

国际经济学

短期汇率决定理论：货币分析法

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2018 年 11 月 19 日

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- 基于 f_x 是一种资产的思想，UIP 和 CIP 分别提出一种即期汇率和远期汇率的决定机制。无论是 UIP 和 CIP 理论，利率都居于核心地位。



JF & Rudi Dornbusch, Fall 1987, Basel

Monetarism 货币主义

Monetarism is a school of thought in monetary economics that emphasizes the role of governments in controlling the amount of money in circulation. Monetarist theory asserts that variations in the money supply have major influences on national output in the short run and on price levels over longer periods.

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- 以上模型的共同点是假定本国债券和外国债券能够完全替代，也就是说影响对它们相对供求的因素只有一个：利率差异。如果允许本国债券和外国债券存在风险差异，则会把我们引向——**资产组合平衡模型**



JF & Rudi Dornbusch, Fall 1987, Basel

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Chapter 15: Money, Interest Rates, and Exchange Rates

Money

■ Why do we need it?

- 1 Medium of exchange
- 2 Unit of account
- 3 Store of value

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Money - Medium of exchange

- Mutual coincidence of wants
 - I want a bottle of water right now
 - 7-Eleven needs economic analysis right now
- Unlikely...
- Money helps us:
 - Avoid complicated barter exchanges
 - Automatically get the value of our own production
 - When we buy something, it is as if we had bartered

Money - unit of account

- Comparing values of different things
- Thought experiment
 - Suppose that the prices at the canteen in 学一 were all in bananas
 - Suppose that the prices at the canteen in 学五 were all in toothbrushes
 - For ex: Coke costs 10 bananas at SP, and 2 toothbrushes at P
 - Where is it more expensive?
- Money helps us:
 - Quickly compare prices across goods and locations

Money - Store of Value

- Money is an asset
 - If you want, keep in under your mattress!
- It is the most liquid asset, a benchmark

What is money?

- More difficult question than it seems!

| Type of money | M0 | MB | M1 | M2 | M3 | MZM |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|-------------------|----|----|-----|
| Notes and coins in circulation (outside Federal Reserve Banks and the vaults of depository institutions) (currency) | ✓ ^[9] | ✓ | ✓ | ✓ | ✓ | ✓ |
| Notes and coins in bank vaults (Vault Cash) | | ✓ | | | | |
| Federal Reserve Bank credit (required reserves and excess reserves not physically present in banks) | | ✓ | | | | |
| Traveler's checks of non-bank issuers | | | ✓ | ✓ | ✓ | ✓ |
| Demand deposits | | | ✓ | ✓ | ✓ | ✓ |
| Other checkable deposits (OCDs), which consist primarily of Negotiable Order of Withdrawal (NOW) accounts at depository institutions and credit union share draft accounts. | | | ✓ ^[10] | ✓ | ✓ | ✓ |
| Savings deposits | | | | ✓ | ✓ | ✓ |
| Time deposits less than \$100,000 and money-market deposit accounts for individuals | | | | ✓ | ✓ | |
| Large time deposits, institutional money market funds, short-term repurchase and other larger liquid assets ^[11] | | | | ✓ | | |
| All money market funds | | | | | | ✓ |

- M1 is the most liquid
- In this book, *money supply* is M1

A difficult question

- Money does three things
 - 1 Medium of exchange
 - 2 Unit of account
 - 3 Store of value
- Why do we use pieces of paper and not gold coins?
- Or at least pieces of paper that could be redeemed for gold
 - What is the advantage we get from paper?
 - Gold has an advantage: independent value...
- Bitcoin...

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 - 3 Liquidity

Expected return and interest

- M1 pays no interest (to a first approximation)
- If hold cash, lose interest gained by holding illiquid asset
- The higher the interest rate, the higher opportunity cost of holding cash
 - One safe way of earning interest is a risk-free bond
 - Classic example, American T-Bill
 - The higher the return on T-Bill, the less demand for cash

Risk

- Textbook claims risk is not important
- Argument, all financial assets are denoted in currency
- Can't insure against risk
- I'm not sold on this argument: flexible rate bonds, bonds denoted in gold, etc
- OK as a first approximation

