

Unit 10

BANKS, MONEY, AND THE CREDIT MARKET

OUTLINE

A. Introduction

B. Income, borrowing and saving

C. Balance sheet

D. Banks and money

E. Credit rationing

A. Introduction

The Context for This Unit

Markets for goods and services allow parties to interact in mutually beneficial ways. (Units 6-9)

In most markets, money is the medium of exchange.

- How do banks create money?
- How do banking systems affect individual consumption choices and economic outcomes?
- What are the limitations of the banking system?

This Unit

- Model how individuals borrow, save, and invest
- Understand the role of commercial banks and the central bank in the economy
- Explain how banks make money and the risks they face and pose

B. Income, borrowing and saving

Money

Money = A medium of exchange used to purchase goods or services

- bank notes, bank deposits, cheques, ...

Money allows purchasing power to be transferred among people.

For money to do its work, everyone else must trust that others will accept your money as payment.

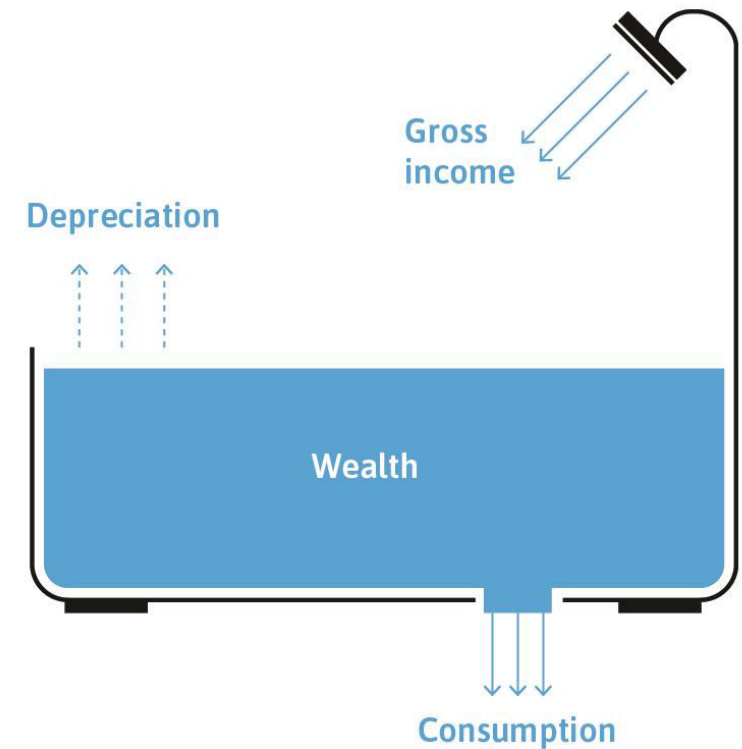
Income and wealth

Wealth = Stock of things owned or value of that stock.

= buildings, land, machinery, capital goods
– debts owed + debts owed to you

Income = The amount of money one receives over some period of time (flow).

- from market earnings, investments, government.



Other Key Concepts

Depreciation = Reduction in the value of a stock of wealth over time.

Net income = The maximum amount that one could consume without running down wealth.

$$\text{Net income} = \text{gross income} - \text{depreciation}$$

Earnings = Wages, salaries, and other income from labour.

Savings = Income that is not consumed.

Investment = Expenditure on newly produced capital goods.

Consumption over time

There is a trade-off between consuming goods now and later.

The opportunity cost of having more goods now is having fewer goods later.

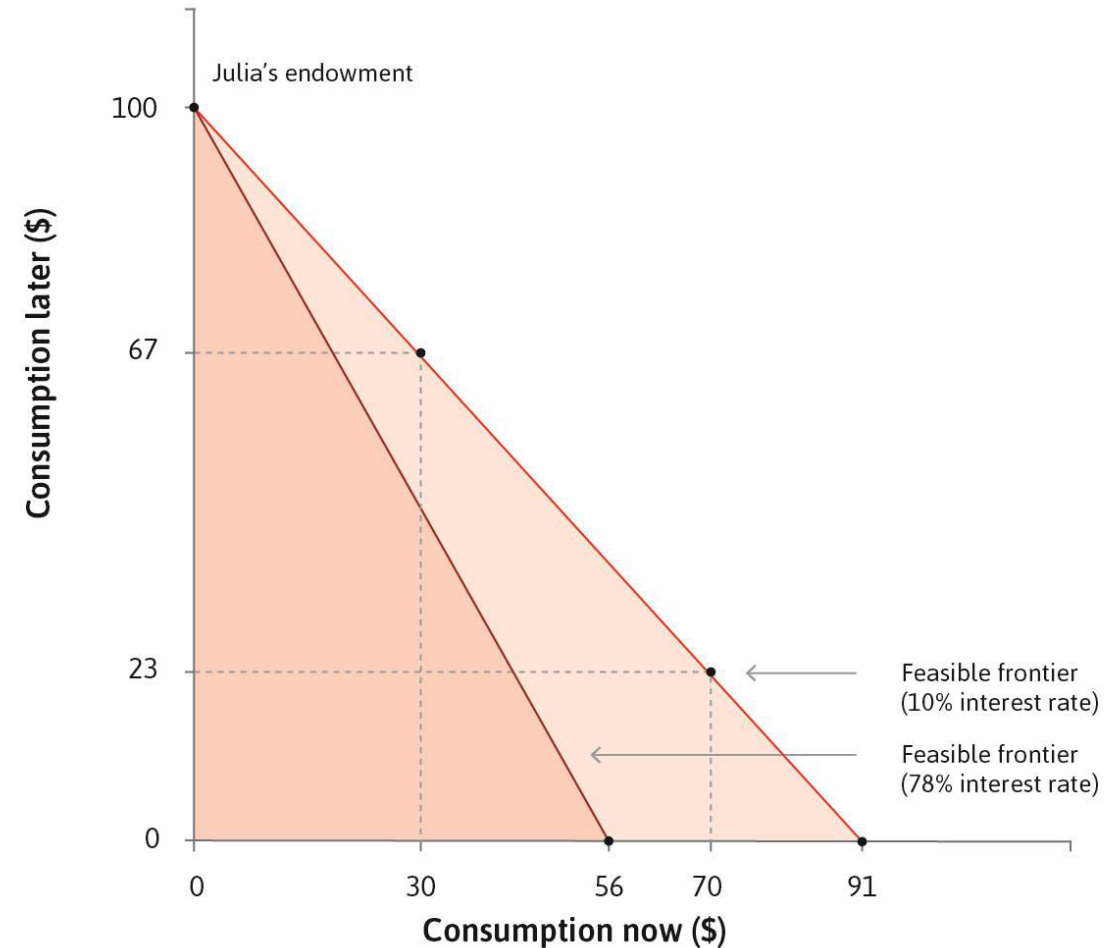
Borrowing and lending allow us to rearrange our capacity to buy goods and services across time

