Bloomberg Project
High Yield Fund

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Portfolio Overview and Bond Description

The bonds chosen for the purpose of the project were high yield bonds. The SEC defines high yield corporate bonds as bonds that offer a higher rate of interest because of its higher risk of default. These bonds will have a credit rating of BBB or lower because of the greater estimated default risk compared to investment-grade bonds. As a result, high yield bonds will have higher interest rates to entice and compensate investors for the higher risk. Some characteristics of companies that issue high yield bonds are highly leveraged, experience financial difficulties or smaller and emerging companies.

When choosing the bonds for our portfolio, I used the SRCH function. The filters used were fixed income, high yield, and convertible, putable and callable respectively. I chose 5 high yield bonds; 3 callable, 1 putable, and 1 convertible. The portfolio can be found in Appendix 1. The following is a description of the bonds chosen and a brief overview of the company:

<u>AMC 10 06/15/26 (AMC Entertainment Holdings Inc)</u>

From Yahoo Finance, AMC Entertainment Holdings Inc is a company that has subsidiaries engages in theatrical exhibition business. The company owns, operates and has interests in theaters in the US and in Europe. As of March 1, 2022, AMC operates approximately 950 theaters and 10,600 screens. The AMC bond is a callable bond that has a 10% coupon and matures on June 15, 2026. The current price of one bond at November 24, 2022 is $35.96 USD. The Market value of the bond in our portfolio is $398.15 USD.

<u>DISH 3 ⅜ 08/15/26 (DISH Network Corporation)</u>

DISH Network Corporation is a satellite television company, providing a direct broadcast satellite subscription television, audio programming, and interactive television services to commercial and residential subscribers. The corporation and its subsidiaries operate two primary business segments, Pay-TV (generating more than 70% of revenue) and Wireless, consisting of two business units, Retail Wireless and 5G Network Deployment (nearly 30% of revenue). The company is one of the biggest pay-TV providers in the United States. As of December 31, 2021, DISH had 10.7 million pay-TV subscribers in the US. The DISH bond is a convertible bond that has a 3.375% coupon and matures on August 15, 2026. The current price of one bond at November 24, 2022 is $64.38 USD. The Market value of the bond in our portfolio is $653.03 USD.

<u>EOFP 7 ¼ 06/15/26 (Faurecia SE)</u>

Faurecia SE is a manufacturer of automotive equipment. It designs, develops and supplies seat components such as frames, adjustment mechanisms, motors, padding, seat covers, electronic and pneumatic systems and accessories and foams. It also provides vehicle interior products like instrument, door, acoustic and module panels, as well as vehicle exterior products like bumpers, engine cooling systems and front-end carriers. The company operates in Europe, Americas, Africa and Asias, and is headquartered in Paris, France. This is a callable bond and has a coupon of 7.25%. The bond matures on June 15, 2026. The current price of one bond at November 24, 2022 is $103.4 USD. The Market value of the bond in our portfolio is $1075.34 USD.

<u>F 7.35 11/04/27 (Ford Motor Company)</u>

Ford Motor Company designs, manufactures, markets and services a range of Ford trucks, cars, sport utility vehicles, electrified vehicles and Lincoln luxury vehicles worldwide. The three segments that it operates through are automotive, mobility and Ford Credit. The Automotive segment sells vehicles, parts and assessors through various mediums to commercial, rental and government clients. The mobility segment builds mobility services and provides self driving systems development services. The Ford credit segment engagements in vehicle-related financing and leasing activities to and through automotive dealers. The bond is a callable bond that has a coupon of 7.35% and matures on November 4, 2027. The current price of one bond at November 24, 2022 is $103.87 USD. The Market value of the bond in our portfolio is $1042.77 USD.

