The Asset Market, Money, and Prices

ECON 202 · Macroeconomics-I

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Sections Covered

§	Topic
7-1	Money and Its Measurement
7-2	Portfolio Allocation & the Demand for Assets
7-3	The Demand for Money
7-4	Asset Market Equilibrium
7-5	Money Growth and Inflation

Learning Objectives

1. Define money, its functions, and how it is measured
2. Discuss the factors that affect how people choose which assets they own
3. Examine the macroeconomic variables that affect the demand for money
4. Discuss the fundamentals of asset market equilibrium
5. Discuss the relationship between money growth and inflation

Introduction

Money: a very short history

> *"Sure, I'll fix your roof — but only if you happen to have twelve dozen eggs **and** want your roof fixed."*
>
> *— barter, the hard way*

- **Barter** ⇒ needs a *double coincidence of wants* — slow, costly trade
- *Did barter ever exist?* ⇒ **no pure barter economy ever found** (Humphrey) — gift/credit came first; barter = the **fallback when money breaks down**
- **Commodity money** ⇒ things with intrinsic value: cattle, salt, cowrie shells, gold (even cigarettes in POW camps)
- **Coinage** ⇒ Lydia, c. 600 BCE: the state stamps weight & purity ⇒ trade at scale
- **Paper & the gold standard** ⇒ notes redeemable for metal ⇒ then **fiat money**: value by decree + trust
- **Today** ⇒ bank balances, cards, crypto ⇒ money keeps shedding its physical form
- **Three jobs, not a thing** ⇒ medium of exchange · store of value · unit of account (*numéraire*) — defined by **function, not form**
- **Medium of exchange** ⇒ the one job only money does ⇒ ends the *double coincidence* ⇒ **specialization** → **productivity**
- Commodity money fails each job (price swings · spoils · indivisible) ⇒ **fiat** fixes it, but lives on **belief** (over-issue ⇒ inflation tax)

Where this chapter fits: the third market

- **Ch 3 · labor market** ⇒ full-employment output $\bar{Y}$
- **Ch 4 · goods market** ⇒ desired saving $=$ investment ⇒ real interest rate r
- **Ch 7 · asset market** *(this chapter)* ⇒ money demand $=$ supply ⇒ price level P
- Three markets ⇒ assembled into general equilibrium **IS–LM, Ch 9**

What Ch 7 adds — and the payoff

- **Portfolio choice** ⇒ how to split wealth across assets — weighing return · risk · liquidity · maturity
- **Money demand** $L(Y, i)$ ⇒ real demand ↑ with Y, ↓ with i
- **Asset-market equilibrium** $\frac{M}{P} = L(Y, i)$ ⇒ price level $P = \frac{M}{L(Y, i)}$
- **Money growth** ⇒ **inflation; Fisher** $i = r + \pi^e$ ⇒ nominal rates
- Roadmap: §7-1 Money · §7-2 Assets · §7-3 Demand · §7-4 Equilibrium · §7-5 Inflation

7-1 · Money & Its Measurement

What counts as money — and is there one best measure?

- Money vs non-money ⇒ a **fuzzy boundary**, not a line
- MMMFs (money-market mutual funds) ⇒ check-writing + market return ⇒ money?
- ⇒ **no single best measure** of the money stock
- Every asset stores value ⇒ **liquidity** (ease of spending) is the real dividing line

The M1 Monetary Aggregate

- **M1** ⇒ currency + checkable deposits + savings accounts
- Savings added to M1 in **2021** (Fed stops distinguishing savings from transaction deposits) ⇒ M1 jumps
- Series revised back only to **May 2020** ⇒ a **break**

The M2 Monetary Aggregate

- **M2 = M1** + less money-like assets
- + savings deposits · small (< $100k) time deposits · retail MMMFs
- Time deposits ⇒ interest + fixed term (early-withdrawal penalty)
- M2 ⇒ broader, more **stable** than M1

Elements of the money stock

Component	Role
Coins · paper money	Physical currency for everyday transactions
Checking accounts	Easily accessible funds for daily use
Savings accounts	Limited access, pays interest
Money-market accounts	Higher interest, limited withdrawals
Fixed · recurring deposits	Term savings at fixed/regular interest
Savings bonds	Government-backed savings securities

How does a central bank change the money supply?

- **Money supply = money stock** available in the economy
- **Buy** assets from the public ⇒ supply ↑ (open-market *purchase*)
- **Sell** assets to the public ⇒ supply ↓ (open-market *sale*)
- Together ⇒ **open-market operations**

Central Banks and Government Financing

- The central bank (CB) buys **new govt bonds directly** from Treasury ⇒ financing spending by **printing money**
- Common abroad ⇒ **forbidden by law in the US**
- Notation: M = money supply (M1 or M2)

7-2 · Portfolio Allocation & Assets

How do people choose which assets to hold?

How do people allocate wealth among assets?

