

Saving, Investment, and the Financial System

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BSC

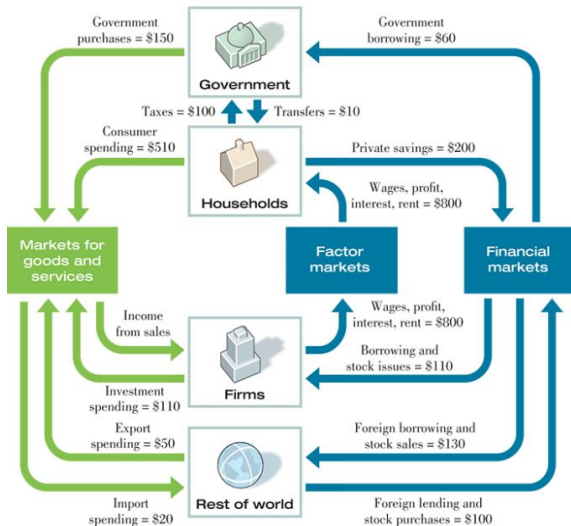
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Context

- ① We now know that physical capital is important for economic growth (CH 9)
- ② But where does it come from?
- ③ We will find the answer in this chapter
- ④ Plus we will learn about how the financial system works

How money flows through the economy

Observe the right hand side of the diagram below:



Trade of promises

- The blue arrows show how money flows in and out of the financial markets
- Governments, firms, and individuals **trade promises** , not goods in the financial markets

Our purpose is to understand where investment comes from. The Savings-Investment (SI) identity helps us do that.

Saving-Investment identity

- Who pays for private investment spending?
 - ▶ In the modern economy, individuals and firms that create physical capital often do it with other people's money.
- This is the reason why savings and investment spending are always equal for the economy as a whole. We call this Saving-Investment identity.
- Why? Let's go back to Chapter 7.

Saving-Investment identity in a closed economy

A closed economy does not trade with other countries.

- In CH 7 we learned that

$$GDP = C + I + G$$

Total income = Total spending

This is true because “one person’s income is another person’s spending”.

We’re going to manipulate these equations to derive the Savings-Investment identity.

Saving-Investment identity in a closed economy

Note that *GDP* equals economy's total income (recall the income approach). Since income is either spent or saved, let's write

Total income (=GDP) = Consumption spending + Savings

$$GDP = C + G + S,$$

where *S* is savings.

From the previous slide, we know

$$GDP = C + I + G$$

Equating two we have,

$$C + I + G = C + G + S \Rightarrow S = I$$

Savings = Investment

Food for thought

For a **closed economy** , it looks like the Savings-Investment Identity must always hold.

Does it mean that it should also hold for Chase, Neel, Anna, Alex, Will, and Cade individually? Not necessarily!

Saving-Investment identity: a closer look at savings

- By now, it is clear that savings is the source of investment. But who are the savers?
- We know households are the main savers.
- Government can save too! How?
 - ▶ If it collects more tax revenue than it spends, then there is **budget surplus**, or *government saving*
 - ▶ If it spends more than its tax revenue, then there is **budget deficit**, or *government dissaving*
- How can government function if it cannot collect enough revenue to finance its expenditures? Government borrowing!

Saving-Investment identity: National savings

Let's define budget balance as the difference between government's tax revenue and its spending

$$\text{Budget Balance} = S_{\text{government}} = T - TR - G,$$

where T is tax revenue and TR is government transfers.

When budget balance is positive $\rightarrow S_{\text{government}}$ is positive.

Note that

$$S_{\text{national}} = S_{\text{government}} + S_{\text{private}} = S$$

Since we already know $S = I$, we can say

$$S_{\text{national}} = I$$

National savings = Investment

Saving-Investment identity in an open economy

An open economy imports (from) or exports (to) other countries.

- If it imports more than it exports, there is a *Net Capital Inflow (NCI)* because it borrows the difference
- In the opposite scenario, there is a negative NCI

$$NCI = Imports(IM) - Exports(X)$$

Recall from CH 7 that,

$$GDP = C + I + G + X - IM$$

Solving for I , we obtain

$$I = \underbrace{GDP - C - G}_{\text{This is the national savings because } GDP=C+G+S} + \underbrace{(IM - X)}_{\text{This is NCI}}$$

$$\text{Finally, } I = S_{\text{national}} + (IM - X) \Rightarrow I = S_{\text{national}} + NCI$$