<u>M 6.79 07/15/27 (Macy's Inc)</u>

Macy's is an omni-channel retail organization that operates stores, websites and mobile applications. The company sells a variety of merchandise such as apparel and accessories, cosmetics, home furnishing and other consumer goods. Macy's operates in the US, Puerto Rico, Guam, Dubai, UAE and Kuwait. Macy's was founded in 1830 in New York, New York. The bond is a putable bond with a coupon of 6.79%. The Maturity of the bond is July 15, 2027. The current price of one bond at November 24, 2022 is $99.24 USD. The Market value of the bond in our portfolio is $1016.72 USD.

Yield and Spread Analysis

The first step is to explore the yield and spread analysis for each of our bonds. This was done by using the PORT function, right clicking each security, and selecting YAC (Yield and Spread Analysis). From the YAC function, there are metrics that have been introduced in the course and will aid in our analysis of these bonds.

<u>G-Spread, I-Spread, Z-Spread and OAS</u>

Analyzing the spread can indicate the credit and liquidity risk, value of the bond, tax effects, and embedded option effects. The spreads that are shown in the YAC function are the G-spread, I-Spread, and Z-spread. The values of the spread can be found in Appendix 2.

The G-spread is the difference between the yield to maturity of a given bond and the yield to maturity of a suitable government benchmark bond. The two bonds with the highest G-Spread in the portfolio are AMC at 4698.1 BPV and DISH at 1236.7 BPV. The 3 other bonds are in the range of 250-450 BPV for the G-Spread.

The I-Spread or the interpolated spread is the difference between the yield to maturity of the bond and the linearly interpolated yield to maturity for the same maturity given government benchmark bonds. Similarly, the I-spread of AMC and DISH are significantly higher and around the same values of their G-spread while the other 3 bonds have an I-spread in the range of 280 - 360 BPV.

The Z-Spread indicates the parallel shift of the yield curve necessary in order to set the model price of the bond equal to the market price. The Z-spread of the bonds in the portfolio follow a similar pattern as the G-spread and I-Spread above.

The OAS, or Option adjusted spread considers how a bond's embedded option can change the future cash flows and the overall value of the bond. In the textbook, it is defined as the uniform shift in an interest rate tree in order for the model and market prices to agree. It removes the option's ability to affect the spread and focuses on elements such as credit and liquidity risk along with tax effects. Aside from DISH which is a convertible bond where OAS cannot be calculated, the remaining bonds follow a similar pattern as the spread behavior above.

For bond spreads above, the analysis is similar. A high spread indicates that the bond will have a lower price, high credit risk and high liquidity risk. This means that there may be concerns that the bond issuer is unable to pay the coupon or the face value of the bond when the bond matures and also concerns that it may be difficult to sell the bond. In our portfolio, AMC and DISH fall under this category. When compared to a bond with a lower spread, the bond will have a higher price, lower credit risk and lower liquidity risk. Holders of these bonds will be less concerned over the ability of the company to repay the debt, as well as the ability to sell the bonds. In our portfolio, the lowest spread overall is Ford, followed by Macys and finally Faurecia (EOFP).

<u>Macaulay Duration, Modified Duration and Convexity</u>

To understand interest rate risk for the bonds in the portfolio, the YAS function also displays the Macaulay duration, modified duration and convexity of the bonds. The values of these metrics can be found in Appendix 3.

The Macaulay duration of a bond is defined to be the weighted average time to maturity of the bond, weighted by the size of the cash flows. The Macaulay duration increases when maturity of a bond increases. It decreases when the bond's coupon increases or if interest rates increase. The greater the macaulay duration, the greater the interest rate risk. This means there is a larger change in its price when interest rates change. The bonds in the portfolio that have the highest Macaulay duration would be Ford, Macy and DISH, while the lower Macaulay duration bonds would be AMC and Fauricia.

The Modified duration expresses the measurable change in the value of a security in response to a change in interest rates. In relation to the Macaulay duration, the modified duration is the Macaulay duration discounted by 1 period. The modified duration reacts similarly to the Macaulay duration in terms of changes in maturity, bond coupon, and interest rate. The Modified duration is important as bonds with higher modified durations have greater price volatility compared to bonds with lower modified durations. From the bonds in the portfolio, DISH, Ford and Macys are most sensitive towards interest rate changes and are higher in price volatility compared to AMC and Fauricia.

