

Tax-exempt Fixed Rate Debt:

# High Cost and Unexpected Risks

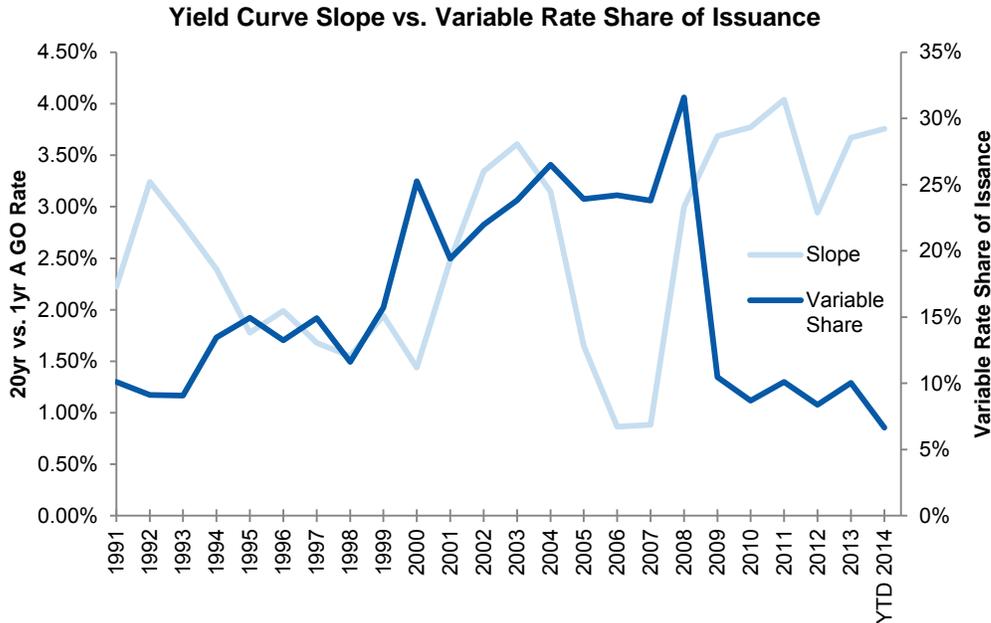
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### In Brief

We examine the public sector's reliance on traditional fixed rate debt (TFRD), the costs and risks of such reliance and suggest a conceptual framework for considering alternatives. We find that the use of variable rate debt as a share of total issuance has declined to twenty year lows even as the cost of fixed rate debt relative to variable has reached new highs. Tax-exempt issuers pay up to \$3.5 million more for fixed rate debt than variable per \$100 million borrowed. We decompose this cost into interest rate, tax-event, liquidity/credit and commitment risk components and calculate break-evens. We then summarize academic findings relating to the "Muni Puzzle" to explain why issuers pay more for fixed rate debt than they would in a more efficient market. While many issuers may select fixed rate bonds to eliminate risk, we show that this choice may actually increase risk by limiting flexibility and asset-liability matching. Next, we show that the market timing argument for fixed rate debt is flawed based on historical experience and the unreliability of interest rate forecasts. We conclude that, while some issuers legitimately must issue TFRD, financial professionals in the public sector could add value to their organizations with a cost- and risk-centric approach to debt management that results in a more resilient debt policy.

## 1. Introduction

In the five years prior to Lehman Brothers' collapse, 76 percent of tax-exempt issuance was long term, with a fixed rate coupon; the average twenty year rate was 203 basis points above the one year rate. In the five years following, the average difference between twenty and one year rates increased to 362 basis points, but the share of long-term, traditional fixed rate debt ("TFRD") increased to almost 91 percent (see figure 1). **The greater share of fixed rate debt increased the interest expense of the public sector by more than \$7 billion annually.**<sup>1</sup> Clearly, getting the borrowing decision right is important not just for each issuer, but also to the public sector as a whole.



**Figure 1: Yield Curve Slope vs. Variable Rate Share of Issuance:** After rising steadily since the 1990s, the share of variable rate debt issued declined precipitously post-crisis and has remained at historic lows. This has occurred even though the cost of fixed rate debt has increased relative to variable as indicated by a steeper yield curve slope.

Probably, this move to TFRD was a reaction to the public sector's experience of the 2008 Global Financial Crisis including some of the strategies that failed as well as the relative scarcity of bank facilities to back variable rate products during the depths of the crisis. This paper considers whether the reliance on TFRD should persist and proposes an analytical risk-management framework in which financial professionals may consider their borrowing choices.