Investment spending = national savings + net capital inflow

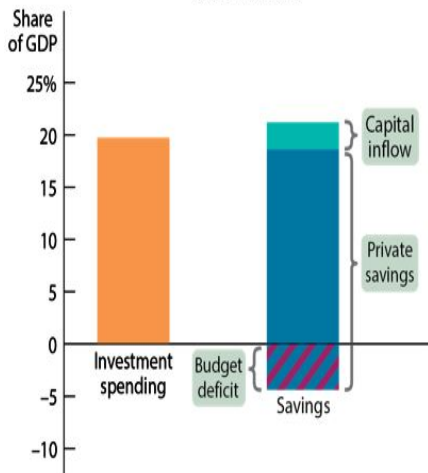
Practice question

Suppose a country exports \$50 million worth of goods and services, while it imports \$60 million worth of goods and services. This country

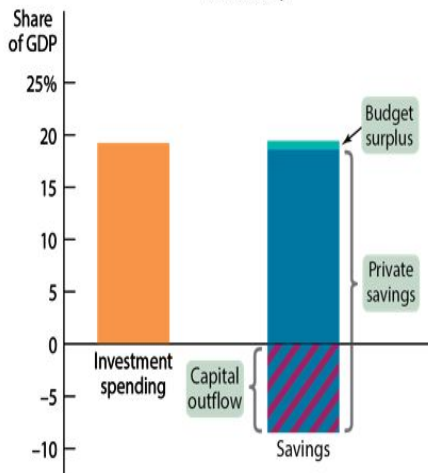
- has a positive capital inflow
- lends funds to foreigners.
- has a negative capital inflow.
- Answers (a) and (b) are both correct.
- Answers (b) and (c) are both correct.

Saving, Investment, NCI in real life

(a) United States



(b) Germany



The market for loanable funds

Market for loanable funds

- On any given day, the people with money to lend are not usually the same as people who want to borrow.
- These borrowers and savers (or lenders) are brought together by financial markets
 - ▶ Financial markets channel the savings of households to businesses that want to borrow in order to purchase capital equipment.
 - ▶ There are many financial markets. For our purposes we'll assume one market where savers and borrowers come together.
- We're now ready to define the loanable funds market!

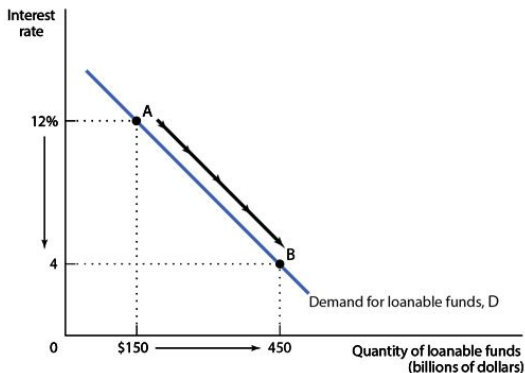
Market for loanable funds

The loanable funds market is a hypothetical market that illustrates the market outcome of the demand for funds generated by borrowers and the supply of funds provided by lenders.

- We assume the price of loans is the (nominal) interest rate.
- Since it is a market, there must be demand and supply curves of loanable funds. That's next.

Demand for loanable funds

- The demand for loanable funds comes from the firms because they need funds to buy physical capital.
- Firms borrow more when the interest rate falls because more projects will earn enough to pay for themselves.



Demand for loanable funds

- Note that firms will borrow money only if the project they plan to invest that money in is potentially profitable
 - ▶ The project is profitable only if the return from investment is higher than the cost
- To evaluate a project's profitability, firms look at the **Present Value** of the cost and return.

Present Value

- Given the interest rate, present value is the amount of money needed today to receive a given amount of money at a future date.
 - ▶ If you need \$1,000 in a year and the interest rate on savings is r , how much do you need to put in the bank now ($x = ?$)

$$\text{Answer : } x(1 + r\%) = \$1000 \Rightarrow x = \frac{\$1000}{1 + r\%}$$

If $r = 5\%$, then in this case, $x = \frac{1000}{1.05} = \952.38

Present Value

Exercise:

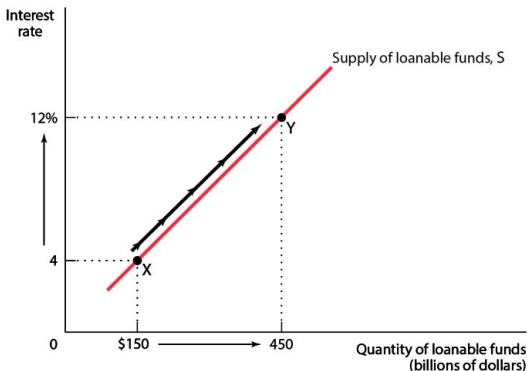
You are an Economist at Poker Inc. Your boss asks you to evaluate the economic viability of two potential investment projects, each of which will yield \$1,000 a year from now. Assume interest rate is 11.5% per year.

