CHAPATER 6

Risk structure of interest rates : the relationship among these, bonds with the same term of maturity have different interest rates.

Term structure of interest rates: A bond’s term of maturity also affects its interest rate, and the relationship among interest rates on bonds with different terms to maturity.

Risk of default : Default occurs when the issuer of the bond is unable or unwilling to make interest payments when promised or pay off the face value when bond matures.

U.S. Treasury bonds have usually been considered to have no default risk b/c the fed government can always inc taxes or print money to pay off its obligations.

Default-free bond : bonds with no default risk.

The spread between interest rates on bonds with default risk and interest rates on default-free bonds, both of the same maturity, is called the risk premium. The risk premium indicates how much additional interest people must earn to be willing to hold the risky bond. Bond with default risk always has a positive risk premium.

The theory of portfolio choice predicts that b/c the expected return on the corporate bond falls relative to the expected return on the default-free Treasury bond while its relative riskiness rises, the corporate bond is less desirable and demand for it will fall.

At the same time, the expected return on default-free Treasury bonds inc relative to the expected return on corporate bonds, while relative riskiness declines. The Treasury bonds thus become more desirable, and demand rises, by the rightward shift in the demand curve for these bonds from D1 to D2

A bond with default risk will always have a positive risk premium, and an inc in its default risk will raise the risk premium.

Credit-rating agencies : investment advisory firm that rate the quality of corporate and municipal bonds in terms of their probability of default.

Junk bonds : have higher default risk and have been aptly dubbed speculative-grade or junk bonds; they also referred to as high-yield bonds.

The most liquid an asset is, the more desirable it is.

U.S. Treasury bonds are the most liquid of all long-team bonds, b/c they are so widely traded, easiest to sell quickly, cost of selling them is low. Corporate bonds are not as liquid b/c fewer bonds for any one corporation are traded. In an emergency

Lower liquidity of corporate bonds relative to Treasury bonds inc the spread between the interest rates on these two bonds.

If the corporate bond become less liquid than the Treasury bond, then demand for it will fall, shifting its demand curve leftward from Dc1 to Dc2; the Treasury bond now becomes relatively more liquid in comparison with the corporate bond, so its demand curve shifts rightward from Dt1 to Dt2; the shift in the curve show the price of the less liquid corporate bond falls and its interest rates rises, while the price of the most liquid treasury bond rises and its interest rate falls.

The result is : the spread between the interest rates on the two bond types rises. The differences between interest rates on corporate bonds’ default risk but also their lesser liquidity.

Once the municipal bonds are givin a tax advantage that raises their after-tax expected return relative to Treasury bonds and make them more desirable, demand for them rises, and their demand curve shifts to the right, from Dm1 to Dm2. Their equi bond price then rises from pm1 to pm2, and their equi interest rate falls.

By contract, Treasury bonds have now become less desirable relative to municipal bonds; demand for Treasury bonds have now become less desirable relative to municipal bonds; demand for Treasury bonds decreases, and D1t shifts to the left to D2T. The Treasury bond price falls from pt1 to pt2. And the interest rate rises. The default income tax exemption, which leads to a higher expected return for municipal bonds relative to Treasury bonds, explains why municipal bonds can have interest rates below those of Treasury bonds.

Yield Curve : A plot of the yield on bonds with differing terms to maturity but the same risk, liquidity, and tax consideration; it describe the term structure of interest rates for particular type of bonds.

Upward slopping : long-term interest rates are above short-term interest rates;

Flat yield curve : short- and long-term interest rates are the same;

Inverted yield curve : long-term interest rates are below short-term interest rates.

Three important empirical facts:

1. Interest rates on bonds of different maturities move together over time.
2. When short-term interest rate are low, yield are more likely to have an upward slope; when short-term interest rate are high, yield curve are more likely to slope downward and be inverted.
3. Yield curves always slope upward, as appears in the following the financial news box.

Expectation theory : the interest rate on the long-term bond will equal the average of the short-term interest rates that people expect to occur over the life of the long term bond.

Expectation theory predicts that interest rates on bonds of different maturities differ b/c short-term interest rates are expected to have different values at future dates. That, buyers do not prefer bonds of one maturity over another bond with a different maturity.

Bond that has this characteristic are said to be perfect substitutes.

This states that the n-period interest rate equals the average of the one-period interest rates expected to occur over the n-period life of the bond.