Borrowing

Borrowing allows us to buy more now, at the cost of buying less later.

Interest rate (r) = The price of bringing some buying power forward in time.

$(1+r)$ = Tradeoff between current and future consumption (MRT)



Preferences for consumption

Borrowing allows us to bring consumption forward

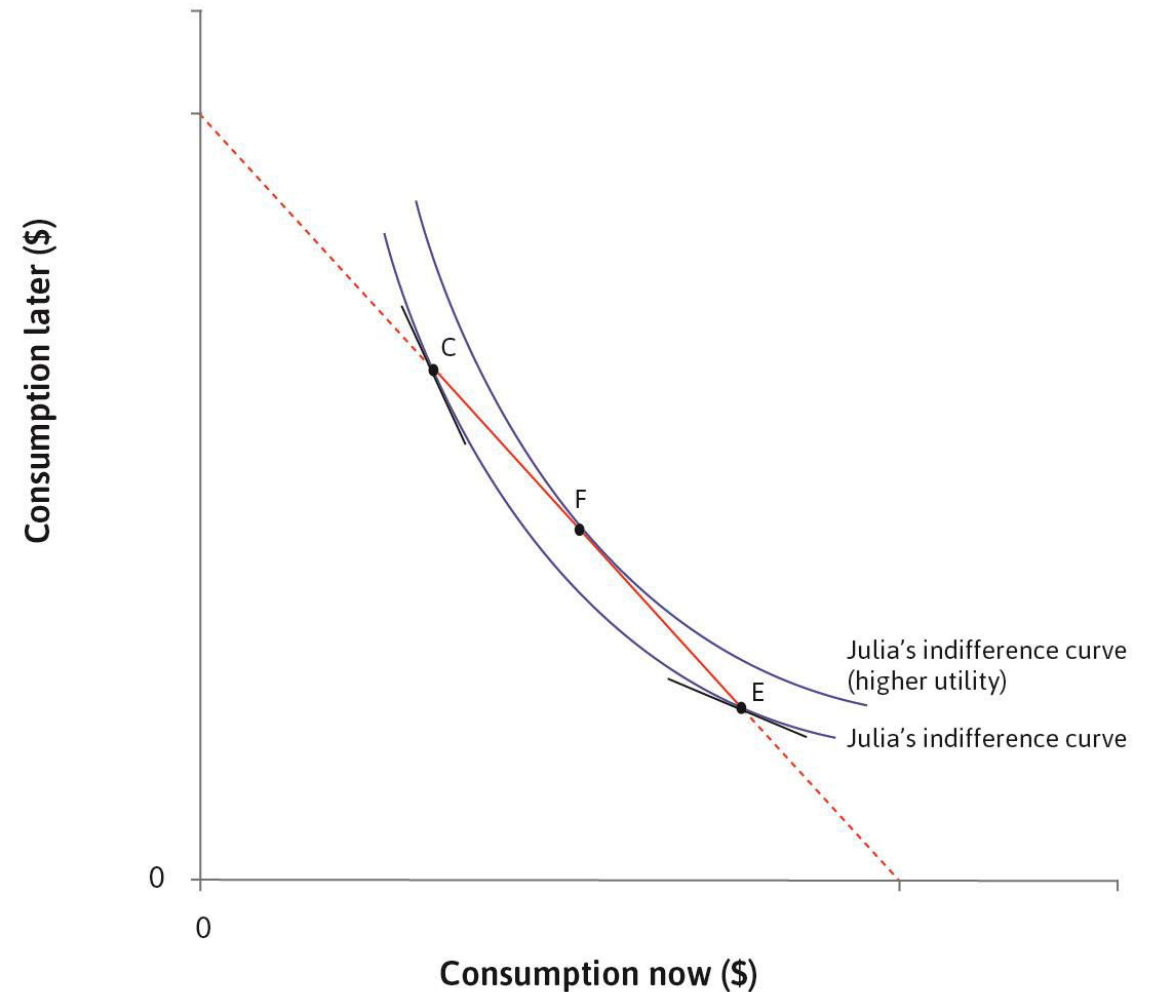
How much consumption an individual will bring forward depends on:

- consumption smoothing
- impatience

Consumption smoothing

Diminishing marginal returns to consumption = The value of an additional unit of consumption declines, the more consumption the individual has.

An individual smooths their consumption to avoid consuming a lot in one period and little in the other.



Pure impatience

Consumption smoothing may appear as being impatient.

