

# **LSE EC1B5 2022/23**

## **Macroeconomics**

Handout 9

**Credit Market:**

**Consumption, Saving and Investment**

## Key Ideas

1. Credit demand curve and credit supply curve (from consumption, saving and investment decision)
2. The credit market equilibrium determines the real interest rate.

# What Is the Credit Market?

## **Debtors, or borrowers**

Economic agents—such as entrepreneurs, businesses, home buyers, college students—who borrow funds.

## **Credit**

The amount of funds that the debtor receives.

## **Nominal Interest rate ( $i$ )**

The additional payment, above and beyond the principal (the loan amount), that a borrower has to repay on a \$1 loan.

# Credit Demand Curve

- Businesses
  - Start-up (entrepreneur)
  - Expansion (business investment)
  - Pay workers salary or other bills when revenue is temporarily low
- Consumers
  - Purchase of consumer durables such as house, cars
  - Smooth consumption when income is temporarily low
  - College students (investment in human capital)

*Total interest payments* =  $i \times \text{\pounds}L$

where  $\text{\pounds}L$  is the loan amount.

Suppose you borrow \$20,000, with a promise to pay it back in one year.

**Question:** What are your total interest payments?

**Answer:** It depends on the nominal interest rate

| Total Loan Amount | Nominal Interest Rate | Total Interest Payments |
|-------------------|-----------------------|-------------------------|
| £20,000           | 1%                    | £200                    |
| £20,000           | 5%                    | £1,000                  |
| £20,000           | 10%                   | £2,000                  |
| £20,000           | 50%                   | £10,000                 |

## Nominal vs. Real Interest Rate

- What matter for the borrowing decision is not just the nominal interest rate because the real price of the loan depends on the changes in the purchasing power of the £1 from this year to next, i.e. the inflation rate.
- We do not derive utility from £ directly, but through what it can buy.



## Nominal vs. Real Interest Rate

- Imagine there is only one consumption good in the economy – apple.
- Let's say the nominal interest rate is 10%, so the total gross payment is £22,000. Its real value depends on how many apples it can buy in a year.
- Higher inflation rate implies that it can buy less, thus the “real price of the loan” is lower because you are paying back less apple.
- The simplest way is to think like “you are borrowing apple now and paying back apple in a year.”

### *The Fisher equation*

The real cost of a £1 loan for a year:

$$r = i - \pi$$

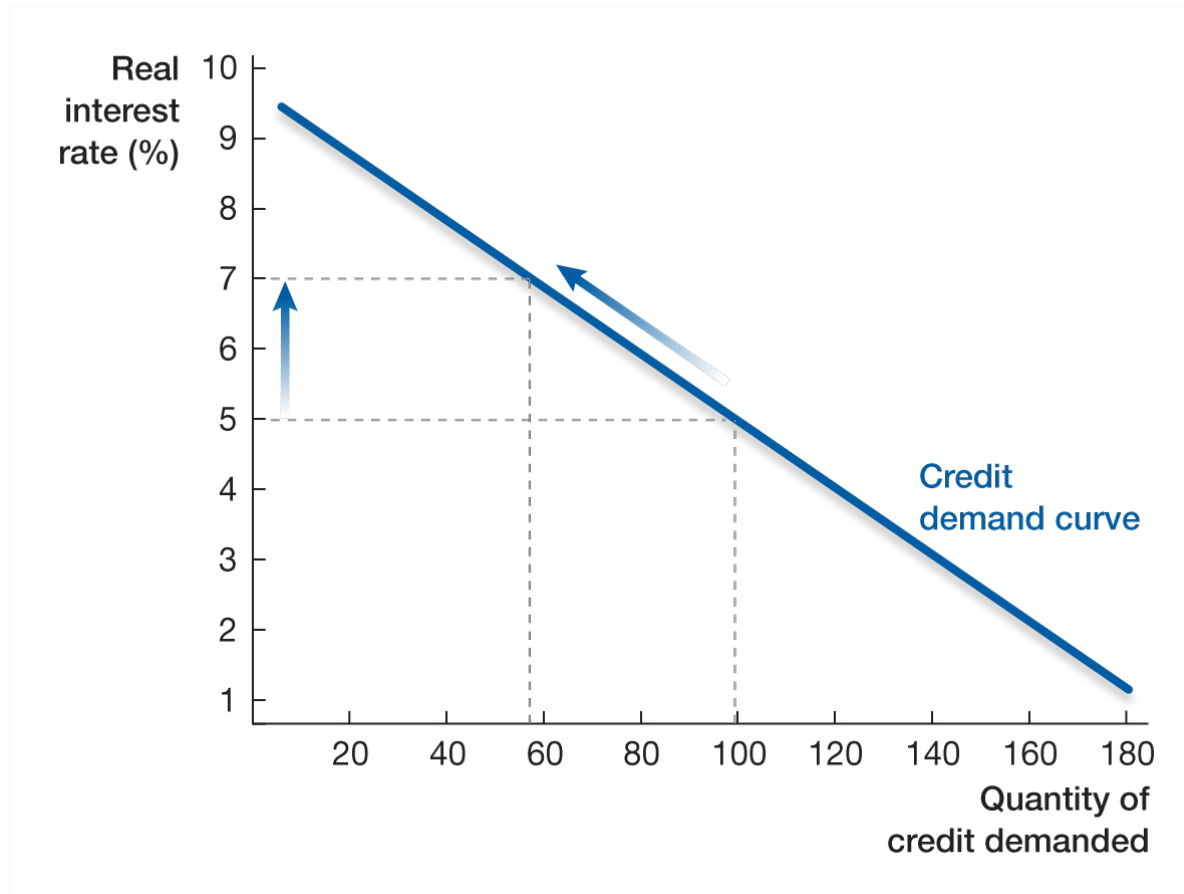
where

$r$  is the real interest rate

$i$  is the nominal interest rate

$\pi$  is the rate of inflation

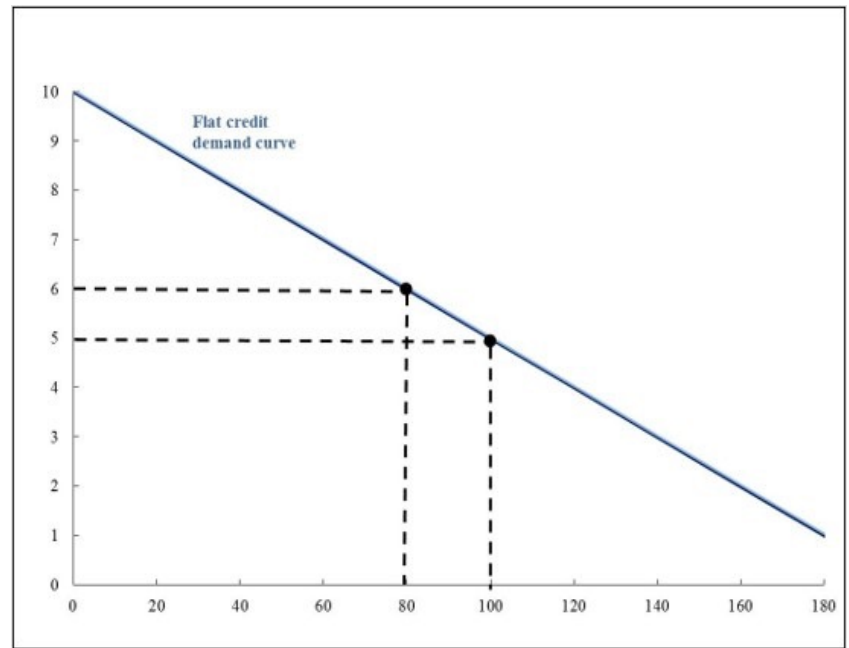
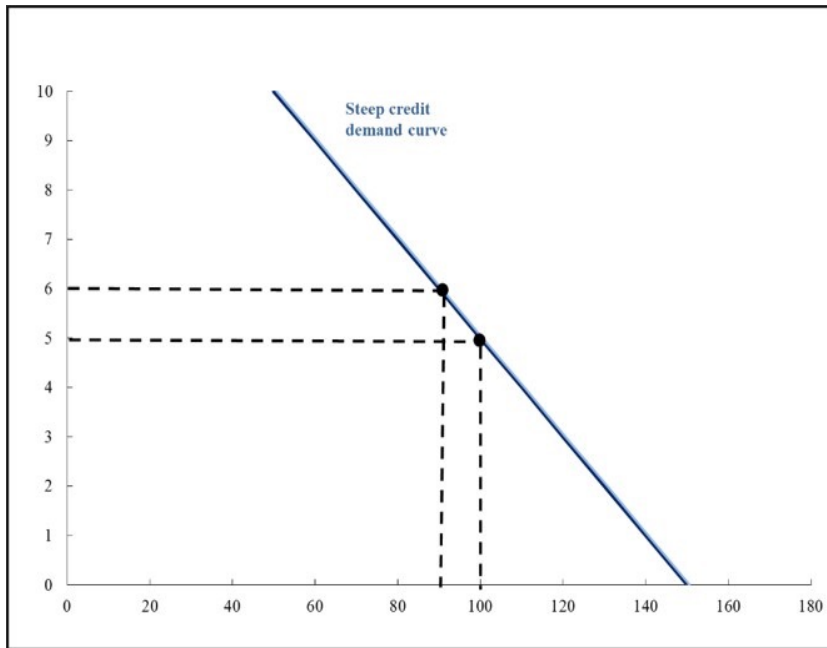
# Credit Demand Curve