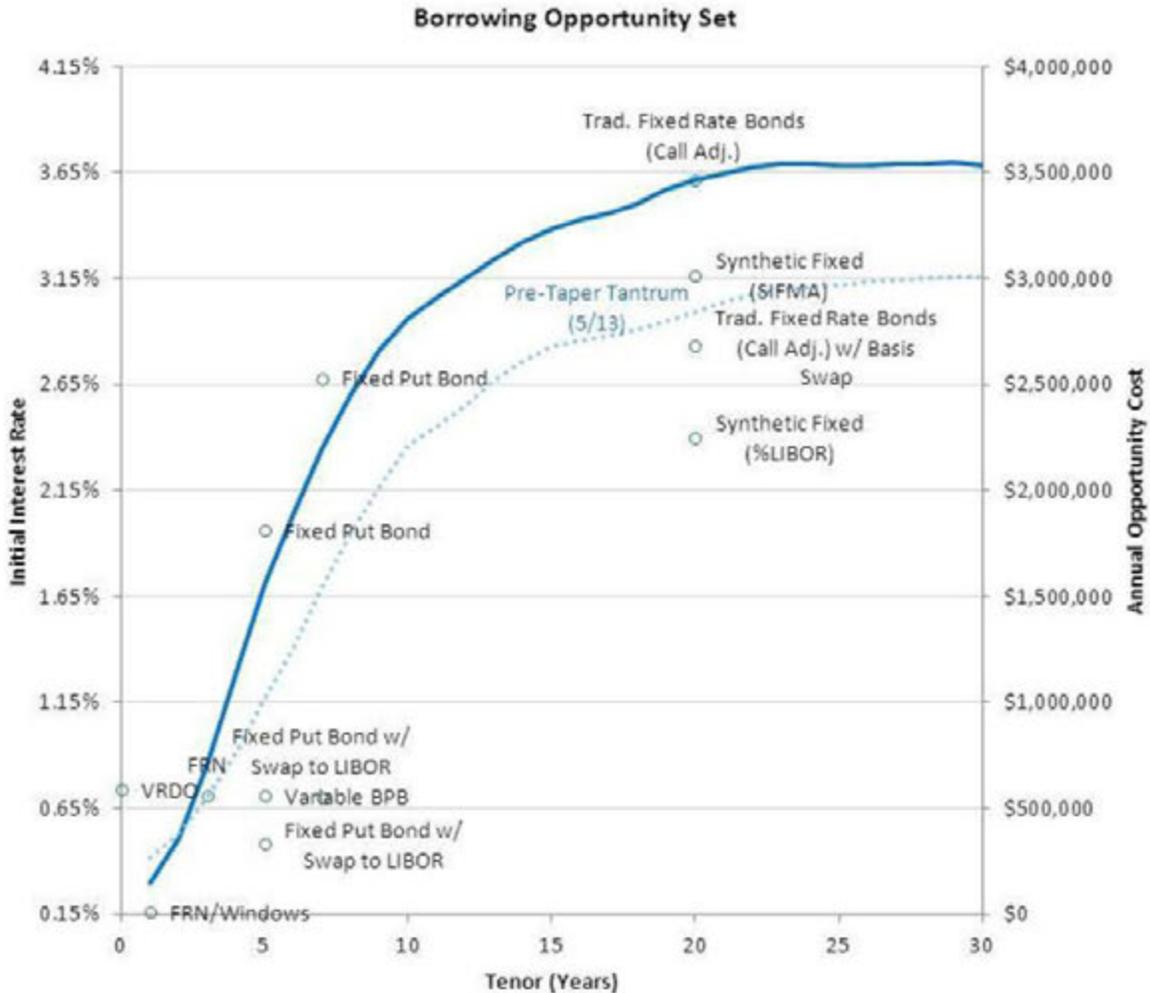
Some issuers must pay any price in an effort to avoid risk. However, even they will find that they are merely exchanging one set of risks for another when they select TFRD. Others with financial flexibility will increase resiliency and reduce cost by expanding their use of virtually anything but fixed rate debt.

This paper explores the high cost of TFRD, how this cost relates to the specific risks that issuers are transferring to investors when they sell these securities, why tax-exempt rates are as much as one percent higher than they would be if the bond market were more efficient and the unexpected risks associated with TFRD. It closes with some thoughts on a risk-centric approach to debt policy that empowers Public sector financial professionals to effectively reduce cost and limit risks.

