MMGT – 411 | Money & Banking

Lecture # 11

Variance

The variance is defined as the probability weighted average of the squared deviations of the
possible outcomes from their expected value.

Standard Deviation

The standard deviation is the square root of the variance.

- The greater the standard deviation, the higher the risk
- It more useful because it is measured in the same units as the payoffs (that is, dollars and not

Squared dollars)

Value at Risk

- Sometimes we are less concerned with the spread of possible outcomes than we are with the value

of the worst outcome.

- To assess this sort of risk we use a concept called "value at risk."
- Value at risk measures risk at the maximum potential loss.

Risk Aversion

Risk aversion is a concept in psychology, economics, and finance, based on the behavior of humans (especially consumers and investors) whilst exposed to uncertainty.

Risk Premium

A **risk premium** is the minimum difference a person requires to be willing to take an uncertain bet, between the expected value of the bet and the certain value that he is indifferent to.

Lecture # 12

Deciding if a risk is worth taking

- List all the possible outcomes or payoffs & Assign a probability to each possible payoff then Divide the payoffs into gains and losses.
- Ask how much you would be willing to pay to receive the gain
- Ask how much you would be willing to pay to avoid the loss
- If you are willing to pay more to receive the gain than to avoid the loss, you should take the risk

Sources of Risk

- Risk is everywhere. It comes in many forms and from almost every imaginable place
- Regardless of the source, risks can be classified as either idiosyncratic or systematic
- Systematic risks affect everyone.
- In the context of the entire economy, Higher oil prices would be an idiosyncratic risk and Changes in general economic conditions would be systematic risk.

Reducing Risk through Diversification

- Risk can be reduced through diversification, the principle of holding more than one risk at a time. By holding several different investments reduces the overall risk that an investor bears
- A combination of risky investments is often less risky than any one individual investment
- There are two ways to diversify your investments: You can hedge risks or You can spread them among the many investments

Lecture # 13

Bonds

In finance, a **bond** is a debt security, in which the authorized issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay interest (the coupon) and/or to repay the principal at a later date, termed maturity. A bond is a formal contract to repay borrowed money with interest at fixed intervals.

Thus a bond is like a loan: the *issuer* is the borrower (debtor), the *holder* is the lender (creditor), and the *coupon* is the interest.

Zero-Coupon Bonds

A **zero-coupon bond** (also called a **discount bond** or **deep discount bond**) is a bond bought at a price lower than its face value, with the face value repaid at the time of maturity.

Fixed Payment Loans

- They promise a fixed number of equal payments at regular intervals , Home mortgages and car loans are examples of fixed payment loans.
- These loans are amortized, meaning that the borrower pays off the principal along with the interest

over the life of the loan.

- Each payment includes both interest and some portion of the principal & the price of the loan is the present value of all the payments.

Coupon Bond

The value of a coupon bond is the present value of the periodic interest payments plus the present value of
the principal repayment at maturity.

Consols

- A consol offers only periodic interest payments; the borrower never repays the principal
- The price of a consol is the present value of all the future interest payments, which is a bit

complicated because there are an infinite number of payments. The first consols were originally issued in 1751. Consols are one of the rare examples of an actual perpetuity.

Yield to Maturity

Yield that would be realized on a bond or other fixed income security if the bond was held until the maturity date. It is greater than the current yield if the bond is selling at a discount and less than the current yield if the bond is selling at a premium. Yield to maturity is actually an estimation of future return, as the rate at which coupon payments can be reinvested when received is unknown.

Lecture # 14

Current Yield

The **current yield**, **interest yield**, **income yield**, **flat yield** or **running yield** is a financial term used in reference to bonds and other fixed-interest securities such as gilts. It is the ratio of the annual interest payment and the bond's current clean price:

$$\text{Current yield} = \frac{\text{Annual interest payment}}{\text{Clean price}}.$$

Holding Period Returns

Holding period return (HPR) is the total return on an asset or portfolio over the period during which it was held. It is one of the simplest measures of investment performance.

HPR is the percentage by which the value of a portfolio (or asset) has grown for a particular period. It is the sum of income and capital gains divided by the initial period value (asset value at the beginning of the period).

HPR = ((Present Value, or face Value, End-Of-Period Value) + (Any Intermediate Gains eg. Dividends) - (Initial Value)) /(Initial Value)

$$HPR_n = \frac{Income + (P_{n+1} - P_n)}{P_n}$$

Bond Supply

The Bond supply curve is the relationship between the price and the quantity of bonds people are
willing to sell, all other things being equal.From the point of view of investors, the higher the price, the more tempting it is to sell a bond they currently hold. From the point of view of companies seeking finance for new projects, the higher the price at which they can sell bonds, the more advantageous it is to do so.
For a $100 one-year zero-coupon bond, the supply will be higher at $95 than it will be at $90, all
other things being equal.

