

# MONEY AND BONDS

APRIL 8, 2009

*Introduction*

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- ❑ **RBC view:** money is **neutral** (because prices are not rigid/sticky in any important way)
- ❑ To seriously consider the issue, need to finally explicitly think about money and monetary policy
  - ❑ It's only been in the background of our analyses thus far...

## THE ROLES OF MONEY

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  - ❑ Medium of exchange
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- ❑ **How to conceptually “model” money a surprisingly hard problem**
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- ❑ **A shortcut: suppose money directly yields utility**
  - ❑ **Period- $t$  utility function**

$$u\left(c_t, \frac{M_t}{P_t}\right)$$
  - ❑ **Money-in-the-utility-function (MIU) formulation**

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  - ❑ **IMPORTANT: It's not  $M_t$  in the utility function, but rather  $M_t/P_t$**

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## REAL MONEY BALANCES

- ❑  $M_t/P_t$  a key variable for macroeconomic analysis
- ❑ **Unit Analysis (i.e., analyze algebraic units of variables)**
  - ❑  $\text{Units}(M_t) = \$$
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- **Utility (composite of medium of exchange, unit of account, store of value) depends on *real* money ( $M/P$ ), not nominal money ( $M$ )**
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- $M_t$  and  $P_t$  can potentially grow at different rates
  - In which case real money balances change

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## MONEY MARKETS AND BOND MARKETS

- A prerequisite for studying money and monetary policy: understanding bonds and bond markets
- Bond markets and money markets intimately linked to each other

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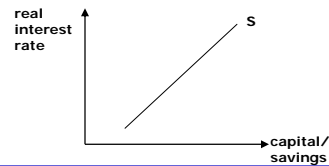
## THE THREE MACRO (AGGREGATE) MARKETS

*Many* different *types* of assets exist...hence many different *types of financial markets*

1. Stock markets (Chapter 8)
2. Real-estate markets (Practice Problem Set 4)
3. Bond markets (Chapter 14)
4. Money markets (Chapter 14)
5. Foreign-currency markets (Chapter 16)

❑ **Capital/Savings/Funds/Asset Markets  
(aka Financial Markets)**

- ❑ Supply derived from C-S model



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- ❑ **Simply put, a debt obligation (i.e., borrow funds today, repay at some future date, probably with interest)**
  - ❑ **Types of bonds**
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    - ❑ Zero-coupon bonds – only pay back at final date of maturity

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Of late: problems in markets for "mortgage-backed bonds" – the source of the "credit crunch" affecting world economies since August 2007

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  - ❑ Understanding how this type of bond is priced key to understanding how all bonds are priced
    - ❑ U.S. Treasury bonds the benchmark in financial markets (Wall Street lingo: "bellwether bond")

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  - ❑ Also sheds light on the pricing kernel (recall from Chapter 8)
    - ❑ Stock prices linked to bond prices

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## BOND MARKETS

- Key relationship between price of a bond and nominal interest rate

Bonds priced according to present-value of future payoff

$$P_t^b = \frac{FV_{t+1}}{1+i_t}$$

- Notation

- $P_t^b$ : nominal price of a one-period bond
- $i_t$ : nominal interest rate between period  $t$  and period  $t+1$
- $FV_{t+1}$ : face-value of bond (i.e., how much will be repaid in  $t+1$ )

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← IMPORTANT: inverse relationship between  $P^b$  and  $i$  →

$$i_t = \frac{1}{P_t^b} - 1$$

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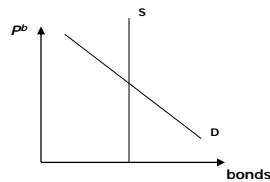
- Inverse relationship between price of a bond and nominal interest rate – critical
- Bond markets are/have been the usual conduit through which Fed conducts monetary policy

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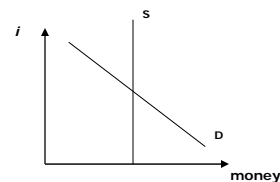
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BOND MARKET