- **Expected return**
- **Risk**
- **Liquidity**
- **Time to maturity**

Expected Return

- **Rate of return** = asset's value gain per period
  - Bank account ⇒ interest rate;
  - stock ⇒ dividend + price gain
- What matters ⇒ **expected real** return
- Investors prefer **high** expected return, other things equal
- Money has the lowest return — held mostly for its **liquidity** services

Risk

- **Risky** ⇒ significant uncertainty about the return
- Investors dislike risk ⇒ hold only if **expected return higher**
- **Risk premium** = extra expected return on a risky asset over a comparable **safe** asset.

Liquidity

- **Liquidity** = ease/speed of exchange for goods, services, or assets
- Money ⇒ **very** liquid; stocks/bonds ⇒ fairly liquid
- House ⇒ **illiquid** (slow, costly to sell)
- All else equal ⇒ prefer liquid assets

Time to Maturity

- **Maturity** = time until all promised payments are made
- Long-term bonds ⇒ generally **higher return**
- Long-term prices swing **more** ⇒ **riskier**
- 📝 *Numerical Problem 1 (ABC): expectations theory + term premium → the bond yield curve.*

Types of Assets and Their Characteristics

- **Money (M1)** ⇒ most liquid, low return
- **Bonds** ⇒ less liquid, higher return, riskier (many maturities)
- **Stocks** ⇒ fairly liquid, can be very risky
- **Houses** ⇒ illiquid + risky

7-3 · The Demand for Money

The Demand for Money

- **Money demand** = monetary assets people want to hold
- Depends on **expected return · risk · liquidity**
- Money ⇒ most liquid, low return ⇒ held for **liquidity**
- Key macro drivers ⇒ **price level · real income · interest rates**

A higher price level raises nominal money demand one-for-one

- Higher price level ⇒ **more money** to transact
- Prices **double** ⇒ nominal money demand **doubles** ⇒ *proportional*
- **Real** money demand M^d/P ⇒ **unchanged** by the price level

Money demand rises with income — but less than proportionally

- Real income ↑ ⇒ more transactions ⇒ money demand ↑
- But the rise is **less than proportional** to income

How do interest rates move money demand?

- i on **nonmonetary** assets ↑ ⇒ money demand ↓
- i^m on **money** ↑ ⇒ money demand ↑
- What matters ⇒ the spread $i - i^m$

The Money Demand Function

$$M^d = P \times L(Y, i) \qquad (7.1)$$

- ↑ in price level P and real income Y; ↓ in i
- Real form ⇒ $M^d/P = L(Y, i)$ (7.2)
- With the spread ⇒ $M^d/P = L(Y,\ i - i^m)$ (7.3)

Other Factors Affecting Money Demand

- **Wealth** ↑ ⇒ money demand ↑ (but wealth moves slowly ⇒ demand stable)
- **Risk** ↑ ⇒ flight to money (financial crisis, 9/11)
- **Liquid alternatives** ↑ ⇒ money demand ↓ (esp. M1)
- **Payment tech** (cards) ⇒ less cash needed (~70% of Americans use cards; 1.2 bn in circulation)

Elasticities of Money Demand

- **Elasticity** = % change in money demand per 1% change in a factor
- **Income** η_Y ⇒ **positive but < 1** (Goldfeld $\approx 2/3$)
- **Interest** η_i ⇒ small, **negative**
- **Price** η_P ⇒ **unitary** (= 1)

Velocity of Money

- **Velocity** ⇒ how often money "turns over" each period

$$V = \frac{\text{nominal GDP}}{\text{nominal money stock}} = \frac{PY}{M} \qquad (7.4)$$

- M2 velocity ⇒ long **downward trend**
- Unstable velocity ⇒ money growth a **poor predictor** of nominal GDP
- 📝 *Numerical Problem 2 (ABC): compute V from a money-demand function.*

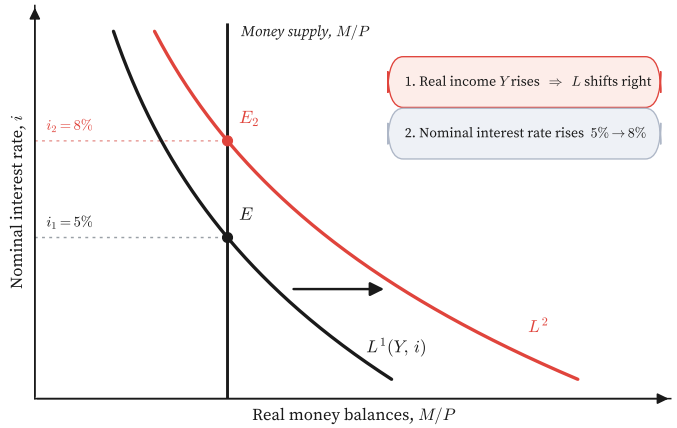
The Quantity Theory of Money

- **Quantity theory** ⇒ real money demand ∝ **real income**

$$\frac{M^d}{P} = kY \qquad (7.5)$$

- Assumes **constant velocity** (no income/interest effect)
- **But** M1 velocity ≠ constant ⇒ rose 1960–80, erratic since
- **M2 velocity** ⇒ closer to constant, **not** short-run

What sets the interest rate? — a preview (full story in Ch 9)