The Convexity of the bond is a measure of the curvature, or the degree of the curve, in the relationship between bond prices and bond yields. Convexity can measure and manage the portfolio's exposure to interest rate risk. Bonds with higher convexity will always have a higher price as interest rates rise or fall since it is a measure of the sensitivity of the duration of a bond as yield changes. The bonds in the portfolio with a higher convexity would be Ford, Macys and DISH. These bonds have positive convexity and would see prices increase at greater levels when yields fall.

Overall, our portfolio includes only high yield bonds, which means the Macaulay duration, modified duration and convexity of the portfolio would be lower than a diversified portfolio. Under normal market conditions, there is less interest rate risk and systematic risk with high yield bonds because market rates would need to increase substantially to surpass the bond's yield. High yield bonds also have a shorter maturity than most bonds. With these factors affecting a lower Macaulay duration, Modified duration and convexity, a high yield portfolio would have less risk of being affected by interest rate risk relative to diversified portfolios.

Evaluate the ratings histories of the bonds using the RATC screen

The default risk of a bond issue is assessed by credit rating agencies such as Moody's, S&P, Fitch, and DBRS Morningstar. According to Credit Ratings Scale by Blake and University of Waterloo CEL (2019), bonds rated BBB/Baa and better are referred to as investment-grade, while junk bonds or high-yield refers to bonds rated BB/BA and lower. Credit ratings can change over time, which will be taken into consideration in the following analysis of each bond in the portfolio. Please see Appendix 4 for additional details from the Bloomberg Terminal.

<u>AMC 10 06/15/26 (AMC Entertainment Holdings Inc)</u>

As of 02/02/2022, according to Moody's, the senior secured debt security is rated Caa1, with the last rating being Caa2. Caa is considered a poor standing, meaning the bond is subject to very high credit risk. This implies that there is a high risk that AMC is unable to repay full interest and principal repayment on a timely basis. That being said, the security's credit risk was adjusted from Caa2 to Caa1 from the last rating, which can be considered a positive change.

AMC LT Corp Family security is rated Caa2, with the last rating being Caa3. Moody's Corporate Family Ratings utilizes the general long-term rating scale and considers a corporate family's ability to make payments. Similar to AMC senior secured security above, Caa2 suggests very high credit risk, although the improvement from Caa3 to Caa2 might be a good sign for improved credit health.

It is understandable that the senior secured debt security is subject to less credit risk than the LT Corp Family security, as the debtholder has direct claim on certain assets and their associated cash flows when it comes to secured debt bonds.

DISH 3 ⅜ 08/15/26 (DISH Network Corp)

As of 11/02/2022, Moody's rated the senior unsecured debt security B3 and the senior secured debt security Ba3. B3 is the lowest of B's, suggesting a speculative security that is subject to high credit risk. Ba3 is the lowest of Ba's, suggesting that a security has speculative elements and may be subject to substantial credit risk. The unsecured debt security is not secured by an asset and the debtholder only has general claim on certain assets and their associated cash flows, hence the higher credit risk presumed.

EOFP 7 ¼ 06/15/26 (Faurecia SE)

The most current rating was Ba2 by Moody's on 08/20/2021, indicating certain speculative elements and substantial credit risk. It is worth noting that on 05/24/2022 and 07/29/2022, S&P and Fitch announced a negative credit rating outlook, meaning there is a heightened probability of a downgrade rating change. This is a rating watch, which is typically event-driven. One of the company's significant events in 2022 is the acquisition of HELLA in 2022 and the launch of FORVIA on February 7, 2022 to combine Faurecia and HELLA.

F 7.35 11/04/27 (Ford Motor Credit Co LLC)

Its Long Term Rating security was rated Ba2 by Moody's on 03/29/2022, indicating a substantial level of credit risk. Ford Shareholder Support rating type was rated bb+ by Fitch on 05/02/2022, which is equivalent to Ba1 by Moody's. This rating suggests that while there is elevated vulnerability to default risk, the company has financial flexibility to service its financial commitments. As of 05/17/2022, DBRS Morningstar gave a positive outlook rating, which might result in a higher rating for Ford in the future as the firm has experienced increased revenues and profits thanks to higher vehicle sales in the past few years.

