

Kosmas Marinakis, Ph.D.

Lecture 9

Banking & The Monetary System

Economics
& Society



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Previously in E&S...

- ★ Definition of growth
 - exponential – catch-up – sustained growth
- ★ History of growth
 - earlier societies – Malthusian cycles – Industrial Revolution
- ★ Inequality and poverty ▶
- ★ The Solow growth model ▶
 - production function – accumulation of capital – saving
- ★ Causes of prosperity ▶
 - climate, geography, culture, institutions, history and luck

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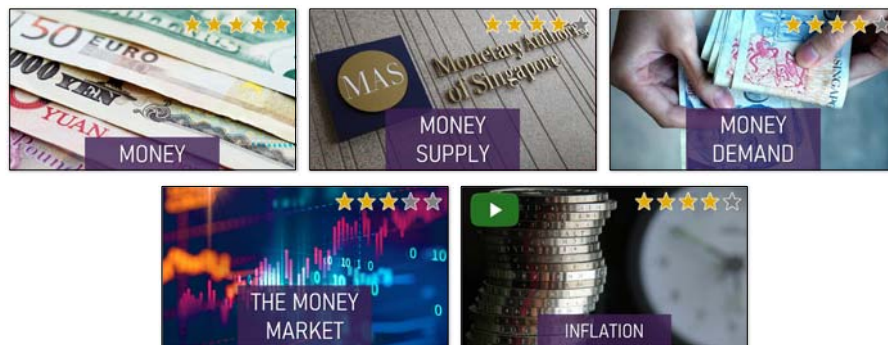
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Banking & The Monetary System

Estimated duration: 120min



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Money

> Money

- ★ Money is **neither a good**, nor a **service**
thus, its total face value is **not included in GDP**
- ★ Money, however, is an **asset**
- ★ The total value of money in an economy is **way lower** than that of **GDP**
- ★ Money **simplifies** transactions by splitting them into **two halves**:

- ★ In reality, holding money represents an “**open account**” or “unfinished business”
only the first half of the transaction is **completed**; the other half is still **pending**.

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Roles & properties of money

> Money

- ★ The **3 roles** of money:
 1. **Medium of exchange**: an asset generally **exchanged** for goods and services
 2. **Store of value**: an asset used to **transfer** purchasing power into the future
 3. **Unit of account**: a universal standard used to **measure** value, price or cost.
- ★ **Various forms** of money have existed throughout **history**
- ★ **Anything** can be used as money as long as it has the following **properties**:
 - ▶ To be **generally accepted** as an **objective value carrier**
 - ▶ To be **controllable in quantity** (not in abundance – not easy to counterfeit)
 - ▶ To be **portable** and relatively **durable**
 - ▶ To be non-destructively **denominated**.

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Fiat vs. commodity money

> Money

There are **3 technologies** of money:

1. **Commodity money**: carries **intrinsic value** due to its nature or the value of the material it is made of
2. **Commodity-backed money**: carries no intrinsic value on itself but **legally represents a fixed quantity of something else** of intrinsic value
invented around the 11th century in China
3. **Fiat money**: neither carries nor represents a fixed intrinsic value but is used as **legal tender by government** decree:
 - ▶ It is valuable only because everyone **has agreed to accept it** as money
 - ▶ Today all economic systems have switched to using **fiat money**.

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The money supply

> Money supply

- ★ There are **2 main definitions** of money supply:
 - ▶ **M1** = Cash held outside banks + checking accounts (debit cards, contactless)
 - ▶ **M2** = M1 + saving accounts + money market accounts.
- ★ **M1** is **more liquid** (easier to be accepted) money than **M2**
money in saving and money market accounts cannot be spent unless it is **converted to M1** first
- ★ In our analysis, we will mainly use the **M1 money supply**
- ★ Cash reserves held by the CB or by commercial banks are **NOT money**.