- 1 Project Moon requires Poker Inc. to borrow \$900 right now.
- 2 Project Zoo requires Poker Inc. to borrow \$950 right now.

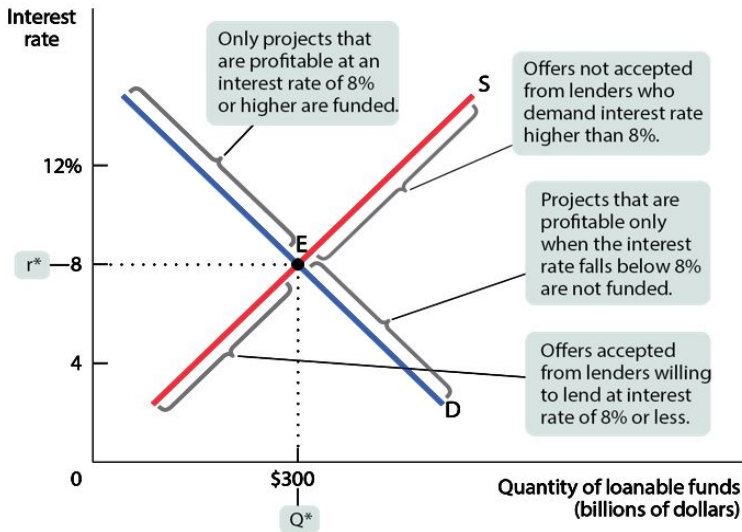
Which one would you recommend? What if interest rate were 10%? 5%?

Supply of loanable funds

- Why does the supply of loanable funds curve slope upward?
 - ▶ If you are supplying loanable funds (that is, saving), you are essentially giving up that much consumption today for a higher consumption tomorrow.
 - ▶ More people are willing to forgo current consumption and make a loan to a borrower when the interest rate is higher.



The loanable funds market equilibrium



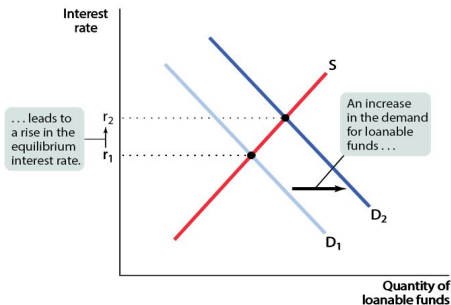
The loanable funds market equilibrium

Notice a few things from the graph in the previous slide

- The projects must return at least 8% return on investment to be financed. The projects with lower return are not funded. This promotes *efficiency*. Why?
 - ▶ The most profitable projects get priority over the less profitable ones. In that sense, the funds find the best possible use.

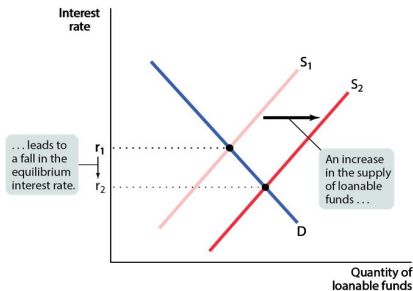
Shift in demand for loanable funds

- changes in perceived business opportunities
- changes in government borrowing
 - ▶ If government borrows from household, it reduces investment spending and leads to higher interest rates. This is called **crowding out**.
 - ▶ While crowding out may be good for an economy in depression, it is bad for private savings in normal economy.



Shift in supply of loanable funds

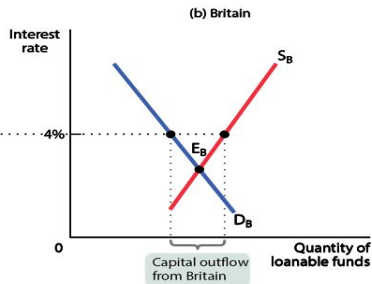
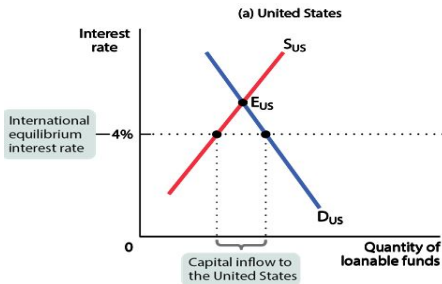
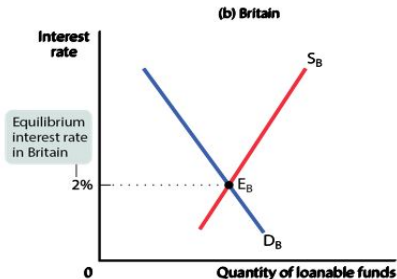
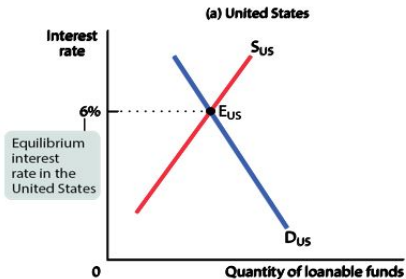
- changes in private savings behavior
- changes in net capital inflows



Global loanable funds market

- A global loanable funds market arises when international capital flows are so large that they affect interest rates across countries.
- There is an incentive for capital to flow to where the returns (interest rates) are higher. Such flow of capital out from a country into another country could **equalize global interest rate**. But there are many caveats to it.
 - ▶ For example, funds may not be allowed to flow freely from a country to another. There are costs!
 - ▶ Even if funds were to flow freely, comparing interest rates with different currencies is an issue because the exchange rates change over time.

How do the global flows of funds affect interest rates?



How are inflation and interest rate related?

Inflation and interest rate

- We now know that anything that shifts either the supply of loanable funds curve or the demand for loanable funds curve changes the interest rate.
- Major changes in interest rates have been driven by many factors, including:
 - ▶ changes in government policy;
 - ▶ technological innovations that created new investment opportunities.
- And, most important, **people's expectations about future inflation.**
- Recall that $\text{Real interest rate} = \text{nominal interest rate} - \text{inflation rate}$.
 - ▶ The true cost of borrowing (and payoff to lending) is the real interest rate.
 - ▶ But neither lenders nor borrowers know what the future inflation will be, so loan contracts specify a nominal interest rate based on **expected future inflation.**

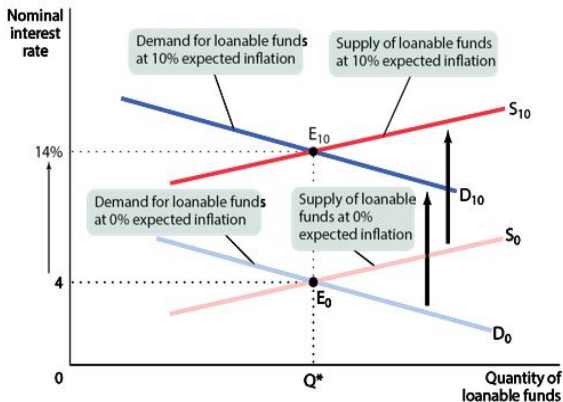
The Fisher Effect

How are the inflation expectation, nominal interest rate, and the real interest rate related? Fisher effect provides an answer.

- According to the Fisher effect, **an increase in expected future inflation drives up the nominal interest rate, leaving the expected real interest rate unchanged.**
- *If the tide rises, these boats will still float on the surface.*
- Let's see it in a graph

The Fisher Effect

According to the Fisher Effect, the expected real interest rate is unaffected by changes in expected future inflation.



The Fisher Effect

- Fisher effect says that each additional 1% increase in future inflation expectation drives the nominal interest rate up by 1%.
- Since the real interest rate remains unaffected, borrowers are willing to borrow as much as before and lenders are willing to lend as much as before. The equilibrium **real interest rate** and the **quantity of loanable funds** remains unchanged.

The Fisher Effect

Question

Suppose that expected inflation is currently 3% and nominal interest rate is 5%. Now imagine expected inflation rises to 6%.

- What happens to the real interest?
- How will the nominal interest rate be affected?
- What happens to the equilibrium quantity of loanable funds?

The Financial System

Financial system consists of financial markets and the financial institutions. Financial system has existed around the world for centuries.

- Financial markets are crucial part of a financial system
 - ▶ Financial markets are where households *invest* their current savings (or wealth) by purchasing a financial asset.
- **Wealth** is the value of a household's accumulated savings.
- **A financial asset** is a paper claim that entitles the buyer to future income from the seller. Example: share of stock, a loan, a bond.
- **A physical asset** is a tangible object that can be used to generate future income. Example, a yacht.

