Student name

Professor’s name

Course name

Date of Submission

Portfolio Management

Credit analysis is the assessment of a company’s ability to meet its financial obligation. Financial institutions such as banks, insurance companies, and investment institutions are usually licensed to perform credit analysis (Bodie, Kane, and Marcus). A financial institution analyzes the financial statement of small businesses before receiving or renewing commercial loans. On the other hand, corporations usually have their audited financial statement examined before or after they issue bonds (Ensslin, Ensslin, and Lacerda). Financial institutions often conduct credit analysis with the objective of determining the financial capability of the borrower, the lending facility being proposed and assign risk rating for the borrower.

Credit analysis is determined through the z-score measurement, where a score is measured based on the relationship of a score to the mean. Therefore, a z-score of zero means the zero is the same as the average. A z-score can be either a negative or a positive, which illustrates whether it is above or below the mean and by how many standard deviations (Ensslin, Ensslin, and Lacerda). The Z score indicates to the financial institutions whether it is either typical or atypical for a particular data set. For financial statement users, a z-score is important in the prediction of the likelihood of a company declaring bankruptcy. A z-score can be determined by the formula;

Where, z = is the z-score, x = value of the element, = population mean, = standard deviation.

Duration is not applicable to callable bonds because the duration of a callable bond is lower than the length of a bond to maturity (Fabozzi and Mann). This is because it takes into account the call option and the bond market volatility. Also, callable bonds have the maturity and cash flow which is not certain which increases the possibility of default. Therefore, the best way to estimate value is to consider non-callable bonds with an embedded short option. Also, the duration is not applicable because the convexity of a callable bond will always be less than non-callable bonds. Non-Callable bond is appropriate by duration because the cash flow stream is known and defined (Fischer and Jordan).

Callable bonds are different from non-callable bonds, and this is because of the market prices for the two bonds behave differently from one another. in typical situations, rates decreases as bond prices increase (Martinsuo). However, this is usually not the case for callable bonds as future interest payments are uncertain. This is because callable bonds can be called away at any time. The more interest rates plummets, the less likely the next interest payment, will reach maturity as the likelihood the issuer will call the bond increases. Therefore, increase in price appreciation is limited for callable bonds which are a trade off for durations. In common stock, duration is not applicable because average stock duration is estimated and not contractual. Therefore, this means that the cash flow and the discount rate is unknown. These makes it difficult to determine the common stock of a duration.

Length and its use in the finance market

Duration is the measurement to price sensitivity of a fixed income of investment to changes in interest rates (Meskendahl). Duration measures some bond prices is likely to change when and if interest rates change. The relationship between interest rates and bond prices is that rates and prices move in opposite directions. These means that when interest rates rise, the bond prices fall. Therefore, when the a person owns an interest rate of 4% from a bond and the interest rate increases, the 4% interest rate is not attractive anymore in the market, and its appeal lost making the return less attractive to the investor. In the financial market, the duration is used to measure such as interest rate risks (Meskendahl). Investors need to understand that the duration of a bond price possess a higher risk to increase in interest rates as bond prices fall. Therefore, the longer a person takes to wait for the payment of coupons and return of the principal amount, the more likely the interest rate is going to rise in the future.

In finance, there is a general rule that state that when there is 1% increase or decrease in interest rates, the bond prices will eventually move in the opposite direction by 1% for every duration (Reilly and Brown). Investors who purchase a bond that yield a specific interest rate over specific timeframe will get back the return and the principal amount regardless of changes in interest rates. However, for those who are planning to sell bonds before maturity has their bond prices or returns affected by the change in interest rates in the future. A duration is a useful tool in adjusting and constructing an investment portfolio in comparing bonds and bond funds (Turner). This means that investors can use duration to anticipate changes in interest rates and avoid incurring any risks. For example, if an investor expects interest rates to rise, the investor will focus on shorter duration investment which has less interest rate risks.

Convexity is used in the measurement of the sensitivity of a bond’s duration to changes in yield to maturity (Turner). A bond with a positive convexity is said to have a larger price increase because of the decline in yields than a price decrease with increase in yield. This means that an investor is likely to benefit from a positive convexity because prices become less sensitive to when yield increases than when yield decreases. Convexity can also work against an investor’s interest when duration rises as yields increases, which indicate a negative convexity.

Classical immunization

These a financial strategy used by firms to minimize the impact of changes in interest rates on the value of a portfolio. Firms use this strategy to protect the value of a portfolio of the firm against the changes in interest rates. Classical immunization strategy is also adopted by many firms to protect their assets by ensuring their asset increase or decrease in the opposite direction of the amount of their liabilities (Reilly and Brown). Investors use classical immunization strategy to construct bond portfolios in such a way that minimizes return regardless of the changes in interest rates. However, traditional immunization can only be relevant when there are no defaults, security price change only in response to interest rates and yield curve changes is parallel. Moreover, classical immunization is harder to achieve with bonds with embedded options, such as call provisions.