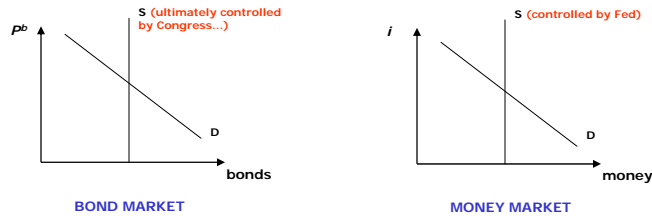
MONEY MARKET

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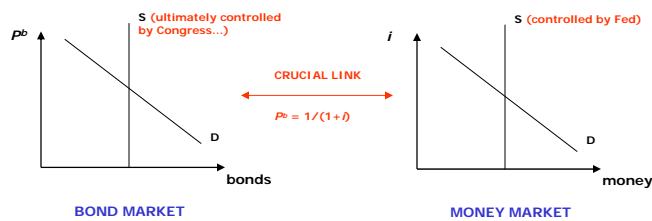
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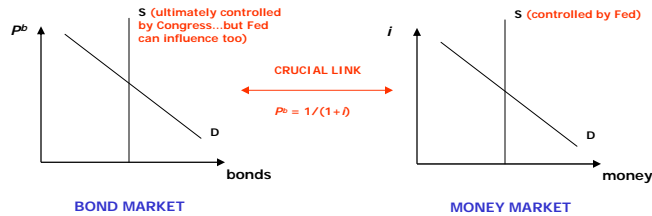
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- $i$  can be thought of in two (mirror-image) ways
  - The interest payoff of a bond
  - Opportunity cost of holding money
    - Each unit of wealth held as a dollar is a unit of wealth *not* held as a bond, which entails the loss of (i.e., opportunity cost) chance to earn interest
    - $i$  sometimes referred to as “the price of money”

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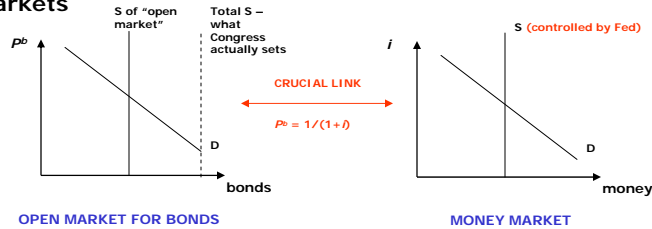
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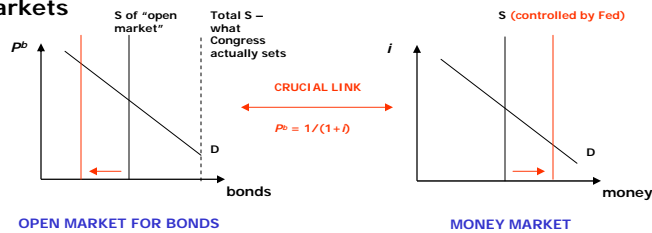


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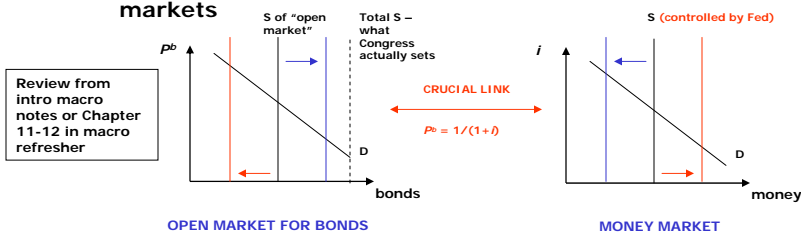
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- Contractionary monetary policy by Fed
  - Fed sells bonds to banking sector, increasing supply on open market...
  - ...in exchange for money, decreasing its supply in money market...
  - ...which causes  $i$  to increase

## **A MORE EXPANSIVE VIEW OF MONETARY POLICY?**

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- ❑ **What else is monetary policy and how else can it be conducted?**
  - ❑ News Supplements (various) posted on web
- ❑ **Allow Fed to purchase other assets, not just U.S Treasury bonds**
  - ❑ i.e., let it conduct other market operations instead of the just the "usual" bond open-market operations
- ❑ **Allow Fed to issue its own bonds (legal issues unclear)**

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- Bail out banks in times of distress
  - Ongoing Fed-coordinated buyout of/loans to distressed financial institutions
- "Communicate" with the public and markets about "how the economy is doing"
  - A "soft" role for monetary policy
  - A confidence-management role

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- The "art" and "science" of monetary policy
  - Activist monetary-policy-making a fairly recent phenomena (only since 1970's)
  - History of money and the Federal Reserve at [www.federalreserve.gov](http://www.federalreserve.gov)