However, we differentiate it from pure impatience = being impatient as a person.

- Myopia (short-sightedness): People experience the present satisfaction more strongly than the same satisfaction later
- Prudence: People know that they may not be around in the future, and so they want to consume now

How much more do you value a good now than later, if your endowments are the same in both periods?

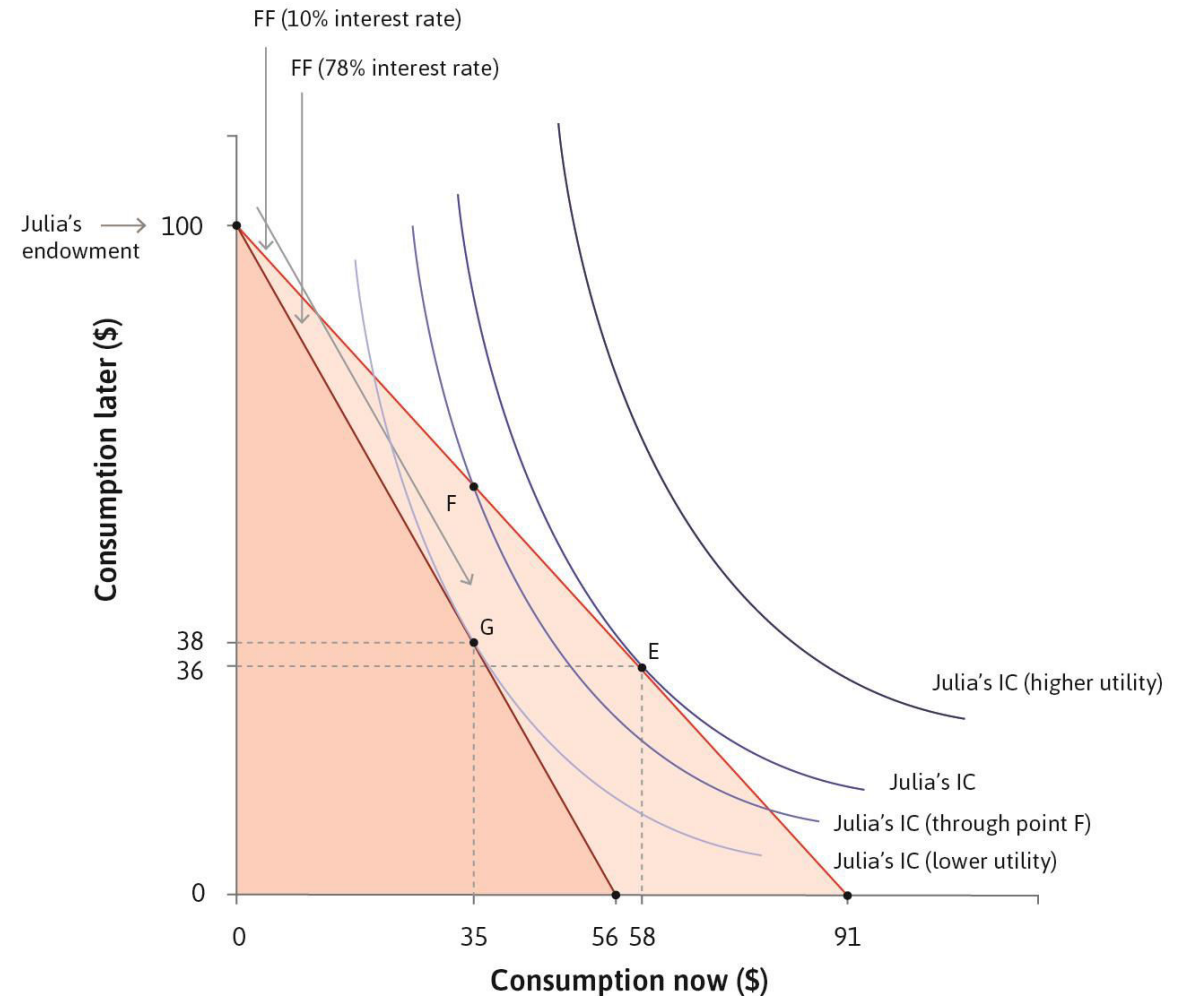
Optimal decision-making

Discount rate (ρ) = a measure of a person's impatience.