Traditional immunization is used in bond portfolio management to minimize interest rate risks by adjusting the portfolio duration to match the investor's investment time horizon. The standard immunization is used to lock in a fixed rate of return during the time the investors wants to invest without cashing it in (Meskendahl). At this point, the investors can secure a fixed rate of return during the amount of time the bond is kept without cashing the bond. In typical situations, interest rate affects bond prices, but once the immunization is applied, the investors can use a fixed rate of return which is not affected by interest rate changes during the time of investment. This means that the bond is immune to fluctuating interest rates. In utilizing the traditional immunization strategy, it is important to consider the duration of the bonds in the portfolio and adjust the bond portfolio duration to match the investment period.

Use of horizon matching in BPM

Horizon matching is a structured portfolio strategy investors use to fund a series of future expenses. Horizon matching used to provide significant returns and tremendous risk-free investment for investors. Horizon matching ensures an income portfolio that guarantees the sustainable investor returns over a particular time horizon (Ensslin, Ensslin, and Lacerda). However, despite the assured return from a stream of cash flow, time horizon investment concept is also associated with some risks as well. Horizon matching is business process management is used to calculate the future liabilities of investment at a given moment.

Determining the time for the future liabilities is not usually accurate and requires overfunding to ensure that the future liabilities identified are entirely covered. In horizon matching, defaults are assumed not to exist (Fabozzi and Mann). However, similar to typical situations, the lower the quality of the security purchased, there is high risk involved, and high returns or losses are expected. Furthermore, in horizon matching, if the investor uses callable bonds the possibility of the investor receiving higher returns increases. However, if the investors decide to call the securities before they mature, the investors would have eliminated the possibility of receiving coupon payment.

Determinants of bond prices

Bond maturity

Bond prices are determined by the maturity period the bond has been issued for in the market. The maturity period is an important determinant because it determines how long an issuing company has until it has to pay back the entire principal and return it owes to the investors (Fischer and Jordan). As an investor, it is important to be aware of the various types of bond prices in the market. Bond prices are more volatile to higher risk when the bonds have a long-term maturity period. The investors face huge risks despite the benefits of long-term maturity bonds. Furthermore, long-term maturity bonds can as result into a loss depending on what happens with the interest rates. Long-term bonds are subjects to higher risk due to the possibility of change in interest rates.

However, there is situation where long-term bonds can be beneficial to the investor. When the interest rates are decreasing, the investor can select long-term bonds. This is because long-term bonds have higher volatility which also means that the bond prices are higher as compared to short-term bonds. High bond prices are subject to higher returns for the investor (Martinsuo). On the other hand, when the interest rates are increasing, it wise for the investor own short-term bonds due to lower volatility and short-term bonds reduces bond prices in the investor's bond holdings. The type of bond duration an investor selects will determine the nature of the bond prices in the market.

Face value of a bond

The face value of a bond is the principal amount of the bond that the organization issuing the bond has to pay at the maturity period with an interest rate. A higher face value of a bond in the market will increase the price of the bond (Ensslin, Ensslin, and Lacerda). This is because the face value of the bond are fixed and bond prices are affected by the change in interest rates in the market. A high face value will increase the bond prices because of the investor expects to gain from the principal amount awarded to the issuing organization. The group issued the principal amount will have to pay interest on top of the principal amount given before the maturity date. Therefore, the cost acquisition of the face value will not be the same as the cost redemption from the perspective of the organization.

Coupon payment

A bond’s coupon payment is simply the interest rate the organization issued the amount of the bond issued on the face value of the bond. Depending on the type of bond awarded, the interest payment is usually made periodically according to the terms of the bond. However, some bonds pay all its interest at the maturity period in a lump sum (Fischer and Jordan). Most coupons issue bonds with fixed interest rates, but there are some situations where interest rates are indexed. These means that the bond issued has interest rates that are calculated based on the rates that fluctuate over time.

Interests rates directly affect bond prices because, in most situations, they are not fixed, but vary over time. The rise in interest rates reduces the bond prices and a decreasing in interest rates increases bond prices. Coupon payments are subject to interest rate risk which affects bond prices. An investor who applies for a bond with coupon payments will be exposed to changes in interest rate risks which affect the bond prices during different periods (Fischer and Jordan). When interest rates are higher than coupon rates, the bond prices will be at a discount. On the other hand, when the interest rates are lower than the coupon rate, the bond prices are said to be at a premium. Bond price at a premium is higher than the face value.