M 6.79 07/15/27 (Macy's Retail Holdings LLC)

As of 11/17/2022, S&P rated both the LT Local Issuer Credit security and the LT Foreign Issuer Credit security BB+. In the past, S&P's rating has remained stable at BB+, which is equivalent to Ba1 by Moody's. Given that Macy's has not been subject to significant changes, the stable credit rating is expected.

Conclusion

AMC has the highest credit risk in the portfolio, as the company continues experiencing a net loss despite the increase in attendance at theaters as a result of the COVID-19 pandemic. DISH Network Corp has high credit risk, although lower than AMC. Faurecia SE and Ford Motor Credit Co LLC were rated similarly and are subject to the same elevated vulnerability to default risk. Macy's seems to be subject to least credit risk out of the five bonds, while still having speculative elements.

Evaluate the default risk of each of the bonds using the DRAM screen

For purposes of this report, the 1-year default risk and the 1-year default probability are used to assess the probability of each company defaulting over the next one year. Bloomberg classifies default risks into three groups: Investment Grade (IG) with the highest credit rating, High Yield (HY) with the middle credit rating, and Distressed (DS) with the lowest credit rating. Please see Appendix 5 for additional details from the Bloomberg Terminal.

<u>AMC 10 06/15/26 (AMC Entertainment Holdings Inc)</u>

The default grade is DS2 and the default probability is 19.08%. This means that AMC is in the Distressed group with the lowest credit rating out of the three groups. This is consistent with its credit rating being in the Caa group by Moody's. Based on the Default Risk Distribution diagram, most companies in the Leisure Facilities and Services Industry are in groups IG 5 - 7. AMC's credit risk is notably higher than other firms in its industry, which can be attributed to the following credit metrics being lower than the median of the industry: EBIT/Interest Exp of -1.2, Interest Coverage of -1.2, ROA of -8.1%. In addition, its Liabilities/EBITDA metric is 1554.8, significantly higher than the median.

<u>DISH 3 ⅜ 08/15/26 (DISH Network Corp)</u>

The default grade is HY3 and the default probability is 2.17%. Most companies in the same sector, Cable & Satellite, are in groups IG 8 – 10, meaning the bond's credit metrics are not on the same level with its competitors: EBIT/Interest Exp of 88.1, Interest Coverage of 0.5, ROA of 4.3%, and Liabilities/EBITDA of 1138.4. Although the first three metrics do not differ significantly from the industry median, the company's debt to EBITDA ratio is alarmingly high. This is because the amount of cash held by the company is only around $7.7 billion, while its advertising expenses totaled $535 million for the year ended 2021. Gaining new subscribers is the main source of revenue for the corporation, resulting in high advertising expenses.

<u>EOFP 7 ¼ 06/15/26 (Faurecia SE)</u>

The default grade is HY5 and the default probability is 5.56%. Other companies in the Automotive Sector in France are mostly either in groups HY 1 – 3 or groups IG 5 – 7. Hence, although Faurecia's default risk is higher than the industry average, the difference is not concerning. Evidently, its credit metrics are close to the industry's weighted average: EBIT/Interest Exp of 0.5, Interest Coverage of 0.5, ROA of -2%. However, its Liabilities/EBITDA ratio is 1306.5, which can be attributed to the considerable amount of cash required for capitalized development costs.

F 7.35 11/04/27 (Ford Motor Credit Co LLC)

The default grade is HY3 and the default probability is 2.22%. The majority of its competitors in the Automotive industry in America is in groups IG 8 – 10, meaning Ford's credit health is considerably lower than others in the same sector. While its ROA is 2.2%, right around the industry median and weighted average, its Liabilities/EBITDA ratio is 1338.3 which exceeds the median and negatively affects its credit rating. Despite having raised cash from operations by 36% to $4.82 billion from earnings collected before depreciation and amortization, the company's debt obligations continue to be a challenge when it comes to default risk.

