Chapter 9: Debt Securities

Features of Debt Securities

1. Companies and governments can borrow money through the issuance of debt securities, or bonds. Debt securities represent a contractual obligation of the issuer to the holder of the debt security. Bonds are governed by a legal contract between the issuer and holder. This legal contract is sometimes referred to as the Bond Indenture or Offering Circular. In the event that the issuer does not meet their contractual obligations, there are specific legal recourse that the bondholder can have.
2. Bonds are typically comprised of the following three components:
    a. Par Value: (also called the principal value or face value) is the amount that will be paid by the issuer to the bondholder at maturity to retire the bond.
    b. Coupon Rate: the promised interest rate on the bond.
        i. Coupon payments are linked to the bond's par value and the bond's coupon rate. The annual interest owed to bondholders is calculated by multupllying the pay value by the coupon rate. The frequency of payments varies across bonds, government bond coupon payments being semi-annual.
    c. Maturity Date: maturity dates of bonds vary across bonds. It is unusual for ebonds to be issued with maturity lengths over 30 years. The life of the bond ends on the maturity date, assuming that all obligations/payments have been made.
3. Other Features:
    a. Covenants: aim to protect bondholders' interests, and are legal agreements that describe actions the issuer must perform or is prohibited from performing.
    b. A bond may also include the explicit description that bondholders have the right, but not an obligation, to take.

Seniority Ranking

1. In the event that the issuer of a bond does not meet their contractual obligations and defaults, there are specific legal recourse bondholders' can take. (This is known as defaulting.) In the event that the bond issuing company is liquidated, the order in which assets are distributed follows a Seniority Ranking, which can affect the amount that an investor receives upon liquidation.
2. The par value of a bond plus its missed interest payments is the maximum that an investor is entitled to receive upon liquidation. Because debt obligations represent a liability of the company, debtors are entitled to payment before shareholders. However, the priority of bonds is determined by the seniority ranking, and they are usually sold as either:
    a. Secured: bonds include a pledge on behalf of the bond issuer to pledge certain assets as collateral to the bond holder, typically in the form of a tangible asset.
    b. Unsecured: bonds are not backed by collateral. This typically results in bondholders demanding a higher coupon rate, as they face higher risk of loss in the event of liquidation. Additionally, unsecured bonds may be issued having lower priority than secured bonds, which makes them "subordinated debt." (This too can have subclassifications.

Types of Bonds

1. Bonds can be classified by issuer type, the type of market they trade in, and by type of coupon rate.
    a. Debt securities with maturities of one year or less are called “bills.”
    Debt securities with maturities between one and ten years are called “notes.”
    Debt securities with maturities greater than ten years are called “bonds.”
    b. Issuer:
        i. Bonds issued by companies are referred to as corporate bonds.
        ii. Bonds issued by governments or central banks are called sovereign or government bonds. Note that local and regional governments can also issue bonds.
    c. Market:
        i. The purchase and sale of bonds from the issuing body to bondholders is done in the primary market.
        ii. The purchase and sale of bonds between investors (meaning that the transaction does not include the issuing body) are done in the secondary market. Bondholders who purchase bonds in the secondary market are entitled to the bonds’ remaining promised payments, including coupon payments and principal at maturity.
    d. Coupon Rates:
        i. Bonds are categorized by coupon rate into three subcategories: fixed-rate bonds, floating-rate bonds, and zero-coupon bonds.
2. Fixed-Rate Bonds
    a. Fixed-Rate Bonds (also called Fixed-Income Bonds) are the main type of debt security that companies and governments issue. They feature a fixed principal value, coupon rate, and maturity date, regardless of changes in market interest rates, inflation, and issuer’s creditworthiness.
3. Floating-Rate Bonds
    a. Floating-Rate Bonds (also called Variable-Rate Bonds) have fixed principal values and maturity dates, but have floating coupon rates. The coupon rate for a floating-rate bond is linked to a Reference Rate (The LIBOR, London Interbank Offered Rate, being a common one.)
    b. The Floating Rate is determined by the relationship between the reference rate and the creditworthiness of the issuer at the time of the issue. The floating rate is equal to the reference rate plus a percentage, the value of which is dependent upon the issuer’s and bond’s features.
        i. The difference between the floating rate and the reference rate is called the spread, and it usually stays constant throughout the life of the bond. Meaning, that the way in which the creditworthiness of the issuer is factored into the bond does not change after the issuance, but the floating rate does change in response to economic changes.