Eighty percent of financial professionals surveyed by the Association for Financial Professionals believe that the treasury function has become more strategic, adding greater value as a result.<sup>2</sup> According to Ernst & Young, "The role of the treasurer has shifted from being primarily the bill payer, the banker, the financier to being a really integral part of decision-making at the company, a real value contributor."<sup>3</sup> Indeed, one reason the Commonwealth of Massachusetts offers for its highly-developed asset-liability matching program is to "...return control of the balance sheet to the Commonwealth's managers." The public sector as a whole benefits from this trend when its treasurers and debt managers consider all reasonable alternatives when they make financing decisions as holistic, analytical risk managers.

## 2. Opportunity Cost

Interest rates on TFRD are normally higher than rates on short-term or variable rate debt. This compensates investors for taking the risks issuers are unwilling to accept. These include interest rate and tax event risk on the value of their investment, default risk of the issuer and liquidity risk relating to their ability to sell the bonds prior to maturity. Figure 2 below shows a generic 'A' rated municipal yield curve against which we have plotted the initial interest cost of a variety of alternative short-term, variable rate and derivative products.<sup>4</sup> Compared to the lowest cost alternative, traditional fixed rate bonds cost an additional \$3.5 million<sup>5</sup> per \$100 million annually, even after adjusting for the value of the call option in the bonds. When issuers sell TFRDs, their opportunity cost is the forgone lower costs of other alternatives. Opportunity cost is a useful concept because it focuses on the hidden costs of decisions. As you can see in the figure, the opportunity cost of fixed rate debt has increased by more than \$500,000 annually since May 2013.<sup>6</sup>



**Figure 2:** Borrowing Opportunity Set. Twenty year fixed rate bonds represent an opportunity cost of at least \$3.5 million per year relative to the least costly short-term/variable rate alternatives. What are tax-exempt issuers buying for this price? Are issuers considering the full menu of alternatives and the reward vs. risk trade-offs of each? Source: MMD and BMO as of June 11, 2014.

### 3. The High Price to Transfer Risk

Is \$3.5 million per \$100 million a high price to transfer interest rate, tax event and liquidity/credit risks? Figure 3 below decomposes the total cost of TFRD into each risk using the bond and swap markets. Interest rate risk is the possibility of higher taxable rates, represented by the LIBOR swap curve; tax event risk is the possibility of lower tax rates reducing the value of tax-exempt income represented by the SIFMA swap curve; liquidity/credit risk represents the issuer’s risk of having uncommitted capital including rollover risk and the investor’s credit risk exposure, represented by the non-callable municipal yield curve. Finally, we include commitment risk to reflect the flexibility issuers usually require to be able to prepay the bonds without penalty. By far the most costly risk to transfer is interest rate risk, at \$2.2 million annually.<sup>7</sup> To determine whether this is a reasonable price to pay, we calculate how high interest rates would have to go to break even versus the cost of hedging this risk. We find that LIBOR would have to increase by at least 375 basis points over two years and remain there for another eighteen years. This implies inflation well above the Federal Reserve’s inflation target of two percent. So, issuers are paying for a hedge against a persistent failure by the Federal Reserve to achieve its policy goals.

Similarly, we calculate the break even tax rate cut at 26 percent<sup>8</sup> and that a failed remarketing would have to occur at least once every 27 years<sup>9</sup>. Issuers can evaluate the likelihood that the federal government with a large and chronic deficit would actually cut income tax rates that much or enact other reform policies to judge if hedging tax risk is cost-effective. Similarly, they may also consider how likely it is that they may find themselves without market access necessary to rollover putable debt compared to the breakeven rate of once every 27 years.



**Figure 3: Imputed Risk Transfer Costs.** We use derivative and bond market data to unbundle a twenty year tax-exempt interest cost into its components. In principle, issuers can elect to retain and manage one or more of each of these risks by using the appropriate combination of bond and derivative products. Issuers are effectively outsourcing these risks to the capital markets when issuing TFRD. Source: BMO and Bloomberg as of June 11, 2014.