Liquidity

- Main use of cash – financing everyday purchases
- More purchases you make, the more cash you need
- Debit card (银联卡) purchases still in M1
- Credit card purchases also involve cash transfers

Individual demand for money

- Decreasing in the interest rate on other assets
- Mostly unrelated to risk
- Increasing in the amount of daily purchases

Aggregate Money Demand

- Sum up all individual demand
- The aggregate demand of real money can be expressed as:

$$M^d = PL(R, Y)$$

where:

- P is the price level: higher prices, more cash needed
- Y is real national income: more stuff, more purchases
- R is a measure of interest rates on non-monetary assets
- $L(R, Y)$ is the aggregate demand of real monetary assets

Aggregate Demand of Real Money

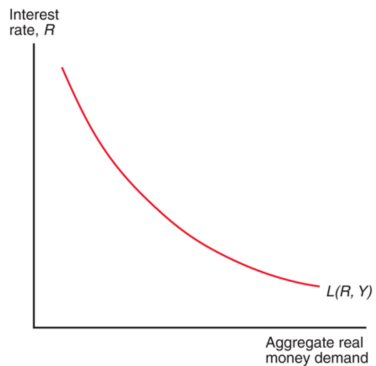
$$\frac{M^d}{P} = L(R, Y)$$

- M^d scales perfectly with P
- If all prices double, need twice as much cash
- Demand for real money

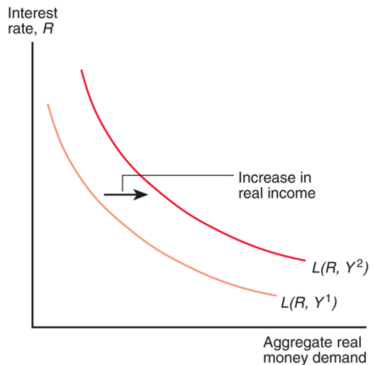
$$\frac{M^d}{P} = L(R, Y)$$

- The L function is demand for holding real value in liquid form

Money demand and interest rate



Shift in National Product



A Short-run Model of the Money Market

- Assume that changes in money supply do not affect:

- 1 Price level
- 2 GNP level

- Changes do affect interest rate of other assets
- In equilibrium:

$$M^s = M^d$$

- Plug in our formula for money demand, in equilibrium

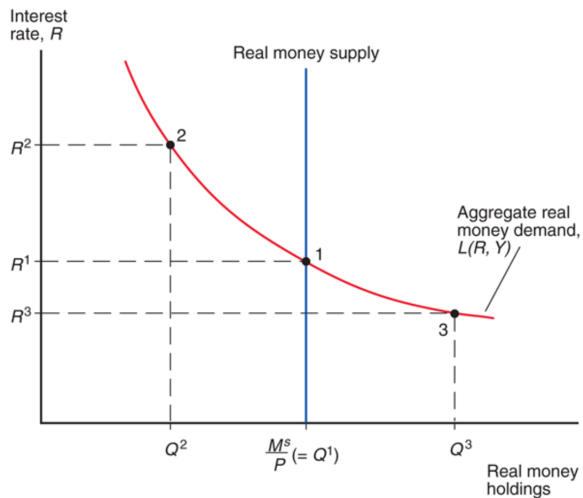
$$\frac{M^s}{P} = L(R, Y)$$

- Real money supply (LHS) equals real money demand (RHS)
- Higher money supply \Rightarrow lower interest rate

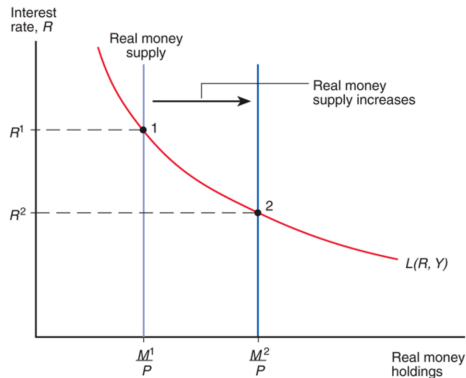
Money supply and interest rate in the short-run

- If more supply than demand for money:
 - 1 People with money will buy bonds for lower interest rate
 - 2 As interest rates fall, people more willing to hold money
- If more demand than supply for money:
 - 1 People will promise more money in the future for money today
 - 2 As interest rates rise, people less willing to hold money

