

## **New York Municipal Bonds As A Leading Fiscal Indicator**

**Joseph Cheng\* and Vigdis Boasson\*\***

### **Abstract**

The S&P 500 has often been used as one of the leading economic indicators for predicting overall economic growth. However, there have been few studies done in the area of leading indicators for predicting the fiscal condition of municipalities. In this paper, we used a lagged regression model to compare the S&P 500 with New York municipal bonds as a leading indicator for the overall economic health of municipalities across the nation. We found that the return on New York State municipal bonds is a more reliable leading indicator than the S&P for predicting future returns of municipal bonds across the nation. Since the returns for national municipal bond funds are associated with the outlook for the local economies of all states, this finding suggests that changes in growth expectation or the level of investor confidence in the New York economy may precede that of the nation in general.

### **Introduction to Municipal Bond**

Municipal bond prices are affected by several factors, including default risk, liquidity, tax status, coupons, interest rates, and term to maturity. As prices of corporate bonds are related to the financial conditions of the firm, so municipal bond prices are affected by the strength of their respective local economies. Unlike interest earned from corporate bonds, interest income from municipal bonds is exempt from federal income taxes. Most states also exempt the coupon interest earned from their own municipal bonds from internal state taxes. This tax exemption feature offers a greater tax advantage during periods when federal income tax rates increase and a smaller advantage during periods when federal income tax rates decline. Thus, prices of municipal bonds are mainly driven by three factors:

1. change in federal income tax rates
2. change in interest rates, which affect the present value of bonds
3. change in the expected growth and stability of municipal government tax revenue, which affect the risk of the bonds.

The latter, expected growth and stability in tax revenue, is a key factor in determining municipal bond yields and prices. As higher earnings expectation leads to higher stock prices, so higher tax revenue growth leads to higher municipal bond prices.

---

\*Associate Professor, School of Business, Ithaca College, Ithaca, NY 14850, Email: [cheng@ithaca.edu](mailto:cheng@ithaca.edu)

\*\*Assistant Professor, School of Business, Ithaca College, Ithaca, NY 14850, Email: [vboasson@ithaca.edu](mailto:vboasson@ithaca.edu)

Tax revenue growth and stability are primarily determined by the robustness of the local economy. As the local economy improves, the tax base expands and revenue increases. This would reduce risk and thus lend to higher municipal bond prices.

The expectation of higher growth drives up the stock market but also drives up interest rates, causing municipal bond prices to drop. This means that while the stock market recovery helps the states by increasing their tax bases, it also increases the cost of debt for states. So a stock market recovery may be a mixed blessing for the municipal bond market.

Since tax revenue growth is primarily determined by the health of the local economy and higher tax revenue growth leads to higher municipal bond prices, could we then use the returns on municipal bonds to monitor a local economy's condition? Could changes in the level of investor confidence in one region spillover to other regions? In order to answer these questions, we investigate whether the returns on the New York municipal bonds could be used as a leading indicator for explaining future returns on municipal bonds across the nation. We also examine whether the recovery of investor confidence in New York, the financial center of the nation, could have a spillover effect. Specifically, since the S&P 500 is one of the components in the index of leading economic indicators, the goal of this study is to compare the S&P 500 with New York State municipal bonds as leading indicators for investor confidence in regions outside of New York.

The remainder of this paper I organized as follows: Section 2 reviews the relevant literature; Section 3 describes our data and research method. Section 4 presents our empirical results.

### **Literature Review**

Since municipal bonds are tax-exempt, reviewing the literature on tax-exempt bonds or bond funds is relevant to our understanding of the role municipal bonds play in regional economic development. Continued effort to understand the pricing of tax-exempt bonds is worthwhile for at least two reasons. First, municipal bonds comprise a significant segment of the U.S. capital markets. In 1995 there was \$1.3 trillion in outstanding municipal debt. For a point of reference, outstanding marketable U.S. Treasury debt totaled \$3.3 trillion in 1995. Second, the role of taxes in asset pricing is unresolved. Unlike tests for tax effects in the equity markets, tax-exempt and taxable bonds provide the opportunity to study the valuation of certain rather than expected before-tax cash flows. Theoretically, after-tax cash flows arriving at the same time should be discounted at identical after-tax discount rates. Calculating the tax effect with fixed cash flows appears straightforward. The fact that economists cannot explain the role of taxes in such a simple case underscores the complexity that taxes introduce to asset pricing. A more complete understanding of the simple case of tax-exempt and taxable bonds is likely to provide insight into the role taxes play in the pricing of other assets.