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The Central Bank

> Money supply

- ★ In every economy, the monetary system is **run** by a **central bank (CB)** an **administrative institution** which serves as the **monetary authority**
- ★ The CB operates **completely autonomously** from the government
- ★ The **institutional roles** of the CB are:
 1. To provide **sufficient liquidity** to the economy
 2. To keep **inflation** under control
 3. To **monitor** and **regulate** the banking system
 4. To assist **solvent** banks if they become **illiquid**
 5. To clear complex **inter-bank payments**
 6. To manage the **exchange rates** and foreign currency reserves.

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The commercial banks

> Money supply

- ★ Commercial banks are **profit maximizing firms** that accept deposits from the public and provide loans
during this process, banks act as a **link** between saving and investment
- ★ Banks **reserve a fraction** of deposits known as **Reserve Ratio (RR)** in order to be able to serve withdrawals
- ★ Commercial banks can **create M1 money** through their function:
 - ▶ If you **deposit** cash to a checking account, you **still have access** to this money
 - ▶ Yet, the bank can **loan out** the cash you deposited, so someone else can use it, too
 - ▶ The maximum amount of **money created** by a commercial bank is $\frac{1}{RR} \cdot \text{deposits}$
 - ▶ $1/RR$ is known as the **Money Multiplier**.

PS9-q1

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How can the CB affect the money supply 🚩

> Money supply

1. **Printing** or withdrawing paper bills and coins
2. Implementing a specific **mandatory RR**
to adjust the quantity of money that is **withheld within** the banking system
3. Adjusting the **discount interest rate**
the discount rate is the rate **banks pay to borrow from the CB if they run out of reserves** – high discount rates make banks to **lend less**
4. Engaging in **Open Market Operations**: PS9-q2
 - ▶ Open Market Sales: CB sells government securities to the public collecting M1 money
 - ▶ Open Market Purchases: CB buys securities from the public injecting M1 money to the economy.
5. Controlling the quantity of **loans** by commercial banks.

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The money supply

> Money supply

- ★ The **CB can affect** the total quantity of money circulating in the economy using any of the previous **5 ways**
- ★ We will be **plotting** the money supply against the **“price” of money**: the **real interest rate, r**

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The demand for money

> Money demand

- ★ **Demand for money (M_D)** is the amount of wealth individuals want to hold in money instead of interest-bearing assets (IBAs) at every real interest rate
- ★ To **investigate** this relationship, we will **decompose** M_D into its **3 components**:
 1. Money held for **transactions**
 2. Money held for **precautionary reasons**
 3. Money held for **speculation**

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Transactions and precaution

> Money demand

- ★ Holding cash is more **convenient** for regular or emergency transactions
- ★ Holding IBAs pays **interest** (r) but also costs a **one-time fee** (f) to cash it
interest earned **must exceed** the cost of the fee to make an IBA worthwhile
- ★ If for an IBA: $r = 0.25\%$ per month and $f = 2\%$
 makes sense to **place in IBAs** only wealth not intended for use for **at least**
- ★ If $r = 0.35\%$, place in IBAs only wealth not planning to use for
- ★ As r **increases**, savers tend to hold **less cash** and **more IBAs**
- ★ Thus, money demand for transactions and money demand for precaution are both **inversely related** to the interest rate

PS9-q4

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Speculation 1

> Money demand

- ★ **Most** of the money in the economy is held for **profiting**
- ★ Speculation is conducted by **flipping** IBAs
bonds, certificates of deposit, MBS, T-bills etc.
- ★ A **bond**, for instance, is a **stylized loan**:
 - ▶ The buyer pays the **face value** (say \$100) to the issuer
 - ▶ The issuer pays a fixed **coupon payment** (say \$10 per year)
 - ▶ The issuer pays back the **face value** when the bond **matures** (say after 10 years)
 - ▶ The buyer can **sell the bond** in the secondary market **before it matures**.
- ★ If r **decreases**, new bonds pay **lower coupons**, thus **past bonds appreciate**
- ★ If r **increases**, new bonds pay **higher coupons**, thus **past bonds depreciate**

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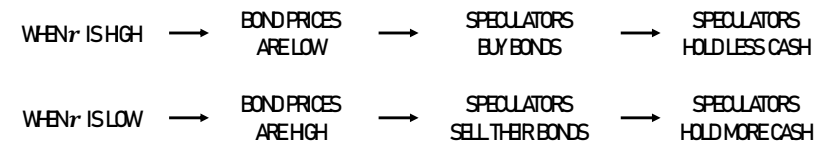
PS9-q5

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Money demand for speculation

> Money demand



- ★ When the interest rate is low, speculators **prefer** to hold more money
- ★ When the interest rate is high, speculators **prefer** to hold less money
- ★ Thus, money demand for speculation is also **inversely related** to r .