Determination of the Equilibrium Interest Rate

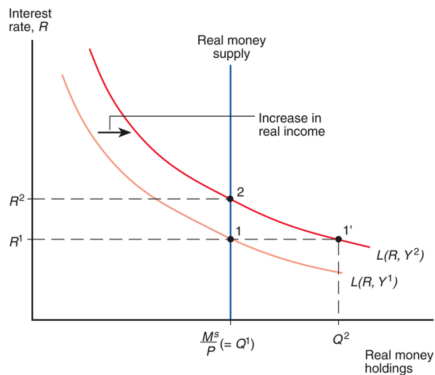


Effect of an Increase in the Money Supply on the Interest Rate



- Short run: Central bank can lower interest rate by increasing money supply
- Short run: Central bank can raise interest rate by decreasing money supply

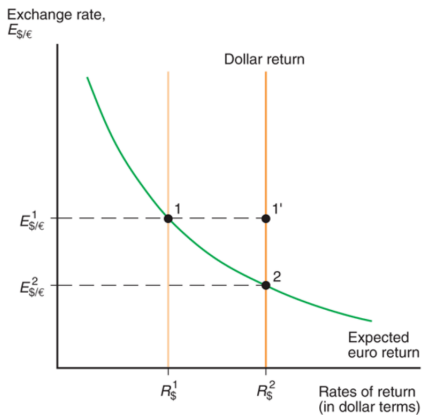
Effect on the Interest Rate of a Rise in Real Income



- Short run: Output growth increases interest rate
- Short run: A fall in output decreases interest rate

Reminder: Interest rate parity condition

- Assume that the return on Euro bonds is fixed in Euros
- Given dollar interest rate, exchange rate adjusts to satisfy parity



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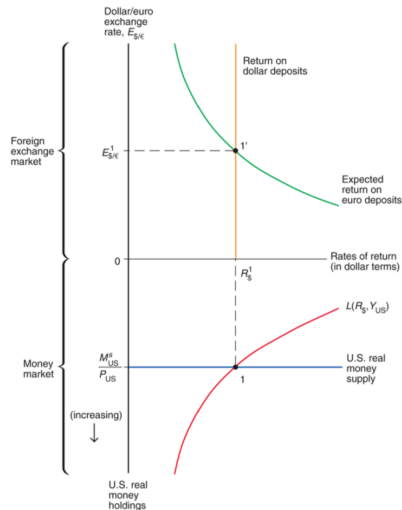
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Money supply and exchange rate

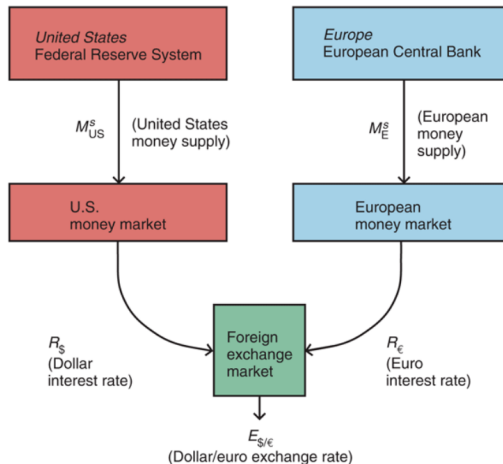
- Suppose Central Bank ups money supply
- Interest rate goes down as people buy bonds
- Dollar depreciates to maintain interest parity

Money supply and exchange rate

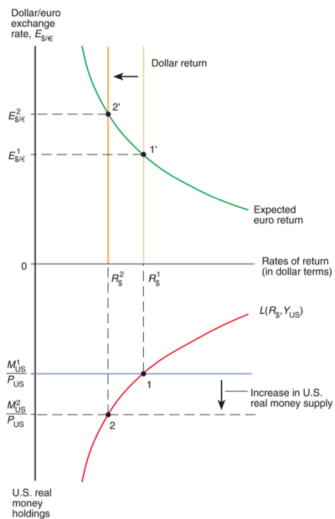


Money Market/Exchange Rate Linkages

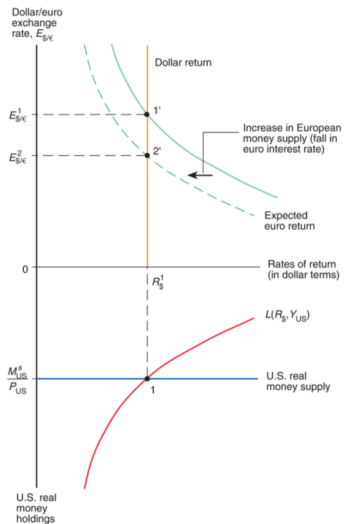
- It is a two central bank game!