Singh and Dresnack (1997) examine the investment performance of two types of open-end municipal bond mutual funds: mutual funds whose objective is generating income free from federal income taxes; and funds whose objective is generating income free from not only federal but also a particular state's income taxes. They find that a municipal bond fund's monthly returns either mirror or lag

the Lehman Brothers Municipal Bond Index returns on a risk-adjusted basis, and when state taxes are significant, such as in California and New York, the investor benefits from investing in state-specific municipal bond funds.

Fama (1977) and Miller (1977) predict that one minus the corporate tax rate will equate after-tax yields from comparable taxable and tax-exempt bonds. Chalmers (1998) examines the muni bond puzzle which refers to the unexplained relation between the yields of tax-exempt and taxable bonds. More specifically, long-term tax-exempt bond yields appear to be too high relative to yields on taxable bonds, while short-term tax-exempt yields are generally consistent with financial theory. Empirical evidence shows that long-term tax-exempt yields are higher than the theory predicts. Two popular explanations for this empirical puzzle are that, relative to taxable bonds, municipal bonds bear more default risk and include costly call options. One clear difference between municipals and Treasuries is that while municipal defaults are possible, U.S. government bond default is unthinkable. Not surprisingly, a widely cited explanation for relatively high municipal yields is that municipal default risk exceeds the default risk of corporate and U.S. Treasury bonds [e.g., Fama (1977), Trzcinka (1982), Yawitz, Maloney, and Ederington (1985), Scholes and Wolfson (1992), Stock (1994)].

Although there is a rich body of literature on municipal bond performance and tax-related issues, there has been virtually no extant literature at all examining the correlation between the returns of municipal bonds of different states. Thus, our paper is an attempt to fill this void.

### **Data and Research Method**

Since the fiscal health of a municipality is generally linked to local economic strength, one might expect that the S&P, a leading economic indicator, would be a viable leading indicator for the fiscal health of municipalities as well. Since New York is a financial center, the performance of its municipal bonds might also be used as a leading fiscal indicator for other states. The purpose of this study is to determine whether the S&P 500 or New York State municipal bond is a better leading indicator for the fiscal health of municipalities across the nation.

We use monthly returns of municipal bond closed end funds as a proxy for the expected fiscal health of municipalities. This has an advantage over the GDP of New York since the latter is not observable on a monthly basis. Furthermore, the returns for municipal bonds reflect not only past performance but also expectations of future economic strength (or weakness) as well. A municipal bond closed end fund is an investment fund whose portfolio is comprised mainly of municipal bonds. Unlike mutual funds, closed end funds are traded on the stock exchanges and their prices reflect the value of their portfolio holdings. Thus, the returns of the municipal bond funds mimic the municipal bonds which they hold. In this study, we use data from one national municipal bond closed end fund which holds municipal bonds from many states. We use monthly return data from three funds specializing in New York municipal bonds. The portfolio descriptions given for the funds are as follows:

Nuveen Municipal Value Fund (NUV) is a diversified, closed-end management investment company incorporated in the USA. The Fund seeks to provide current income exempt from regular

federal income tax. The Fund invests primarily in a diversified portfolio of municipal obligations issued by state and local governments.

Nuveen New York Investment Quality Municipal Fund (NQN) is a diversified, closed-end management investment company incorporated in the USA. The Fund's objective is to provide current income exempt from both regular federal and New York state income taxes. The Fund invests in a diversified portfolio of municipal obligations issued by state and local government authorities within New York.

Muni Yield New York Insured Fund (MYN) is a non-diversified, closed-end management investment company incorporated in the USA. The Fund seeks to provide a high level of current income. The Fund invests primarily in a portfolio of long-term New York municipal obligations.

