Bond Valuation Project

Dunn Company

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Executive Summary

Dunn company classifies as a corporation because it is a distinct legal entity composed of one or more individuals. Also, it is the only form of business that can issue bonds. It has an unlimited life, it is easy to transfer ownership and it has unlimited liability. However, the drawbacks are double taxation and the cost of set-up and report filing. It is a legal person separate and distinct from its owners and it has many of the rights, duties, and privileges of an actual person. Corporations can borrow money and own property, can sue and be sued and can enter into contracts. They can own stock in another corporation as well. It is considered a resident of the state and is created by preparing the articles of incorporation and a set of bylaws. After much research, the Mutual of Maryville Company has decided invest in bonds issued by Dunn's company. Our company evaluated the bond's different yields, inflation, company risk, interest rate risk, maturity, and coupon payment period. These bonds are expected to sell as a premium. Selling a bond at a premium will lead to higher profits and is less risky to fluctuate due to interest rates.

Introduction

Out of all the types of businesses in the business industry, only a corporation has the power to issue bonds. Since Dunn Company has the ability to issue bonds for Maryville Mutual to invest in, we conclude that the Dunn Company is a corporation. A corporation has many advantages and disadvantages that affect the business. One of the corporation's advantages is that the liability of the company is separate from its owners, meaning that owners of the corporation are entitled to limited liability from the corporation. Another advantage is that a corporation's ownership is easily transferable. Due to how the corporation is divided into shares of stock, it makes it just as easy for owners to buy and sell their shares of stock. The third advantage is a corporation has unlimited life. This is possible since ownership can be transferred

once the original owners are gone. In addition to this, as long as the shares of stock are active, the corporation remains active.

The first disadvantage is the setup process. A corporate charter must be filed, and the corporation must lay out a set of bylaws. Second, a corporation goes through double taxation. This means that a corporation's earnings are taxed twice, once at the corporate level and when they are paid out as dividends to the stockholders of the company.

The firm's debt position is the most important part to research when looking to purchase bonds. The components needed to decide the debt position are the debt ratio, times-earned interest ratio, and cash coverage ratio. The debt ratio for 2016 it is 54.75% and 2017 is 59.61%. We, then, calculate the times-earned ratio, which is 25.23 times for 2017 and 31.87 times for 2016. The last part needed to analyze the firm's debt position is the cash coverage ratio, which is 31.87 times for 2016 and is 25.23 times for 2017. With the answers to these equations, we can conclude that the higher the debt ratio, the more leverage a company has, implying greater financial risk. At the same time, leverage is an important tool that companies use to grow, and many businesses find sustainable uses for debt. The total debt ratio for 2017 is 54.75%, appears to be lower to that of the industry's average debt ratio, we can conclude that the firm has less debt. In 2018 the debt ratio was 59.61%, meaning that the company is paying off their debts causing the rate to lower. In addition, the times-earned interest ratio of the company turned out to be higher than the industry's average which means that the firm can cover its debt. Then the third component, the cash coverage ratio of the company is higher than the industry average, meaning that they have enough cash available to cover their interest expense.The firm's debt position is that the company is in good standing because it proves to be doing better than the industry's average (For the numbers throughout this section refer to appendix part D).

Bond Issue Characteristics

   The key features of a bond are essential to know before purchasing. These are what bond contracts are composed of. The first term to know is bond indenture. A bond indenture is the written agreement between the corporation and the lender detailing the terms of the debt issue. When agreeing to a bond a trustee, which is usually a bank, is what holds all terms true and accountable. In addition, corporate bonds is an important topic to discuss when looking at the characteristics of a bond. Corporate bonds have a higher risk than normal bonds and usually have higher interest rates due to risk. A part of corporate bonds is call provisions which is an agreement giving the corporation the option to repurchase a bond at a specified price prior to maturity. Another term related to bonds is par value, also called face value, is the amount that will be repaid by the end of the loan. This is important to look at so that you will know exactly how much you are spending. Next, is coupon payment, which is the interest payment received from a bond. The coupon rate can be found by taking the annual coupon divided by the par value. After finding this, you have then found the payment interest. It is also important to know the maturity date of the bond. This is when the par value will be due. Then, the yield to maturity is the required interest in the market of a bond. This means the estimated rate of return is based on the assumption that it will be held until maturity date and not called.