Increase in dollar supply



Increase in euro supply



Changes in the Domestic Money Supply

An increase in a country's money supply:

- $R \downarrow$
- depreciation of the domestic currency

An decrease in a country's money supply:

- $R \uparrow$
- appreciation of the domestic currency

Changes in the Foreign Money Supply

How would a change in the supply of euros affect the U.S. money market and foreign exchange markets?

- An increase in the supply of euros \Rightarrow depreciation of the euro

- 1 $R_{EURO} \downarrow$

- 2 depreciation of the euro

- A decrease in the supply of euros \Rightarrow appreciation of the euro

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Long & Short Run

- Affect of more money supply
- **Short run:** Prices are sticky, real money supply rises
- **Long run:** Prices adjust so that real money supply falls to its original level

In the Long Run

In the long run, there is a direct relationship between the inflation rate and changes in the money supply.

- $M^s = PL(R, Y)$

- $P = \frac{M^s}{L(R, Y)}$

Money supply has no long run effect on output and interest rates

Money supply, output and interest

- Money supply has no long run effect on output and interest rates
- Intuition
 - A currency reform: Turkish millionaires
 - 2005, new Turkish lira, divide old lira by one million
 - For a period, both lira could be used
 - Everything in the country lost six zeros
 - No effect on output or interest
- Central Bank actions are similar
- Double the money, halve the prices

Money supply, demand, and inflation

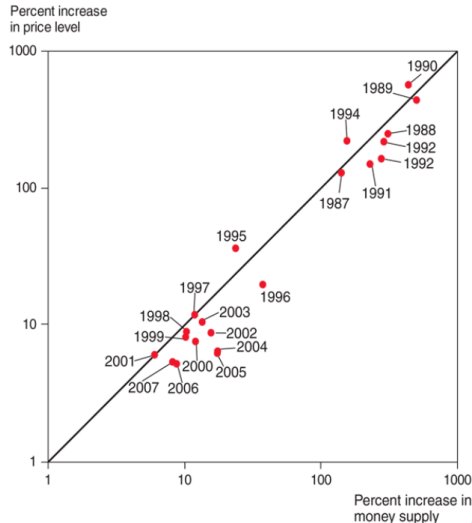
- Long run prices:

- $P = \frac{M^s}{L(R, Y)}$

- $\frac{\Delta P}{P} = \frac{\Delta M^s}{M^s} - \frac{\Delta L}{L}$

The inflation is the growth rate in money supply minus the growth rate in money demand.

Average Money Growth and Inflation in Western Hemisphere Developing Countries, by Year, 1987-2007



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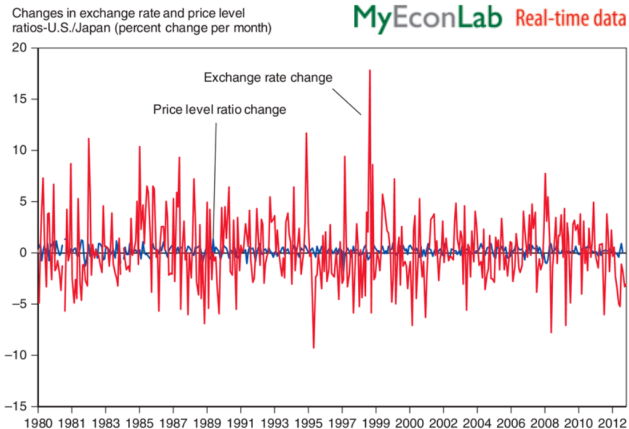
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Short run and Long run

- Money cannot shift prices immediately
 - Long-term contracts
 - Menu costs

Exchange Rates vs Price Level

- In short-run example, we let exchange rates adjust, not prices;
- This assumption seems reasonable for US and Japan



Source: Price levels from International Monetary Fund, *International Financial Statistics*. Exchange rate from Global Financial Data.