### 4. The “Muni Puzzle”

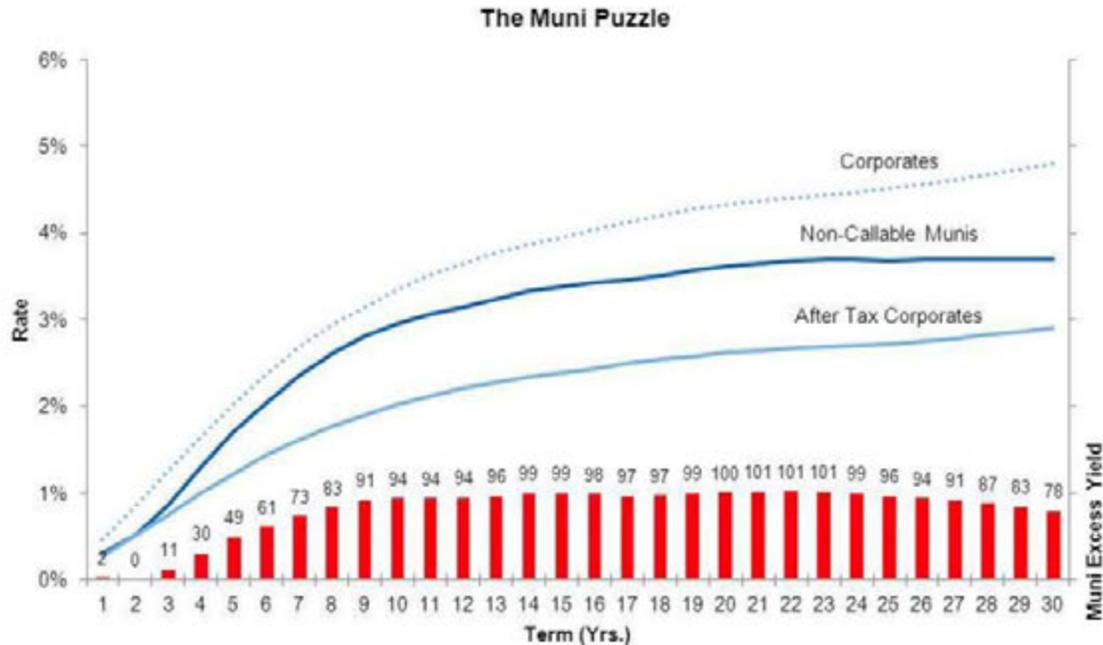
Why are these implied costs so high relative to the risk protection issuers receive? Do investors know something issuers do not? It turns out the high prices investors charge may well reflect an inefficient market that benefits neither investors nor issuers.

Academics have been studying the “Muni Puzzle” for years; this is the mystery surrounding why tax-exempt rates seem too high relative to the tax benefit investors receive. Figure 4 below compares corporate bond rates, both pre- and after-tax, to non-callable municipals yields. Except in the very early maturities, tax-exempt rates are about sixty to one hundred basis points above corporate bond yields, after tax. Academics have offered a number of explanations:

1. Limited liquidity: buy and hold investors and one million different tax-exempt securities can make it hard to find a buyer at a fair price should an investor need to sell prior to maturity<sup>10,11</sup>
2. Market fragmentation: state-specific bond funds and differential taxation of out-of-state bond interest, geographic specialization of bond dealers and local preferences of investors can limit the marketability of bonds across state lines, further reducing liquidity<sup>12</sup>
3. Excess supply: the supply of longer term debt overwhelms demand of the limited natural long-term bond buyers like property and casualty insurance companies, whose demand depends on their profitability<sup>13</sup>

4. Limited disclosure: investors demand (deserve?) compensation for additional credit work resulting from less frequent and robust disclosure compared to corporations<sup>14</sup>
5. Other causes may include the risk of tax law changes reducing the value of tax exemption and concern over political risks<sup>15</sup>

One consequence of the Muni Puzzle is that issuers of fixed rate debt are paying up to an additional one hundred basis points (and sometimes much more) with little to show for it.<sup>16</sup>



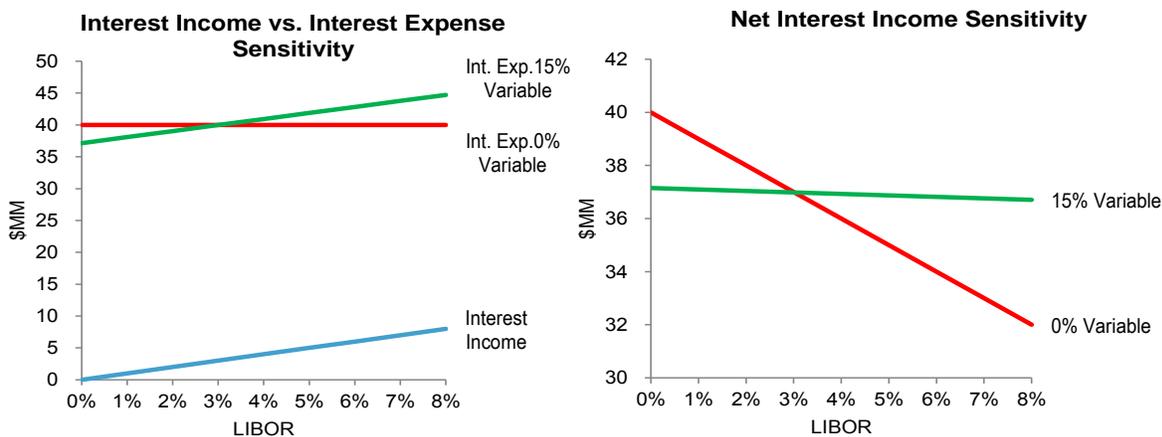
**Figure 4:** The Muni Puzzle. Tax-exempt yields offer significant excess yield over the after-tax rate on comparably rated corporate securities, assuming a 39.6 percent tax rate. This excess yield is a direct cost to tax-exempt issuers, without material offsetting benefits. Source: TM3 and Bloomberg as of June 11, 2014.