   The value of a 10-year bond, $1,000 par value bond with a 9% annual coupon with a 9% required rate of return then the present value will be $90. If the bond value is computed semiannual, then the interest will be paid twice a year. To make the par value equal to the value of the bond, then the required rate of return would have to be equal to the coupon rate.

Yields

Determining the yield of a project is one of the most important aspects of a bond valuation project. In order to calculate the current yield of a bond you must first know the current price, or the present value and the interest earned annually, or the payment. In this valuation, the payment was equal to 90 and the present value was equal to 1000 (refer to appendix part H). Since we have both of the values of importance to calculate the current yield, the current yield comes out to be 9% (refer to appendix part I). Yield to maturity is the amount of total return that you expect to receive if you hold a bond clear up until its maturity date. The yield to maturity is also known as the "book yield." The difference between yield to maturity and current yield is the fact that yield to maturity takes into consideration the time value of money.In this instance the yield to maturity and the current yield are equal to one another at 9%(refer to appendix part I).The capital gains yield is simply the difference between yield to maturity and current yield. Since both, the yield to maturity and the current yield, are nine percent, our capital gains yield is therefore 0. Calculating our present value of 1000, we were then able to calculate our total return. When numbers are plugged in we find that our total return is also 9% (refer to appendix part I).

In some instances, a bond may be redeemable before it actually reaches maturity. This type of bond is called a callable bond. If the bond is callable, it then is given a yield to call; this is the yield received at the time that the bond is called. In our case the bond was callable after five years at a call price equal to $1,000 and the future value is equal to 1,100. With those numbers, we are able to compute the rate which equals 12.53%. We then compared that YTC with YTC's of bonds with different market values. When the market value, or present value, decreased to $930, the YTC dropped to 12.52%. When the market value increased to $1,242.30, the yield to call decreased to 5.18% (for the numbers in this section refer to appendix part J).

Sensitivity Analysis

The present value of a ten year bond that has a 9% coupon, $1000 par value, and a required rate of return of 9% is $1,000. If the inflation rate rises to 12%, then the present value of the bond will be equal to $830.49. It would sell at a discount because the required rate is greater than the coupon rate. The value of the bond would decrease. If the expected rate decreased to 8%, then the bond would sell at a premium and the present value would raise to $1,067.10. The yield-to-maturity on the same bond with a 9% coupon, $1000 par value, and required rate of return of 9% is 9%. When the bond sells for $930, the discount price, the yield to maturity is 11.198% and when it sells for $1,242.30, the premium price, the yield to maturity is 6.6118%. Bonds that are sold at a discount rate have a higher yield to maturity than bonds that are sold at premium rates. As a result, the market rate is greater in the discount rate, which makes the coupon rate greater than the interest rate. The current yield equals 9%. The capital gains yield is 0 because the yield to maturity and the current yield are the same. The total return is also 9%.

If the bond is callable in five years at a call price of $1,100 and the market value $930, then the yield to call is 12.53%, the current yield is 8.18%, the capital gain yield is 10%, and the total return is 19%. If this bond has a call price of $930, then the yield to call is 12.52, the current yield is 9.68%, the capital gain yield is 18.28%, and the total return is 27.96%. If the bond has a market value price is $1,242.30, then the yield to call is 5.18%, the current yield is 7.24%, the capital gain yield is -11.45%, and the total return is -4.21%. The bond with a $1,000 par value, 9% annual coupon, and 12% required return has a current yield of 10.83%, a capital gain yield of 20.41%, and a total return of 31.25%. For the discount bond that has a ten year maturity, 10% annual coupon, and $1,000 par value that sells at a discount price of $930, the current yield is 10.75%, the capital gain yield is 7.53%, and the total return is 18.28%. If that same bond is

selling at a premium price of $1,242.30, the current yield is 8.05%, the capital gain yield is -19.5%, and the total return is 18.28%. (refer to appendix part J, 2(J), 2(K), and 2(L) for completed formulas.