The **steepness** of the credit demand curve tells us the sensitivity of the relationship between the real interest rate and the quantity of credit demanded.

- A relatively steep credit demand curve implies that the quantity of credit demanded doesn't change that much in response to variation in the real interest rate.

## Why the slope matters



## Shift in Credit Demand Curve

The credit demand curve **shifts** with changes in any of the following:

1. Perceived business opportunities for firms
2. Household preferences or expectations
3. Government policy

# Credit Supply Curve

## Credit Supply Curve

- Where do banks obtain the money that they lend out? From the deposits they hold!
- Deposits come from savers – someone who postpones current consumption to future (Saving is for future consumption)
- Banks play the role of middleman, obtaining deposits and lending out loans



**Question:** What do people save for?

**Some answers:**

1. Retirement – consumption smoothing
2. Their kids (bequests)
3. Consumer durables such as computer, car, house, or other large purchase
4. To start a business
5. A “rainy day” (insurance)

## Consumption vs. Saving

- The consumption and saving decision is an application of what you have learnt in Michaelmas Term under “Household Behaviour” on the consumption choice over two goods.
- Here the two goods are current consumption  $c_1$  vs. future consumption  $c_2$ .
- The consumer lives for two periods: current and future.

## Life-time budget constraint

- In the current period, she decides how much to consume and how much to save:

$$c_1 + S = y_1$$

- In the future period, she consumes all her saving and life ends:

$$c_2 = (1+r) \times S + y_2$$

- The life-time budget constraint becomes:

$$c_1 + \frac{c_2}{1+r} = y_1 + \frac{y_2}{1+r}$$

## Optimal consumption choices

- The relative price of current consumption in terms of future consumption is  $(1+r)$  – if you give up consuming one apple today, you receive  $(1+r)$  unit of apple in a year.
- The optimal  $(c_1, c_2)$  is when the marginal rate of substitution across current and future consumption is equal to the relative price.

## Consumption vs. Saving

- If the optimal point is such that your choice of current consumption is below your current income, then you save.
- If the optimal point is such that your choice of current consumption is above your current income, then you borrow