        ii. The floating rate of a floating rate bond is typically adjusted quarterly based on the reference rate. Floating rate payments are made at the end of each quarter using the rate that was set at the beginning of that quarter. This is when the floating rate is reset, and this will determine the payment value at the end of the next quarter.
    c. In bond markets, percentage points are expressed as basis points. A basis point is one hundredth of a percent. Basis Points are abbreviated to bps.
    d. Inflation-Linked Bonds: are a specific kind of floating rate bond. They include a provision stating that the bond's par value is to be adjusted for inflation, protecting the bondholder. Because of this factor, the coupon rates of inflation-linked bonds are typically lower than in other types.

4. Zero-Coupon Bonds
    a. Zero Coupon Bonds do not offer period interest payments during the life of the bond. Instead, they offer a single payment equal to the bond's par value that is to be paid on the bond's maturity date.
    b. Zero-Coupon Bonds are issued at prices lower than the principal value, the difference representing the interest that is earned by the bondholder.
    c. Many debt securities issued with maturities of one year or less are issued at zero-coupon bonds. Because of the risk and loss increases in the event of issuer default, investors are less inclined to purchase zero-coupon bonds that feature a long maturity. So, if they are willing, the interest rate is typically demanded to be higher.

Bonds With Embedded Provisions

1. Bonds can include features known as embedded provisions, which give the issuer and/or the bondholder the right, but not the obligation, to take certain actions. Three common provisions are calls, put, and conversion provisions, which are types of options.
2. Callable Bonds
    a. Callable Bonds give bond issuers the right to buy back the issued bond at a predetermined price known as the call price prior to the bond's maturation. The call price represents the par value of the bond plus an amount referred to as the premium.
    b. Generally, bond issuers will choose to include a call provision so that if interest rates fall after a bond has been issued, they can call the bond and issue new bonds at a lower interest rate.
    c. Call provisions are advantageous to the issuer and disadvantageous to the bondholder. Consequently, the coupon rate of a callable bond will typically be higher than that of a comparable bond without a call provision. The risk that the bondholder takes on is called the Call Risk.
        i. Call provisions are disadvantageous for bondholders in the sense that the new bonds that will be issued by the issuer will have lower interest rates.
    d. For most callable bonds, the issuer does not have the ability to buy the bond back until a few years after the bond's issuance.

e. The call price can either be fixed or variable, and when variable typically declines over time and tends toward the bond's par value.

3. Putable Bonds
    a. Put Provisions give the bondholder the right to sell the bond back to the issuer prior to the maturity date at a prespecified price referred to as the put price.
    b. Bondholders may want to exercise this right in the situation that interest rates rise, as it can allow them to reinvest in bonds with higher interest rates.
    c. The inclusion of a put provision is advantageous to the bondholder, and disadvantageous to the issuer. They are advantageous to the bondholder as they allow holders to sell the bonds and repurchase bonds with higher interest rates, and they are disadvantageous to issuers because if the option is exercised, they must reissue bonds at higher interest rates.
    d. The coupon rate on putable bonds is typically lower than that of a comparable bond without a put provision. Bondholders are willing to accept a lower coupon rate because they have the added protection of the provision.
    e. The ability to exercise the right of the put provision typically becomes available to bondholders a few years after the bond is issued. It is typically sold back at the par value of the bond.

4. Convertible Bonds
    a. Convertible Bonds are a type of hybrid security that give the bondholder the right to exchange the bond for shares of the issuing company's stock prior to the maturity date. The number of shares which the bondholder can convert the bond into is prespecified. Because of the conversion option, the value of convertible bonds must be determined in a manner such that it factors in the common share price. Because convertible bonds are advantageous to the bondholder, they typically feature lower coupon rates than comparable bonds without a convertible provision.

