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MUNICIPAL BONDS: WATERS ARE ROILING IN THIS ONCE-SLEEPY SECTOR

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Municipal Bonds: Waters Are Roiling in this Once-Sleepy Sector

The municipal bond market, normally a rather placid place, has been extraordinarily turbulent over the past eight months, creating opportunities and exposing previously hidden perils. Municipal bond prices have been hit by bond insurers' credit woes, deleveraging on a significant scale, turmoil in the short-duration market, and an extraordinarily high liquidity premium.

We aim in this brief paper to update our taxable clients on the recent developments in the municipal bond market, with a particular focus on emerging risks, opportunities, and possible action items. We also consider whether a properly structured municipal bond portfolio may be appropriate as a hedge against malign deflation or prolonged economic contraction.

What Has Happened in the Muni Market?

Muni bond cumulative total returns have been positive since July, but they have trailed far behind the returns on Treasury securities. Treasury notes maturing five years hence, for example, returned 14.5% from July 2007 through the end of February, while five-year municipal bonds trailed by a full 10 percentage points, returning just 4.5%. During the month of February, the return on ten-year muni bonds trailed the return on ten-year Treasury notes by 527 basis points (bps) at 5.3%, the widest monthly performance gap in more than 20 years, and 167 bps wider than even the performance gap during September 1998—dark days indeed, when the crumbling of a massive hedge fund, Long-Term Capital Management, roiled markets and caused forced deleveraging on a significant scale.

Investors are showing a clear preference for issues that are highly liquid, easy to understand, and that have absolutely no association with any part of the credit market that has run into problems. Issues that have limited liquidity, a degree of complexity, or even the slightest taint have seen a buyers' strike, and issues that were leveraged have seen sharp price declines as margin calls forced rapid selling.

The Liquidity Penalty Box

Municipal bonds delivered cumulative positive returns over the past nine months as the credit crisis has unfolded, but the downward pace of muni yields (and conversely, the upward pace of bond prices) trailed those of Treasuries for most of that time, and by a significant margin. Investment-grade and corporate bonds trailed too, as did asset-backed securities. Were munis simply suffering the same fate as credit writ large? To a degree, yes, but the primary reasons that investors have steered away from many types of muni securities are their low level of liquidity and their association with troubled "monoline" bond insurers,¹ rather than concerns about default potential surrounding the underlying bonds.

¹ The stability of the "monoline" insurers that protect about half of muni bonds against default is very much in doubt, which we will discuss later, but the underlying bonds are generally of such high quality that this is not likely to prevent bondholders receiving their full schedule of coupons and timely principal repayment.

Treasury securities trade in very deep, liquid markets, and in times of crisis, investors are willing to trade yield for liquidity. Municipal bonds are nowhere near as liquid as Treasuries. The municipal bond universe includes more than a million individual securities, and the Lehman Brothers Municipal Bond Index contains more than 42,000 securities. That is not a misprint. Daily muni bond trading volume averages roughly \$25 billion, seemingly robust, but actually representing less than 1% of the outstanding municipal securities market. Further, the trading-volume distribution is remarkably skewed, with active trading limited to a tiny fraction of the universe's outstanding securities. (In fact, about two-thirds of outstanding muni securities *do not see a single trade in a given year!*) In 2005, the latest year for which we have daily trading data available, only about 5% of the securities in the entire muni bond universe saw more than two trades per month.² If this scenario were mapped to the equity market, most of the S&P 500 and all of the Russell 2000® would be considered completely illiquid.

Credit Quality Still Shines

Investor demand for the vaunted liquidity of the Treasury market, rather than concerns about municipal bond credit quality, is responsible for most of the lagging returns and stubbornly high yields of the muni market (relative to Treasuries) as market participants have engaged in a flight to quality since the beginning of July. It is true that municipal bonds do not have quite the same credit quality as U.S. Treasuries or other sovereign bonds, but munis are probably the next best thing, and generally are of higher quality than all but a tiny fraction of corporate bonds. A March 2007 Moody's study of all municipal bonds in its ratings universe from 1970 to 2006 found that muni defaults were much less frequent than corporate defaults at a given rating level (Table A). For every 1,000 muni bonds that were rated Baa (the lowest investment-grade rating, equivalent to a BBB rating from S&P), on average just one defaulted over the course of the next ten years. The same statistic applied to Moody's corporate bond universe resulted in an average of 46 defaults. Overall, the average ten-year cumulative default rate for all munis in Moody's universe was 0.1%, compared to 9.7% for the entire rated corporate bond universe and compared to 0.5% for *Aaa-rated corporate bonds alone*. To be sure, tax revenue for some counties is trending lower as property values decline, but a broad and significant increase in muni defaults, pacing the expected increase in corporate bond defaults, remains unlikely.

Troubled Monoline Insurers

About half of municipal bonds are issued with a protective insurance wrapper that promises timely repayment of principal and interest to maturity in the event the issuer runs into problems. These wrappers are underwritten by a handful of bond insurers, typically called "monolines" because they maintain just one line of business (they only insure debt securities—they stay away from life insurance, homeowner's policies, etc.). The monolines obtained pristine credit ratings from S&P, Moody's, and Fitch (AAA in most cases), and because of the very low historical default rates for municipal bonds, they have been able to write an extraordinary book of default insurance on a relatively tiny equity capital base.

² We are grateful to Professor Justin Marlowe of the University of Kansas for providing us with a helpful analysis of daily muni bond trading volume.

The growth in the amount of bonds insured has been quite strong since the 1971 development of bond insurance, though it appears to have reached a plateau. In 1983, 10% of bonds were insured; by 1993, 37%; by 1996, 47%; and now roughly half of new issues carry bond insurance. The growth slowdown in the traditional muni insurance business has encouraged the monolines, many of which are publicly traded or owned by public companies, to move into faster-growing lines of bond insurance, such as guaranteeing non-U.S. bonds and structured debt products like collateralized debt obligations (CDOs) (Table B). In recent years, most of the monolines wrote billions in insurance policies promising timely payments to the holders of CDOs that now appear very unlikely to remain current. Very late in the game, the rating agencies began to threaten the monolines with downgrades if they did not add to their capital base, reinsure to lay off some of their exposure, or both. Several of the monolines have been downgraded by at least one rating agency, and others are being reviewed for potential future downgrades. The credit markets are not waiting for the foot-dragging rating agencies to move—market participants have priced default insurance on the monolines' own bonds as if the monolines were on the shady side of the speculative junk market, rather than pristine AAA credits (Table C). The value of the equity in these firms has also declined precipitously (Table D).³

Some monolines, including Federal Guaranty Insurance Company (FGIC), have already lost their AAA credit rating, and it is quite possible that one or both of the two largest underwriters—MBIA and Ambac—will lose theirs as well, absent further state or federal government invention.⁴ A significant monoline downgrade or default would have a detrimental impact on the entire municipal bond market, but this impact would largely be limited to further removal of liquidity from the market, and to relatively modest price declines as insured bonds traded down to the level of their underlying issuer's creditworthiness. Similarly, if Chubb or Fireman's Fund ran into financial problems, it would certainly give mortgage lenders and homeowners palpitations, but it would not make houses more likely to catch fire.

The insurance guarantees have historically made bonds more marketable, in part by limiting much of the credit research and due diligence that investors felt was necessary. For issuers, the decision about whether to add an insurance wrapper is relatively simple. The underwriter can speak with institutional investors to find out the likely yield they would demand with and without insurance, and compare that difference with the cost of the insurance wrapper (a variable up-front premium that may be as low as 10 bps for low-risk issues) to determine whether insurance makes economic sense. Further, the thousands of smaller issuers who could not afford to purchase their own credit rating (as well as larger issuers with less-than-pristine ratings) were able to "rent" a rating of AAA from a squeaky-clean monoline, allowing issues to be sold at a reasonable yield. Now, the market assigns little, if any, value to many of these insurance wrappers (the exception remains wrappers from FSA, which did not "diversify" into writing a significant amount of insurance on now-troubled structured products). Table E illustrates that the yield premium of insured bonds over those that have an underlying, or "natural," AAA rating has increased significantly.

³ We have included Berkshire Hathaway in Tables C and D, in part to compare the monolines with a true AAA insurer (Berkshire Hathaway, steered by famed investor Warren Buffett, is a diversified company, but insurance is important to the firm's earnings), and also because Berkshire previously announced plans to enter the muni bond insurance market. New York and other states gave Berkshire permission to write bond insurance, and Berkshire also offered to write reinsurance on the muni bond insurance portfolios of three issuers, although the offer was later withdrawn.

⁴ State officials have made it clear that they expect the ratings agencies, which are government-chartered, to be patient with the monolines as recapitalizations are completed, and state insurance commissioners have also become involved in recapitalization and restructuring efforts.

In some circumstances in recent months, in fact, issuers have been unable to sell bonds wrapped by an on-the-ropes issuer, and when they have eliminated the insurance wrapper, the issue sold just fine. In that case, the market is saying that the insurance has a negative value. How is this possible? Consider the dilemma faced by a portfolio manager evaluating whether to buy a high-quality bond with an FGIC insurance wrapper, versus an unwrapped version of the same bond. A portfolio manager that buys the insured bond must be prepared to have to answer to fund shareholders or the firm's risk management department about why the fund has exposure to FGIC. For a manager that buys the uninsured bond, the credit quality of the bond is arguably similar, and the headline risk and career risk are much lower.

This flurry of monoline recapitalizations and belated credit-rating reassessments may be rendered irrelevant if several senators, other members of Congress, and state treasurers are successful in their efforts to allow the government-chartered Federal Home Loan Banks (FHLB) to underwrite muni bond insurance. The FHLB system, established by the federal government during the Depression, maintains a credit rating of AAA. FHLB bonds are generally perceived, similar to those of Fannie Mae and other government-sponsored enterprises, as obligations of the U.S. government, even though the government repeats the mantra that they are not.

Short-Duration Muni Securities: More than Plain Vanilla

The muni bond market is not simply a basket of long-maturity, fixed-rate bonds issued by municipalities. Demand for municipal securities with short durations, especially shorter than one year, has been persistently high, coming from corporations, wealthy individuals, and the money market funds that serve them both. This steady demand, combined with the low liquidity of long-duration issues, results in a yield curve that has been persistently steep.

That steep yield curve theoretically would encourage borrowers to issue more debt at the short end of the yield curve. Municipalities, however, fund long-term projects and have little desire to refinance every few months. To bring those two competing interests together, investment banks created a range of cash-like municipal securities that promise an effective short duration, yet a long actual maturity. The three types of securities are variable-rate demand notes (VRDNs), tender option bond floating-rate securities (TOB floaters), and auction-rate securities (ARS). VRDNs and TOB floaters are typically eligible for money market mutual funds, while ARS are not, but ARS were marketed as high-yielding cash substitutes to individual investors and corporations. A brief description of each security type follows.

Variable-Rate Demand Notes

VRDNs compose the majority of securities in a tax-free money market mutual fund. VRDNs are long-maturity securities issued by municipalities, with interest rates that typically adjust weekly. They often include an insurance wrapper written by one of the now-troubled monoline insurers. VRDNs are putable by

the holder back to a sponsoring bank. VRDNs have not suffered a significant hiccup as of this writing,⁵ but some analysts have expressed concern that they and particularly their TOB cousins share some characteristics with the structured investment vehicles (SIVs) that have roiled the taxable cash market in recent months. We do have some moderate concerns,⁶ although the transparency into, and the quality of, the underlying bond assets of VRDNs are vastly better than those of SIVs.

Tender Option Bond Floating-Rate Securities

TOB floaters are synthetic securities created when specialized hedge funds or other professional investors work with investment banks to purchase municipal bonds with leverage. These hedge funds, which are generically called municipal arbitrage funds, develop trades that take advantage of the persistent steepness of the yield curve. The structures involve the creation of a trust by an investment bank, into which traditional long-maturity municipal bonds are placed (typically these just include one security). The trust then issues residual floating-rate securities. These floaters are puttable back to the bank on a weekly basis in most cases, and this liquidity option typically helps them to qualify for inclusion in money market mutual funds. The hedge funds are using several turns of leverage in creating the TOB trusts. They typically hedge the risk of yield spread compression, but these hedges may have significant basis risk,⁷ and numerous TOB trusts were unwound last summer and during February of this year, dumping billions of long-duration muni bonds out into the market. Like VRDNs, independent credit analysts have questioned the safety of TOB floater paper. Last fall, holders of much of the floater paper outstanding would have seen their putability rights evaporate if *either* the issuer or the insurer were downgraded by one of the major credit rating agencies. Now, much of the documentation supporting this paper has been rewritten so that putability would remain intact as long as either the issuer or the insurer retained its investment-grade rating.

Auction-Rate Securities

Unlike the first two types of securities, ARS are not eligible for purchase by money market mutual funds, yet the ARS market has still managed to grow to \$330 billion. ARS are typically long-maturity securities sold in \$25,000 units and are held directly by individuals (they are sold to investors by private banks or by stock brokers) or by corporations as a cash substitute. They are issued by municipalities, universities, hospitals, and by closed-end mutual funds (closed-end funds use them to provide leverage). Each week or month, a Dutch auction is held to determine the interest rate for the following period, and to allow the securities to change hands (if the current holder wants to sell them). The risk is, of course, that if the auction is not successful, then the holder may be stuck with the ARS until the next successful auction (as compensation, the “penalty rate” of interest paid in the case of a failed auction is typically higher than the clearing rate in the case of a successful auction, and this penalty rate is paid until the next successful auction).

⁵ “Backstop” banks have seen an increase in the amount of issues that are being put to them, and some VRDN issuers have been seen their interest rates increase substantially, but the VRDN market has generally functioned more smoothly than many other cash markets in recent months.

⁶ In the unlikely event that investors became spooked by monoline downgrades and looked to redeem large amounts from tax-free money market funds at once, capital-constrained banks might see the put options on these securities exercised in larger quantities than they are able to manage. We are not concerned with the underlying assets of TOBs and VRDNs, however.

⁷ Basis risk refers to an indirect hedge, akin to hedging an oil price shock using natural gas futures.

Because sponsoring firms participated in auctions, auction failures were indeed rare until this year, but now they have in fact become the rule, rather than the remote possibility. As the credit crunch made investors increasingly wary and banks increasingly capital constrained, auctions began to sputter. Last month, numerous brokerage firms declined to participate in low-demand auctions, and auctions began failing in droves. Table F illustrates the degree to which the auction market fell apart in February, and auction failures continue as of this writing, particularly for securities that have modest penalty rates. After initial failed auctions in February, well-publicized securities with annualized penalty interest rates of 10%, 15%, or even 20% have begun to clear again as hedge funds, proprietary trading desks, and broad-mandate bond funds picked up this low-hanging fruit. Individuals and corporations holding ARS that have modest penalty rates may be stuck with them for some time, unless they are able to find a secondary market purchaser and willing to relinquish the bonds well below par. Some municipal bond managers are asking clients for permission to purchase these securities within diversified municipal bond portfolios.⁸ We believe attractive opportunities may still be available, but the juiciest yields were gone within a week.

Cash Allocation Options

While we believe the risks to VRDNs and TOB floaters are fairly low, their underlying exposures are solid, and the chance of widespread difficulties is remote, the risks are somewhat higher than we like for a cash allocation. Investors cannot afford for cash held as dry powder to be impaired or unavailable when opportunities present themselves. Similarly, cash that is unavailable when needed for a capital call would be frustrating at best. Investors who purchased ARS now find that their investments are largely locked into the securities, with margin loans or discounted secondary-market sales the only option for accessing the cash.

What are taxable investors to do with their cash (particularly if the amount held is large relative to the overall portfolio)? We see several possibilities, none perfect:

1. Investors are very likely to experience no problems in tax-free money market mutual funds, so remaining in these funds is an acceptable course of action. These funds primarily hold VRDNs and TOB floaters, and the risks of these securities are real but appear to remain low. We would recommend in this case that investors choose carefully to ensure that the fund is a true money market mutual fund, regulated under Rule 2(a)7 of the Investment Company Act of 1940, and managed by a firm with both substantial financial resources and a strong asset management franchise and reputation to protect. This increases the likelihood that the firm will step in and purchase the securities out of their fund at par should they become impaired.⁹
2. Investors may choose to shift assets into a Treasury money market mutual fund. The safety of such a fund is excellent, but at today's yields, the fund's return will surely be negative on an after-inflation, after-tax basis.

⁸ We believe these securities are not appropriate for a *cash* holding, but may be attractive as a piece within a long- or intermediate-duration municipal bond portfolio.

⁹ Our advice on choosing investment vehicles is quite similar for investors in taxable "prime" cash funds, which are used by some taxable investors and which are similarly not completely free of risk.

3. Investors may choose to take on a bit of interest rate risk and invest further out on the municipal bond yield curve. This is not appropriate for cash holdings that are pledged in the near term for other purposes, but for more strategic cash, moving a few years out on the yield curve to own more of an intermediate-term muni bond portfolio will increase price volatility somewhat, but potentially decreases the exposure to potentially problematic muni cash securities.

Current Valuations Are Attractive

The increasing pressure on muni short rates pressures issuers to refinance with long-term, fixed-rate bonds, and in fact \$22.5 billion in new fixed-rate bond issues is on the calendar for the next 30 days—the largest such supply in five months. The crisis has also forced leveraged buyers and the margin clerks who haunt them to sell munis into an illiquid market. The prospect of further deleveraging and much more long-term bond supply, combined with thin trading, has pushed muni bond yields up at the same time Treasury yields are being bid down. Table G illustrates that the correlation of daily returns for ten-year Treasury and ten-year municipal bond returns has generally been high from 2001, but of late this correlation has broken down completely.

Municipal bond valuations are typically evaluated by their yield ratio versus Treasury securities of comparable maturity. In normal circumstances, muni yields are slightly *lower* than those of Treasuries, despite the modestly better credit quality and much better liquidity of Treasuries, because of muni bonds' considerable tax advantages.¹⁰ That normal negative yield spread has turned sharply positive recently as muni bond prices did not rally as much as did Treasuries (Table H). Relative to overvalued Treasury securities, munis are now quite cheap—once-in-a-generation cheap, according to PIMCO co-CEO Bill Gross. Is this undervaluation noteworthy for investors in the 35% U.S. federal tax bracket? It is. For most high-bracket investors, paying 35% taxes on ten-year Treasury yields and ending up with a 2.3% after-tax yield is not going to be palatable when ten-year muni bonds exempt from federal income taxes are yielding more than 4.0%. For investors in each tax bracket, however, there is a fulcrum point—a muni bond yield ratio at which after-tax yields on munis and Treasuries are equal. While the fulcrum point for a 35%-bracket investor is not something we are likely to see in the foreseeable future, recent muni yield premia are sufficient to attract investors even in lower income tax brackets, and this could provide a bit of further support for the market.

Does that mean that the pain is finished? Not necessarily. There is still some leverage in the system, and further supply and deleveraging could cause further price declines. However, prices should recover at some point, and meanwhile the bonds are kicking off 4% to 5% in tax-free income. Prospective after-tax returns are unlikely to beat our *long-term* return assumptions for equities, but they may top after-tax expected returns for absolute return hedge funds.

¹⁰ Most municipal securities offer income that is exempt from United States federal income tax, and also from state income tax if issued by a municipality located in the taxpayer's own state. Some muni bonds are subject to the federal alternative minimum tax. The income from Treasury securities, on the other hand, is typically exempt from state income tax but subject to federal income tax. This should not be construed as tax advice; please contact your tax expert for further details.

Can Muni Bonds Serve as a Disaster Hedge?

An important role of bonds is to provide a hedge against a prolonged economic contraction and/or a malign deflationary period, buttressing an equity-dominated portfolio from what could be savage declines in asset prices. In these periods, interest rates tend to decline significantly as investors seek safety and central banks push short-term borrowing rates lower, boosting bond prices. Can municipal bonds serve in this deflation-hedging role for taxable investors, just as tax-exempt institutions typically use intermediate- to long-duration Treasuries or high-quality corporate bonds?¹¹ It is worthwhile to examine individually the characteristics that inform our view of whether muni bonds can be an appropriate core for a deflation-hedge bond portfolio.

- **Liquidity.** Municipal bonds, as discussed earlier, have limited liquidity, but even in times of crisis a well-constructed and professionally managed portfolio should have adequate liquidity to allow bonds to be sold without investors suffering overly punitive trading spreads. The lower liquidity of municipal bonds is likely to result in prices that are somewhat less responsive in crises than those of Treasuries, as investors demand a greater yield premium for less-liquid munis (as has been the case in recent months).
- **High quality.** Municipal bonds have maintained very low default rates in the post-1970 period. But the United States has not seen a prolonged economic contraction during that period, so it is worthwhile to look back much further in time at the extant but vastly smaller muni market of the period from 1839 to 1965—a period that included several deep recessions and depressions. From 1929 through 1937, during the Great Depression, an estimated 15% of the \$18.5 billion municipal debt market ended up in default, although many of the defaults were short-lived and investors were largely made whole (the total loss of principal and interest was 0.5% of the total muni market—this compares quite favorably with the corporate bond environment).¹² In the post-Civil War period from 1873 to 1879, defaults were serious, with nearly a quarter of the \$1 billion market defaulting, resulting in eventual principal and interest losses of 15%.¹³ Going back further still in the historical record, the deflationary period from 1837 to 1843 resulted in widespread repudiation of state debt, as states were faced with the prospect of needing to use now-more-valuable dollars to repay debt. Four states skipped interest payments, and five unilaterally canceled their debt entirely.¹⁴ The default rate during the period equaled 51% of the tiny (even in today's dollars) \$245 million muni bond market.¹⁵ Of course, municipal finance has evolved significantly since those days, as markets have become broader and deeper and risk management skills have improved. Nonetheless, the risk of default in a

¹¹ While non-callable, high-quality corporate bonds should provide reasonable diversification in a recession, we would caution against relying on them to hold up in a malign deflationary period, as even the highest-quality corporations can experience financial distress.

¹² From George Hempel's exhaustively researched 1971 book *The Postwar Quality of State and Local Debt*, available via the National Bureau of Economic Research's website at www.nber.org.

¹³ Hempel, 1971. Many of these defaults, particularly those in the Southern states, were repudiations.

¹⁴ Murray Rothbard, "Repudiating the National Debt," January 16, 2004, available on the website of the Ludwig Van Mises Institute, www.mises.org.

¹⁵ Hempel, 1971.

prolonged economic contraction or deflationary period is present, though likely to be less than the severe examples of the distant past.

Bonds with very high underlying credit quality, rather than simply an insurance-generated high rating, should perform better and be less likely to default in a grinding economic contraction. General-obligation bonds have not been devoid of problems, but they are perceived as considerably safer than other types such as tobacco bonds or hospital bonds.

- **Call features.** Municipal bonds are often callable by their issuers. When interest rates fall (as they would generally be expected to do in a deflationary event), issuers would have the incentive to call in their outstanding bonds at par (they would likely be trading at a premium to par). For this reason, callable bonds will rise in value during a falling-rate environment, but the price increases will dwindle as the call option becomes more attractive to the issuer. When a bond is called, the reinvestment environment is often not as attractive as it was when the bond was issued. The call options inherent in muni bond portfolio are not ideal, but most bonds have a decade of call protection post-issuance, limiting the ill effects somewhat.
- **Maturity.** Municipal bonds with long maturities and durations are plentiful, and in fact relatively long durations are preferred for a deflation-hedging portfolio. The longer durations will provide a larger “kick” from falling rates,¹⁶ although given a municipal bond and a Treasury bond of the same duration, the Treasury’s yield will likely fall further and its price will rise higher.¹⁷
- **Tax-hedging traits.** Municipal bonds offer a hedge against federal income tax increases, assuming they retain their income-tax protection. This hedge may well be particularly useful to the investor in a deflationary period, if marginal tax rates are increased to provide additional tax revenues to fund various bailout programs and fiscal stimuli, and/or to compensate for shrinking capital gains and corporate profit tax income streams. Increasing marginal tax rates, *ceteris paribus*, will result in lower muni yields and higher muni prices.

Reviewing these characteristics, it appears that municipal bonds are appropriate for portfolios intended to protect against malign deflation and prolonged economic contraction. This is particularly true when one considers that the after-tax opportunity cost of owning muni bonds relative to higher-returning assets is significantly less than the opportunity cost of owning Treasuries and paying 35% tax on their coupon income.

¹⁶ Assuming that the rate decrease over time is uniform across the yield curve.

¹⁷ This effect is likely due to liquidity premia, call provisions, and to the fact that if yields on taxable Treasuries fall by 100 bps, an identical 100 bps fall in municipal bond yields would result in a shrinking taxable-equivalent yield spread to Treasuries.

Advice for Holders of Municipal Bonds

A taxable investor with an allocation to municipal bonds should:

1. *Evaluate opportunities on an after-tax, total-return basis.* The bond that minimizes taxes the most (such as New York bonds for a taxpayer that pays New York city and state income taxes) may not offer the best prospects for after-tax total return.
2. *Diversify across states*, which reduces exposure to potential defaults by the home state or local institution, and which may even increase after-tax returns (bonds issued by states without high income taxes typically need to offer higher yields to attract investors—those yield premia will at times more than compensate for the state tax liability on the income).¹⁸
3. *Consider your reasons for owning the bond portfolio and structure it accordingly.* If the portfolio is primarily intended as a deflation hedge, as discussed above, it should be dominated by very high underlying quality, relatively liquid bonds with a degree of call protections, and relatively long maturities. Investors should also consider adding a sprinkling of Treasuries to the mix in a deflation-hedging portfolio, despite their lower expected after-tax return, in periods when Treasury valuations are favorable (with Treasury valuations currently stretched and muni valuations attractive, now is certainly not the time to move in that direction, however).

Other Storm Clouds on the Horizon

Muni defaults are rare indeed, but it is worth noting that the revenue picture for states in the coming years is far from clear as the economy slows and property values sink (some counties with large house price declines and rafts of foreclosure filings will need to cut services significantly or spread tax increases across a tax base that is already suffering). Some municipalities have also painted themselves into a corner with promises of pension and retiree health benefits that are beyond their means. When the bills on these pledges come due, the politicians who made the promises are no longer in office, and it is left to future generations to fund them. The picture is not pretty, but a massive increase in defaults is unlikely, particularly outside of hospital issues. Municipalities generally maintain broad authority to levy taxes and fees, providing them with considerable cushion in the event of a revenue downturn.

Another concern is on the legislative front. It is *possible* but not at all likely that a shift in the income tax structure, or even in the tax exemption of muni bond interest, would eliminate or reduce the tax advantages of municipal bonds, hitting their prices broadly. There appears to be no such legislation on the horizon, however. More likely in the current political and fiscal environment would be an increase in income taxes, which might make munis advantageous to even more investors. Movement on this is possible, but is far from certain and likely years away in any case—don't hang your hat on it.

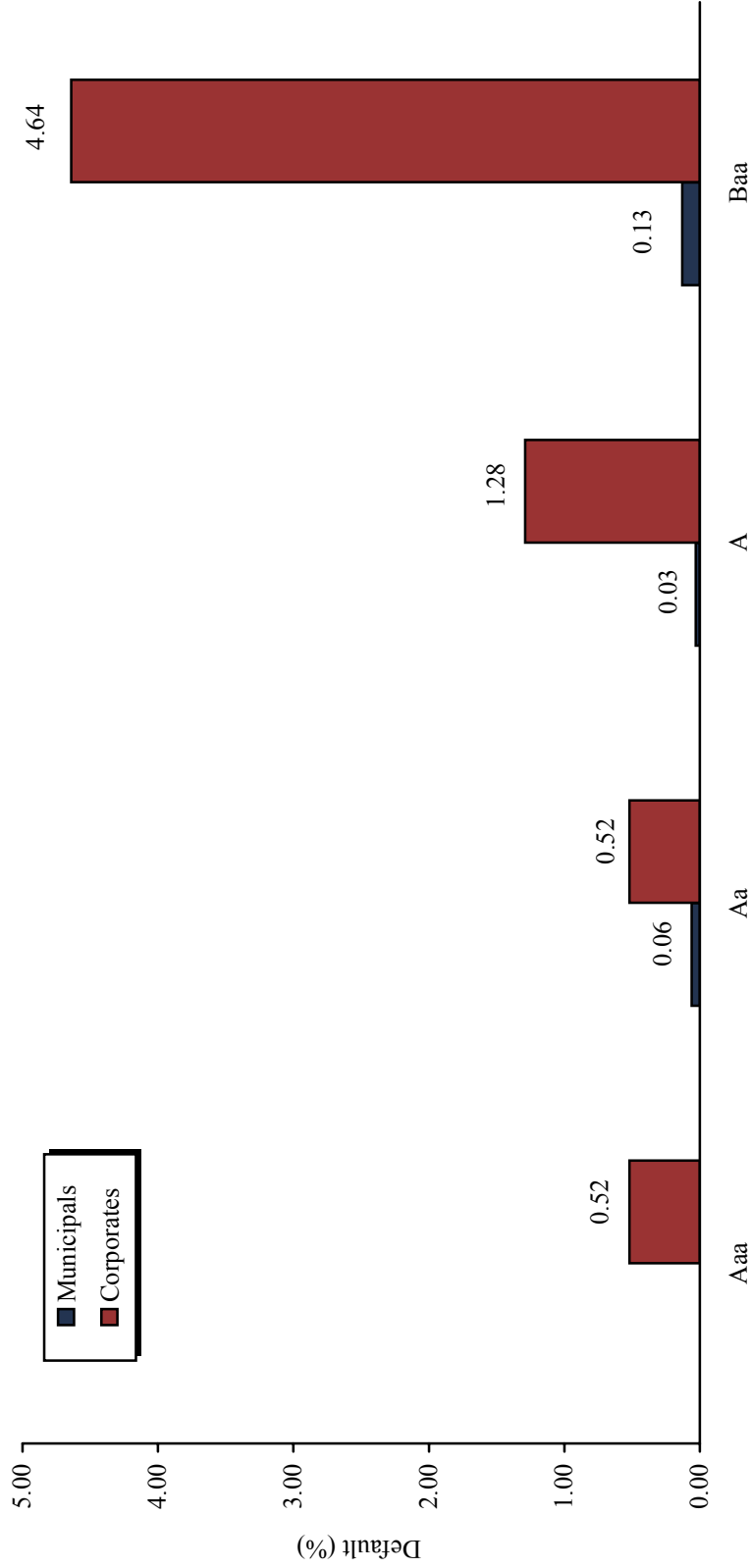
¹⁸ See the brief discussion later in this paper of *Kentucky v Davis*.

A third concern relates to a current Supreme Court case: *Kentucky v Davis*. Income from municipal bonds that are issued by an investor's home state are not subject to tax by that home state. For instance, a New York City resident who owns New York City bonds generally pays no federal *or state* tax on the bonds' coupon payments. In deciding *Kentucky v Davis* (a ruling appears likely by mid-summer), the court will determine whether this state tax exemption is lawful. If the justices decide that it is not, we would expect to see the bonds of states with large, affluent populations and high income tax rates to decline in price relative to bonds of smaller states or states with no income tax. New York's bond yields would need to become competitive with Nevada's and South Dakota's, for example.

Conclusion

The turmoil in the municipal bond market has engendered fear, confusion, and volatility, and these in turn have created a beneficial opportunity for those investors who have available cash and the stomach for continued volatility (and who do not put themselves at the mercy of a margin clerk).

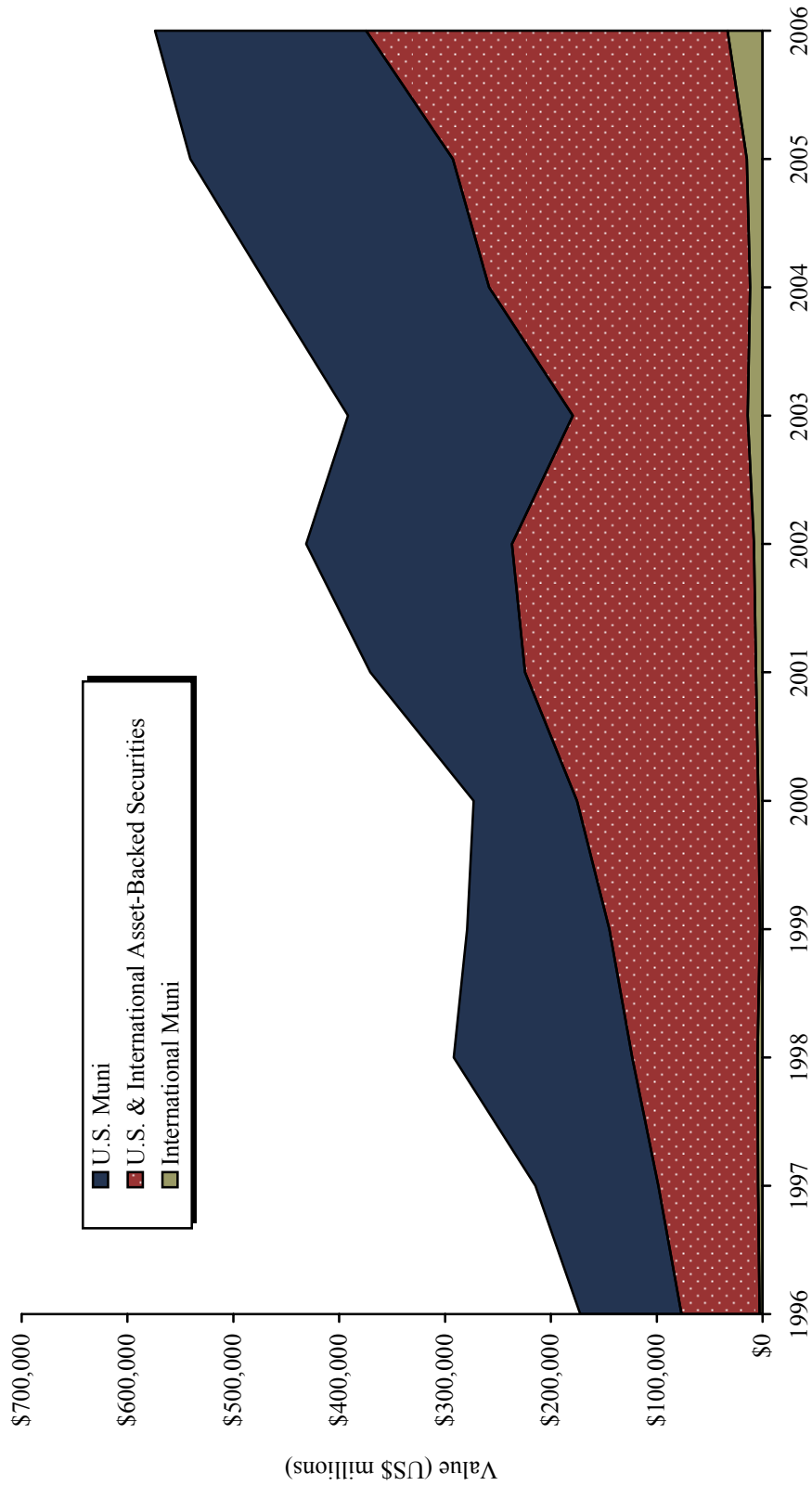
Table A
CUMULATIVE TEN-YEAR DEFAULT RATES OF MUNICIPAL BONDS VS CORPORATE BONDS
BY CREDIT RATING
1970–2006



Sources: Moody's Investors Service and Standish Mellon.

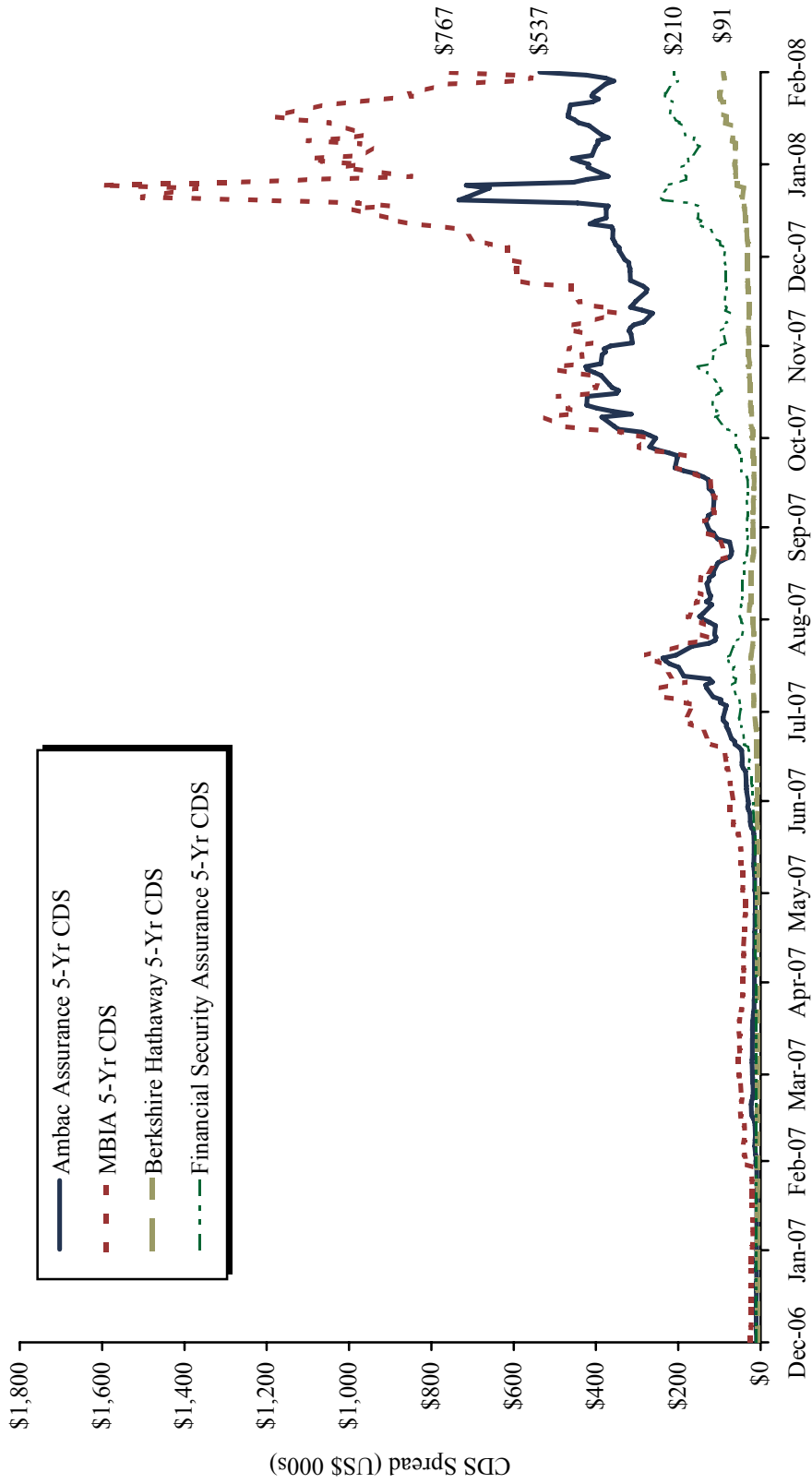
Notes: The Aaa municipal default rate is zero percent. Baa is Moody's lowest investment-grade rating, equivalent to a BBB rating from Standard & Poor's.

Table B
BREAKDOWN OF BOND INSURANCE WRITTEN BY MONOLINE INSURERS
1996–2006



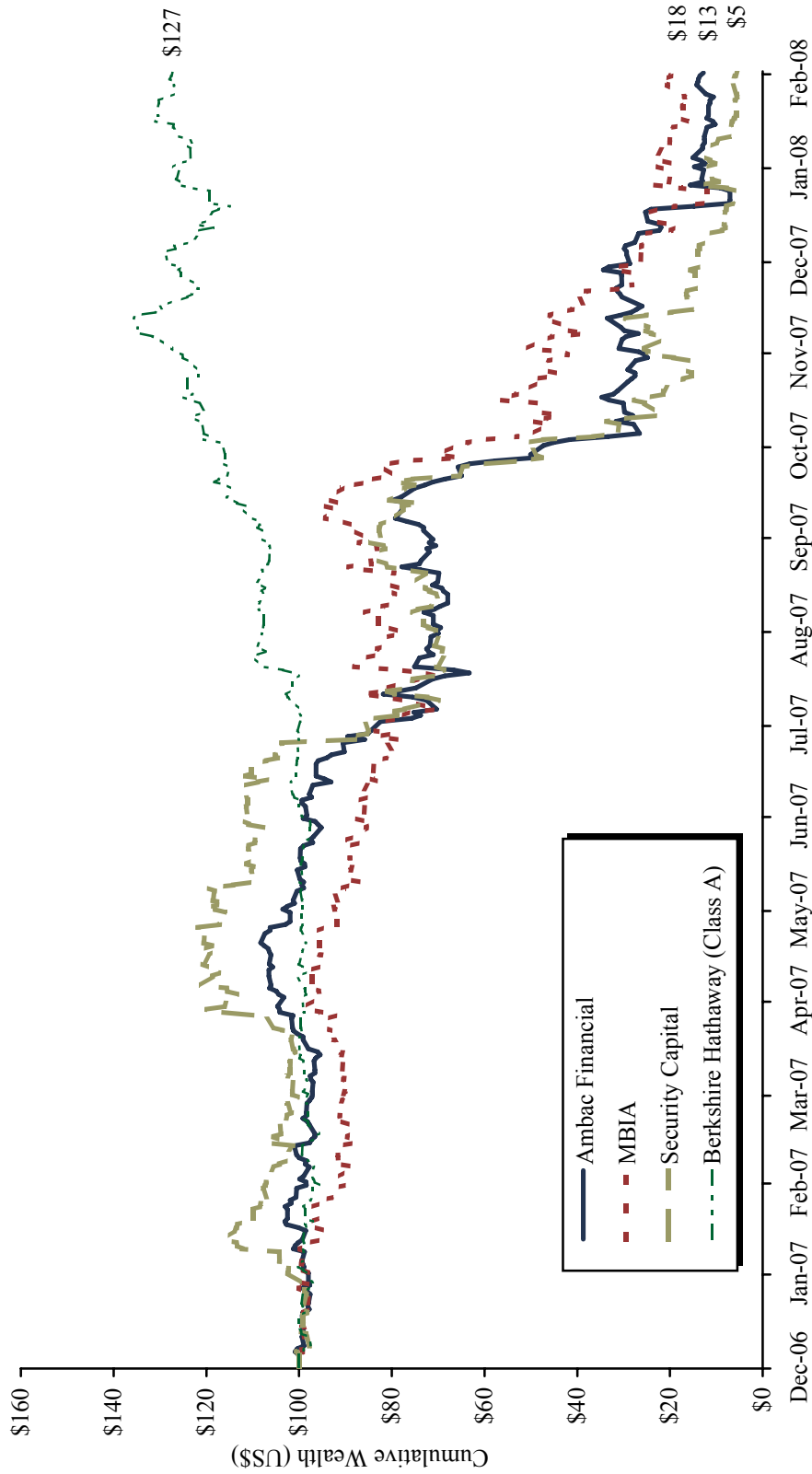
Source: Association of Financial Guaranty Insurers.

Table C
CREDIT DEFAULT SWAP SPREADS FOR SELECTED INSURERS
December 31, 2006 – February 29, 2008



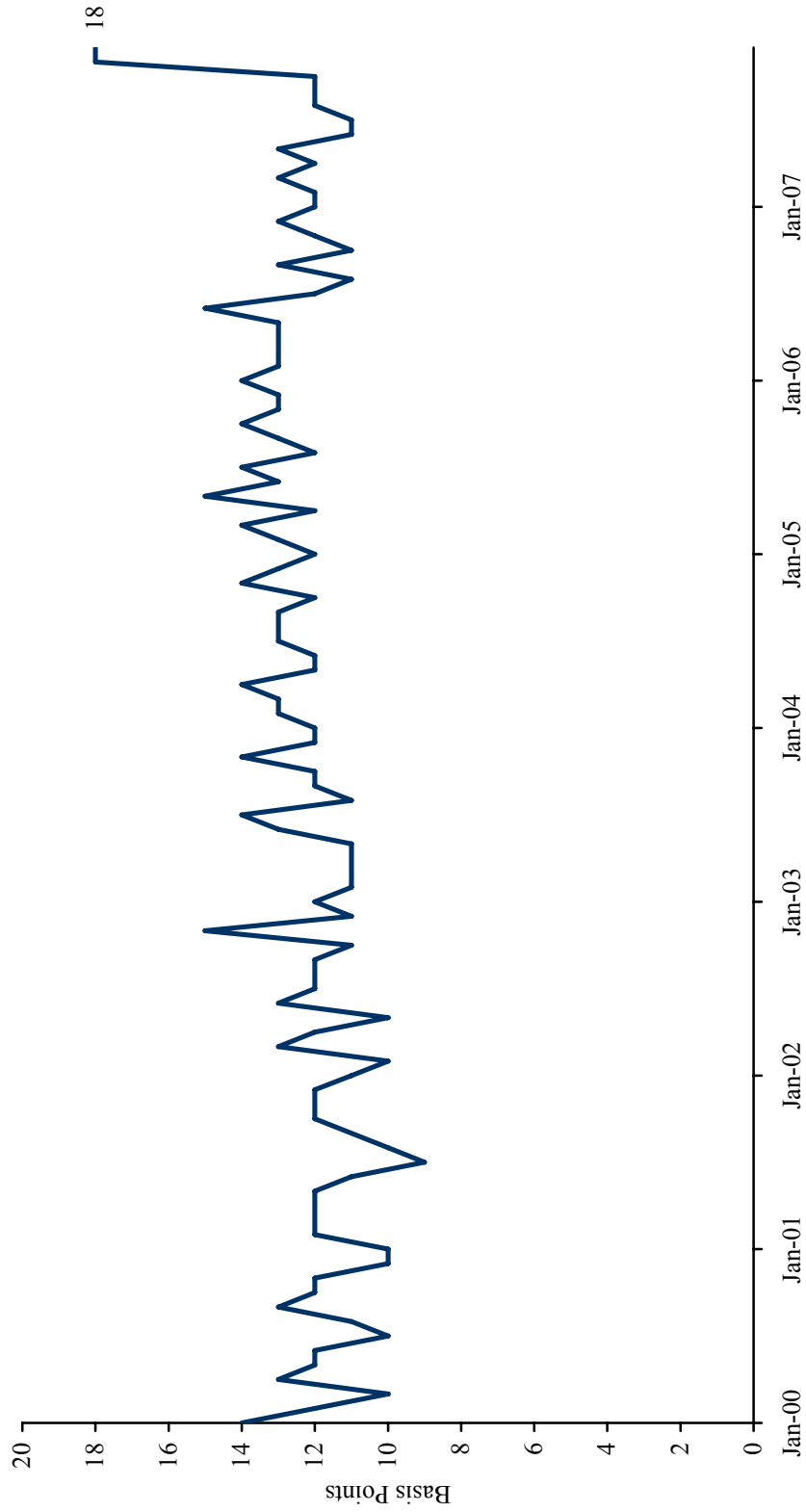
Source: Thomson Datastream.

Table D
CUMULATIVE WEALTH OF SELECTED INSURER SHARES
December 31, 2006 – February 29, 2008



Source: Thomson Datastream.

Table E
YIELD SPREAD OF INSURED MUNICIPAL BONDS TO AAA GENERAL OBLIGATION MUNICIPAL BONDS
January 31, 2000 – December 27, 2007

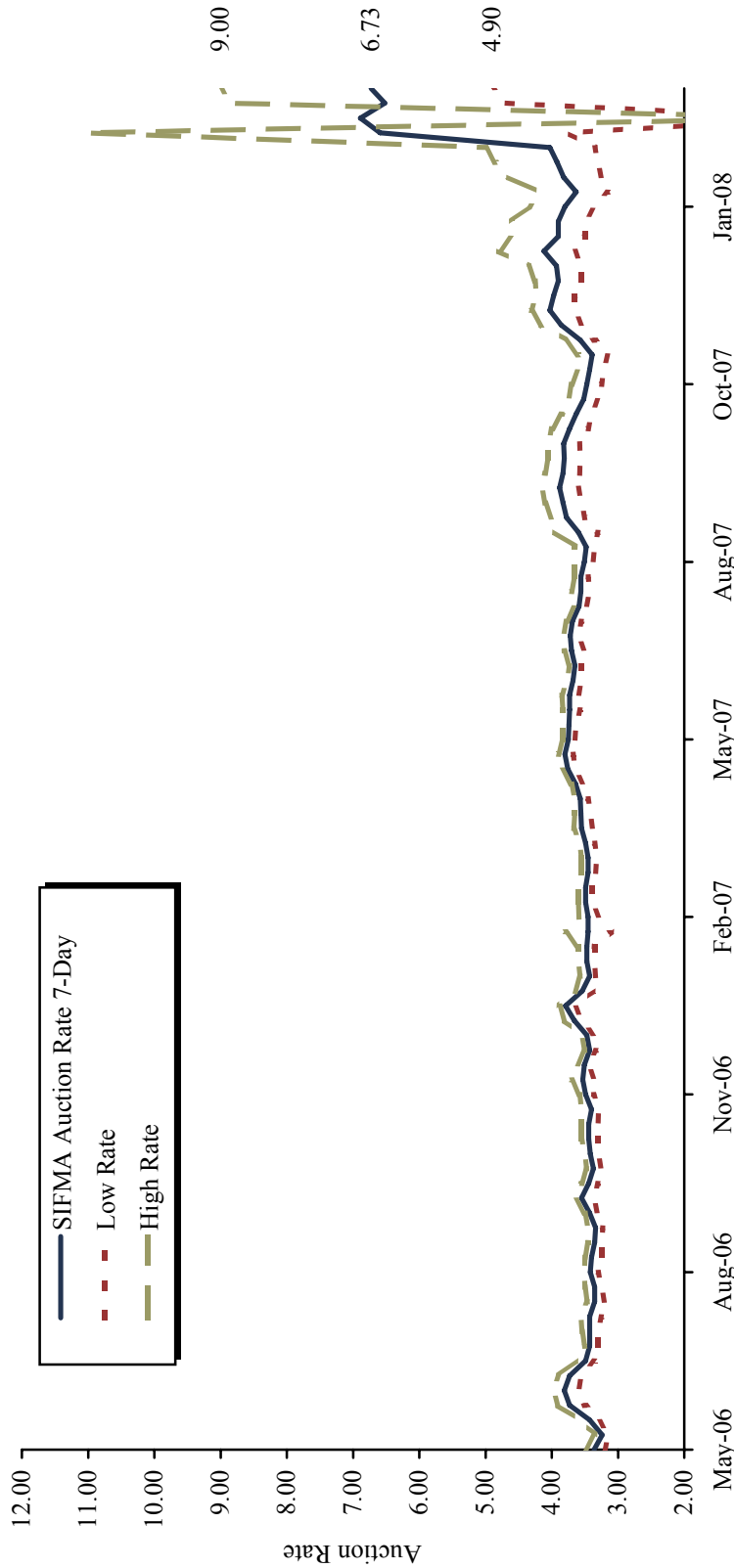


Sources: Standish Mellon and Thomson Datastream.

Table F

DISPERSION OF AUCTION RESULTS FOR AUCTION-RATE MUNICIPAL SECURITIES

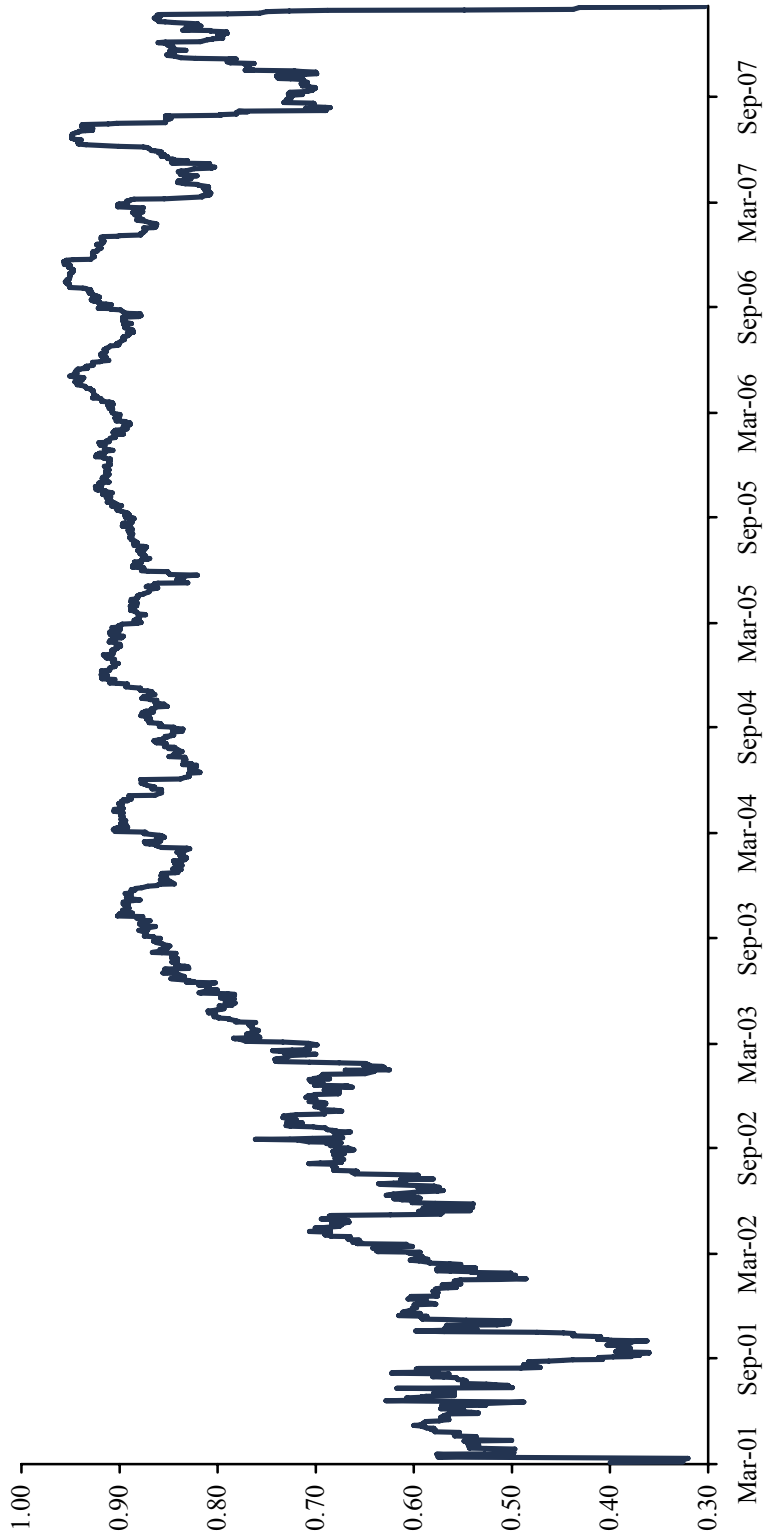
May 31, 2006 – March 5, 2008



Sources: Securities Industry and Financial Markets Association and Thomson Financial.

Notes: The SIFMA Auction Rate 7-Day Index is composed of ARS issues provided by broker dealers and auction agents. Those data are replaced the SIFMA 7-Day Tax-Exempt Index on August 22, 2007. Due to widespread auction failures, rate data for the week of February 20, 2008, are unavailable. It is represented here by the average of the rates of the weeks immediately prior and after.

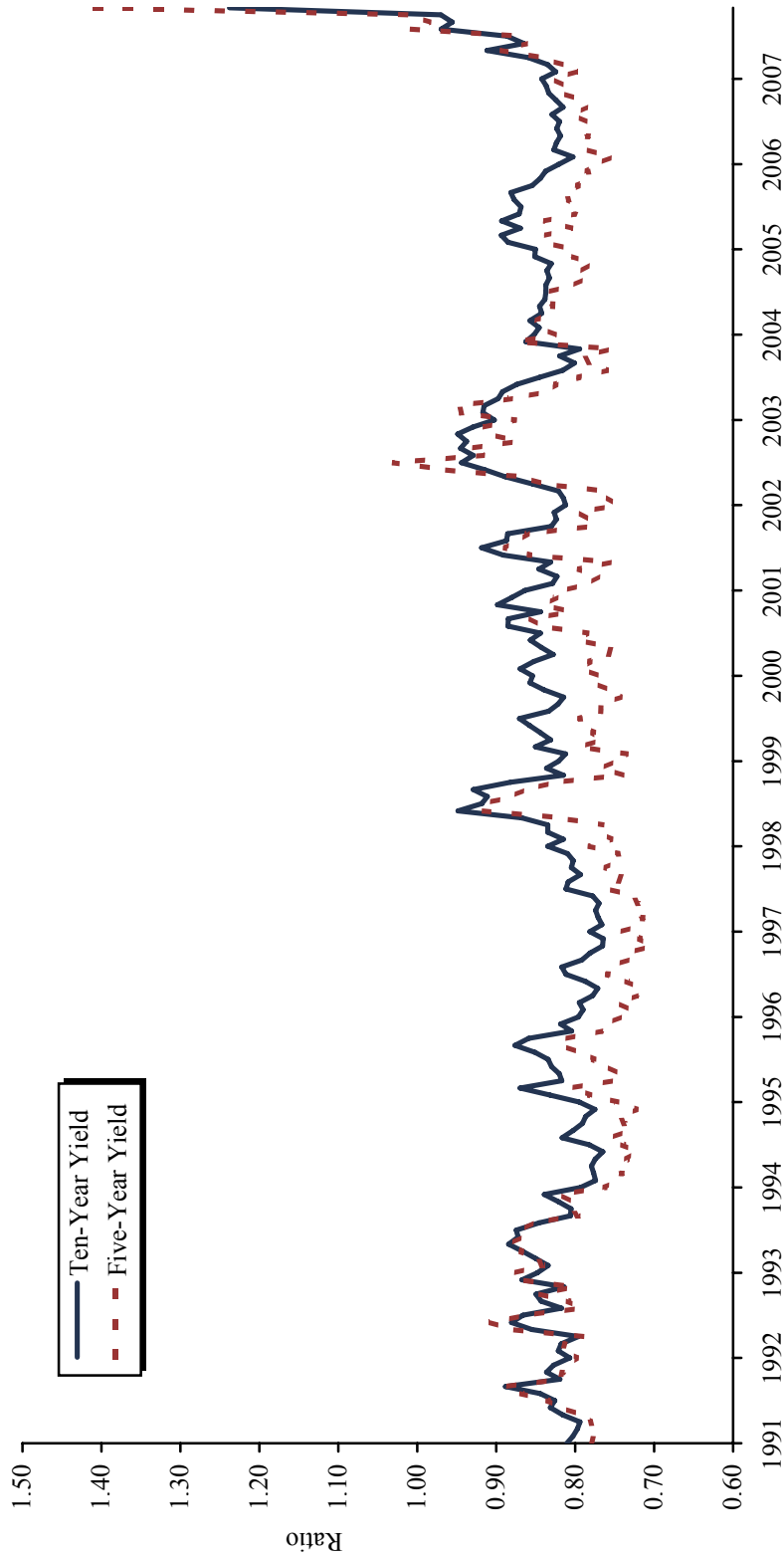
Table G
ROLLING CORRELATION OF TREASURY BOND AND MUNICIPAL BOND DAILY RETURNS
March 30, 2001 – March 6, 2008



Sources: Citigroup Global Markets, Lehman Brothers, Inc., and Thomson Datastream.

Note: Graph shows rolling three-month correlation of daily returns of Lehman Brothers Ten-Year Municipal Bond Index to Citigroup Ten-Year Treasury Bond Index.

Table H
RATIOS OF MUNICIPAL BOND YIELDS TO U.S. TREASURY YIELDS
April 30, 1991 – February 29, 2008



Sources: Citigroup Global Markets, Lehman Brothers, Inc., and Thomson Datastream.

Note: Indicates the ratio of the yields of the ten- and five-year Lehman Brothers municipal bond indices to the yields of the Citigroup ten- and five-year Treasury bond indices.