- Consumption smoothing
- Pure impatience

Individual borrows at the point where discount rate = interest rate

$$\begin{aligned} \text{MRS} &= \text{MRT} \\ 1+\rho &= 1+r \end{aligned}$$

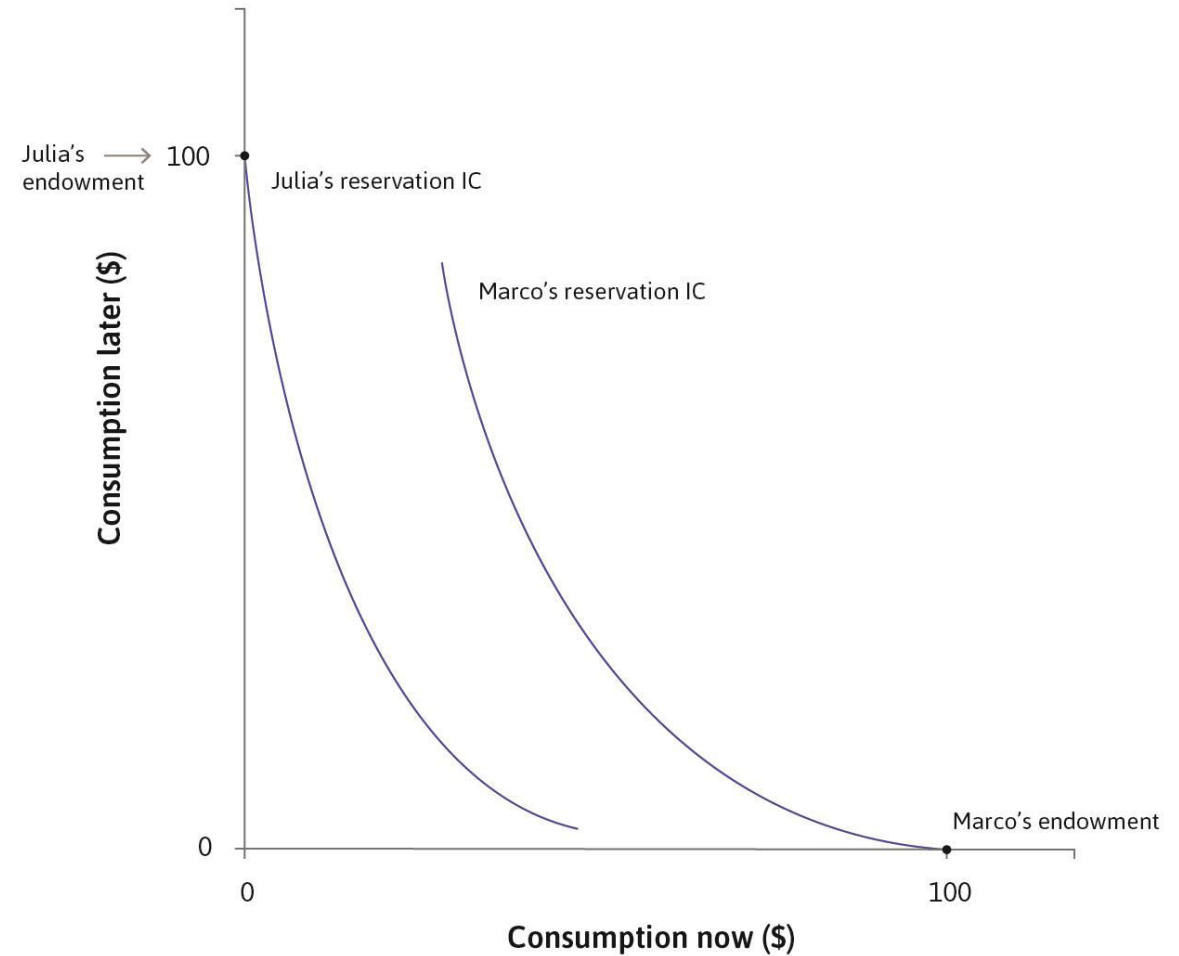


Borrowers and savers

Reservation indifference curve

= all of the points at which the individual would be just as well off as at the reservation position (endowment).

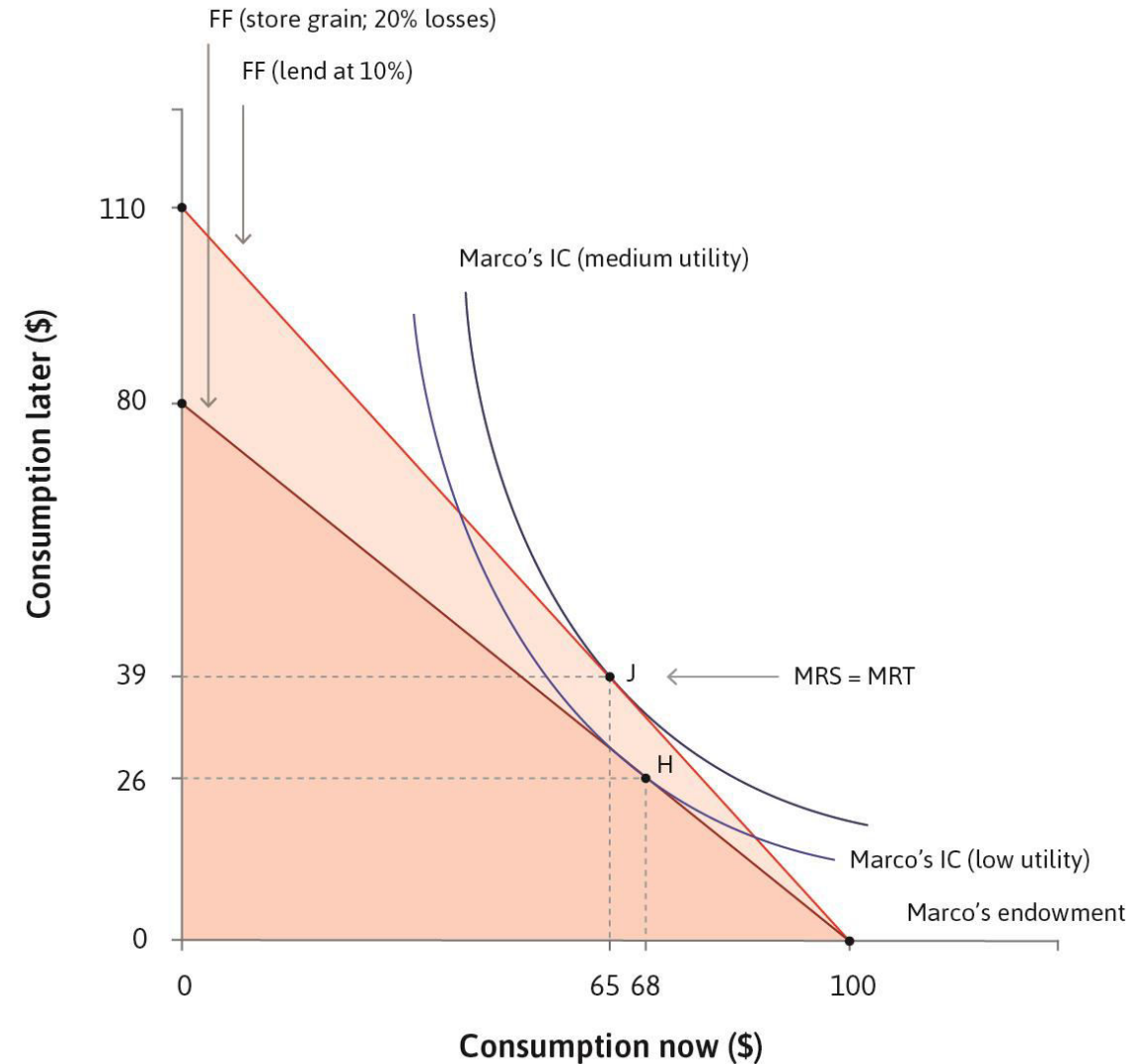
The borrower and the saver have different indifference curves because they have different endowments.