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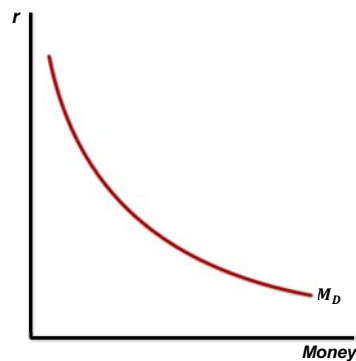
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Money demand

> Money demand

- ★ All **three constituent** money demands are **negatively related** to the interest rate
- ★ Therefore, their sum, money demand (M_D), is also **negatively sloped**



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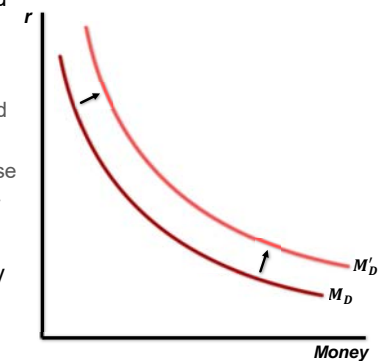
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Money demand shifters

> Money demand

- ★ Money demand will shift if people want to hold **more money independently of r**
- ★ This can happen for various **reasons**:
 - ▶ If **real GDP increases**, people will want to hold more money for their transactions **[L1]**
 - ▶ If **prices increase**, money demand will increase
 - ▶ If **public safety** is at risk, money demand may rise...
- ★ The interest rate affects the quantity of money demanded but **not the M_D**



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Control of the money market

> Money market

- ★ The **intersection** of M_D and M_S determines r^* but the CB can **manipulate** r^* by **setting** M_S
- ★ For instance, if the CB **wishes** $r = 2\%$ it will simply **set** M_S
- ★ For $r = 3\%$, it will **shift** M_S to M'_S
- ★ For $r = 1\%$, it will **shift** M_S to M''_S
- ★ Before 2008, CBs used **OMOs** to withdraw or infuse money in the economy for M_S to shift this was known as the **scarce reserves regime**.

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The ample reserves regime

> Money market

- ★ In 2008, CBs gave to commercial banks access to **massive cash reserves** to ensure **sufficient liquidity** and **reinstate public trust** to the banking system
- ★ Those vast reserves **remained in the system**
- ★ Banks can use them to provide **loans** at the **interest rate** the CB has set
- ★ What **prevents** banks from **over-loaning**?:
 - ▶ **Money demand**
 - ▶ Access to reserves **limited** by the bank's **capital**
 - ▶ Banks must cover **from pocket** any defaults.

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Monetary policy

> Money market

- ★ Assume that the CB has **set** r^*
- ★ Then, a **shock** causes M_D to **shift** to M'_D
- ★ If reserves were **scarce**:
 - ▶ r^* will **tend to increase** to r'
 - ▶ The CB can **prevent** r^* from changing by conducting OMPs that will **shift** M_S to M'_S .
- ★ If reserves were **ample**:
 - ▶ M_S would shift **by itself** to M'_S
 - ▶ Because banks **already have reserves** to provide **more loans** at r^* till M_S becomes M'_S .

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Internal video

In this video I explain why inflation is bad. There are several different reasons that come from all sides of economics: distortion of the income distribution, worsening of the economic environment, distortion of credit relations, distortion of competition, inefficiencies from anti-inflationary policies and more.

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External video

Watch how hyperinflation has recently caused a major societal crisis in Zimbabwe and what are the consequences in the economy when money loses its value almost entirely.

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Thank you!

(you are welcomed to stay for consultation or discussion)

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⚠ WARNING! ⚠

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