M 6.79 07/15/27 (Macy's Retail Holdings Inc)

The default grade is HY2 and the default probability is 1.02%. While Macy's has the lowest default probability out of the five bonds in the portfolio, it still has higher default risk than the majority of companies in the Retail sector in the U.S, which are mainly in groups IG 5 – 7. It has a number of credit metrics that align with the industry weighted average: EBIT/Interest Exp of 9.3, Interest Coverage of 9.3, ROA of 7.7%. On the other hand, its Liabilities/EBITDA ratio is 886.7 and can be considered exponentially higher than the industry median and weighted average.

Conclusion

All five bonds in the portfolio have higher default risk than other companies in the same sector, mainly due to disadvantageous Liabilities/EBITDA ratios, suggesting that their debt obligations are considerably higher than cash available. None of the bonds are in the highest credit rating group (IG). Macy's has the most favorable default grade of HY2, which is consistent with its credit rating of BB+. AMC's default grade of DS2 is the lowest out of the portfolio, as suggested by its low credit rating of Caa.

Corporate Action Calendar and Events Calendar

There are a few events that influence the analysis of the bonds in the portfolio. The date is set from November 7th 2022 to November 23rd 2022, and the events that were effective during this period are evaluated. Please see Appendix 6 for the conclusion of the events (reformat of results generated from the CACT function in Bloomberg Terminal).

On November 7th and November 14th, Ford Motor announced issuing a total of 78.95 million high-yield bonds at the price of 100.000% of its original bonds, which was effective on November 14th and 21st accordingly. DISH Network also reported issuing a total of 2 billion bonds at 98.17% on November 2nd, effective on November 7th. Same for Faurecia, it issued 700 million of bonds at par which was effective on November 7th. As bonds function as a loan between the investor and the corporation, Ford and DISH Network bolstered cash by issuing bonds to generate funds from the investors. The funds then could be used to finance their operations according to their needs. Compared to borrowing from the bank, companies usually prefer issuing bonds as it provides them with the opportunity to borrow large sums at low-interest rates to invest in growth and other projects.

Ford issued these international bonds which were sold at 100% at par to fund its EV developments, which were clean transportation projects and specifically to the design, development, and manufacture of its battery electric vehicle portfolio. Investment in the electric vehicle space has been on the rise as sales of Ford's electric models soar, driving up the bond price of Ford.

For DISH Network, it issued bonds at a discount of 98.17% at par, which means the yield to maturity is higher than the coupon rate. This kind of bond can provide higher returns but is riskier, which lowers the bond price. In this case, DISH Network secures the bonds by certain subsidiaries and assets. DISH Network intended to use the net proceeds of the offering for general corporate purposes, including the buildout of wireless infrastructure.

Moreover, Faurecia priced 700 million in aggregate principal amount of SL Notes at 7.25%. The net funds will be used to refinance in part the bridge facilities put in place for the acquisition of Hella. These SL Notes are conformed to the sustainable goal of Faurecia, including the ambition to be CO2 neutral on both scopes by 2025. ISS ESG has reviewed these SL Notes and considered Faurecia as having a "Significant Contribution" to "Affordable and Clean Energy" and "Climate action" goals, making the bond favourable to investors.

The EVTS function from the Terminal also identifies past and future events that are worth considering. The period is set to be from November 7th to the last day of November. From the EVTS screen, AMC released its Q3 2022 Earning Report on November 8th, which provides some insights compared to last year. It reported another quarterly loss regardless of the higher revenue from a year ago. AMC's net loss increased by 22% per share compared to a year ago, which is $226.9, compared to the expectation of 26%. Its revenue of $968 million is also higher than the expected value of $961.1 million. Although the total debt of AMC is 10.5 times LTM EBITDA as of September 30, 2022, the company will continue to invest in the theatres, movie screens and the number of special effects screens to attract more audiences. The high debt and continuous revenue loss can be considered to increase the credit risk of AMC and lower its ratings accordingly.