Remember that *investing* (buying financial or physical assets) is different from *investment spending* (adding to the current stock of physical capital).

What does the Financial System do?

- Four types of assets exist in the financial markets
 - ▶ Loans, stocks, bonds, and bank deposits
- Financial intermediaries such as banks, mutual funds, pension funds, and life insurance companies facilitate flow of funds from one person to another.
- Financial system performs three major tasks
 - ① **Reducing transaction costs:** these are the expenses of negotiating and executing a deal.
 - ② **Reducing risk:** by offering opportunity for diversification.
 - ③ **Providing liquidity:** Liquidity is a measure of how quickly an asset can be converted into cash with relatively little loss of value. Your checking account balance is liquid asset, while your home is an illiquid asset.

Financial fluctuations

It is clear that financial system is quite crucial for long run economic growth. But it doesn't always function well. When it fails, the price of the financial assets fluctuate. What causes the fluctuation in asset prices?

- the demand for stocks

- ▶ Demand for a stock depends on what the investors think about how the company will do in future.
- ▶ In particular, people's expectations about the stock's future value or price determines today's demand for stocks.
- ▶ As the expectations change, so do the demand and the price.
- ▶ Demand also depends on the attractiveness of a substitute asset.
 - ★ Domino's announces that it forecasts higher than expected profits due to soaring orders of its new pizza
 - ★ Apple announces that it expects loss as iPhone 13 is a failure
 - ★ Lakers announce that LeBron James might leave them soon

Financial fluctuations

What causes the fluctuation in asset prices?

- the demand for other assets
 - ▶ The same thing applies to other assets as well.
 - ▶ For example, the demand for real estate depends on what the investors think will happen to the market in future.
 - ▶ Investing in real estate normally has two purposes: regular flow of rent income and expectation of higher value of real estate in future.
 - ▶ It also depends on the attractiveness of a substitute asset.
 - ★ if the interest rate on bonds increases, stocks or real estate may be less attractive

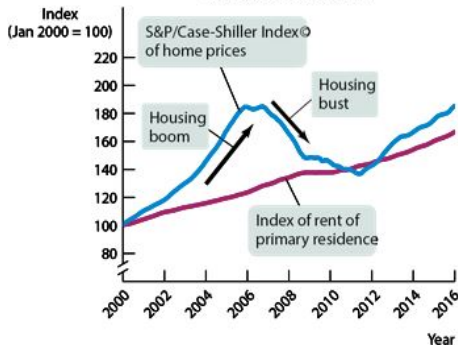
Financial fluctuations

What causes the fluctuation in asset prices?

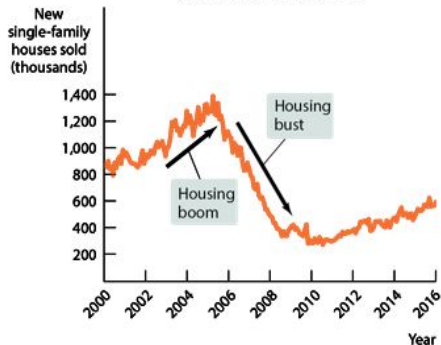
- How are asset price expectations determined?
 - ▶ Efficient market hypothesis
 - ★ Says that stock prices always reflect their fair value—they are neither under-priced nor overpriced. Any movement in stock price is due to new information about the underlying fundamentals. The problem with this view is that it assumes people are rational. Many economists argue people could be irrational.
 - ▶ Asset price fluctuations depend on how irrational people are. What determines irrationality?
 - ★ overconfidence
 - ★ loss aversion
 - ★ herd mentality

The Great American Housing Bubble 2007-08

(a) Home Prices vs. Rents



(b) Annual New Home Sales



The Great American Housing Bubble 2007-08

- Between January 2000 and summer 2006, home prices more than doubled in the major U.S. cities.
- Many economists warned that such high increase was a *bubble* and was due to **unrealistic expectations about future prices** of houses.
- The then Fed chair Alan Greenspan denied this until the markets collapsed in the summer of 2007. He later conceded that there had been a bubble.
- As house prices started falling **expectations about future prices were revised downward**, precipitating a sudden dramatic fall in housing prices. And there was the collapse! That collapse created severe stress on the banking system.

Group work

- ① The Great American Housing Bubble
- ② Business case- Grameen Bank: Banking Against Poverty