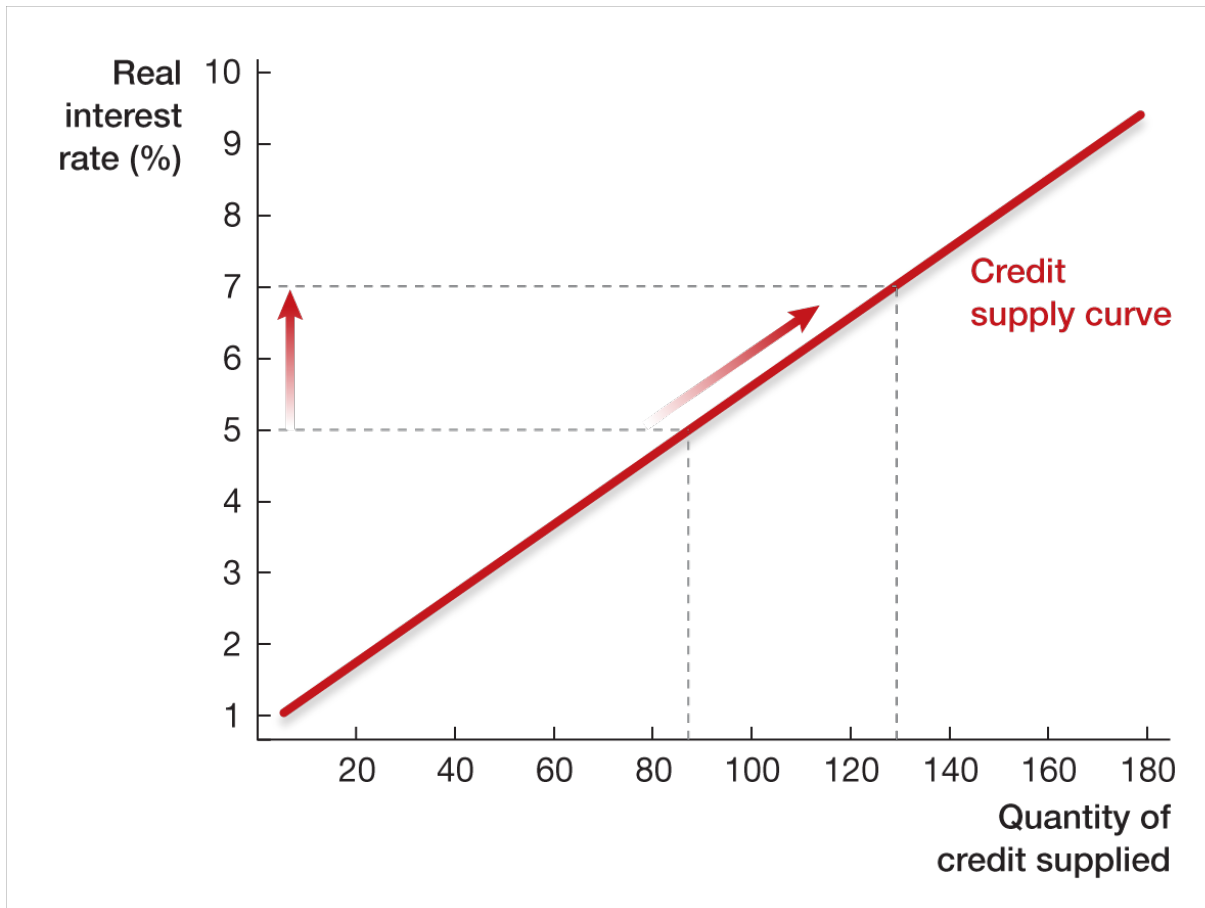
## Consumption vs. Saving

- What if real interest rate  $r$  increases?
- There are both substitution and income effects
- Substitution effect – the relative price of current consumption increases, so  $c_1 \downarrow$  and  $c_2 \uparrow$
- Income effect depends on whether you are a saver or a borrower:
  - Saver: income increase so  $c_1 \uparrow$  and  $c_2 \uparrow$
  - Borrower: income falls so  $c_1 \downarrow$  and  $c_2 \downarrow$

## Consumption vs. Saving

- The total effects are:
  - Saver:  $c_2 \uparrow$ , i.e. save more for future consumption
  - Borrower:  $c_1 \downarrow$ , i.e. borrow less for current consumption
- The credit supply curve is upward sloping.
- The credit demand curve is downward sloping for consumer (just as credit demand curve is downward-sloping for firm) .