Short run and Long run

- Money cannot shift prices immediately
- Over time, however, prices will adjust
 - 1 Excess demand of goods and services: labor $\uparrow \Rightarrow$ wage $w \uparrow P \uparrow$
 - 2 Inflationary expectations: $P^e \uparrow w \uparrow P \uparrow$
 - 3 Raw materials prices: Adjust quickly

Excess demand for factors

- More money but the same prices means people buy more
- To produce more, firms have to buy more inputs
- Old workers are stuck on contract
- New workers can bargain for higher wages
- The increase in input price causes increase in output price

Inflationary expectations

- People know about increase in money supply
- Long run, prices will rise
- Workers bargaining for Long-term contracts will demand higher wages

Raw materials

- The price of raw materials (oil) adjusts quickly
- Output prices eventually need to reflect increase in input cost

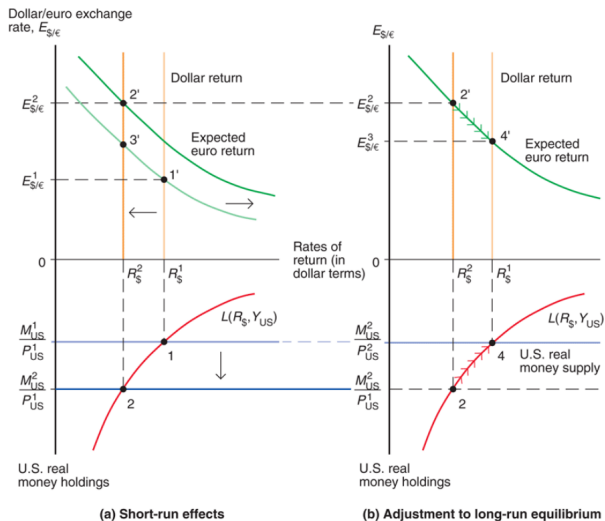
Money supply and exchange rates, long-run

- Review:
 - The return to Euro bonds in dollars depends on expected depreciation
 - The more the dollar is expected to depreciate, the higher Euro bond returns
- Permanent money supply increases raise expected depreciation

Increase in money supply and exchange rate, long-run

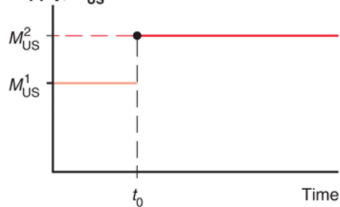
- Initially:
 - Money supply goes up, interest rate falls, depreciation
 - Money supply goes up, expected depreciation, more depreciation
- Then:
 - Prices adjust to long run real money supply level
 - Real money supply falls, interest rate rises, appreciation
 - Exchange rate settles level depreciated relative to initial level
- The double depreciation followed by appreciation: *exchange rate overshoot*

Money, Prices, Exchange Rates, and Expectations

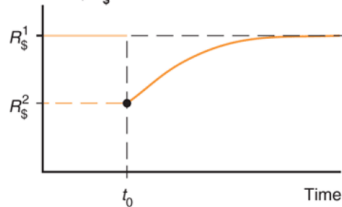


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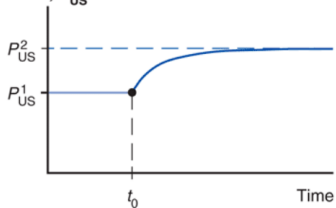
(a) U.S. money supply, M_{US}



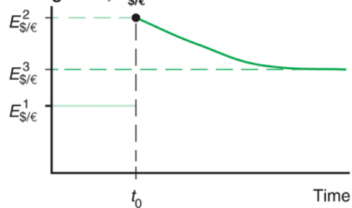
(b) Dollar interest rate, $R_{\$}$



(c) U.S. price level, P_{US}



(d) Dollar/euro exchange rate, $E_{\$/\epsilon}$



Summary of Chapter 15

- We have seen short run sticky prices which cause short-run real effects
- We have seen that in the long run, money is neutral (no real affect)
- We have seen that expectations about money supply affect current exchange rates
- In Chapter 16, we will study how long-term demand and supply shifts affect exchange rate
- Discussion builds on the linkages studied in Chapter 15