

Lecture Two

Determinants of Interest Rates

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1. Interest Rate Fundamentals: Chapter Overview

The interest rates that you actually see quoted are **nominal** interest rates; as a result, nominal rates are sometimes called ‘quoted rates.’ The purpose of the lecture is to examine the components of the nominal interest rate. They are a) the real riskless rate of interest (**risk free rate**) that is compensation for the pure time value of money, b) an expected **inflation premium** that is time dependent and c) a **risk premium** for **liquidity**, **default** and **interest rate risk**.

2. Loanable Funds Theory

The interaction of supply and demand of funds sets the basic opportunity cost rate (real interest rate) in the economy. The European Central Bank estimates supply and demand of funds from households, business, government and foreign sources through its flow of funds accounts.

a. Supply of Loanable Funds

The predominant suppliers of loanable funds are households (about 35% of total supply).¹ Household savings increase with higher interest rates and the supply curve is upward sloping wrt interest rates. However, the main determinants of household savings are 1) income or wealth, the greater the income, the greater the amount saved, 2) attitudes about saving versus borrowing, 3) credit availability, the greater the amount of easily obtainable consumer credit the lower the need to save, 4) belief about safety of the Social Security system and 5) tax policy. Hereby, I show you some examples of how the five

¹ Households are the top gross and net (net of funds demanded) suppliers.

determinants may affect the interest rate level. In Italy tax policy favors borrowing only in the case of loans for real estate (c.d. “prima casa”) but taxes virtually all savings. As a result, the supply curve is steeper than one might expect. In the case of higher interest rates, savers do not have to save as much to hit specified future values, so savings are not all that sensitive to interest rates. Where consumers put their savings is sensitive to interest rates, they move out of liquid accounts as interest rates rise (as the price of foregoing higher rates of return to maintain liquidity rises). Households apparently try to smooth consumption patterns over different levels of income. As income falls they save less to maintain consumption, as income rises households save more. Other factors include the perceived riskiness of investments, near term spending needs, European Central Bank policy and general economic conditions. Favorable economic conditions increase savings. In 2001 in the U.S. foreigners supplied 9.25% of total funds. Foreign sources examine the same factors as U.S. funds suppliers except that they must also factor in expected changes in currency values, global interest rates and different tax rates. There is typically some built in demand for U.S. investments however because the U.S. is considered a **safe haven**, i.e., a country with relatively lower political and economic risk.

b. Demand for Loanable Funds

Business demand (financial and nonfinancial) comprises 76.5% of funds demanded. The quantity of loanable funds demanded is greater at lower interest rates. Businesses prefer to finance internally when interest rates are high. The demand for loanable funds by households for big ticket items is quite sensitive to interest rates as these items comprise a large percentage of their budget (homes, autos, boats, etc). The Government’s demand for funds is relatively insensitive to interest rates, but not wholly so because much of the interest owed on the public debt (which is 106,4% on the GNP on 12/31/05) is financed by borrowing. As interest rates rise, the Government has to borrow more to pay off the interest on the existing debt. State and local government financing is very sensitive to interest rates. New municipal offerings drop when interest rates rise. Not surprisingly, government entities that cannot print money (or raise taxes) are more sensitive to financing costs!

c. Equilibrium Interest Rate

It is the job of the 12 National banks to estimate aggregate supply and demand of funds from the various sectors at different interest rates and then build the aggregate supply and demand curves. The intersection of the supply and demand curves then sets the equilibrium real rate of interest.

d. Factors that Cause the Supply and Demand Curves for Loanable Funds to Shift

Increase in	Affect on Supply	Affect on Demand
Wealth	Increase	N/A
Risk	Decrease	Decrease
Near term spending needs	Decrease	N/A
Monetary expansion	Increase	N/A
Economic growth	Increase	Increase
Utility derived from assets		Increase

Restrictive covenants

Decrease

3. Movement of Interest Rates Over Time

Interest rates fluctuate in a nearly continuous manner due to the actions of traders. In a free market (capitalist) society, governments do not set prices. Interest rates are the price of borrowing money associated with a specific instrument. Actions to buy, sell and issue securities affect interest rates. In turn, demand and supply of funds fluctuate daily as current and expected conditions evolve.

4. Determinants of Interest Rates For Individual Securities

a. Inflation

Inflation is the rate of change in the overall price level. The Consumer Price Index (CPI) is the most commonly quoted measure of inflation. The CPI purports to measure the price level of a market basket of goods and services purchased by the typical urban consumer.

b. Real Interest Rates

c. Fisher Effect

The Fisher effect states that nominal rates equal real rates plus a premium for expected inflation. This relationship is the basis for the term structure. Differences in annual expected inflation rates cause differences in bond rates with different maturities. In 2001 the realized real rate was about 1.89%.

d. Default or Credit Risk

Default risk premiums (**DRPs**) are increases in required yield needed to offset the possibility the borrower will not repay the promised interest and principle in full or as scheduled. In 2001 credit risk premiums were between 1% and 2% on high grade corporate debt and were as high as 3.5% on medium grade debt. DRPs are cyclical, and rose in 2001 and 2002 due to weak economic conditions.

e. Liquidity Risk

Liquidity risk premiums are increases in required or promised yields designed to offset the risk of not being able to sell the asset in timely fashion at fair value. These are similar to, but not the same as, the liquidity premiums in the term structure discussion. Liquidity risk can be more significant for some debt instruments than for stocks as many bonds trade in thin markets.

f. Special Provisions of Covenants

- ◆ Taxation: $i_C = i_M / (1 - t_S - t_F)$ (includes t_S : state and local tax rates – i.e. IRAP –, t_F : Government tax rate – i.e. IRE e IRES –, C = Corporate, M = municipal bond)
Muni rates are lower than similar corporate bonds because interest (but not capital gains) is exempt from federal taxation. In most states, the holder of a muni bond issued in that state is also exempt from state taxes.

- ◆ Convertible bonds have lower yields than straight bonds because the bondholder has the right to convert them to preferred or common stock at their choice. Offering a conversion feature may save 100 to 200 basis points, *ceteris paribus*. In most cases however, the stock has to appreciate 15%-25% over the at issue price in order to make conversion attractive.

g. Term to Maturity

The **term structure** depicts the relationship between maturity and yields for bonds identical in all respects except maturity. In practice, 'identical' means same rating and hopefully the same coupon (or differential tax effects will be present). The graph of the term structure can take on any shape, but upward sloping is most common (meaning longer term bonds promise higher nominal yields). An inverted yield curve appeared in Feb 2000. Note that for Treasuries, 'on the run' (newly issued) securities often carry price premiums over 'off the run' (previously issued) securities.

h. Summary

$i_j^* = f(\text{Riskless real rate, Expected inflation, Default risk premium, Liquidity risk premium, Special covenant premium, Maturity risk premium})$

Tratto e adattato da: Saunders, Cornett, Anolli, Economia degli intermediari finanziari, McGraw Hill; lettura suggerita, cap2, parr. 1, 3, 4, 5.