Another event is that Third Bridge held an interview on November 15th, and Ford is one of the relevant companies. Third Bridge Forum is the largest archive of high-quality expert interviews in the world, which provides its clients with critical knowledge to make better decisions with the help of experts. The agenda of the interview is to assess the operating environment, evaluate the strengths and weaknesses in Waymo's current offerings and highlight current friction. Since Google and Ford have signed a partnership for connected vehicle technology, Waymo and Ford are acting as both partners and competitors. Getting information about Waymo and the market environment can help Ford make better decisions and hence cause an increase in bond price stably.

Compare portfolio to the Bloomberg Global High Yield Benchmark

The benchmark is set to be LG30TRUU (Bloomberg Global High Yield). Please see Appendix 7 which shows the total return of the portfolio compared to the benchmark for the past week.

The period is set to be one week since the portfolio was created within one week, hence the yearly return is not shown. As shown in the graph, the total return of the portfolio is the white line (MATBUS471 PROJECT), and the benchmark is the orange line (MATBUS 471). In general, one portfolio is preferred to have higher returns compared to the set benchmark. The benchmark reached a peak on November 4th of 1.18% and started to decline since then, dropping rapidly to –0.132%. Although the total return of the portfolio is below the benchmark in the beginning, which is only 0%. It is quite stable and started to increase on November 24th continuously, rising to 0.2789% at the end of the period.

There are some key differences that need to be paid attention to. Please see Appendix 8 for the statistical summary of the portfolio compared to the benchmark for 1 year. The Sharpe ratio is –2.23 for the portfolio and 3.42 for the benchmark. In general, higher Sharpe ratio means the bond/ portfolio has higher risk adjusted return. Sharpe ratio is negative when excess return is negative, which means the return on the portfolio is less than the risk-free rate. It is further proved by the negative values shown in the return part. While the return is not so attractive, the portfolio has much lower risk than the benchmark. The standard deviation, down-side risk and VaR of the portfolio is much lower than that of LG30TRUU. It means the volatility of the portfolio is lower, showing that it has much lower risk than the benchmark. Moreover, the beta of the portfolio is 0.22. Beta measures the activity of the return respective to the swings in the market. Value of 0.22, which is smaller than 1, means the portfolio is less volatile than the benchmark.

In general, the return and the risk of the portfolio act as trade-offs. In exchange for the lower risk, the portfolio has lower returns and has even negative in the past one year. However, as shown in the graph of the total returns, the return has been rising steadily for the past week. Together with bonds with great potential like Ford, the portfolio is expected to be a good choice in the long run.

Evaluate portfolio relative to the indexes using the total return screen COMP

By using the function COMP in order to evaluate the five bonds, Appendix 9 illustrated the fluctuation of the price for each bond from the date range 11/09/2022 to 11/24/2022.

Firstly, we are going to analyze the background for each company issuing the bond to see why the fluctuation trend is forming that shape. As for the yellow one issued by Faurecia SE, the company's main field is automobile technology such as automotive seats, emission control technology systems, automotive interiors and exteriors. Auto parts companies are strong cyclical businesses which hold obvious off-peak seasons. Therefore, it is reasonable for us to see that the yellow line's fluctuation is near the profit and loss axis (which is the straight line across the whole graph). Such companies can hardly sustain profit growth without changes in external factors. For the red line, which is the bond issued by Ford Motor Credit Co LLC, unlike Faurecia SE, Ford's main profit comes from oil cars, since some of its competitors converted to electric cars, thus Ford's market passively expanded which leads to its performance presenting a continuously increasing behavior. As for Macy, which is a retail holding for the public, there are two possible reasons that could explain the increasing trend. One is the recovery of the real economy after the COVID-19 and the other is the profit growth caused by the consumption degradation after inflation. Moreover, as we can see, lines for AMC and DISH Network Corp demonstrate similar features overall. AMC is doing theatrical exhibition business through its subsidiaries. It operates through the U.S. Markets and International Markets segments. The U.S. Markets segment is involved in owning, leasing, or operating theaters and screens in the U.S. The DISH network corp is an American television provider and the owner of the direct-broadcast satellite provider DISH, and the over-the-top IPTV service, Sling TV. Based on the above, it can be concluded that both of their main working fields are streaming media and movie services, thus it is not surprising that their price fluctuations are similar. The function also provides price change, total return, difference and annual Eq for each bond as shown in Appendix 11.