Saving and lending

A **saver** smoothes his consumption by postponing it into the future.

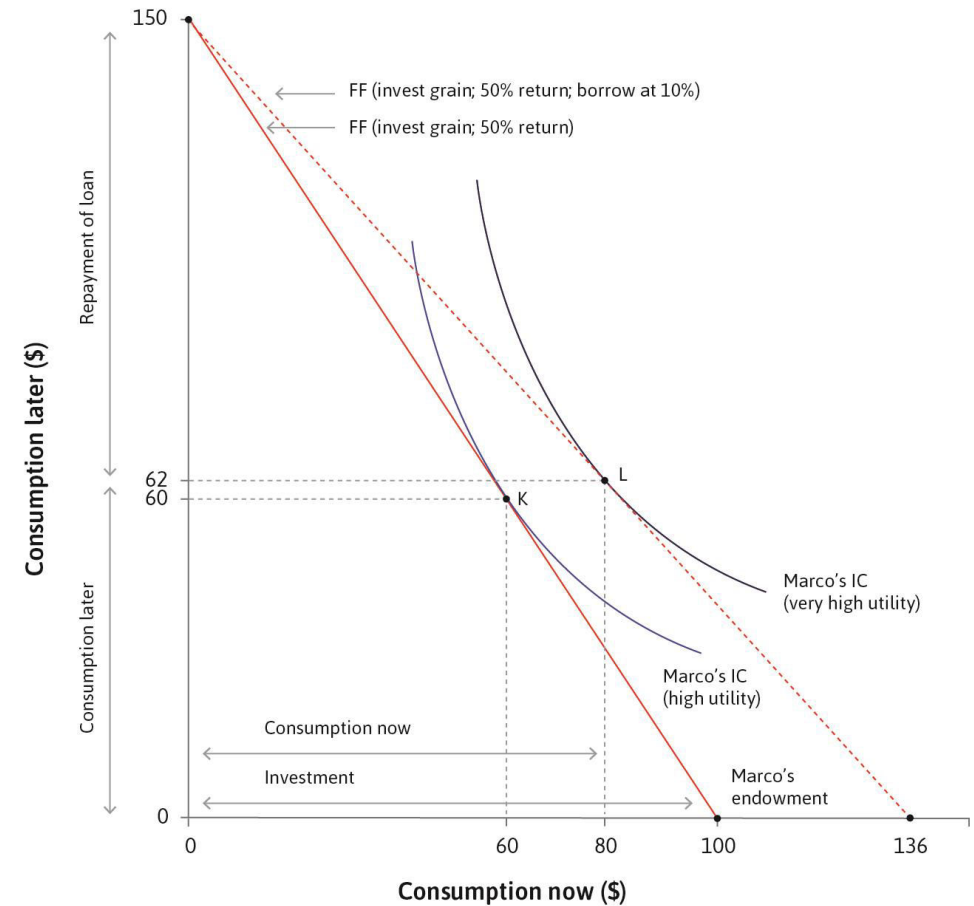
Lending money at interest expands the saver's feasible set, compared to simply storing it.



Investment

Investment is another way to move consumption to the future

Combination of investing and borrowing can increase consumption in both periods



An individual's situation e.g. wealth and income affects their opportunities to engage in these activities, and their interest rates

C. Balance sheet

Balance sheet

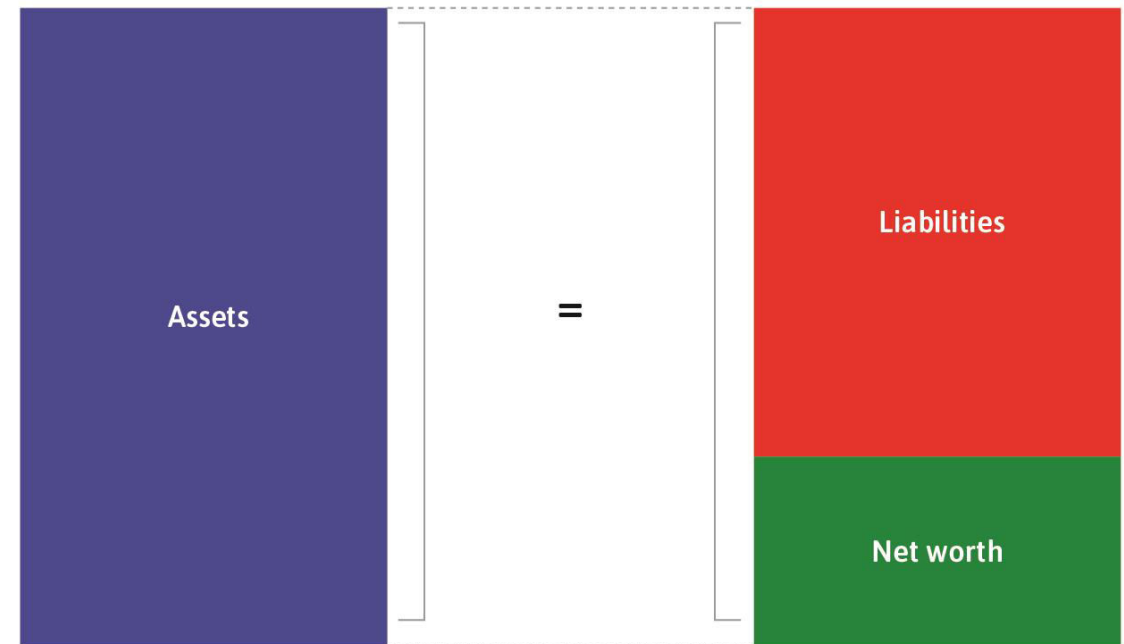
A **balance sheet** summarises what the household or firm owns, and what it owes to others.