7-4 · Asset Market Equilibrium

Asset Market Equilibrium — An Aggregation Assumption

- Group all assets into **two** categories:
- **Money** ⇒ currency + checking; pays i^m; supply fixed at M
- **Nonmonetary** ⇒ stocks, bonds, land…; pays $i = r + \pi^e$ (Fisher relation — §7-5); supply fixed at NM

If the money market clears, the whole asset market clears

- Demanded: $M^d + NM^d$ (7.6) = Supplied: $M + NM$ (7.7)
- Subtract ⇒ $(M^d - M) + (NM^d - NM) = 0$ (7.8)
- ⇒ excess demands sum to **0** (Walras' Law)
- Money market clears ⇒ **entire** asset market clears

The price level = nominal money supply ÷ real money demand

$$\frac{M}{P} = L(Y,\ r + \pi^e) \quad (7.9) \qquad \Longrightarrow \qquad P = \frac{M}{L(Y,\ r + \pi^e)} \quad (7.10)$$

- (7.9) ⇒ **real supply = real demand**
- M ⇒ central bank; π^e fixed (for now)
- Y ⇒ labor market + production; then r ⇒ goods market
- (7.10) ⇒ P = nominal supply ÷ real demand ⇒ double M ⇒ double P
- 📝 *Numerical Problems 3 & 4 (ABC): solve for the equilibrium interest rate and the price level.*

7-5 · Money Growth & Inflation

Does money growth cause inflation?

- Inflation closely tied to the **growth rate of the money supply**

$$\frac{\Delta P}{P} = \frac{\Delta M}{M} - \frac{\Delta L(Y, r + \pi^e)}{L(Y, r + \pi^e)} \quad (7.11)$$

- Equilibrium ⇒ **inflation = money-supply growth − real-money-demand growth**

How do we forecast inflation from money growth?

- Long run ⇒ i constant ⇒ watch only growth in Y (η_Y = income elasticity)

$$\pi = \frac{\Delta M}{M} - \eta_Y \frac{\Delta Y}{Y} \qquad (7.12)$$

- **Your turn:** with $\Delta M/M = 10\%$, $\Delta Y/Y = 3\%$, $\eta_Y = 2/3$ — what is π?
- 📝 *Numerical Problems 5–7 (ABC): use elasticities to predict inflation and the price level.*

In high inflation, money-supply growth dominates

- Both demand & supply growth matter, **but supply dominates** in high inflation
- Real demand moves little ($\eta_Y = 2/3$: $\pm 15\%$ growth ⇒ only $\pm 10\%$ demand)
- Supply growth differs by **hundreds of points** ⇒ explains inflation gaps

Why Allow Rapid Money Growth?

- Why permit it if it causes inflation?
- ⇒ sometimes the **only way to finance** government spending
- Esp. **very poor** or **political-crisis** countries (seigniorage)

Expected inflation raises the nominal interest rate

- Expectations **can't** be ignored in the real world
- $\pi^e > 0$ ⇒ **raises the nominal rate** ⇒ changes money demand & P
- Stable conditions ⇒ $\pi^e \approx \pi$ (actual)
- Real rate stable ⇒ nominal rate moves **one-for-one** with inflation (Fisher)

How can we measure inflation expectations?

- Find expectations ⇒ **surveys**, or **better**, read from **bond rates**
- US issues **nominal bonds** and **TIPS**
- TIPS ⇒ **real** payments (interest & principal adjust for inflation)
- Compare the **nominal** rate with the **real** (TIPS) rate
- **India:** the analogue is **IINSS-C** — inflation-indexed bonds with principal linked to **CPI**

The Break-Even Inflation Rate

- **Break-even** = nominal-bond rate − real (TIPS) rate ⇒ rough **expected inflation**
- Inflation-risk premium ⇒ break-even **too high**; liquidity premium ⇒ **too low** ⇒ roughly **right**
- Data ⇒ break-even **fluctuates**; survey expectations fairly **constant**
- ⇒ markets differ from forecasters, **or** TIPS premia varied since 1998

Taking Stock

Putting it all together

- **Money demand:** $L = P\,L(Y, i)$ — real demand **rises** with income, **falls** with the nominal rate
- **Asset-market equilibrium:** $\frac{M}{P} = L(Y, i) \;\Rightarrow\; P = \frac{M}{L(Y, i)}$
- **Quantity theory** ($MV = PY$)**:** in the long run, **inflation ≈ money growth − real output growth**
- **Fisher relation:** $i = r + \pi^e$ — expected inflation is built into nominal rates

Building blocks: how the pieces connect

Portfolio choice ⟶ **Money demand** $L(Y, i)$ ⟶ **Asset-market equilibrium** $\frac{M}{P} = L$ ⟶ **Price level** ⟶ **Money growth ⇒ inflation** ⟶ **Nominal rates** ($i = r + \pi^e$)

- The asset market is the **third leg** of the Ch 9 three-market model (labor · goods · **assets**)
- It pins down the **nominal** side — the **price level and inflation** — while the goods and labor markets set the **real** side

Thank you

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