## 5. Traditional Fixed Rate Bonds are Risky

Not only are fixed rate bonds overly pricey in a way that does not provide direct value to issuers, but also they bring their own set of underappreciated risks. Foremost among these is commitment risk. Since these bonds typically provide investors ten years of call protection, it may be prohibitively expensive for the issuer to pre-pay or restructure its debt earlier. A need to restructure could result from any number of long-term risks including economic, competitive, political, regulatory, demographic, catastrophic, climate change, etc. For example, a city may wish to retire debt early to maintain an appropriate debt burden as its population migrates and ages. A utility may wish to restructure debt associated with a project that no longer complies with changing environmental regulations. A healthcare system may be driven by healthcare reform to merge. A key hurdle in all of these cases is the high cost of defeasing TFRD.

Excessive fixed rate debt can also increase risk at the enterprise level when the issuer fails to match assets and liabilities. Asset-liability matching refers to a balance-sheet risk management approach that links the interest rate sensitivity of liabilities and assets.<sup>17</sup> Issuers with insufficient variable rate debt relative to cash when the Federal Reserve cut short term rates to near zero in 2008 found to their chagrin interest income slashed while interest expense remained essentially fixed.

With variable rate debt sufficient to match cash, an issuer's net interest margin (interest expense net of interest income) becomes much less sensitive to interest rates. If short-term interest rates stay low, the pain of limited interest income will be offset by low interest expense. Conversely, higher rates will cause interest income to rise, offsetting higher interest expense. A rule of thumb is to ensure that the amount of variable rate debt equals 100 to 150 percent of cash. (See Figure 5, below.)



**Figure 5: Variable Rate Debt Can Reduce Overall Risk.** These charts reflect a hypothetical issuer with \$1 billion of debt and \$100 million in cash. The left chart shows that 15 percent variable rate debt causes interest cost to rise and fall with interest income under different LIBOR scenarios. (Since taxable rates tend to rise and fall 150 percent as fast as tax-exempt debt, tax-exempt variable rate debt equal to 150 percent of taxable cash will minimize net interest rate risk.) The right chart focuses on net interest income, the difference between interest expense and interest income and shows that 1) net interest income is much more stable with 15 percent variable than 0 percent variable and 2) net interest expense is much lower, unless rates rise significantly.

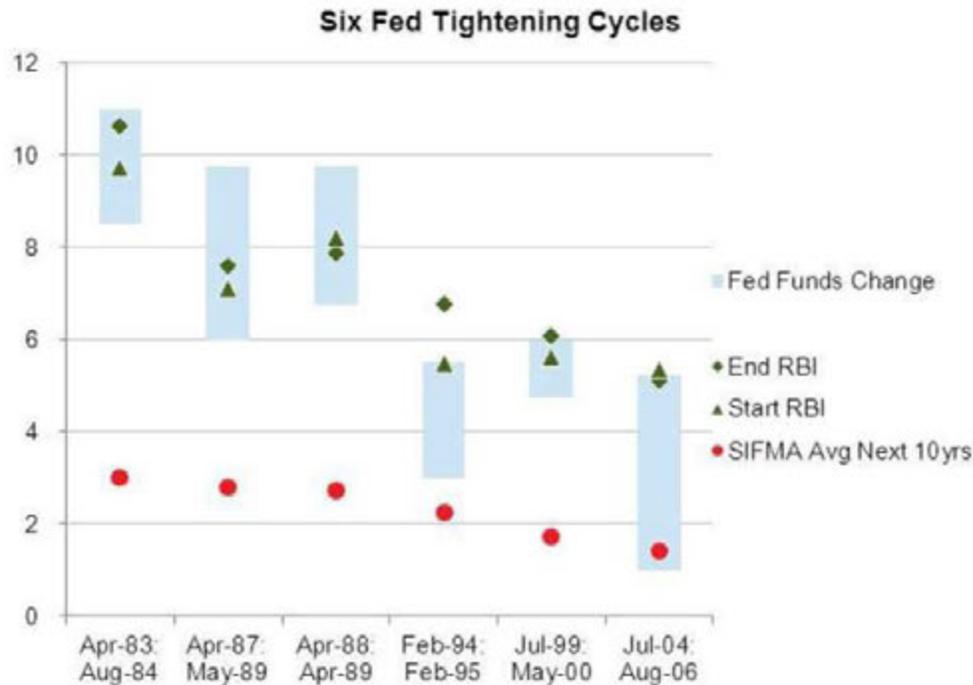
Even issuers without significant cash balances can find a fixed rate debt bias unexpectedly risky if revenues and expenses are economically sensitive. Many public sector issuers find revenues fall faster in a recession than expenses.<sup>18</sup> When the Federal Reserve responds to the recession by cutting interest rates, only issuers with variable rate or short term debt will benefit. (Issuers with both cash and economically sensitive revenues may benefit from more variable than indicated by the above rule of thumb.)

