

January 2022

Municipal yields and inflation: Investors take a long view



Cadmus Hicks, CFA
Director of Performance and Risk Analysis

In light of the recent sharp increases in the Consumer Price Index (CPI), we consider the historical relationship between inflation and the general level of interest rates on municipal bonds. Our analysis suggests that investors typically take a long view of inflation, requiring consistently strong increases in consumer prices over an extended period before they make major adjustments to how they value municipal bonds and other fixed income securities.

AN INCONSISTENT RELATIONSHIP SHOWS GENERAL PATTERNS

The oldest series of municipal yields is the Bond Buyer 20 Index (BB20), which tracks the theoretical yields at which high grade general obligation bonds maturing in 20 years would be expected to trade if newly issued.

This series provides monthly average yields going back to January 1953 (which, coincidentally, was one month after the birth of the author of this report). At that time, the BB20 yield was 2.44%. With one exception, yields remained below 3% until November 1956, when they climbed to 3.16%. After June 1958, they never again fell below 3% until June 2016, when they dropped to 2.99%.

As of 30 Dec 2021, the BB20 yield was 2.06%. In other words, the index has returned to roughly where it started nearly 70 years ago. But in the intervening time it has been as high as 13.28% (January 1982) and as low as 2.04% (August 2021).



Municipal yields react slowly to changes in inflation and are not subject to sudden, exogenous shocks.

The relationship between the BB20 and year-over-year changes in inflation has been inconsistent, but with some general patterns:

1. Inflation is only stable at low levels.
2. Inflation is more volatile than municipal yields.
3. Municipal yield changes lag inflation.
4. The market can tolerate a negative spread for longer than one might expect, but yields remain elevated even as inflation recedes.
5. Municipal yields are more closely correlated with inflation over longer periods.

Figure 1 illustrates the relationship between the BB20 and 12-month changes in consumer prices since 1953. The average yield of the BB20 has been 5.22%, while the average 12-month inflation rate has been 3.46%, for an average spread of 1.77%. This is sometimes referred to as the real yield, although it is a projected, rather than a realized, rate of return. This average spread masks a wide dispersion, as the spread has been low as -6.82% (May 1980) and as high as 7.16% (August 1983).

INFLATION IS ONLY STABLE AT LOW LEVELS

Between January 1953 and June 1968, the average 12-month inflation rate was 1.62%, ranging from -0.74% to 4.20%. During that period, the average standard deviation was 1.15%. Likewise, between October 2008 and December 2020, the average inflation rate was 1.55% with a standard deviation of 1.08%.

On the other hand, inflation averaged 6.98% between June 1968 and March 1980 and 5.40% between March 1980 and October 1990. The standard deviations in those periods were 2.80% and 3.23%, respectively.

As a general rule, inflation persisting above 4% appears to make it harder for the Federal Reserve to control expectations, which allows for more volatility and higher rates.

INFLATION IS MORE VOLATILE THAN MUNICIPAL YIELDS

Municipal yields react slowly to changes in inflation and are not subject to the sudden, exogenous shocks that can temporarily distort consumer prices. Therefore, over the entire period, the standard deviation of 12-month changes in the BB20 was only 2.09%, versus the CPI at 2.80%.

Figure 1: The average spread masks a wide dispersion



Data source: U.S. Federal Reserve, 01 Jan 1953 – 30 Dec 2021. Past performance is no guarantee of future results. Representative indexes: municipal bond yields: Bond Buyer 20 Index; inflation: Consumer Price Index 12-month.

MUNICIPAL YIELD CHANGES LAG INFLATION

Municipal yields do not rise as fast as inflation, but they also do not fall as fast. Hence, they tend to peak after inflation has hit its high water mark. For example:

- Between June 1955 and March 1957, inflation rose from a low of -0.74% to a high of 3.72%. During the same period, the BB20 yield rose from 2.41% to 3.09%, but did not peak until August 1957 at 3.54%.
- Inflation peaked (12.34%) in December 1974, while the BB20 peaked (7.44%) in September 1975.
- Inflation hit a new high (14.76%) in March 1980, but the BB20 did not reach its maximum (13.28%) until January 1982, by which point inflation had already declined to 8.39%.