A semiannual bond is a bond that gives interest payments to investors twice a year. The bond that is callable in 10 years will be multiplied by 2 which makes it 20 years, also the rate of return that is 9% will be divided into 2 which makes it 4.5 The bond that is callable in 10 years (see appendix H) has 20 payments (N) and the par value stays the same. The rate of return that is 9%, so it becomes 4.5% and the present value is $1,585.36. For the bond in appendix I, the number of payments is 20 and the coupon payment is divided by 2 and becomes $45. The yield to maturity becomes 4.5%, the current yield is 9%, and the total return is 4.5%.

The semiannual amounts for part J (see appendix J) are that the payment is $45, the future value is $1100, and the yield to call is 6.21%. However, if the same calculation applies except if the market value price is changed to 1,242.30, the yield to call is going to be changed into 2.60%. In part K, the bond is callable in 20 years, the coupon rate is 6%, and the PMT is 90, so the market value price is $1,344. In part L, the payments are changed to $50 and the future value is $1000. This gives the yield to maturity at a discount rate of 5.59% multiplied by 2, which equals 11.18%. Now, the market value price is $1,242.30 instead of $930 and the yield to maturity is at a premium rate instead of discounted rate. This gives us the original premium rate multiplied by 2, which is 6.64%. For further formula wise explanations, please refer to the appendix, parts O(h), O(i), O(j), O(k), and O(l).

Conclusion

In conclusion, after comparing the bond's different yields, inflation, company risk, interest rate risk, maturity, and coupon payment period, the best recommendation for the Mutual

of Maryville Company is to invest in the bonds issued by Dunn's Company. We believe that it would be best to invest in their bond at its current yield of $930 because of its high coupon rate of 9%. If purchased at this rate the Dunns company will earn 9% of the bond. In addition this bond will have a capital gain of 0 and a yield to maturity of 9%. After comparing the different total returns, the best choice is the total return for $930 because it gives us a yield to maturity of 9% In addition, if the inflation rate rose from 10% to a required rate of return of 12%, the value of the new bond will be equal to a present value of $830.49. This bond would sell at a discount because the required rate of return 13% is higher than the coupon rate 10%, dropping the price from $930 to $830.49. If the expected rate declines to 8%, then the amount of the present value would be $1,067.10; this means that the bond would sell at a premium because the required rate of return 7% is lower than the coupon rate of 10%, raising the price from $930 to $1,067.10.

The best option in this case is to accept when the required rate of return decline to 8% because the amount for the PV would be more; this means that this is a premium bond that will make more money and also it is less sensitive to fluctuations in interest rates. In addition, the bond that has more interest rate price risk is the 10 year bond. The 10-year bond would have more risk associated with it than the 1- year bond, because there is a greater probability that the interest rates could rise within a longer period of time than a shorter time. After comparing all these calculations, we can conclude that the best Maryville Mutual should choose to invest in the bonds provided by Dunn Company.

Appendix

Part D

Long-Term Debt Ratio: 2017: (97,207,000) / (97,207,000 + 231,404,000) = **.419898 or 41.98%**

2016: (75,427,000) / (75,427,000 + 203,042,000) =**.371347 or 37.13%**

Total debt ratio: Total Debt Ratio = Total assets / total liabilities (added total current liabilities and long term debt). **2016:** 79,006,000 + 75,427,000/282,048,000 = .547541553 = 54.75%

2017: 100,814,000 + 97,207,000/332,218,000 = .596057408 = 59.61%

Cash Coverage Ratio: (Earnings Before Interest and Taxes + Non-Cash Expenses) ÷ Interest Expense. **2017:** (58,599,000 + 2,745,000)/2,323,000 = **26.41 times** ; **2016:** (46,401,000 + 1,348,000)/1,456,000 = **32.79 times**

Times Interest Earned Ratio: 2017: 25.23 times (58,599,000/2,323,000); **2016: 31.87 times** (46,401,111/456,000)