Factors that shift Bond Supply

- Changes in government borrowing
- Changes in business conditions
- Changes in expected inflation

Bond Demand

The bond demand curve is the relationship between the price and quantity of bonds that investors
demand, all other things being equal. As the price falls, the reward for holding the bond rises, so the demand goes up. The lower the price potential bondholders must pay for a fixed-dollar payment on a future date, the
more likely they are to buy a bond. The zero-coupon bond promising to pay $100 in one year will be more attractive at $90 than it will at $95, all other things being equal.

Factors that shift Bond Demand

- Wealth
- Expected inflation
- Expected return on stocks and other assets
- Risk relative to alternatives
- Liquidity of bonds relative to alternatives

Lecture # 15

Shifts in Equilibrium

An increase in expected inflation:

An increase in expected inflation shifts bond supply to the right and bond demand to the left. The two effects reinforce each other, resulting in a lower bond price and a higher interest rate.

A business-cycle downturn:

A business-cycle downturn shifts the bond supply to the left and the bond demand to the left. In this case the bond price can rise or fall, depending on which shift is greater. But interest rates tend to fall in recessions, so bond prices are likely to increase.

P.S : Please check the figures in handouts.

Lecture # 16

Sources of Bond Risk

- Default Risk
- Inflation Risk
- Interest-Rate Risk

Default Risk

There is no guarantee that a bond issuer will make the promised payments. Investors who are risk averse require some compensation for bearing risk; the more risk, the more compensation they demand. The higher the default risk the higher the probability that bondholders will not receive the promised payments and thus, the higher the yield.

Inflation Risk

Bonds promise to make fixed-dollar payments, and bondholders are concerned about the purchasing power of those payments. The nominal interest rate will be equal to the real interest rate plus the expected inflation rate plus the compensation for inflation risk. The greater the inflation risk, the larger will be the compensation for it.

Interest-Rate Risk

Interest-rate risk arises from the fact that investors don't know the holding period yield of a longterm
bond. If you have a short investment horizon and buy a long-term bond you will have to sell it before it
matures, and so you must worry about what happens if interest rates change. Because the price of long-term bonds can change dramatically, this can be an important source of risk.

P.S : Check the examples of Bond Risks in handouts.

Lecture # 17

Tax Effect

- The second important factor that affects the return on a bond is taxes. Bondholders must pay income tax on the interest income they receive from privately issued bonds (taxable bonds), but government bonds are treated differently.
- Interest payments on bonds issued by state and local governments, called "municipal" or "taxexempt" bonds are specifically exempt from taxation
- A tax exemption affects a bond's yield because it affects how much of the return the bondholder gets to keep.
- Tax-Exempt Bond Yield = (Taxable Bond Yield) x (1- Tax Rate).

Term Structure of Interest Rates

- The relationship among bonds with the same risk characteristics but different maturities is called

the term structure of interest rates. & A plot of the term structure, with the yield to maturity on the vertical axis and the time to maturity on the horizontal axis, is called the yield curve.

Term Structure "Facts"

- Interest Rates of different maturities tend to move together.
- Yields on short-term bond are more volatile than yields on long-term bonds
- Long-term yields tend to be higher than short-term yields.

Lecture # 18

The Liquidity Premium Theory

Liquidity premium is a segment of a three-part theory that works to explain the behavior of yield curves for interest rates. The upwards-curving component of the interest yield can be explained by the liquidity premium. The reason behind this is that short term securities

are less risky compared to long term rates due to the difference in maturity dates. Therefore investors expect a premium, or risk premium for investing in the risky security.

Stocks: An Introduction

Stocks are a share of the ownership of a company. Initially, they are sold by the original owners of a company to gain additional funds to help the company grow. The owners basically sell control of the company to the stockholders. After the initial sale, the shares can be sold and resold on the stock market.

Essential Characteristics of Common Stock

- Stocks, also known as common stock or equity, are shares in a firm's ownership. From their early days, stocks had two important characteristics that today are taken for granted: The shares are issued in small denominations and the shares are transferable.
- A stockholder is entitled to participate in the shares of the enterprise, but this is a residual claim i.e. meaning the leftovers after all other creditors have been paid.
- Stockholders also have limited liability, Even if a company fails, the maximum amount that the stockholder can lose is the initial investment.

Some salient features of stock trading

1. An individual share represents only a small fraction of the value of the company that issued it.
2. A large number of shares are outstanding.
3. Prices of individual shares are low, allowing individuals to make relatively small Investments.
4. As residual claimants, stockholders receive the proceeds of a firm's activities only after all other creditors have been paid because of limited liability , investor's losses cannot exceed the price they paid for the Stock.
5. Shareholders can replace managers who are doing a bad job.

Note : Please Consult handouts & video lectures for examples & figures.