For the price change, EOFP 7 ¼ 06/15/26, F 7.35 11/04/27 and M 6.79 07/15/27 all illustrate positive feedback which F 7.35 11/04/27 has the greatest as 4.22%. These data fit the upward trend of those curves as the graph shows. However, both AMC 10 06/15/26 and DISH 3 ⅜ 08/15/26 has negative values for price change which also prove that their trends are similar to each other. Similar phenomena also display on Total return for out holding period, EOFP 7 ¼ 06/15/26, F 7.35 11/04/27 and M 6.79 07/15/27 all illustrate positive feedback which F 7.35 11/04/27 has the greatest as 4.53%. Moreover, even both AMC 10 06/15/26 has total return with 0.57% but it is still much lower compared with other 3 bonds and DISH 3 ⅜ 08/15/26 holds negative return. As for the difference, we set the EOFP 7 ¼ 06/15/26 as the control group which means all other four bonds need to be compared with this bond. The main reason for that is the fluctuation of EOFP 7 ¼ 06/15/26 is most stable and closest to the profit and loss axis. F 7.35 11/04/27 and M 6.79 07/15/27 both has greater return than EOFP 7 ¼ 06/15/26 and both AMC 10 06/15/26 and DISH 3 ⅜ 08/15/26 has negative values when comparing with EOFP 7 ¼ 06/15/26. Finally, the annual equivalent rate is the interest rate for a savings account or investment product that has more than one compounding period, therefore, higher AER is going to be more attractive for the investor, F 7.35 11/04/27 has the highest AER with 193.72% which is followed by M 6.79 07/15/27148.10%. DISH

3 ⅜ 08/15/26 has negative AER with -15.93%. The AER also reflects the fact that DISH 3 ⅜ 08/15/26 and AMC 10 06/15/26 has lower investment value compared with other bonds.

Overall, F 7.35 11/04/27 and M 6.79 07/15/27 prefer more like conservative bonds since they have a stable increasing trend, EOFP 7 ¼ 06/15/26 prefer more oriented bonds since it keeps stable around the profit and loss axis. AMC 10 06/15/26 and DISH 3 ⅜ 08/15/26 reflect violent fluctuations and low or even negative returns, especially for AMC 10 06/15/26, thus, they could be concluded as high risk bonds.

Set up an RV screen for evaluating and monitoring the companies comprising the portfolio

To better analyze the credit risk for our bonds, the solvency and liquidity ratios could be used for the companies. First of all, I review that with the exception of AMC, the other companies all have a fairly low debt/equity ratio with the highest being Ford at 3. Since these companies are mostly mature and not growth-oriented, a capital structure with lower debt levels gives greater confidence that these companies will not default. Furthermore, the debt/assets ratios for all companies besides AMC are all below 0.5, showing that they have the ability to cover their debts if liquidations became necessary. However, when it comes to Ford, its debt/EBITDA ratio is higher than expected for its industry. This indicates that they may not be generating enough profit, and could have issues with repayments later on. Contrasting this, DISH and Faurecia both have a healthier debt/EBITDA ratio but have an interest coverage ratio below 1, bringing into question their current ability to pay interest. AMC presents the greatest risk out of all our companies, with a very high debt/EBITDA ratio, a poor debt/asset ratio, and a negative interest coverage ratio as the company is at the moment not profitable. Overall, based on our solvency ratios, Macy's appears to have the lowest potential risk while AMC shows an alarming trend.