Asset-Backed Securities

1. Securitization refers to the creation and issuance of new debt securities, called asset-backed securities, that are backed by a pool of other debt securities. The assets which underlie asset-backed securities vary and include securities from a variety of industries.
    a. Asset-backed securities reduce risk of an asset class by allowing default and early repayments to become much more predictable and less volatile. For instance, it is less harmful to a portfolio of securities for a single mortgage to default if it is part of an asset-backed security than if the portfolio consisted of single mortgage debt securities. Additionally, it is easier to predict mass default than individual default, as mass default can be analysed, predicted, and managed as part of the entire housing market.
        i. Additionally, risk is reduced by allowing investors to diversify, gain the benefits of economies of scale in loan servicing, and bypass the formal credit screening process.

b. Asset-backed securities increase liquidity in markets of the underlying asset markets because it allows investors to indirectly buy assets they otherwise would not or could not buy directly.
c. Because the risks associated with asset-backed securities are more easily predictable than the risk of individual assets, the pricing of asset-backed securities is much simpler. Therefore, they are an instrument that can be used by companies who need to raise money quickly.
d. This also means that the markets for asset-backed securities are typically more liquid than the markets for the assets which underlie them. And, because investors value liquidity, they will pay more for securitised assets than for underlying assets.
e. Asset-backed securities typically typically make payments in the form of monthly payments towards interest and principal.

Valuation of Debt Securities

1. Debt Securities are often valued using a DCF (Discounted Cash Flow) method, which estimates the value of a security as the present value of all future expected cash flows. These future payments typically include future coupon payments and the final principal payment. So, the value of a bond is equal to the present value of all future cash flows and the final principal payment. This calculation also involves the use of a discount rate that factors in the probability of all future cash flows actually being received. Once this calculation is complete, the value can be used to determine whether a bond is under, fairly, or overvalued.

2. Current Yield
    a. A bond's Current Yield is equal to the annual coupon payment divided by the market price of the bond. The current yield provides investors with an estimate of the annualised return from coupon income, without concern for the effect of any capital gain or loss resulting from changes in the bond's value over time.

3. Valuation of Fixed-Rate and Zero-Coupon Bonds
    a. The timing and promised amount of interest payments, as well as the principal value of fixed-rate and zero-coupon bonds are known. Therefore, simply PV/FV calculations of these cash flows are used to calculate the PV of a bond of these types. The discount rate should reflect market conditions as well as the riskiness of the borrower. Bonds with higher risk have higher discount rates, and bonds with lower risk have lower discount rates.
    b. The Relationship Between Coupon Rate and Discount Rate:
        i. If the bond's coupon rate is the same as the required rate of return, the bond's value is its par value. Thus, the bond should trade at par value.
        ii. If the bond's coupon rate is lower than the required rate of return, the bond's value is less than its par value. Thus, the bond should be traded at less than par value (at a discount.)

iii. If the bond's coupon rate is higher than the required rate of return, the bond's value is more than its par value. Thus, the bond should be traded at above par value (at a premium.)

c. For zero-coupon bonds, the only promised payment is the principal payment at the maturity date of the bond. So, this should be calculated with a discount rate that accurately reflects the riskiness of that payment format.

4. Yield to Maturity
    a. Inventors can determine the discount rate implied by a bond's market price by using the DCF method to determine what rate equates the present value of a bond's promised cash flow to bond's market price. This is known as the bond's "yield."
    b. A comparison of a bond's yield with the required rate of return can inform an investor's decision to purchase it or not.
    c. Investors also use a bond's yield to approximate the annualised return from buying the bond at the current market price and holding it until maturity.
    d. It is important to note that bond prices and yield are inversely related. If a bond's price falls, its yield increases, and vice versa.

5. Yield Curve
    a. When investors attempt to determine the appropriate discount rate (yield or required rate of return) of a bond, they can compare the bond in question with the yields offered by government bonds.
    b. The Term Structure of Interest Rates (or Term Structure) shows how interest rates on government bonds vary with maturity. The Yield Curve is a graphical representation of the Term Structure, with maturity on its x-axis and yield on the y-axis. It is important to ensure that the bonds being compared are identical aside from maturity.
    c. The yield curve is typically upward sloping, meaning that as maturity increases, yield increases. However, there are places where the yield curve is flat, meaning that changes in maturity do not lead to changes in yield. Additionally, the yield curve can be downward sloping, which can occur if people are expecting interest rates to drop.
    d. Because of the relatively higher risk of corporate bonds compared to government bonds, any comparable corporate bond should have a higher yield than a government bond, which is to account for the additional risk being taken on by the bondholder.

