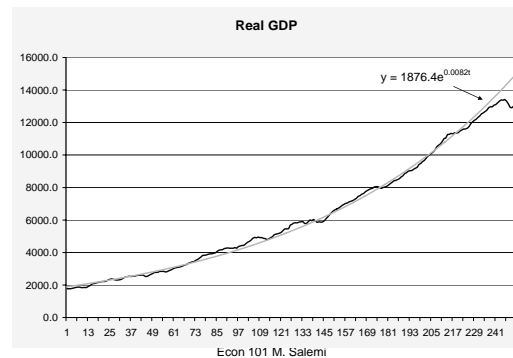


Real Rate of Interest Examples

Correction
Saving and Investment
Demand and Supply Examples
Saver Examples
Borrower Examples
What Have We Learned?

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The trend formula I showed on Nov. 12 was incorrect. Here is the correct formula which shows a quarterly growth rate of .8% and an annual growth rate of 3.2%.



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What is the Real Rate of Interest?

The Nominal Interest Rate (i) is the annual percentage increase in the nominal (current dollar) value of a financial asset.

The Real Interest Rate (r) is the nominal interest rate minus the rate of inflation expected over the coming year.

The real rate of interest measures the expected change in purchasing power of a financial asset over the coming year.

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Use Your Clicker To Answer
The Following
Graded Question

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What is the real rate of interest for June 2005 implied by the data?

- A. 5.5%
- B. 5.05
- C. 4.5%
- D. 4.0%

Date	Nominal Interest Rate	Growth in Prices over the Past 12 months
June 2005	7.5%	3%
June 2006	8.5%	3.5%

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Saving is the source of funds for capital formation.

The financial reward to saving is the real rate of interest.

A high real interest rate is an incentive to save.

National saving comprises household saving, firm saving, and government saving.

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Investment is Capital Formation

Firms acquire new capital only when the expected benefits of new capital exceed the expected costs.

Cost-benefit analysis must take into account the fact that the costs and benefits occur at different times.

The real rate of interest is a cost of investment.

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Why is the real rate of interest a cost of investment?

If firms must borrow funds, they regard the real rate of interest as a cost for an investment project.

If firms have the necessary funds, the real rate of interest is still a cost of an investment project—an opportunity cost.

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Saving, Investment, and Financial Markets

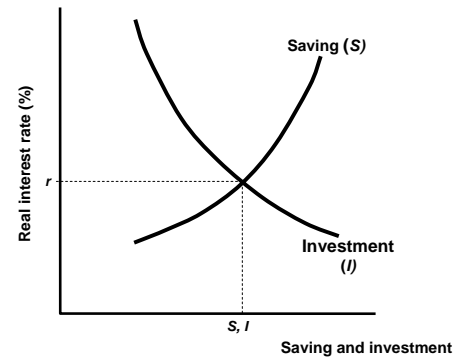
Financial markets equate the supply of funds from savers and the demand for funds by capital builders.

Demand and supply each depend on the real rate of interest.

In equilibrium, desired investment equals saving.

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In the short run, the real rate is determined by the Supply of and Demand for funds.



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Analyzing Effects Of Shocks To The Supply of Saving And Investment Demand

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What Happens When A New Technology Is Invented?

Suppose benefit-cost analysis shows that many firms believe it profitable to use the new technology.

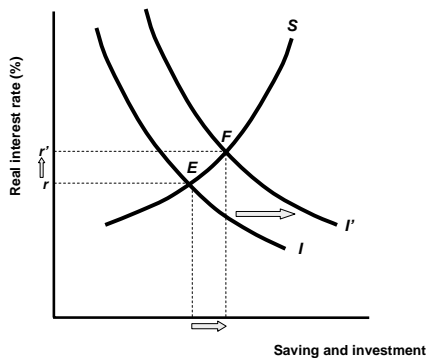
Firms demand additional funds to buy the capital that embodies the technology.

The real rate of interest rises as funds become more scarce.

The analysis holds other factors unchanged.

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The Effect of a New Technology



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Practice using the Demand and Supply for Funds Model

For each of the following scenarios, use supply and demand analysis to predict the resulting changes in:

- The real interest rate
- National saving
- Investment

Draw appropriate demand and supply diagrams.

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What Is The Impact on Saving, Investment and the Real Rate?

The legislature passes a 10 percent investment tax credit. For every \$100 that a firm spends on new capital, it receives \$10 in tax refunds.

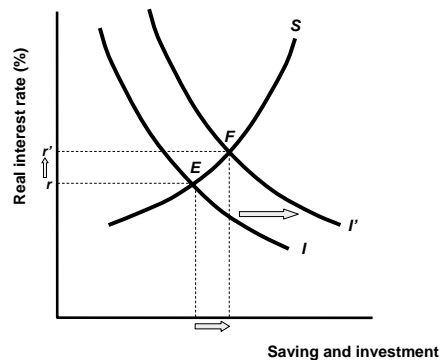
The government raises its tax on corporate profits. Other tax changes also are made, such that the government's deficit remains unchanged.

A reduction in military spending moves the government's budget from deficit into surplus.

Concerns about job security raise precautionary saving.