An overreliance on high cost fixed rate debt can have other unintended consequences. It can slow the accumulation of liquidity (an important credit rating support), result in a less diversified set of investors and simply turn out to be unnecessary and costly protection against risks that never materialize.

## 6. The Market Timing Argument for Fixed Rate Debt

We have argued that traditional fixed rate debt is costly, inefficient and brings its own set of risks. However, many issuers may be attracted to TFRD because fixed rates are historically low and short-term rates are forecast to rise. However, we find that historical experience and the Federal Reserve's long term forecast do not support this argument and that forecasts in general have proven to be unreliable guides to action.

Figure 6 below shows that historical experience does not support this argument. Over the last six Fed tightening cycles, while the Fed increased short term rates by an average of 288 basis points, the SIFMA average over the following ten years still averaged 460 basis points below the fixed rate at the start of the cycle. Moreover, tax-exempt fixed rates represented by the Bond Buyer Revenue Bond Index (RBI) increased just forty-two basis points on average during the tightening cycle. This means that historically, even the beginning of a tightening cycle has been a good time to sell variable rate debt.



**Figure 6:** Short Rates Averaged Well Below Fixed Rates Through Fed Tightening Cycles. Also, long-term tax-exempt rates (RBI) increased an average of just forty-two basis points. Source: BMO and Bloomberg

If history does not support the Market Timing Argument, neither does the Federal Reserve’s own forecasts. At the June 18, 2014 Federal Reserve Board meeting, the “longer-run” fed funds target was forecasted to be around 3.75 percent.<sup>19</sup> This implies tax-exempt variable rates of about 2.79 percent.<sup>20</sup> This is sixty one basis points below current twenty year, AA fixed rates of 3.40. Moreover, there is considerable uncertainty about how long it will take to get to that longer-run level, during which time the opportunity cost of TFRD remains much higher.<sup>21</sup>

Furthermore, the consensus about the future path of interest rates is unreliable. Figure 7 below plots the consensus market forecast of ten year US Treasury rates versus their actual path over the last four years.<sup>22</sup> Research has shown that a simple random walk model predicting on average no change in rates would have outperformed two-thirds of economists over the 1982-2002 period.<sup>23</sup>