Assets = Anything of value that is owned.

Liabilities = Anything of value that is owed.

Net worth = assets - liabilities

$$\text{assets} = \text{liabilities} + \text{net worth}$$



Balance sheet and wealth

Wealth or net worth does not change when you lend or borrow.

A loan adds both assets and liabilities to the balance sheet:

- the borrowed money (cash) is an asset
- the debt is an equal liability

	JULIA'S ASSETS		JULIA'S LIABILITIES	
Now (before consuming)	Cash	\$58	Loan	\$58
			Net worth = \$58 - \$58	0
	JULIA'S ASSETS		JULIA'S LIABILITIES	
Now (after consuming)	Cash	0	Loan	\$58
			Net worth	-\$58
	JULIA'S ASSETS		JULIA'S LIABILITIES	
Later (before consuming)	Cash	\$100	Loan	\$64
			Net worth = \$100 - \$36	\$36
	JULIA'S ASSETS		JULIA'S LIABILITIES	
Later (after consuming)	Cash	\$64	Loan	\$64
			Net worth	0

D. Banks and money

Banks

A **bank** is a firm that makes profits by lending and borrowing.

Banks borrow from households (**deposits**), other banks, and the central bank.

The interest they pay on deposits is lower than the interest they charge on loans, which is how banks make profits.

Central bank

Base money/high-powered money = notes and coins. Money as legal tender.

Legal tender has to be accepted as payment by law.

The **central bank** is the only bank that can create legal tender.

- the central bank is usually owned by the government.
- acts as the banker for the commercial banks, who have accounts at the central bank that hold legal tender.
- by crediting these accounts, the central bank can create money.

Bank money

Commercial banks create money by making loans

- this is called bank money \neq legal tender
- it is a liability to the bank, not an asset
- banks earn profits by charging interest on bank money

Bonus Bank gives Gino a loan of \$100

Bonus Bank's assets	Bonus Bank's liabilities
<u>\$20 base money</u> \$100 bank loan Total: \$120	\$120 payable on demand to Gino

Broad money = base money + bank money

Default risk and liquidity risk

Banks provide the service of maturity transformation:

- deposits can be withdrawn at any time
- but loans only need to be repaid after a specified time

This is also liquidity transformation:

- deposits are liquid
- loans to borrowers are frozen (illiquid)

bank

This exposes the bank to risks:

- 1. Default risk**
- 2. Liquidity risk**

Banking crisis

Banks make money by lending much more than they hold in legal tender.

Bank run = situation when all depositors demand their money at once; may result in bank failure.

Banks can also fail by making bad investments, such as by giving loans that do not get paid back.

The government may intervene, because unlike the failure of a firm, a banking crisis can bring down the financial system.

