phil and their two children over the next two years.
- So the only question they have is whether it makes financial sense for Phil to take this major step.
- So what should Priscilla and Phil do, assuming an interest rate of 6%?

**Pause the presentation now if you want to try this exercise.**



## Here's The Numbers

- Did you remember to count Phil's foregone salary as an opportunity cost of entering the program?
- That's \$50,000 per year for two years.
- And that plus the \$40,000 tuition for two years gives an annual cost of Phil's investment in human capital of \$90,000.

$$NPV = \frac{90,000}{1.06} + \frac{90,000}{1.06^2} = \boxed{\$165,903}$$

## The Other Side Of The Coin



- Phil's incremental income from getting his MBA will be \$35,000 per year, the difference between his current and future salary.
  - However, his new salary won't start until year three.
- Properly discounting this income flow through year ten when Phil reaches retirement yields \$193,434.
- So what's the NPV of Phil and Priscilla's investment?

**Pause the presentation now to finish the math!**

## He Should Get His MBA



- That's right, it's a positive \$27,531, which is simply the difference between the NPV of the investment outlay and the NPV of the income stream.
- So Phil should go get his MBA!
- But would that still be the case if interest rates were 12 percent?

**Pause the presentation now if you want to work this one out on your own.**



## LECTURE TEN - PART SIX

## Interest Rates In The Real World

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- So far, we have assumed that there is only one interest rate in the economy and that it will stay stable over time.
- In fact, while economists often speak in terms of a single interest rate, there is actually a cluster or range of interest rates.

## Various Factors

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- This range of rates is based on a variety of factors:
  1. Degree of loan risk
  2. Length or maturity of the loan
  3. Size of the loan
  4. Taxability of the interest on the loan



## The Risk Premium

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- Suppose you have the choice of lending a \$1000 to either General Motors or the Fly by Knight Corporation.
- **Question:** Which company is most likely to pay you back with interest?

## General Motors



- If you lend your money to Fly By Knight, you would want to charge them a higher interest rate.
- This is to compensate for the risk of lending to a smaller, much less known company that might not repay the loan.
- That higher rate for risk is known as the **risk premium**.

## **Length of Maturity**

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- By the same token, the longer the term of the loan, the higher usually is the interest rate.
- This is to compensate the long-term lender for the inconvenience and possible financial sacrifice of foregoing alternative uses of his or her money for a greater length of time.

## Loan Size

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- Given two loans that are equal in both length and risk, the interest rate usually will be somewhat higher on the smaller of the two loans because the administrative costs of a large and a small loan are about the same.

## Taxability

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- Interest on certain state and municipal bonds is **tax exempt**.
- Because lenders are interested in their after-tax rate of interest, state and local governments can attract lenders even though they pay lower interest rates.

## **Example: Tax Exempt Bond Discount**

- Let's say that you earn over \$100,000 a year.
- This puts you in the top Federal marginal tax bracket which for the purposes of this example, we shall say is 28%.
- That means that for every additional dollar over \$100,000 that you earn, you must pay Uncle Sam 28 cents in taxes.



## Here's Your Choice

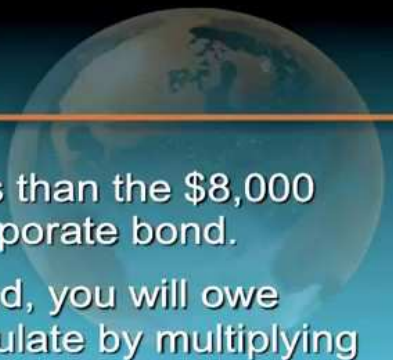


- You can invest in a \$100,000 municipal bond which pays 6% in tax-free interest.
- Or you can invest in a taxable corporate bond paying 8% interest.
- **Question:** Which bond will you choose?

**Pause the presentation now if you want to do this exercise.**



## The Tax-Free Bond



- Provides you with \$6,000 –less than the \$8,000 you would receive from the corporate bond.
- If you opt for the corporate bond, you will owe \$2,240 in taxes, which we calculate by multiplying the \$8,000 in pre-tax interest times your marginal tax rate of 28%.
- **You will prefer the lower interest rate with the tax-free bond!!!!**
- This is because you wind up, after taxes, with \$240 more than you would with the corporate bond.

## Feedback — Lecture Ten Quiz [Help](#)

You submitted this quiz on **Wed 27 Nov 2013 3:02 PM PST**. You got a score of **25.00** out of **25.00**.

### Question 1

The upward sloping supply curve of loanable funds reflects the idea that:

Your Answer	Score	Explanation
Households prefer future consumption to present consumption	Correct 1.00	
Households prefer present consumption to future consumption		
Households are indifferent to present consumption versus future consumption		
Don't know		
Total	1.00 / 1.00	

### Question 2

The theory of loanable funds is based on the assumption that:

Your Answer	Score	Explanation
1. Businesses supply funds for investment by abstaining from production and accumulating savings over time	Correct 1.00	
2. Households supply funds for investment by abstaining from consumption and accumulating savings over time		
Both 1 and 2		
Don't know		
Total	1.00 / 1.00	

### Question 3

Suppose you own an apartment building that generates rental payments of \$10,000 per month from your tenants, and you are thinking of selling the building. The lump sum payment you would accept will:

Your Answer	Score	Explanation
Decrease with the interest rate	Correct 1.00	
Increase with the interest rate		
Be independent of the interest rate		
Don't know		
Total	1.00 / 1.00	

### Question 4

Capital analysis can help business executives answer questions like:

Your Answer	Score	Explanation
Should I invest in new plant and equipment?		

## How much inventory should I maintain?

Correct 1.00

Total

1.00 / 1.00

Financial capital includes:

### Explanation

Correct 1.00

Don't know

Total

1.00 / 1.00

Which of these is NOT a category of capital goods?

### Explanation

Correct 1.00

Total

1.00 / 1.00

The cost of money is defined as:

### Explanation

Correct 1.00

Don't know

Total

1.00 / 1.00

The amount of money that must be paid for the use of one dollar of loanable funds for a year is:

### Explanation

Correct 1.00

Total

1.00 / 1.00

### Question 9

Suppose I buy a bottle of grape juice for \$10 and then sell it a year later as wine for \$11. What is my rate of return on this investment assuming that I have no other expenses?

Your Answer	Score	Explanation
1%		
5%		
10%	Correct 1.00	
Don't know		
Total	1.00 / 1.00	

### Question 10

Depreciation is a:

Your Answer	Score	Explanation
1. Flow concept	Correct 1.00	
2. Stock concept		
Both 1 and 2		
Don't know		
Total	1.00 / 1.00	

### Question 11

When depreciation over a period of time exceeds investment over the same period of time:

Your Answer	Score	Explanation
The capital stock will decrease	Correct 1.00	
The capital stock will increase		
The capital stock is unaffected		
Don't know		
Total	1.00 / 1.00	

### Question 12

Suppose the firm ends its fiscal year with a capital stock of \$1,000,000. Over the course of the current year, the firm invests \$100,000 in new plant and equipment. At the same time, it incurs depreciation of \$50,000.

Your Answer	Score	Explanation
The capital stock has decreased		
The capital stock has increased	Correct 1.00	
The capital stock is unaffected		
Don't know		
Total	1.00 / 1.00	

### Question 13

The Theory of Loanable Funds states that firms will demand loanable funds to invest in new projects so

long as:

Your Answer	Score	Explanation
The rate of return on capital is greater than or equal to the interest rate paid on funds borrowed	Correct 1.00	
The rate of return on capital is less than the interest rate paid on funds borrowed		
The rate of return on capital reaches double digits		
Don't know		
Total	1.00 / 1.00	

### Question 14

The interest rate:

Your Answer	Score	Explanation
1. Rations out society's scarce supply of capital goods for the uses that have the lowest rates of return		
2. Induces people to sacrifice current consumption in order to increase the stock of capital	Correct 1.00	
Both 1 and 2		
Don't know		
Total	1.00 / 1.00	

### Question 15

Suppose the federal government significantly expands the social security retirement program. What is this likely to do to the supply curve for loanable funds and the market rate of interest?

Your Answer	Score	Explanation
Shift the curve inward and decrease the market rate of interest		
Shift the curve inward and increase the market rate of interest	Correct 1.00	
Shift the curve outward and decrease the market rate of interest		
Don't know		
Total	1.00 / 1.00	

### Question 16

Suppose the economy had been in a deep recession, but now is moving towards full employment as businesses increase their investment in new plant and equipment. What do you think will happen to the interest rate?

Your Answer	Score	Explanation
Fall		
Rise	Correct 1.00	
Stay the same		
Don't know		

Total 1.00 / 1.00

### Question 17

What tool can you use to evaluate an investment when your capital outlay occurs today but the benefits from that investment come in the form of a revenue stream over many years?

Your Answer	Score	Explanation
1. Net present value		
2. Present discounted value		
Both 1 and 2	Correct 1.00	
Don't know		
Total	1.00 / 1.00	

### Question 18

Net Present Value is:

Your Answer	Score	Explanation
1. Defined as the dollar value tomorrow of a stream of income today.		
2. Measured by calculating how much money invested today would be needed, at the going interest rate, to generate the asset's future stream of receipts.	Correct 1.00	
Both 1 and 2		
Option text		
Total	1.00 / 1.00	

### Question 19

A perpetuity is:

Your Answer	Score	Explanation
1. An asset that lasts forever		
2. Pays a certain amount of dollars per year from now to eternity		
Both 1 and 2	Correct 1.00	
Don't know		
Total	1.00 / 1.00	

### Question 20

When an investment will generate an undiscounted sum of money greater than the initial investment outlay, your company should:

Your Answer	Score	Explanation
Always make the investment		
Never make the investment		
Make the investment only if the net present value is positive	Correct 1.00	
Don't know		
Total	1.00 / 1.00	

### Question 21

The range of interest rates is based on the:

Your Answer	Score	Explanation
1. Degree of loan risk		
2. Length or maturity of the loan		
Both 1 and 2	Correct 1.00	
Don't know		
Total	1.00 / 1.00	

### Question 22

The greater the risk:

Your Answer	Score	Explanation
The higher the interest rate	Correct 1.00	
The lower the interest rate		
Risk has no impact on the interest rate		
Don't know		
Total	1.00 / 1.00	

### Question 23

The shorter the term of the loan:

Your Answer	Score	Explanation
The higher the interest rate		
The lower the interest rate	Correct 1.00	
The length of term has no impact on the interest rate		
Don't know		
Total	1.00 / 1.00	

### Question 24

Tax-exempt loans like state and municipal bonds can typically:

Your Answer	Score	Explanation
Attract lenders even though they pay lower interest rates	Correct 1.00	
Only attract lenders by paying higher interest rates		
Tax-exempt status has no impact on the interest rate		
Don't know		
Incorrect option 1		
Incorrect option 2		
Incorrect option 3		
Total	1.00 / 1.00	

### Question 25

Assume your marginal tax rate is 20% and you must choose between a \$100,000 tax-free municipal



bond paying you an annual payment of \$6,000 at 6% versus a \$100,000 corporate bond paying out \$8,000 a year at 8%. Which would you choose to get the best after-tax return?

Your Answer	Score	Explanation
The corporate bond	Correct	1.00
The tax-free muni		
Either is fine		
Don't know		
Total		1.00 / 1.00