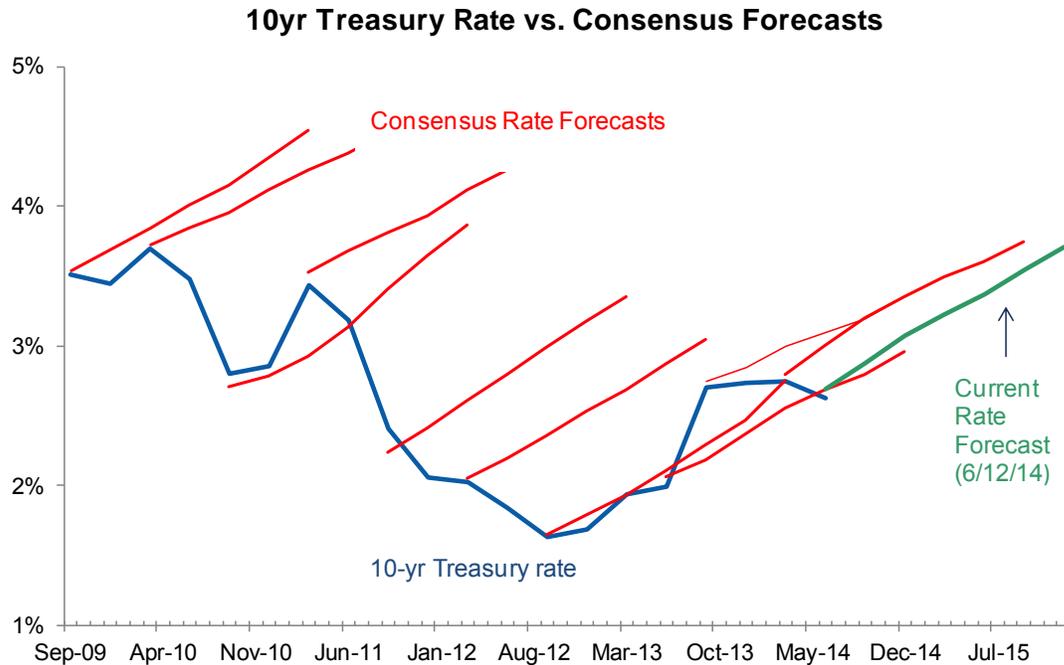


Figure 7: Even professional economists cannot accurately forecast interest rates. According to economist John Kenneth Galbraith, "Pundits forecast not because they know, but because they are asked."<sup>24</sup>

Of course history and projections could be wrong and short term rates could indeed spike and remain high. Issuers may still not regret having variable rate debt because the initial savings will have built liquidity and flexibility; higher interest rates will bring higher interest income and likely higher economically sensitive revenues due to a stronger economy; and the ease of restructuring could be helpful if known and unknown future risks materialize.

## 7. Toward a Resilient Variable/Fixed Rate Debt Policy

TFRD offers issuers obvious benefits including the certainty of a fixed debt service and committed capital, without liquidity, tax event, credit and other risks. For lower-rated issuers with limited financial flexibility and staffing especially, TFRD deserves its privileged place on the balance sheet. Yet, we have shown that the high cost of fixed rate debt may not always be worth these perceived benefits for other issuers.

Viewed as a risk management exercise, the choice of TFRD versus everything else begins with an examination of the costs of transferring certain risks to investors or banks. Are these costs reasonable for the issuer to outsource its risk management or are there certain risks the issuer can and should retain? The academic literature supports a bias against TFRD because these bonds are priced so inefficiently. Moreover, a bias towards TFRD actually entails a new set of risks including a lack of flexibility to respond to future risks. Finally, we have seen that the market-timing argument for fixed rate debt fails based on history, longer-term perspectives and our inability to predict the future.

Many public sector issuers with financial flexibility and appropriate staffing would benefit from a flexible, yet risk-centric debt policy that permits going beyond TFRD. A variety of strategies exists that allows such borrowers to minimize their opportunity cost by retaining only tolerable, manageable risks; transferring or hedging the rest.

For example, certain issuers may reduce cost and improve asset-liability matching with a policy such as: target variable rate debt equal to 100 to 150 percent of cash, more if its revenues are economically sensitive. Others may wish to perform a detailed asset-liability study to analyze the reward/risk trade-offs of alternative debt and hedge policies at the enterprise-level. Either way, issuers with such policies are likely to be more resilient in the face of future uncertainties and better positioned to provide essential services regardless of what the future may bring.<sup>25</sup>

Questions? Feedback? Suggestions for other topics? Email [brett.whysel@bmo.com](mailto:brett.whysel@bmo.com) or call 212.702.1823

### About the Author

Mr. Whysel is a Managing Director at BMO Capital Markets, Financial Products, Issuer Structured Solutions group. He joined BMO in 2010 with more than twenty years' industry experience. For virtually his entire career, he has served public sector borrowers including state and local governments, not-for-profits, utilities and other essential service providers with prudent, innovative and cost-saving financial strategies. His role at BMO is to build, aggregate and focus BMO's capital markets, lending and analytics resources on solutions that help clients achieve their goals. These include direct lending, derivative and structured products solutions. Mr. Whysel has spoken publicly and published articles in *The Bond Buyer*, *Journal of Government Financial Management*, *HFMA* magazine and elsewhere on risk management, derivatives, liquidity, investor relations and other topics. Mr. Whysel earned an MA in philosophy from Columbia University and a BS in managerial economics and French from Carnegie Mellon University.

