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Case Study Series

Investing in Tax-Free versus Taxable Bonds

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Abstract

This case deals with the comparison of tax-free and taxable bonds. Students will learn which bonds are tax-free and which are not. They will first analyze a hypothetical situation. Then, they will analyze a real-world situation. This is a hands-on experience for students who want to learn different types of bonds and the tax issues related to bonds.

Keywords: municipal bond, tax-free bond, taxable bond
JEL Classifications: G11, G12

Introduction

Investors make investment decisions based on the risk-return tradeoff. U.S. tax system has significant impacts on the investment returns. Investors need to use after-tax returns instead of pre-tax returns when making investment decisions. This is especially true in the case of municipal bonds, where their interest is exempt from federal taxes and potentially, state taxes, if an investor buys bonds issued from its own state.

Tax-free and taxable bonds are introduced to our finance student, John, in the first part of the case. John is interested in bonds because he prefers lower risk investments that give him supplementary income. He will learn to identify which bonds are tax-free and which are not. Then, a hypothetical example will be used to demonstrate the techniques for calculating bond-equivalent yield and then use that to make investment decisions. In the second part of the case, John will apply the techniques to analyze real-world data. This gives John, hands-on experience on analyzing after-tax returns on different types of bonds and on finding the critical tax rate that makes those bonds indifferent to investors.

Tax-Free Versus Taxable Bonds

Taxable bonds are bonds that require the holder to pay tax on their interest income. One of the financial websites, "finance.zachs.com", explains the taxable bonds as follow: "The types of bonds that pay taxable interest include government and corporate varieties. U.S. Treasury bonds can be easily bought and sold and are considered the safest investment securities. Treasury securities set the base interest rates against which other bond types are judged. Bonds issued by corporations range in quality from investment grade bonds to high-yield, noninvestment-grade bonds, often referred to as "junk" bonds. Bonds with lower credit ratings pay higher yields but have higher risk of default".

The same website explains the nontaxable bonds as follows: "Nontaxable bonds, or municipal bonds, are issued by state and local governments. Their interest is exempt from federal taxes, and if you buy bonds issued in your state, it is also exempt from state income taxes. Municipal bonds are either general-obligation bonds, which are backed by the full taxing authority of the issuer, or revenue bonds, which are paid off from the earnings of a specific project. Municipal bonds tend to be less liquid than government bonds and corporate bonds from large companies. Investors should view tax-free bonds as buy-and-hold investments."

If we have a municipal bond and a corporate bond with the same credit rating, we will notice that the municipal bond's yield is lower than the corporate bond's yield. This is due to the tax-advantage of the "muni". If the municipal bond's yield is the same as the corporate bond's yield or if it is higher than the corporate bond's yield, no one would invest in the corporate bond, because with the corporate bond, the investor needs to pay tax. So, municipal bonds tend to pay lower yields when compared to taxable bonds.

If an investor wants to choose between a muni and a corporate bond, he needs to compare their yields. In order to compare a taxable bond to a tax-free bond, an investor needs to compute the tax-equivalent yield. This is explained by "Investopedia.com" as follows: "The tax-equivalent yield is the pretax yield that a taxable bond needs to possess for its yield to be equal to that of a tax-free municipal bond. This calculation can be used to fairly compare the yield of a tax-free bond to that of a taxable bond to see which bond has a higher applicable yield. It is also known as after-tax yield."

The formula to compute the tax equivalent yield is:

Tax equivalent yield = Tax-free municipal bond yield / (1-Tax rate)
Where "Tax rate" is the investor's marginal tax rate.

If there is a municipal bond that yields 7% per year, and if the investor's marginal tax rate is 10%, then the tax equivalent yield = 7% / (1-0.10) = 7.78%. If this investor finds a comparable taxable bond (i.e. a corporate bond with the same credit rating) that yields more than 7.78%, he should choose the taxable bond (i.e. corporate bond) over the tax-free bond (municipal bond). On the other hand, if there is another investor who is in the 35% tax bracket, his tax equivalent yield = 7% / (1-0.35) = 10.77%. So, this investor is more likely to choose the tax-free municipal bond because it would be very hard for him to find a corporate bond with a yield greater than 10.77%.