Part H

N = 10, FV = 1,000, i/y = 9, PMT = 90 CPT PV

PV= 1,000

Part I

Yield to maturity = (N=10, FV=1,000, PV= -1,000, PMT= 90) = **9%**

Current Yield = PMT (90) / PV (1000) = **9%**

Capital Gains Yield = difference between yield to maturity and current yield = 9% - 9% = **0**

Total Return = (Coupon pymt + FV-PV)/PV (90+1000-1000)/1000= **9%**

Part J

N = 5   PV = 1000   PMT = 90   FV = 1,100   CPT I/Y = 12.53%   **YTC = 12.53%**

N = 5   PV = -930   PMT = 90   FV = 1,100   CPT I/Y = 12.52%   **YTC = 12.52%**

N = 5   PV = -1,242.30 PMT = 90   FV = 1,100   CPT I/Y = 5.18%   **YTC = 5.18%**

Part K

N = 10, FV = 1,000, i/y = 12, PMT = 90 CPT PV

PV= $830.49 discount

K Part 2

N = 10, FV = 1,000, i/y = 8, PMT = 90 CPT PV

PV= $1,067.10 (premium)

Part L

N = 10; PV = -930; PMT = 100 = (1000*10%); FV = 1000

YTM (I/Y) = 11.1985% (Discount)

N = 10; PV = -1242.30; PMT = 100; FV = 1000

YTM (I/Y) = 6.6118% (Premium)

J Part 2

(Call price = $1,100)   90/1100 = 8.18%

(Call price = $930)   90/930 = 9.68%

(Call price = $ 1,242.30)   90/1242.3 = 7.24%

Capital Gain Yield =(FV-PV)/PV

(call price = $1,100)   (1100-1,000)/1000 = 10%

(Call price = $930)   1100-930/930 = 18.28%

(Call price = $1,242.30) (1100-1,242.30)/1,242.30 = -11.45%

Total Return = (Coupon pymt+FV-PV)/PV

(Call price = $1,100)   (90+1,100-1000)/1000 = 19%

(Call price = $930)   (90+1100-930)/930 = 27.96%

(Call price = $1,242.30)   (90+1100-1242.3)/1242.3 = -4.21%

K) **Current Yield** =90/830.49 =10.83%

Capital Gain Yield = (FV-PV)/PV (1000-830.49)/830.49 = 20.41%

Total Return = Coupon+(FV-PV)/PV (90+1000-830.49)/830.49= 31.25%

L) (Discount bond)

current yield =100/930=10.75%

Total return = (Coupon+FV-PV)/PV (100+1000-930)/930= 18.28%

Capital gain yield = (FV-PV)/PV (1000-930)/930 = 7.53%

(premium bond)

current yield = 100/1242.30 = 8.05%

Total return = Coupon pymt+(FV-PV)/PV (100+1000-930)/930 = 18.28%

Capital gain yield = (FV-PV)/PV 1000-1242.3)/1242.3 = -19.50%

Part O

H) N = 10*2, FV = 1,000, i/y = 9/2, PMT = 90 CPT PV; PV= $1,585.36

I) YTM = (N = 10*2, FV = 1,000, PV = -1,000, PMT = 90/2) = 4.5

Current Yield = PMT (90) / PV(1000) = .090

Capital Gains Yield = 9.0 - 9.0 = 0

 ((coupon pymt+FV-PV)/PV=Total Return - Total Return = (45+1000-1000)/1000=4.5%

J) N = 5*2   PV = -930   PMT =90/2   FV = 1,100   CPT I/Y = 6.21%   YTC = **6.21%**

N=5*2   PV = -1,242.30   PMT = 90/2   FV = 1,100   CPT I/Y = 2.60%   YTC =

2.60%

K) N = 10*2=20 , FV = 1,000 , i/y = 12/2 = 6, PMT = 90 CPT PV; PV = 1,344

L) N = 10*2 = 20, PV = -930, PMT = 100/2 = 50, FV = 1,000, YTM (I/Y) = 5.5901% Discount*2=

11.1802%

N = 10*2 = 20, PV = -1242.30, PMT = 100/2 = 50, FV = 1000, YTM (I/Y) = 3.3224% Premium*2=

6.6448%