THE MARKET CAN TOLERATE A NEGATIVE SPREAD

These lags have produced periods of negative spread between yields and inflation, as the inflation rate rose faster than bond yields. In subsequent periods, spreads were quite generous as inflation fell even as bond yields were increasing.

Figure 2 shows four periods in which the inflation rate was greater than the BB20 yield, and indicates when the negative spread was greatest, when the subsequent positive spread was greatest and the BB20 yield and inflation rate on those dates.

MUNICIPAL YIELDS ARE MORE CLOSELY CORRELATED WITH INFLATION OVER LONGER PERIODS

The combination of the BB20's lower volatility and its lagged response to changes in inflation indicates that investors tend to adjust the interest rate that they require based on the inflation rate over a period longer than the most recent 12 months.

We can quantify this relationship with a few statistics. The R-squared correlation between the BB20 and 12-month changes in the CPI was 0.34 over the period from January 1953 to December 2021, and the standard deviation of the spread between the two series was 2.32%.

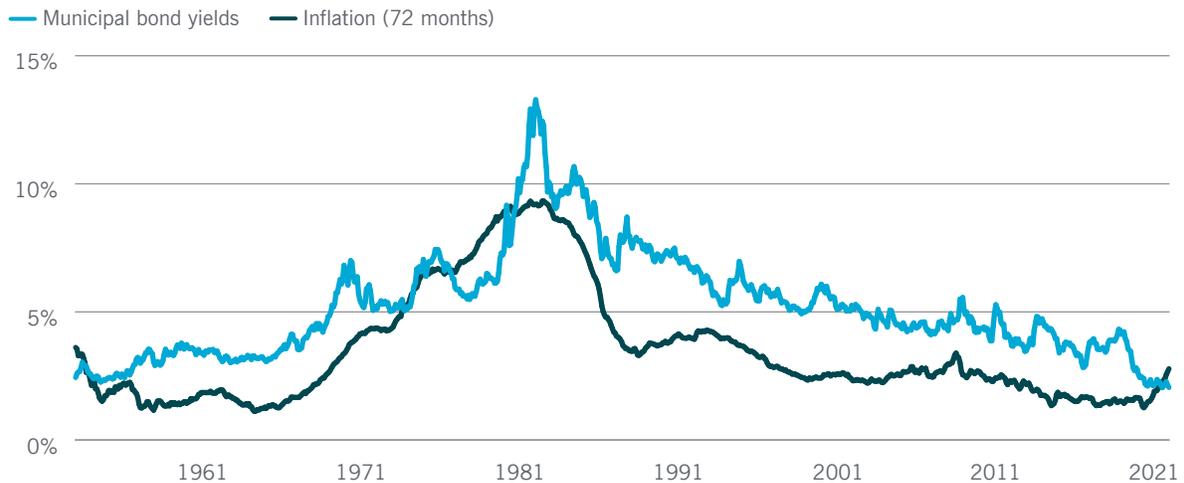
However, if we compare the BB20 to the annualized change in the CPI over the preceding 24 months, we get an R-squared of 0.48 and a standard deviation of the spread of 1.90%. When inflation is measured over a period of 72 months, the R-squared jumps to 0.70, and the standard deviation of the spread falls to 1.24%. Figure 3 compares the BB20 yield to the change in consumer prices over the preceding 72 months.

Figure 2: Lags have produced periods of negative spread

Months of negative spread	Maximum negative spread	BB20/inflation maximum negative spread	Maximum positive spread	BB20/inflation maximum positive spread
Feb 1957 – May 1958	Jan 1958	2.91% 3.62%	May 1959	3.57% 0.35%
May 1973 – Oct 1975	Nov 1974	6.61% 12.20%	Jul 1976	6.79% 5.35%
Feb 1977 – Mar 1981	May 1980	7.59% 14.41%	Aug 1983	9.72% 2.56%
Jun 2008 – Sep 2008	Jul 2008	4.68% 5.60%	Jul 2009	4.72% -2.10%

Data source: U.S. Federal Reserve, 01 Jan 1953 – 30 Nov 2021. Past performance is no guarantee of future results.

Figure 3: Correlation of yields and inflation is narrower over 72 months



Data source: U.S. Federal Reserve, 01 Jan 1953 – 30 Dec 2021. Past performance is no guarantee of future results. Representative indexes: municipal bond yields: Bond Buyer 20 Index; inflation: Consumer Price Index 72-month.