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The Effect of an Investment Tax Credit on Saving, Investment and the Real Rate



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Use Your Clicker To Answer
The Following
Graded Questions

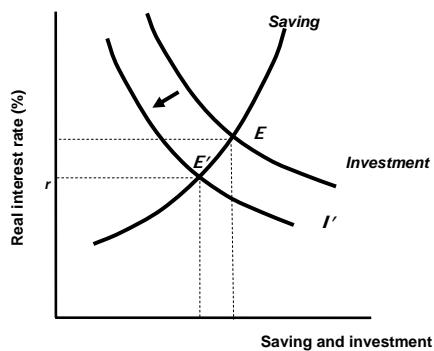
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Suppose the government raises the tax on corporate profits and lowers other taxes so that its deficit is unchanged. The policy change will _____ investment and _____ the real rate of interest.

- A. Lower, lower
- B. Lower, raise
- C. Raise, lower
- D. Raise, raise

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The Effects on Saving and Investment of an
Increase in the Corporate Profits Tax



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Which of the following changes will
raise the equilibrium rate of interest
(other factors unchanged)?

- A. An increase in household saving due to the aging of baby boomers.
- B. An increase in U.S. imports.
- C. A decrease in the U.S. government budget deficit.
- D. A decrease in saving by firms.

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Which of the following changes will lower the equilibrium rate of interest (other factors unchanged)?

- A. A decrease in household saving due to increased stock market wealth.
- B. An increase in exports with no change in imports.
- C. The onset of an economic recession that makes capital projects unattractive.
- D. The discovery of a new information technology.

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How The Real Rate Affects Personal Economic Decisions

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Example: Jerry's Dream Trip

Jerry has just graduated and found a job.

Jerry has decided that in ten years s(he) would like to take a year off to travel the globe.

To realize her dream, Jerry has decided to save something out of each paycheck.

Should Jerry use the nominal or real rate of interest as she plans how much to save?

Why?

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Use Your Clicker
To Answer
The Following
Non-Graded Question

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As she decides what amount to save for her dream trip, Jerry should use_____.

- A. The nominal rate because it keeps track of the rate at which her purchasing power will grow.
- B. The real rate because it keeps track of the rate at which her purchasing power will grow.
- C. The nominal rate because it keeps track of the rate at which her saving account will grow.
- D. The real rate because it keeps track of the rate at which her saving account will grow.

Example: Mario's Pasta Machine

Mario is the owner of an Italian restaurant in Cary. Mario would like to serve freshly made pasta but does not own a pasta making machine.

A commercial pasta machine costs \$5000.

Should Mario use the nominal or real rate of interest in deciding whether the purchase of the pasta machine is rational?

Why?

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Example: Cinema Paradiso

Michele is trying to decide how many movie screens to build.

After paying the movie distributor and meeting non-interest expenses, he expected to net \$2.00 per ticket.

Screens cost \$1,000,000 each.

How many screens should Michele build?

Number of Screens	Number of Patrons
1	40,000
2	75,000
3	105,000
4	130,000
5	150,000

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Use Your Clicker
To Answer
The Following
Non-Graded Question

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If he nets \$2.00 per patron, the price of a screen is \$1,000,000 and the real rate is 7.5% how many screens should Michele build?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

Number of Screens	Number of Patrons
1	40,000
2	75,000
3	105,000
4	130,000
5	150,000

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Cinema Paradiso

Screens	Patrons	Marginal Benefit	Marginal Cost		
			5.5%	7.5%	10.0%
1	40,000	\$80,000	\$55,000	\$75,000	\$100,000
2	75,000	\$70,000	\$55,000	\$75,000	\$100,000
3	105,000	\$60,000	\$55,000	\$75,000	\$100,000
4	130,000	\$50,000	\$55,000	\$75,000	\$100,000
5	150,000	\$40,000	\$55,000	\$75,000	\$100,000

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Cinema Paradiso

Michele's decision depends on the interest rate.

A higher rate, lowers the investment he undertakes.

Interest Rate	Optimal Number of Screens
5.5%	3
7.5%	1
10.0%	0

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Example: Using an IRA

Individual retirement accounts, or IRAs, were established by the U.S. government to encourage saving.

An individual who deposits part of current earnings in an IRA does not have to pay income taxes on the earnings deposited, nor are any income taxes charged on the interest earned by the funds in the IRA.

When the funds are withdrawn from the IRA, the full amount withdrawn is treated as income and is taxed at the individual's current income tax rate.

In contrast, as individual depositing in a non-IRA account has to pay income taxes on the funds deposited and on interest earned in each year but does not have to pay taxes on withdrawals from the account.

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Example: Greg's IRA Question

Greg, who is five years from retirement, receives a \$10,000 bonus.
He has decided to save the bonus either in an IRA or in a regular saving account.
Both accounts earn 5% nominal interest.
Greg is in the 30 percent tax bracket now and expects to be in the same bracket during retirement.
Should Greg put his bonus in an IRA?

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Example: Greg's IRA Question

How much will Greg have at the time he retires if he deposits his bonus in an ...

$$\begin{aligned} \text{IRA} & (0.70)(10,000)(1.05)^5 = \\ & (0.70) \$12,763 = \$8934 \end{aligned}$$

$$\begin{aligned} \text{Sav Acct} & (7,000)[1 + (.70)(.05)]^5 = \\ & (7,000)(1.035)^5 = \$8314 \end{aligned}$$

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What Have We Learned?

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Real Rate of Interest Examples

An increase in the real rate of interest tends to raise saving and lower investment.

Economists use demand and supply to predict the effects of a shock that shifts the saving or investment schedule.

The real rate of interest should be used when deciding how much to save for a planned future expenditure.

The real rate of interest should be used when deciding how much to invest.

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