Secondly, look at liquidity ratios. Three of our five companies have current ratios above one and are well-positioned to meet their short-term obligations. There is not a great difference when looking at the quick ratio outside of Macy's which is reasonable given that the nature of its business necessitates greater investment in inventory. The trend continues for the cash ratio with Macy's holding the least in cash. Overall, DISH and Macy's appear the least liquid, but there is little reason to believe that Macy's presents a great risk based on these metrics due to its sector. DISH, with a sub-1 interest coverage ratio, also has a current ratio below one, showing possible liquidity problems. AMC continues to be the riskiest company as its current ratio is below one, meaning it is weak financially both in the long and short term.

Next, examine the defensive interval and cash conversion cycle of our companies. Macy's has the shortest defensive interval of 8.5 days, meaning it has the highest level of daily expenditures and is under the most pressure to continuously operate. On the other hand, Ford and Faurecia both have defensive intervals of around 200 days, allowing them plenty of time to recover if they were to meet with unforeseen circumstances. Macy's also has the longest cash conversion cycle, further compounding its need to remain operational. Yet again, while Macy's appears vulnerable, the retail nature of its business means that these numbers are fairly normal and should not present a large risk of the company defaulting on its debts.

Finally, look at some other miscellaneous ratios. Fixed asset turnovers are normal for all companies besides AMC, which shows problematically poor return on investment.
Otherwise, the days sales outstanding, accounts payable turnover, and inventory turnover for all five companies are roughly consistent with their respective industry averages. None of these metrics show any particular issues for our five companies. However, the Altman Z-Scores for Ford, Faurecia, and AMC are lower than 1.8, the benchmark traditionally used for companies at risk of bankruptcy. AMC is particularly egregious with a score of -0.72, implying significant issues with its financials.

After analyzing these factors, it is clear that AMC is the company with the greatest credit risk. AMC has extremely poor financials, a high level of debt, and is currently losing money every quarter. The other four companies in our portfolio are mostly neutral. While some metrics could be interpreted as risky, they are generally offset by strengths in other areas, such as Macy's low defensive interval but also a very low debt/EBITDA and a high interest coverage ratio. In conclusion, the overall credit risk of our portfolio is within acceptable bounds with AMC as the main speculative addition.

Hedging The Risk of The Portfolio

Based on the analysis, it can be inferred that the bonds: AMC 10 06/15/26 and DISH 3 ⅜ 08/15/26 from our portfolio contain highest risks not only illustrated by their indexes but also by their history events and price fluctuation trend. For instance, AMC and DISH have experienced a profit loss for the past year and they are expected to have a further loss on return in the future. Their high credit risk is also proven by the high spread, showing that it is highly possible for investors to lose their profits. Hence, it is important for us to use hedging to offset the risk of any adverse price movements.

To hedge the risks that may occur in our portfolio, since the main risk will be caused by AMC and DISH bonds' decrease, one practical method is to use the put spread strategy to hedge. Notice that a put spread consists of long and short put positions. For example, a portfolio manager can buy a put with a strike price at 95% of the spot price and sell a put with an 85% strike. The sale of the put will offset part of the cost of the bought put. In this example, the portfolio would only be hedged while the market falls from 95% to 85% of the original strike. If the spot price falls below the lower strike, gains on the long put will be offset by losses on the short put. In this way, if the bond price of AMC and DISH decreases (which is expected), we can apply our put option which allows us to sell the bond at strike price when the price is decreasing. Using put spread helps offset the cost of purchasing the put option with the higher strike price. Moreover, as mentioned in part g, the F 7.35 11/04/27 could be identified as a stable increasing bond, thus, it could also be an acceptable method as a buying call option of F 7.35 11/04/27.

However, there are some drawbacks to the put method. When purchasing the put option, the buyer needs to pay a premium. While the value of the put option decreases as it goes to the expiry date, which drives down the premium price, the amount of protection the put option can provide to the bond also decreases. It means if the investor wants to get a higher level of protection, he or she has to pay a higher premium. It would be expensive to use the put option to hedge every single bond in the portfolio.

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