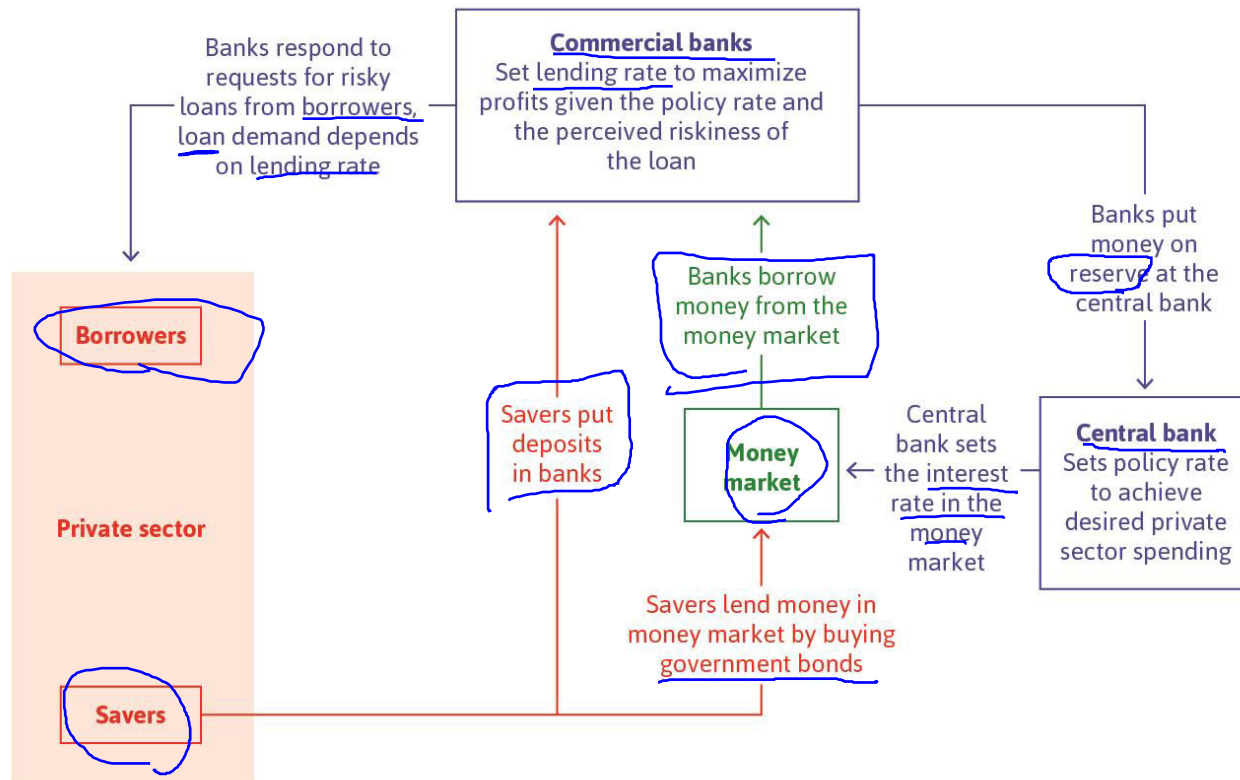
The money market

Banks need enough base money to cover their net transactions.

They borrow base money on the **money market** at the short-term interest rate.

- The demand for base money depends on how many transactions commercial banks have to make.
- The supply of base money is a decision by the central bank.

The financial system



Policy interest rate = The interest rate on base money set by the central bank.

Bank lending rate = The average interest rate charged by commercial banks to firms and households.

The business of banking

Bank's costs:

- **operational**: the salaries of bank officers, branch rents
- **interest costs**: paying interest on their liabilities (deposits and other borrowing)

Bank's revenue:

- **interest and repayment of loans**

Expected return = The **return on the loans**, taking into account the **default risk**.

Bank's balance sheet

Assets (owned by the bank or owed to it)		% of balance sheet	Liabilities (what the bank owes households, firms and other banks)		% of balance sheet
1. Cash and reserve balances at the central bank	Owned by the bank: immediately accessible funds	2	1. Deposits	Owned by households and firms	50
2. Financial assets, some of which (government bonds) may be used as collateral for borrowing	Owned by the bank	30	2. Secured borrowing (collateral provided)	Includes borrowing from other banks via the money market	30
3. Loans to other banks	Via the money market	11	3. Unsecured borrowing (no collateral provided)		16
4. Loans to households and firms (e.g. mortgages)		55			
5. Fixed assets such as buildings and equipment	Owned by the bank	2			
Total assets		100	Total liabilities		96
			4. Net worth = Total assets – total liabilities = equity		4

Assets: bank lending

Liabilities: bank borrowing (deposits and other)

Bank's net worth

Net worth = **assets – liabilities**

The net worth of a bank is what is owed to the shareholders/owners. It is also called **equity**.

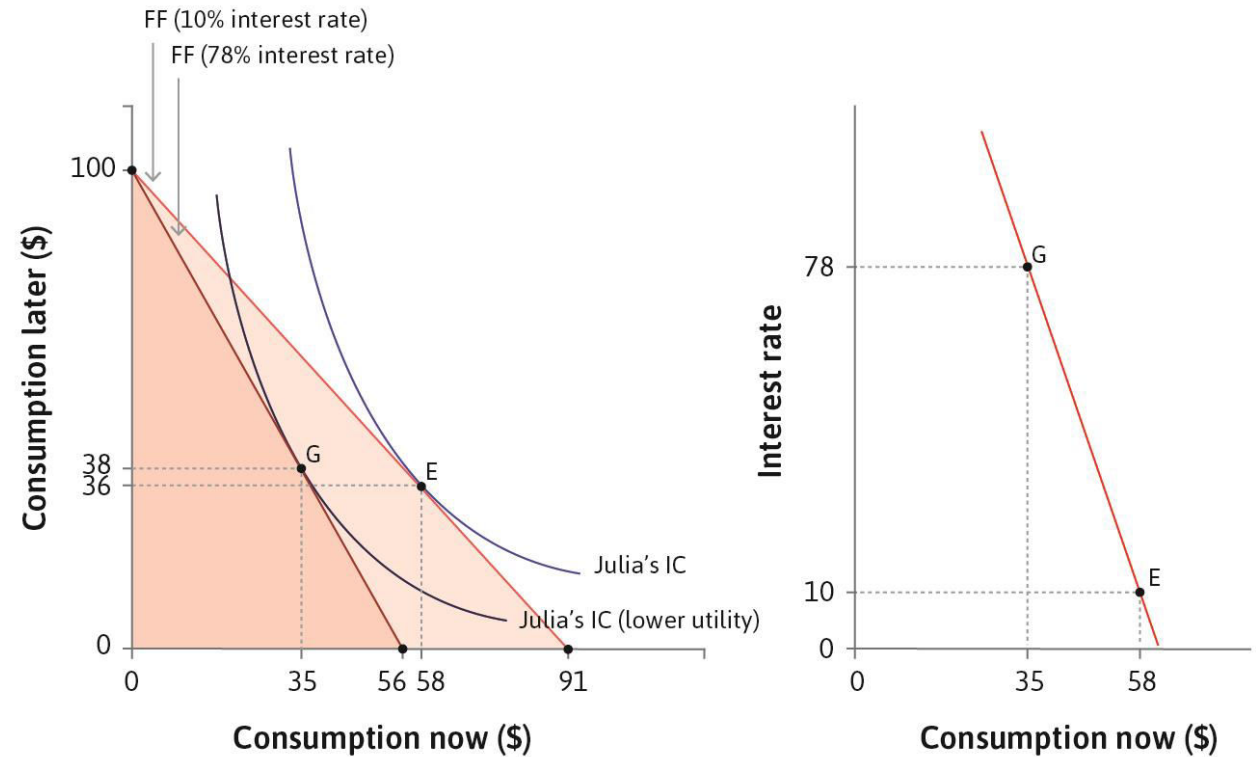
Negative net worth means the bank is **insolvent**.

