The Behavior of Interest Rates
Money and Banking

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ReCap

The theory of asset demand

Supply and demand in the bond market

Equilibrium interest rates and comparative statics

Supply and demand for money: preference for liquidity

Comparative statics in the market for money
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Nominal interest rates don’t tell us the whole story; we need to look at real interest rates (why and what’s the difference?)
The theory of asset demand: determinants

- **Wealth:**

Suppose that you worked hard for a full month and your employer is now ready to pay you a generous salary. After consuming some of your income (salary) you realize that you have some left. You are wealthier. So you think about ways to store that additional purchasing power. You invest in some asset. Thus; the wealthier you are, the higher is your demand for assets.

**Expected return:**

Suppose that you are ready to save that extra purchasing power by buying an asset. You are offered 100 different alternatives. Which would you buy? I say the one with highest return. Thus the higher the return, the higher your demand for a particular asset.
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Suppose that you are ready to save that extra purchasing power by buying an asset. So you are offered 100 different alternatives but all offer the same return. Which would you buy? I say the one with lowest risk. Thus the lower the risk, the higher your demand for a particular asset.

- Liquidity:

Now you are offered 100 different alternatives but all offer the same return and expose your wealth to the same amount of risk. Which would you buy? I say the one with highest liquidity. The one that gives you faster access to your purchasing power. Thus the more liquid it is, the higher your demand for that particular asset.
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A compact way to summarize what determines interest rates is to express them as a function of the aforementioned variables:

\[ A^d = f (w, R^e, \sigma, l) \]

\[(+)(+)(-)(+)\]
The theory of asset demand: summary

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And:

- \( A^d \) = Asset demand
- \( w \) = wealth
- \( R^e \) = expected return
- \( \sigma \) = risk
- \( l \) = liquidity
Supply and demand (S&D) in the bond markets

First, think about this: "interest rates of different assets tend to move together".
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From previous micro course we know that any S&D analysis we need to know the relevant prices and quantities.

Quantities are easy: amount in $ demanded of supplied.

Prices: we could use interest rates, but we know that there’s a close relationship between bond prices and interest rates.
Example

Suppose that you can buy a bond with face value of $1,000 and no coupon payments (i.e. interest rate=YTM=rate of return) for $920. Now suppose that under such conditions you would be happy to hold $500k worth of that bond. If the price of such bond falls to $850, would you demand more or less of it? Why?

Because the price fell, we know (from last lecture) that the interest rate must have risen. Since in this case interest rate=return, the theory of asset demand tells us that the quantity demanded will rise.
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- Draw demand curve.
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Example

Suppose that you are the CFO of a firm and are considering issuing $1,000 face value, no coupon bonds (i.d. a debt contract). This week you survey the market and you realize that, at prevailing interest rates, it is willing to buy your bonds at $650 each. You issue $100k. If the price at which you can sell them rises, would you issue more or less of them?
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- Equilibrium: $B^s = B^d$ or where the market settles.
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- Excess demand and excess supply.
Equilibrium interest rates and comparative statics

- When are we moving along the S/D curves?
Equilibrium interest rates and comparative statics

- When are we moving along the S/D curves?
- As in your kindergarten micro: when the quantity demanded/supplied changes as a result of a price change:
Equilibrium interest rates and comparative statics

- When are we shifting S/D curves?
Equilibrium interest rates and comparative statics

- When are we shifting S/D curves?
- When quantities demanded/supplied for any given price:
What shifts the demand for bonds curve?

- Wealth
- Risk
- Liquidity
- Expected returns: only relevant when interest rates change if return.

Why?

"Exogenous" to the particular asset market (e.g. economic expansions).
What shifts the **demand** for bonds curve?

**Wealth**...why? direction?
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- Note the subtlety: suppose that you expect interest rates to rise in the future compared to their current level.

Recall the example in which returns are very different from interest rates due to capital gains (difference in prices). Thus, at any given interest rate prevailing today, we would obtain a higher return. And we know that higher expected return increases demand for the underlying asset.
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Now, that shifts the supply curve?
Equilibrium interest rates and comparative statics

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- Expected profitability of investment:
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- If expected inflation rises the demand curve shifts as well...why?.
What’s the effect of business cycle expansion on the bonds market?
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Demand effect....
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- Demand effect....
- Wealth!
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Demand effect....

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Profitability!
Preference for liquidity and the market for money

- Drop the perfect substitute assumption.
Preference por liquidity and the market for money

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- Liquidity preference framework (Keynes)
Preference por liquidity and the market for money

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- Liquidity preference framework (Keynes)
- Suppose people only hold bonds and money:

\[ B^d + M^d = B^s + M^s \]

that is, the bonds market is in equilibrium, the money market is in equilibrium.

Money earns no return \((R_{EM} = 0)\); bonds earn \(R_{EB} = i_B = i\).

Opportunity cost of holding money!

This is Keynes' extreme case where money = M1 but it's useful nevertheless since the rate of return on more liquid assets is always smaller than that earned by less liquid assets.
Drop the perfect substitute assumption.

Liquidity preference framework (Keynes)

Suppose people only hold bonds and money:

\[
B^d + M^d = B^s + M^s
\]

(total wealth) = (supply of assets)

Or \(B^s - B^d = M^d - M^s\). That is, the bonds market is in equilibrium ⇔ the money market is in equilibrium.
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\( B^d + M^d \) = total wealth  \( B^s + M^s \) = supply of assets

- Or \( B^s - B^d = M^d - M^s \). That is, the bonds market is in equilibrium \( \Leftrightarrow \) the money market is in equilibrium.
- Money earns no return \( (R_M^e = 0) \); bonds earn \( R_B^e = i_B = i \).
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\[
\begin{align*}
B^d + M^d &= B^s + M^s \\
\text{total wealth} &= \text{supply of assets}
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\]

- Or \( B^s - B^d = M^d - M^s \). That is, the bonds market is in equilibrium \( \iff \) the money market is in equilibrium.
- Money earns no return \( R^e_M = 0 \); bonds earn \( R^e_B = i_B = i \).
- **Opportunity cost of holding money!**
Preference for liquidity and the market for money

- Drop the perfect substitute assumption.
- Liquidity preference framework (Keynes)
- Suppose people only hold bonds and money:

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\frac{B^d + M^d}{\text{total wealth}} = \frac{B^s + M^s}{\text{supply of assets}}
\]

- Or \(B^s - B^d = M^d - M^s\). That is, the bonds market is in equilibrium \(\Leftrightarrow\) the money market is in equilibrium.
- Money earns no return \(R_M^e = 0\); bonds earn \(R_B^e = i_B = i\).
- **Opportunity cost of holding money!**
- This is Keynes’ extreme case where money = M1 but it’s useful nevertheless since the rate of return on more liquid assets is always smaller than that earned by less liquid assets.
Preference por liquidity and the market for money

- Suppose that the money supply is fixed by the monetary authority. (i.e. \( M^s \) is a vertical line).
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Thus, equilibrium is entirely determined by money demand, which depends negatively on its opportunity cost.: