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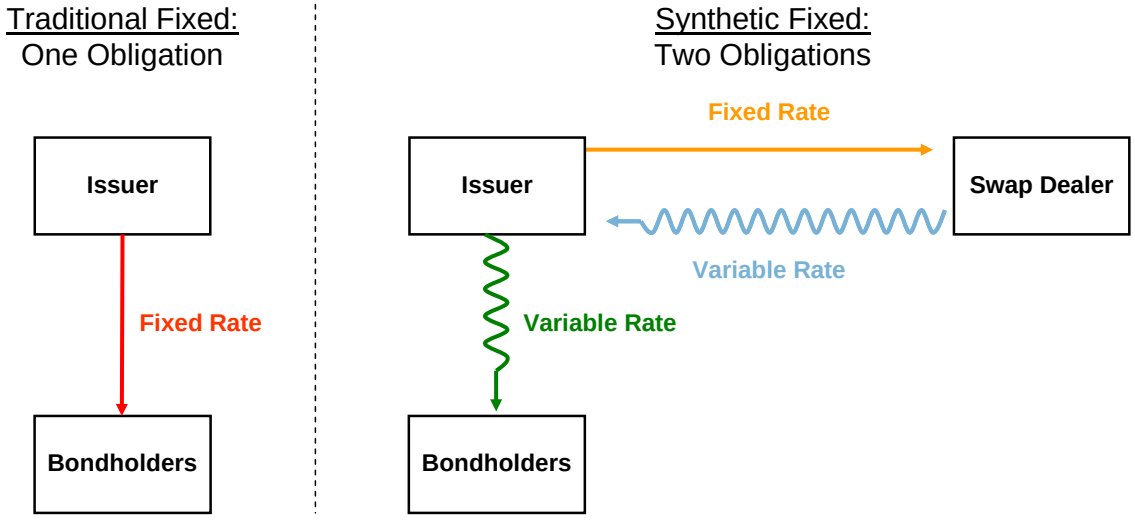
Implied Cost of Cancellation Option in the Municipal Bond Market

Municipal issuers of debt are often presented with various alternatives to issuing fixed rate debt. Many of these alternatives propose using swaps in conjunction with variable rate bonds so that "synthetic" fixed rate debt is created. On the surface, these alternatives often appear to result in a lower interest rate cost to the issuer. However, this is not always the case as the option to call traditional fixed rate bonds is not appropriately accounted for. If an issuer truly wants to minimize the cost of issuing debt, possibly by giving up the call feature, the actual cost of this option must be thoroughly analyzed and the option itself possibly arbitraged.

To understand how to account for the call option embedded in fixed rate bonds we first need to review how callable fixed rate debt can be synthetically created. Fixed rate debt can be synthetically replicated by issuing variable rate bonds and simultaneously entering into a cancellable swap under which the issuer pays a fixed rate, receives a floating rate, and the issuer has the right to cancel the swap after ten years, assuming the fixed rate bonds would be callable after ten years. Figure 1 shows the payment flows for traditional and synthetically fixed rate debt.

Figure 1: Traditional versus Synthetic Fixed Rate Debt



A call option on fixed rate bonds become valuable when interest rates fall since the issuer can repurchase the bonds at, or close to, par and reissue new bonds with lower coupons. This is a traditional refunding and would not make economical sense unless the issuer could call the bonds close to par value.

In contrast, in a synthetically fixed rate deal, the change in value as a result of changes in interest rates does not occur on the actual bonds, but on the swap. The variable rate bonds can always be repurchased at par. A swap contract, however, without a cancellation option, would become a liability to the issuer if rates fall and the present value savings from a refunding would equate the cost of cancelling the swap.[1] In other words, if the cost of cancelling the swap is its mark-to-market value, synthetic fixed rate debt cannot be refunded economically.

In order to replicate the call feature included in fixed rate bonds, a cancellation option must be included in the swap in a synthetic fixed rate deal so that the issuer can cancel the swap at no cost and repurchase the variable rate bonds for a total cost of par, which is the same as a traditional refunding. This cancellation option should then be exercisable after ten years, every six months to correspond to the call feature in fixed rate bonds. The cancellation option itself in this structure is referred to as a Bermudan swaption.

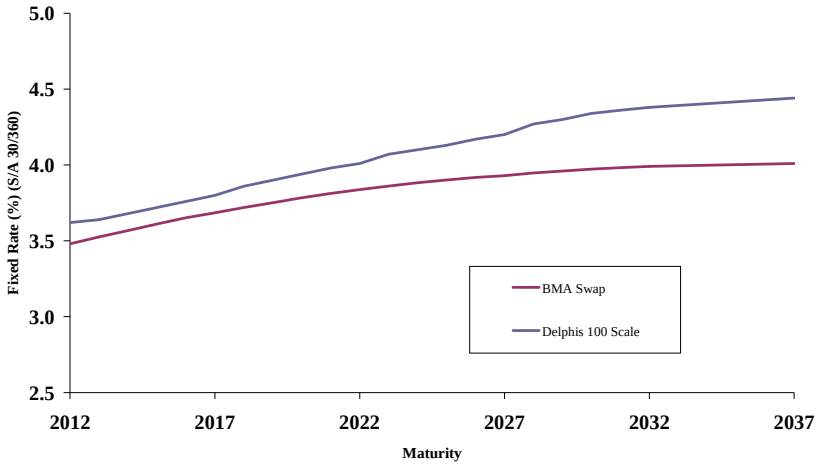
A swaption is an option to enter into a swap at a future date and if the option is to enter into a reverse of the original swap, it effectively cancels the original swap. The value of this option can either be paid for upfront or over time, when the transaction is not cancellable. In a traditional fixed rate issue it is paid for over time as a higher coupon than what otherwise would be required.

The following data was collected on May 7, 2007.[2] To issue fixed rate debt, callable after ten years, or to enter the BMA swap market, the scales shown in Table 1, and graphically in Figure 2, were in effect.

Table 1: Delphis Hanover and BMA Swap Scale

Maturity:	*2012*	…	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*	*2037*
Delphis 100 Scale	3.62	…	3.80	3.86	3.90	3.94	3.98	4.01	4.07	4.10	4.13	4.17	4.20	4.27	4.30	4.34	4.36	4.38	4.44
BMA Swap	3.48	…	3.68	3.72	3.75	3.78	3.81	3.84	3.86	3.88	3.90	3.92	3.93	3.95	3.96	3.97	3.98	3.99	4.01

Figure 2: Delphis Hanover and BMA Swap Scale



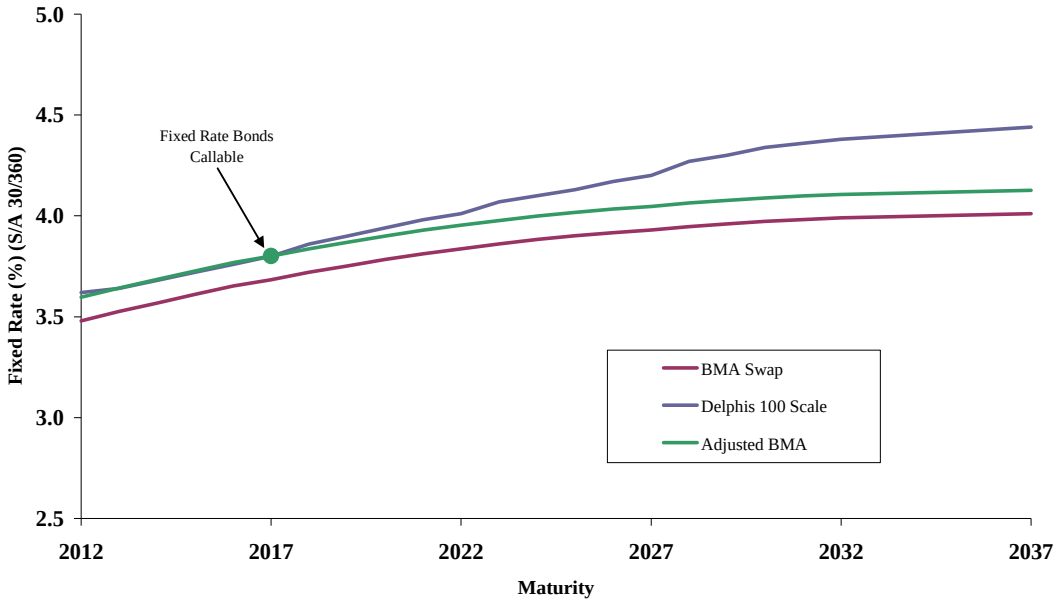
[1] This assumes that the same discount rate is used to calculate present value savings. Municipal issuers frequently use their new bond rate to calculate present value savings whereas LIBOR rates are used to calculate the cost of cancelling a swap.

[2] Source: Delphis Hanover and Bloomberg.

On the surface, the cost of issuing variable rate notes and synthetically fixing the rate appears to be the most cost efficient alternative. However, there are ongoing costs associated with issuing variable rate debt, such as remarketing and liquidity costs. The cost of liquidity is mostly associated with the put feature present in variable rate notes,[3] since the liquidity provider stands ready to take possession of notes unless they can be remarketed. This feature is not present in fixed rate bonds, so it will not be accounted for here. Remarketing costs must be included though since it is an ongoing cost of having variable rate notes outstanding. In addition, one may questions whether or not the BMA Index is biased downwards since it excludes notes deviating more than a given amount from the mean, and such deviation is more likely to occur for higher rates than it is for lower rates.

Under the assumption that the market is efficient when there is no call option present, the implied cost of issuing variable rate debt instead of fixed rate debt is approximately 12 basis points, which would be an approximate cost of remarketing and a possible BMA Index bias. The BMA Swap rates are therefore adjusted by this amount and the resulting rates are shown in Figure 3.

Figure 3: Delphis, BMA, and Adjusted BMA Scales

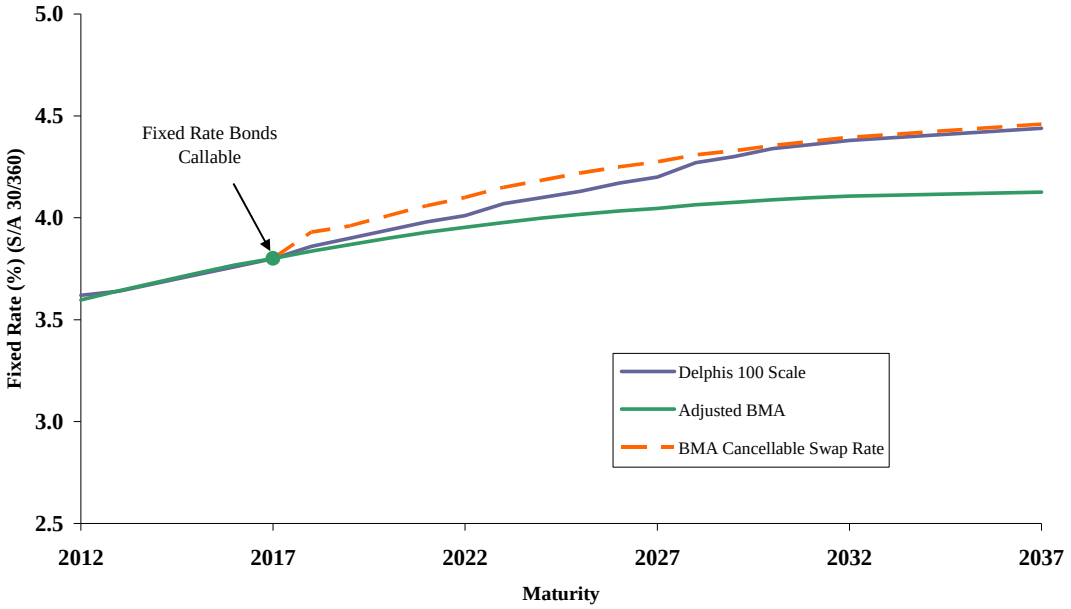


As can be seen in Figure 3, the cost issuing fixed rate bonds, as compared to a synthetic fixed rate deal without any call feature, clearly begins to deviate for maturities that are beyond the call date. The difference between the Delphis and the Adjusted BMA Swap scale is the cost of the option, to the issuer, to have the right to call the bonds at par after ten years.

Once the cost of the cancellation option on the swap is included in the fixed swap rate, the difference to the Delphis Hanover 100 scale is not as apparent, and this is shown in Figure 4.

[3] Assuming a highly rated issuer.

Figure 4: Cancellable Swap Rate



For maturities less than 20 years, it is actually cheaper for an issuer to issue traditional fixed rate debt as compared to synthetically fixing the rate, whereas the issuer may be indifferent for a 30 year maturity. If an issuer truly wants to minimize the cost of new debt, possibly by giving up the call feature embedded in fixed rate bonds, the best strategy may actually be to issue fixed rate bonds, which includes a purchase of a call option, and then separately *sell* the call option only.

Since it is only tax-exempt issuers, as opposed dealers in the option markets, that can issue tax-exempt debt and buy options in that specific market, there might be a slight discrepancy in the pricing of options in the two markets. In other words, an issuer may be able to purchase the call option at a lower price than what it could be sold for.