Leverage describes the reliance of a company on debt.

$$\text{leverage} = \frac{\text{total assets}}{\text{net worth}}$$

Policy rate and the economy

The central bank's policy rate affects the level of spending in the economy, because households and firms borrow to spend.



higher interest rate → low spending today

E. Credit rationing

Principal-agent problem

Principal-agent problem =

a conflict of interest between principal and agent,
about some hidden action or attribute of the agent
that cannot be enforced or guaranteed in a binding
contract.

E.g. Financing a project

Lenders face the risk that money borrowed will not be repaid,
but lack information about the project's success or borrower's
effort so cannot ensure that the project succeeds.

Equity and collateral

To resolve the conflict of interest between the principal (lender) and the agent (borrower):

- **Equity**: the lender may require the borrower to put some of her wealth into the project
- **Collateral**: the borrower has to set aside property that will be transferred to the lender if the loan is not repaid

Credit rationing

Those with less wealth find it more difficult to provide equity or collateral.

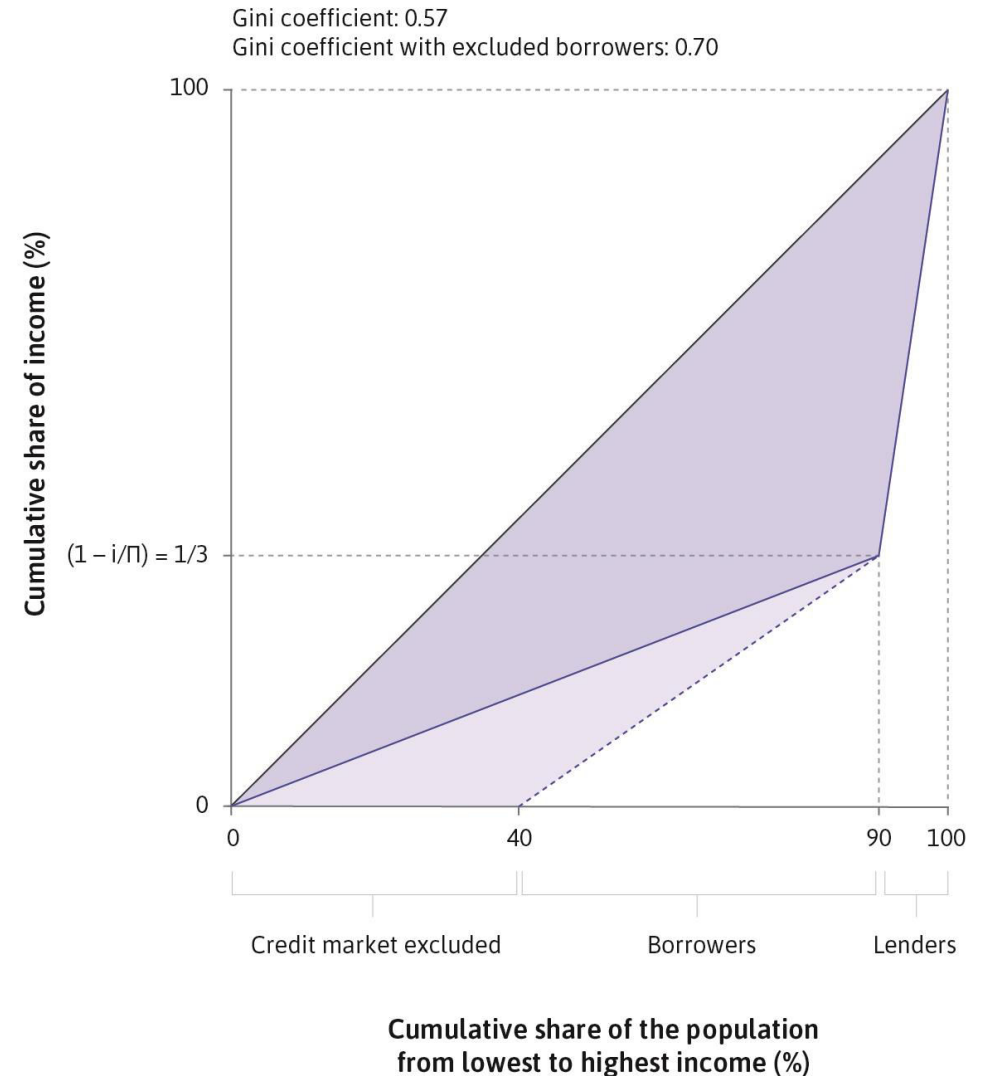
Credit rationing = when those with less wealth

- borrow on unfavourable terms compared with those with more wealth (credit-constrained)
- or are refused loans entirely (credit-excluded)

Lending and inequality

Inequality may increase when some people are in a position to profit by lending money to others.

Credit-rationing increases inequality: people with limited wealth are not able to profit from the investment opportunities that are open to those with more assets.



Summary

1. Ways to move consumption forward/into the future
 - Borrowing, saving, investing
 - Options available depend on individual's endowment
 - Optimal choice depends on individual's discount rate
2. Outline of the banking system
 - Banks create money (lend) to make profits
 - Central bank sets the policy rate, which influences spending
 - Issues: principal-agent problem, credit constraints

In the next unit

- More about markets for financial assets: How prices change, and how price bubbles form
- Prices as signals in other markets: The process of reaching market equilibrium