# Credit Supply Curve





## Shift in Credit Supply Curve

The credit supply curve **shifts** with changes in either of the following:

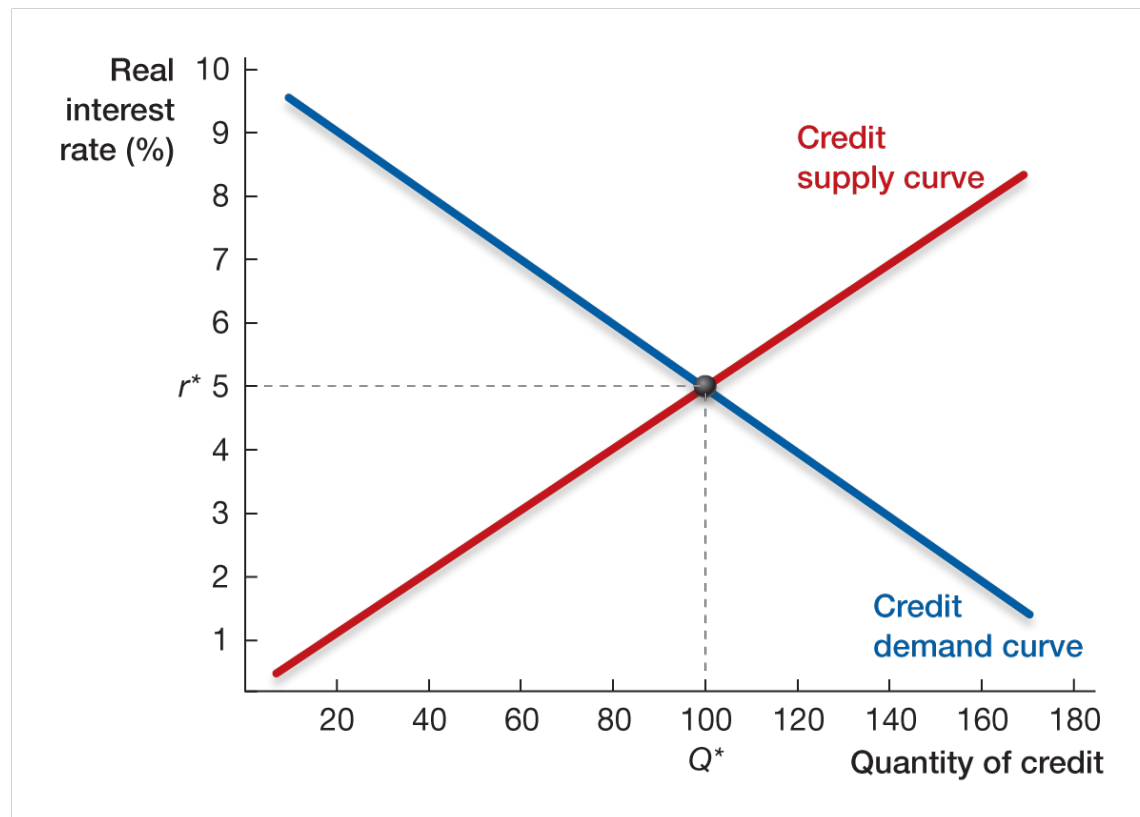
1. Saving motives of households
2. Saving motives of firms – retain earning

## Equilibrium in Credit Market

The equilibrium in the credit market is the point at which the credit supply curve and the credit demand curve intersect.

This intersection determines both the total quantity of credit in the market ( $Q^*$ ) and the equilibrium real interest rate ( $r^*$ ).

# Credit Market Equilibrium



The credit market improves the allocation of resources in an economy by enabling savers to lend their money to borrowers.

Suppose you have \$1,000 set aside for next year. Consider the case with and without credit market.

If there are *no* credit markets,

- you would keep the money in a safe box in your house and earn a zero nominal return and a negative real return.
- firms would be unlikely to borrow the money and invest in new plant and equipment.

If there are credit markets,

- you could “lend” the money (e.g. deposit into a bank) and earn a positive nominal return and even a positive real return.
- firms could borrow the money and invest in new plant and equipment.