Muni Holdings New York Insured Fund (MHN) is a non-diversified, closed-end management investment company registered in the USA. The Fund's objective is to provide shareholders with current income exempt from Federal income taxes and New York State and New York City personal income taxes. The Fund invests primarily in a portfolio of long-term, investment-grade New York municipal obligations.

The monthly returns (October 1997-December 2003) of these funds are obtained from CRSP (Center for Research of Security Prices). Since there are only a few New York municipal closed-end funds, we derive the proxy for New York bond returns by averaging the returns of the three New York funds.

$$NYA = (NQN + MYN + MHN) / 3 \quad (1)$$

where NYA represents the average of the three New York municipal bond fund returns, and NQN, MYN, and MHN represent the monthly returns for the three New York municipal bond funds

Changes in New York municipal bond prices may be attributed to several possible factors, including general changes in interest rates and federal income tax rate changes. To filter out most of these effects, we create a variable NYEXCESS, which equals New York municipal bond returns minus the municipal bond returns at the national level.

$$NYEXCESS_t = NYA_t - NUV_t \quad (2)$$

NYEXCESS is a variable that captures the performance of New York municipal bonds relative to the national average. It is the return of New York municipal bonds in excess of returns of municipal bonds across the nation in general. When NYEXCESS is positive, New York municipal bonds outperform the national average. When NYEXCESS is negative, New York underperforms the average. Since the general interest rate and federal income tax rates are determined at the national level, any difference between New York municipal bond fund returns and the national municipal bond fund returns would be primarily attributed to differences in revenue stability and risk perception.

Since general changes in interest rates and federal income taxes affect municipal bonds of all states, including New York, the return differentials (NYEXCESS) will only change when something other than these common effects changes. Thus, NYEXCESS may be viewed as a residual that captures primarily the differentials in revenue stability and growth. In other words, if New York outperforms the

national average, then expected revenue and growth have stabilized more than the national average, indicating that the perceived fiscal health for the state has improved more than the national average. Thus, NYEXCESS is the variable we used to gauge the investors' sentiment regarding the expected fiscal strength of New York State relative to the rest of the nation.

To see whether there is any lead or lag relationship between the expected fiscal condition of New York municipalities and those in other states, we could regress the monthly returns on the national fund (NUV) against NYEXCESS of the previous month. However, it is likely that a portion of the portfolio held by NUV is invested in New York municipal bonds. Assuming that this portion is relatively stable over the sample period, we can strip out the effect of holding New York securities on the fund's monthly returns by first regressing the monthly returns on the national fund (NUV) against the monthly returns on the New York funds (NYA). The regression results may be summarized as follows:

$$\text{NUV}_t = .002 + .583 * \text{NYA}_t \quad (3)$$

(7.8)

The  $R^2$  for the regression of (3) is .454, which indicates that there is a modestly strong and positive correlation between the returns on NUV and the returns on NYA. The estimated residuals from (3) represent the portions of returns for the national municipal bonds which are uncorrelated with or unexplained by those of New York, such as portion of returns resulting from growth expectations specific to those regions. By using the residuals, not only have the returns derived from investments in New York bonds been stripped out, but also the correlation between returns on municipal bonds in general and the returns on New York bonds, including price co-movements caused by general interest rate changes. In effect, any price movements due to changes in common factors affecting all regions are eliminated. Thus, this set of residuals may serve as an index of monthly returns linked primarily to growth expectation specific to the non-New York regions. To see whether the growth expectation for the New York region leads those for other states, we regress the index (residuals from (3)) against the excess returns for New York municipal bonds in the previous month:

$$\text{USMUNI}_t = a + b \times \text{NYEXCESS}_{t-1} + e \quad (4)$$

where USMUNIt represents the index for monthly returns on the national municipal bond fund exclusive of New York bonds. Estimating equation (4) helps us to see whether the change in investor confidence in the economy of New York leads the changes in investor confidence in those of the other states. Another regression equation similar to (4) is specified as:

$$\text{USMUNI}_t = a + b \times \text{SPEXCESS}_{t-1} + e \quad (5)$$

where SPEXCESS<sub>t-1</sub> represents the monthly return of the Standard & Poor's 500 in excess of treasury return for the previous month. Again, the treasury returns are being subtracted from S&P in order to eliminate the returns due to interest rate changes. Thus, SPEXCESS reflects the portion of stock market returns due to a general improvement in the economic outlook. The regression results from (5) are compared with those of (4) so that we can evaluate the relative strength of the S&P and New York municipal bonds as leading indicators of the fiscal health of municipalities across the nation.