WHAT DOES THIS ANALYSIS MEAN FOR TODAY?

Over the 12 months through December 2021, the inflation rate was 7.04%, up from 1.36% a year earlier. However, over the last 72 months, the annualized inflation rate was 2.78%, which compares to an annualized rate of 1.74% a year ago. If, as in the past, the BB20 yield is more likely to reflect the inflation rate of the last 72 months rather than the last 12 months, we would expect an increase of about 1.00% as a result of the recent upturn in inflation.

The fact that we have not seen such an increase is likely because (a) the Fed has implemented an unprecedented quantitative easing policy, (b) the U.S. fixed income markets are more tightly integrated with international markets than in the past, and (c) it has only been in the last ten

months that the year-over-year change in CPI has exceeded 2%.

As we look ahead, much depends on whether consumer prices continue to rise at the furious pace of the last year. If they moderate, the Federal Reserve will be under less pressure to implement sharp increases in the fed funds rate, and investors' current refusal to overreact to short-term changes in the trends of consumer prices will have been validated.

In the meantime, this analysis of the relationship between municipal yields and inflation suggests that investors take a long view of inflation, and implies that they will need to see consistently strong increases in consumer prices over an extended period before they make major adjustments to how they value municipal bonds and other fixed income securities.

For more information, please visit nuveen.com.

Endnotes

Sources

U.S. Federal Reserve

This material is not intended to be a recommendation or investment advice, does not constitute a solicitation to buy, sell or hold a security or an investment strategy, and is not provided in a fiduciary capacity. The information provided does not take into account the specific objectives or circumstances of any particular investor, or suggest any specific course of action. Investment decisions should be made based on an investor's objectives and circumstances and in consultation with his or her financial professionals.

The views and opinions expressed are for informational and educational purposes only as of the date of production/writing and may change without notice at any time based on numerous factors, such as market or other conditions, legal and regulatory developments, additional risks and uncertainties and may not come to pass. This material may contain "forward-looking" information that is not purely historical in nature. Such information may include, among other things, projections, forecasts, estimates of market returns, and proposed or expected portfolio composition. Any changes to assumptions that may have been made in preparing this material could have a material impact on the information presented herein by way of example. **Past performance is no guarantee of future results.** Investing involves risk; principal loss is possible.

All information has been obtained from sources believed to be reliable, but its accuracy is not guaranteed. There is no representation or warranty as to the current accuracy, reliability or completeness of, nor liability for, decisions based on such information and it should not be relied on as such. For term definitions and index descriptions, please access the glossary on nuveen.com. **Please note, it is not possible to invest directly in an index.**

A word on risk

Investing involves risk; principal loss is possible. All investments carry a certain degree of risk and there is no assurance that an investment will provide positive performance over any period of time. Investing in municipal bonds involves risks such as interest rate risk, credit risk and market risk. The value of the portfolio will fluctuate based on the value of the underlying securities. There are special risks associated with investments in high yield bonds, hedging activities and the potential use of leverage. Portfolios that include lower rated municipal bonds, commonly referred to as "high yield" or "junk" bonds, which are considered to be speculative, the credit and investment risk is heightened for the portfolio. Bond insurance guarantees only the payment of principal and interest on the bond when due, and not the value of the bonds themselves, which will fluctuate with the bond market and the financial success of the issuer and the insurer. No representation is made as to an insurer's ability to meet their commitments.

This information should not replace an investor's consultation with a financial professional regarding their tax situation. Nuveen is not a tax advisor. Investors should contact a tax professional regarding the appropriateness of tax-exempt investments in their portfolio. If sold prior to maturity, municipal securities are subject to gain/losses based on the level of interest rates, market conditions and the credit quality of the issuer. Income may be subject to the alternative minimum tax (AMT) and/or state and local taxes, based on the state of residence. Income from municipal bonds held by a portfolio could be declared taxable because of unfavorable changes in tax laws, adverse interpretations by the Internal Revenue Service or state tax authorities, or noncompliant conduct of a bond issuer. It is important to review your investment objectives, risk tolerance and liquidity needs before choosing an investment style or manager.

CFA® and Chartered Financial Analyst® are registered trademarks owned by CFA Institute.

Nuveen provides investment advisory solutions through its investment specialists.

This information does not constitute investment research as defined under MiFID.

nuveen

A TIAA Company