For example, if an issuer wants to issue the lowest cost debt possible, including giving up the call option, and only taking a slight basis risk,[4] the best strategy may actually be to issue traditional fixed rate bonds and then separately sell off the call option to a bank. Table 2 shows the implied cost of the call option included in fixed rate bonds and the estimated freely traded market value for the option for a $100 million issue.[5] For maturities approaching 30 years, the arbitrage profit available is probably less than transactions costs although for many maturities it may actually pay for the cost of issuing the bonds.

Table 2: Implied Arbitrage Profit Available (All amounts in $ '000)

Maturity:	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*	*2037*
Implied Cost of Call Option	185	267	355	496	570	980	1,113	1,287	1,619	1,872	2,591	2,868	3,308	3,516	3,747	4,644
Freely Traded Value of Call Option	682	727	921	1,156	1,394	1,667	1,907	2,136	2,396	2,642	2,943	3,175	3,433	3,645	3,852	4,852
Arbitrage Profit Available to Issuer	497	460	566	660	824	687	794	849	777	770	352	307	125	129	105	208

[4] Basis risk between variable rate bonds and the BMA Index, which tends to be very small for highly rated issuers.
[5] For illustrative purposes, no amortization is included.

Another important consideration is the fact that an issuer actually pays for the call option by borrowing at a tax-exempt rate, but can sell the option and invest the proceeds at a taxable yield. However, to execute this arbitrage strategy, an issuer must be prepared to issue variable rate debt in the future if rates fall.

If an issuer sells tax-exempt fixed rate bonds and separately sells a swaption mimicking the call option on the fixed rate bonds, and rates have fallen when the debt becomes callable, the issuer will have to call the fixed rate bonds originally sold, issue variable rate debt, and begin making payments on the swap underlying the swaption. After the issuance of variable rate debt, the fixed rate paid will be the same, however, it will now be made to the counterparty of the swap instead of the bonds holders and the swap will remain in place for the remainder of the original term of the fixed rate bonds.

So, what conclusions can be drawn from this? Should a municipal issuer ignore the synthetic market and always issue fixed rate bonds since there appears to be little to gain? Not necessarily, but an issuer should not enter either market without having made a fair comparison between the two. Further, if an issuer truly wants to issue low cost, non-callable debt using derivatives, the best answer may be to arbitrage the two markets.

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