The sample period spans 75 months. The monthly returns are from October 1997 to December 2003. The data for monthly returns begin on October 1997 because one of the New York municipal bond funds (MHN) began trading on that date.

The regression results for (4) and (5) are as follows:

**Table 1. Regression Results Comparison**

	Coefficient	R- Square
Equation (4)	.22 (2.314)	.07
Equation (5)	-.03 (.87)	.01

The coefficients in (4) and (5) may be interpreted as the sensitivity of the overall returns of the municipal bonds of other states to New York municipal bond returns and to S&P returns, respectively. As seen in Table 1, the t-statistic for the coefficient NYEXCESS is 2.314, which is significant at the ninety five percent level, whereas the result for SPEXCESS is statistically insignificant. The results suggest that the performance of the New York municipal bond market may be a better leading indicator for the fiscal health of localities than the performance of the stock market. Since the returns of the municipal bond returns have been adjusted in order to reflect the fiscal expectations for municipalities, the study suggests that the changes in investor confidence in the municipalities of New York may precede those of other states. Since the t-statistic for the coefficient in (4) is significant, one may interpret this as meaning that when New York's fiscal outlook improves, the fiscal condition for municipalities across the nation, as perceived by the market, tends to improve as well in the following period, and vice versa.

In general, economic recovery is measured by actual economic growth such as changes in GDP. But since the market is driven by expectations and the returns on municipal bonds reflect investors' expectations about the respective local economies, it is important to note that our study focuses on growth as expected by the financial market (rather than actual growth). Thus, the term "leading indicator" being used in this paper may be interpreted as a leading indicator for growth expectation or investor confidence. Furthermore, the word "leading" used in this paper pertains to chronological order, not to order of importance or ranking. While the state of New York may have lost many manufacturing jobs in the last decade, it retains its status as a national financial and commercial center. If New York leads the rest of the nation in the realm of growth expectation and investor confidence, then the next logical question is why. Searching for such underlying factors would make an interesting topic for future research.

## REFERENCES

Chalmers, J. M.R. 1998, "Default Risk Cannot Explain the Muni Puzzle: Evidence from Municipal Bonds that are Secured by U.S. Treasury Obligations", *Review of Financial Studies Vol. 11, Issue 2*.

- Fama, E. F., 1977, "A Pricing Model for the Municipal Bond Market," working paper, University of Chicago. *Fundamentals of Municipal Bonds* (4th ed.), 1990, Public Securities Association, New York.
- Miller, M., 1977, "Debt and Taxes," *Journal of Finance*, 32, 261–275.
- Scholes, M. S., and M. A. Wolfson, 1992, *Taxes and Business Strategy: A Planning Approach*, Prentice-Hall, Englewood Cliffs, NJ.
- Singh, S., and Dresnack, W.H. 1997, "Market Knowledge in Managed Municipal Bond Portfolios", *Financial Services Review*, Vol 6, No 3.
- Stock, D., 1994, "Term Structure Effects on Default Risk Premia and the Relationship of Default-Risky Tax-Exempt Yields to Risk-Free Taxable Yields-a Note," *Journal of Banking and Finance*, 18, 1185–1203.
- Trzcinka, C., 1982, "The Pricing of Tax-Exempt Bonds and the Miller Hypothesis," *Journal of Finance*, 37, 907–923.
- Yawitz, J. B., K. J. Maloney, and L. H. Ederington, 1985, "Taxes, Default Risk, and Yield Spreads," *Journal of Finance*, 40, 1127–1140.