Risks of Investing in Debt Securities

1. Introduction:
    a. Investing in debt securities is generally considered to be less risky than investing is equity securities. But, a number of risks still exist. Bonds with higher degrees of risk tend to have higher interest rates, representing higher returns for higher risk.

2. Credit Risk:
    a. Credit Risk (or Default Risk) is the risk of loss if the bond issuer defaults, meaning that they fail to make full and timely payments of interest and/or principal. Another dimension of credit risk is that the general economic sentiment regarding a bond issuer's creditworthiness can cause changes in the price of the bond. If the bond's perceived risk increases, its price decreases.
    b. Credit Rating:
        i. Independent credit rating agencies assess the credit quality of specific bonds and assign them ratings based on the credit worthiness of the issuer. Bonds can be classified by credit risk as:
            1. Investment-Grade Bonds
            2. Non-Investment-Grade Bonds (which are commonly referred to as high-yield bonds or junk bonds).
        ii. Credit rating agencies assign bonds ratings at the time of issue, but they also review the rating and can change a bond's credit rating over time based on the perceived creditworthiness of the issuer.
            1. An improvement in credit rating its known as an "upgrade," and a reduction in credit rating is known as a "downgrade."
            2. A high credit rating gives companies the following advantages:
                a. The ability to issue debt securities at a lower interest rate
                b. The ability to access a larger pool of investors (including institutional investors which are required to hold certain percentages of their assets in investment-grade bonds.)
    c. Credit Spreads:
        i. Government bonds from the US treasuries and some developed and emerging countries are considered very safe securities that carry minimal default risk. The difference in yield between a corporate bond and a comparable government bond of the same maturity is known as the Credit Spread. The credit spread informs investors of the return that is being offered for investing in a bond that has a greater probability of default.
        ii. The higher the risk, the higher the credit spread, as higher risk bonds typically have higher interest rates. Given that the market price of a bond is affected by the public perception of the creditworthiness of the issuer, increases and decreases in perceived creditworthiness affect market price and credit spread.

3. Interest Rate Risk:
    a. Interest Rate Risk refers to the risk associated with bonds that results from changes in interest rates. Market prices for bonds and interest rates are inversely related; increases in interest rates cause decreases in market prices and vice versa.
    b. Interest Rate Risk is particularly prevalent in fixed-rate bonds and zero-coupon bonds, as their market prices are more sensitive to changes in interest rates compared to the market prices of floating-rate bonds, whose prices are adjusted for interest rates. However, the market price of floating-rate bonds can decrease in situations of decreasing interest rates, so they do carry some interest rate risk.

4. Inflation Risk:
    a. Nearly all debt securities expose investors to Inflation Risk because the promised payments (both coupon and principal) are nominal, meaning that they are not adjusted to inflation as time goes on. The risk occurs due to the fact that in the event of inflation, investors face losses as the purchasing power of the payments they receive decreases. There are inflation-linked bonds, which account for inflation by readjustment of the principal value.

5. Other Risks:
    a. Liquidity Risk:
        i. Liquidity Risk refers to the risk of being unable to sell a bond prior to the maturity date without having to accept a significant discount to market value. Bonds that do not trade frequently face high liquidity risk.
    b. Reinvestment Risk:
        i. Reinvestment Risk refers to the fact that in times of falling interest rates, the coupon payments received from a bond will have to be reinvested at lower interest rates than the bond's original coupon rate.
    c. Call Risk:
        i. Call Risk refers to the risk that bondholders are exposed to when holding callable bonds, resulting from the possibility of issuers buying the bonds back. A bond issuer is likely to call the bond if interest rates fall below the coupon rate of the callable bond, as it allows them to reissue bonds at a lower rate. Additionally, callable bonds and mortgage-backed securities allow borrows to make prepayments in advance of maturity, which is another risk.

6. Relationship Between Risk and Bond Price
    a. Higher risk is associated with higher yields and relatively lower prices.
    b. Lower risk is associated with lower yields and relatively higher prices.
    c. Subordinated debt carries higher risk than secured debt, and therefore will provide higher yields and trade at higher prices.
    d. Bonds that have similar maturity and risk should trade at prices that offer approximately the same yield.