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## REFERENCES

- <sup>1</sup> The increase in the proportion of debt in a fixed rate mode of approximately 14.9 percent applied to the total five year issuance of \$1.84 trillion, multiplied by the difference between the actual average coupon of 3.33 percent and the average one year rate for 'A' rated bonds of 0.77 percent. Calculations compare calendar years 2003-2007 and 2009-2013. Source: BMO, IPreo and Thomson Reuters.
- <sup>2</sup> "Evolution of Treasury." Treasury & Risk Magazine, June 26, 2014.
- <sup>3</sup> "The Massachusetts ALM Program, Reducing Risk from a Global Balance Sheet Perspective ", June 2014, <http://www.massbondholder.com/sites/default/files/files/MA%20ALM%20Credit%20Presentation%20FINAL%20POSTED.pdf>, p.33.
- <sup>4</sup> Each product has its own set of risks and may not be suitable for specific issuers. The mechanics, risks and benefits of each are beyond the scope of this paper. Generic A rated pricing curve as of June 11, 2014.
- <sup>5</sup> As of June 11, 2014 the 20 year, call adjusted A GO rate was 3.61 percent, compared to the initial floating rate on a Floating Rate Note of about 0.15 percent. The 3.46 percent difference represents the opportunity cost of fixed rate debt under current market conditions.
- <sup>6</sup> Neely, Christopher "Lessons from the Taper Tantrum", Economic Research, Federal Reserve Bank of St. Louis, Economic Synopses, 2014, No. 2.
- <sup>7</sup> This cost to transfer interest rate risk is current expense of a 20 year, percentage of LIBOR, floating-to-fixed interest rate swap.
- <sup>8</sup> We find that tax rates would have to drop from 39.6 percent to 13.9 percent over two years and remain there for another eighteen years for 1M LIBOR and SIFMA curves to share the same present value, assuming LIBOR increased and stayed at its 10 year average of 1.87 percent.
- <sup>9</sup> Assuming a failed remarketing penalty of 12 percent, a fail risk rate of 3.7 percent per year would need to be realized to justify the cost.
- <sup>10</sup> Wang, Junbo, Wu Chunchi and Zhang, Frank. Liquidity, Default, Taxes and Yields on Municipal Bonds, Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, D.C., July 2005; p. 5.
- <sup>11</sup> Seventy-nine basis points of the excess yield on AA/A rated tax-exempt securities have been found to result purely from poor liquidity according to Wang, Wu and Zhang (2005), p. 7.
- <sup>12</sup> Fairchild, Lisa and Koch, Timothy. The Impact of State Disclosure Requirements on Municipal Yields. National Tax Journal; December 1998; p. 742.
- <sup>13</sup> Brown, David and Sirmans, Stace. Maturity Clienteles in the Municipal Bond Market: Term Premiums and the Muni Puzzle, July 2013; p. 11.
- <sup>14</sup> Wang (2005), p. 5.
- <sup>15</sup> Wang (2005), p. 3.
- <sup>16</sup> This has consequences for federal tax policy. Tax-exempt interest paid is a major subsidy and expense of the federal government. If one percent of the \$2.724 trillion fixed rate debt outstanding or \$27.24 billion per year is lost to an inefficient delivery mechanism—the municipal bond market—then it is not benefiting the public sector.
- <sup>17</sup> For an excellent example, see Massachusetts (2014)
- <sup>18</sup> "The Local Squeeze: Falling Revenues and Growing Demand for Services Challenge Cities, Counties, and School Districts." The Pew Charitable Trusts, June 1, 2012. <http://www.pewtrusts.org/en/research-and-analysis/reports/0001/01/01/the-local-squeeze>

- <sup>19</sup> June 18, 2014. "Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents, June 2014." (n.d.): n. pag. Web. 19 June 2014.
- <sup>20</sup> Based on a ten year Ordinary Least Squares regression of SIFMA index on Fed Funds rate:  $SIFMA = 0.684*FF + 0.22 + \epsilon$ ;  $R^2 = 88.1$  percent. Source: BMO.
- <sup>21</sup> The June 18, 2014 press release closed with, "...even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run."
- <sup>22</sup> Thanks to Dimitrios Delis, BMO Strategic Analytics Group.
- <sup>23</sup> Mitchell, Karlyn and Pearce, Douglas. "Professional Forecasts of Interest Rates and Exchange Rates: Evidence from the Wall Street Journal's Panel of Economists." March 2005, p15.
- <sup>24</sup> Housel, Morgan. "Bad News: Everyone is Right!" The Motley Fool, April 12, 2013
- <sup>25</sup> Issuers should rely on their advisors, creditors, rating agencies and other stakeholders before changing their debt strategy or policy.

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