As a result, investors in the higher tax brackets are more likely to choose the "municipal bonds" over the "corporate bonds" while investors in the lower tax brackets are more likely to choose the "corporate bonds" over the "municipal bonds".

Let's assume that there is a taxable bond yielding 10%. There is also a comparable "muni" that yields 8%. If the investor's marginal tax rate is 15%, which one would be a better investment for him?

There are two ways to answer that question:

1. The first one is to compute the tax equivalent yield:
   Tax equivalent yield = 8% / (1-0.15) = 9.41%, so this is less than the taxable bond's yield (10%). Therefore, he needs to invest in the taxable bond.

2. The second way is comparing the two bonds' after-tax yields:
   The muni has no tax; therefore its after-tax yield is still 8%.
   For the corporate bond, the after-tax yield = 10% * (1-T) = 10% * (1-0.15) = 8.5%.
   This is greater than the yield for the "muni" (which is also the after-tax yield for the muni, which is 8%); therefore the investor needs to choose the taxable bond in this case.

Calculating the tax equivalent yield and comparing it to the taxable bond's yield leads us to choose the taxable bond. Similarly, comparing the after-tax yields of the two bonds leads us to choose the taxable bond. In fact, both methods should lead us to the same decision.

"Finance.zachs.com" gives additional advice to investors who choose between taxable and tax-free bonds: "To decide between a taxable and tax-free bond, you should compare bonds with similar credit ratings and time to maturity. A tax-free bond with a high credit rating and a 4.7 percent taxable equivalent yield is a safer investment than a taxable bond paying 5 percent with a low credit rating. Do not buy tax-exempt bonds just to get the tax-free income if you are in a lower tax bracket or can invest in taxable bonds with yields above the taxable equivalent rate."

The Decision

John is trying to answer the following questions:

1. "Which bonds are taxable and which are not?"
2. "If there are two bonds with the same risk-level (i.e. credit rating), one of them being tax-free and the other one taxable, would the yield on the tax-free bond or the taxable bond be higher? Why?"
3. "There is a AA "muni" with a YTM of 5%. There is a AA corporate bond with a YTM of 7%. My marginal tax rate is 25%. Which bond is better for me as an investment?"
4. "There is another investor that needs to choose between the above two bonds. His marginal tax rate is 35%. Which one would be a better investment for him?"
5. "There is a AAA muni with a YTM of 3%. There is a AAA corporate bond with a YTM of 4%. What is the critical tax rate that makes the two investments equivalent? If my tax rate is 30%, which one should I choose?"

John's professor also asked him to find some information on two specific bonds. One of them is a municipal bond and the other one is a corporate bond (i.e. Wal-Mart's corporate bond).

The "muni" is a state bond with a credit rating of AA and a coupon rate of 4.200%. It expires in 2018.

John has found the below information on the corporate bond:

Symbol	Company	Rate	Expiration	Rating
B-WMT-5.8-15022018	Wal-Mart Stores Inc.	5.800%	2/01/18	AA

John's assignment continues with the following questions on these two bonds that he collected information on:

6. "When making an investment, which tax rate should we consider: our average tax rate or our marginal tax rate?"
7. "If your average tax rate is 20% and your marginal tax rate is 25%, is the above "muni" or the above corporate bond better investment for you? Show your calculations."
8. "If your friend's average tax rate is 25% and his marginal tax rate is 35%, which of these two bonds would be a better investment for him? Show your calculations."
9. "What is the critical tax rate that makes these two bonds equivalent for an investor?"
10. "If an investor's tax rate is greater than this critical tax rate (that you found in #9), should he invest in the above "muni" or the above corporate bond?"

References

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