Interest rate

An interest rate is an additional cost an organization or any other entity has to pay on the bond’s face value. This means that when a bond price id issued, a fixed interest rate is paid until the bond matures. When the interest rate rises, the bond price in the market becomes less attractive, and when the interest rates fall, the bond prices increases in the market making the bond more attractive to investors. As discussed earlier, interest rates hold some degree of risk on the bond prices for investors in the financial market (Meskendahl). These interest rate risks are associated with the change in the interest rate in the market. These, in turn, affect how bond issuer values their bond in the market. The duration of the interest rate is a major determinant of the type of bond prices the bond issuer adopts. Long-term interest rates are subject to changes in interest rate risk as compared to short-term interest rates which are less volatile (Bodie, Kane, and Marcus).

Inflation

Inflation is another determinant of bond prices because it erodes the purchasing power of the investor expects to earn from an investment. Similar to interest rates, inflation determines the purchasing power of the bond price by the change in economic factors such as interest rates risk. When the inflation is high, the bond prices rapidly falls making the bond unattractive in the market (Reilly and Brown). On the other hand, when inflation falls, the bond prices increases which attract investors in purchasing the bond. Also, the purchasing power of the investor is increased which increases the earnings of the investor from buying the bond. When an investor’s bond matures and there is an increase inflation, the return earned on investment would worth less than that anticipated in the past.

Credit ratings

Credit ratings are determined by credit rating agencies who assign ratings to bond issuers on their capability to pay back the principal amount and the interest payment on time. Rating agencies provide the bond issuer with valuable information about his or her ability to repay the principal on the bond which is important for an investor (Fabozzi and Mann). Credit ratings determines the bond prices to be issued based on the ability of the issuer to repay back the loan. A higher credit ratings means the more likely the bond issuer is to make payment obligations on time. Therefore, this means the more top the issuer will get the best bond price. If the credit ratings increase, the bond prices will also increase, giving the sender, an opportunity makes huge returns from the bond. On the other hand, lower credit ratings will drive bond prices down making the investment unattractive to investors.

Demand

In the financial market, the demand level for bonds in the market will affect the bond prices. When there is an increase in demand for bonds, the prices of bonds will increase to offset the demand level (Ensslin, Ensslin, and Lacerda). This means the cost of investment will increase to meet the demand level. The issuer will increase the bond prices to reduce the demand level of the bond in the market. Reducing demand level through increase bond prices means the issuer are unable to satisfy the market with limited bonds available for purchase. On the other hand, low level of demand for bonds will mean the issuer will have to make the bonds more attractive. In this situation, there are fewer investors in the market to purchase the bonds available for sale in the market. Therefore, the bond issuer will reduce the bond prices to make the bonds more attractive to investors.

Supply

The supply level of the bonds available for purchase in the market also affects the bond prices. If the ratio of investors to bond supply are not proportional, the bond issuer will have to adjust their bond prices to meet the bond supply. A little supply of bonds in the market by the financial institutions meets the number of investors will be higher. This will require the issuer to increase the bond prices in the market to meet the supply. This concept is similar to the demand function of relationships (Ensslin, Ensslin, and Lacerda).

Problems

1. Using the CAPM model; E(R) = where, E(R)= expected return, , = Beta coefficient, = rate of return on the market

Therefore,

E(R) = =7.475

1. Yield to maturity , in this case, the current bond price will be assumed to be the call value of the bond. This is because the call value of the bond is the amount of the bond the investor has decided to make a call before maturity.

therefore, Yield to Maturity

Yield to maturity = 0.0022 =0.22%

Yield to call =

In this case, the market price will the face value of the bond since the market price is the initial value set forth by the bond issuer.

Therefore, Yield to call =

Yield to call = = 0.00748

Yield to call =0.75%

In this case, yield to maturity is lower than the yield to call. Therefore, the investor is likely to choose yield to call because the annual return the investor is likely to receive will be higher than the return the investor is likely to receive upon maturity.

1. Realized compound yield

Realized compound yield =

Realized compound yield =

Realized compound yield = 0.03 × 100 =3%

# Works Cited

Bodie, Z, A Kane and AJ Marcus. " Investment and portfolio management." *Business Journal* (2011): 1-3.

Ensslin, Sandra Rolim, Leonardo Ensslin and Rogério Tadeu de Oliveira Lacerda. "A performance measurement framework in portfolio management: A constructivist case." *Journal of Management* (2011): 648 - 668.

Fabozzi, FJ and SV Mann. *The handbook of fixed income securities*. New York: McGraw Hill Professional, 2012 .

Fischer, DE and RJ Jordan. *Security analysis and portfolio management*. New York: Prentice Hall, 2004.

Martinsuo, Miia. "Project portfolio management in practice and in context." *International Journal of Project Management* (2013): 794–803.

Meskendahl, Sascha. "The influence of business strategy on project portfolio management and its success — A conceptual framework." *International Journal of Project Management* (2010): 807–817.

Reilly, Frank K. and Keith C. Brown. *Investment Analysis and Portfolio Management*. Boston: Cengage Learning, 2011.

Turner, R. *The handbook of project-based management*. New York : McGraw-hill, 2014.