The expectations theory is an elegant theory that explains why the term structure of interest rates (as represented by yield curve) changes at different times. When the yield curve is upward-sloping, the expectation theory suggests that short-term interest rates are expected to rise in the future.

When the yield curve is inverted (slope downward), the average of future short-term interest rates is expected to be lower than the current short-term rate, implying that short-term interest rates are expected to fall, on average, in the future.

When the yield curve is flat does the expectation theory suggest that short-term rates are not expected to change, on average, in the future.

Expectation theory also explains that interest rates on bonds with different maturities move together over time. If short-term interest rates increased today, they will tend to be higher in the future. Hence a rise in short-term rates will raise people’s expectations of future short-term rates, a raise in short-term rates will also raise long-term rates, causing short-term rates to move together.

When the short-term rates are low, people generally expect them to rise to some normal level in the future, and the average of future expected short-term rates is high relative the current short-term rate. Therefore, long-term interest rates will be substantially higher than current short-term rates, and the yield curve will have an upward slope.

Conversely, if short-term rate are high, people usually expect them to come back. Long-term rates will then drop below short-term rates b/c the average of expected future short-term rates will be lower than current short-term rates, and the yield curve will slope downward and become inverted.

Segmented markets theory : the interest rate on a bond of particular maturity is then determined by the supply of and demand of that bond and is not affected by expected returns on other bonds with other maturities. Bonds of different maturities are not substitutes at all, and be the expected return from holding a bond of one maturity has no effect on the demand for a bond of another maturity. Investors have very strong preferences for bonds of one maturity as opposed to another.

In segmented markets theory, differing yield curve patterns are accounted for supply and demand differences associated with bonds of different maturities.

Risk-averse investors have short desired holding periods and generally prefer bond with shorter maturities that have less interest-rate risk, the segmented markets theory can explain which yield curves typically slope upward.

The demand for long-term bonds is typically relatively lower than that for short-term bonds, long-term bonds will have lower prices and higher interest rates, and hence the yield curve will typically slope upward.

Liquidity premium theory states that the interest rate on a long-term bond will equal an average of short-term interest rates expected to occur over the life of the long-term bond plus a liquidity premium that responds to supply and demand conditions for that bond.

Key assumption: bonds of different maturities are substitutes, which the expected return on one bond of a different maturity. Bond of different maturities are assumed to be substitutes, but not prefect substitutes. Investors tend to prefer short-term bonds because these bonds bear less interest-rate risk. For this reason, investor mush be offered a positive liquidity premium to induce them to hold longer-term bonds.

The liquidity premium theory is written as

Where is the liquidity (term) premium for the n-period bond at time t, which is always positive and rises with the term to maturity of the bond, n.

Liquidity premium theory is closely relative to the preferred habitat theory, which assumes that investors have a preference for bonds of on maturity over bonds of another – a particular bond maturity in which they prefer to invest. B/c risk-averse investors are likely to prefer the habitat of short-term bonds over that of longer-term bonds if they have higher expected returns. That is with a term premium that typically rises with maturity.

There we see that b/c the liquidity premium is always positive and typically grows as the term to maturity inc, the yield curve implied by the liquidity premium theory is always above the yield curve implied by the expectation theory and generally has a stepper slope.

LPT fact 1: a rise in short-term interest rates indicates that short-term interest rates will, on average, be higher in the future, and the first term in equation () then implies that long-term interest rates will rise along with them.

LPT fact 2: B/c investors generally expect short-term interest rates to rise to some normal level when they are low, the average of future expected short-term rates will be high relative to the current short-term rate. With the additional boost of a positive premium, long-term interest rates will be substantially higher than current short-term rates, and the yield curve will have a steep upward slope. Conversely, if short-term rates are high, people usually expect them to come back down. Long-term rates will then drop below short-term rates b/c the average of expected future short-term rates will be far below current short-term rates, despite positive liquidity premiums, and so the yield curve will slope downward.

LPT fact 3: by recognizing that the liquidity premium rises with a bond’s maturity b/c of investor’s preferences for short-term bonds. Even if short-term interest rates are expected to stay the same, on average, in the future, long-term interest rates will be above short-term interest rates, and yield curves will typically slope upward.

At times, short-term interest rates are expected to fall so much in the future that the average of the expected short-term rates is well below the current short-term rate. Even when the positive liquidity premium is added to this average, the resulting long-term rate is still lower than the current short-term interest rate.