

Note

Credit Default Swaps on Municipal Bonds: A Double-edged Sword?

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The municipal bond market has traditionally been viewed as a relatively safe market, where credit risk wasn't a primary concern. The spate of fiscal crises that state and local governments have experienced in recent years, however, has changed this narrative. With credit risk increasingly on the forefront of investors and bond issuers' minds, credit default swaps ("CDSs") loom large as a financial derivative that can directly mitigate or hedge municipal credit risk. A nascent market for municipal credit default swaps (muni CDSs) does exist. The market, however, is thinly traded, and, for a number of reasons, a robust muni CDS market has not yet developed.

This Note explores whether a more robust muni CDS market should be developed and considers the available options for doing so. While a number of policies could make the muni CDS market safer and more robust, policymakers must grapple with costs and benefits that come with more widespread use of muni CDSs. Besides tracing the reasons for the historical lack of a robust muni CDS market, this Note makes a number of additional contributions. It provides an overview of the mechanics and state of the extant muni CDS market. Additionally, it argues that the current distressed conditions within the municipal bond market may be tempering some of the constraints that have historically limited the muni CDS market. It also suggests a number of proposals that would help make the muni CDS market more robust, while also discussing at length the costs and benefits of these proposals.

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Introduction

Although the municipal bond market has traditionally been viewed as a relatively safe market where credit risk was not a primary concern,¹ recent history suggests that market participants may have to pay more attention to a municipality’s ability to make its payments in full and on time. State and local governments have experienced a spate of fiscal crises in recent years, some of which have even ended in defaults and bankruptcies.² As credit risk becomes more of a concern for market participants, credit default swaps (CDSs) could be a financial instrument that mitigates or hedges the credit risk of these municipal bonds. CDSs are financial derivatives that function as insurance against credit events of the underlying securities (i.e. municipal bonds). Thus, the owner of a CDS can directly hedge the credit risk associated with owning

1. The risk is that the borrower (in this case the issuer of the bond) will not be able to make payments in full. See, e.g., Sugato Chakravarty & Asani Sarkar, *Liquidity in U.S. Fixed Income Markets: A Comparison of the Bid-Ask Spread in Corporate, Government and Municipal Bond Markets* 2 (FRB New York, Staff Report No. 73, 1999), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=163139 [<http://perma.cc/7NZY-X7P5>].

2. See John Patrick Hunt, *Constitutionalized Consent: Preemption of State Tax Limits in Municipal Bankruptcy*, 34 YALE J. ON REG. 391 (2017); Richard Ravitch & Paul Volcker, *Final Report*, ST. BUDGET CRISIS TASK FORCE (2014), http://www.pgpf.org/sites/default/files/state_budget_crisis_task_force_finalreport_01142014.pdf [<http://perma.cc/C587-T9DK>].

the underlying bond.³ Indeed, CDSs are widely used in corporate, sovereign, and other credit markets.⁴

A nascent market for municipal credit default swaps (muni CDSs) exists; however, these CDS instruments are thinly traded, with notional amounts that are small compared with the cash municipal bond market and with other CDS markets.⁵ To date, a robust muni CDS market has not yet developed for a number of reasons. First, given the low historical rate of municipal defaults, investors have not traditionally demanded protection against credit events. Second, municipal bonds are largely concentrated in the hands of investors who invest in these securities for their tax advantages and hold them to maturity. Another hurdle to more widespread use of muni CDSs is the fact that muni CDSs do not receive the same tax benefits as the underlying cash instruments.

This Note will evaluate the normative arguments for developing a robust muni CDS market and consider the options available for doing so. While a number of policies could make the muni CDS market safer and more robust, policymakers must also grapple with the complex set of costs and benefits associated with the more widespread use of muni CDSs.⁶ Although this Note does not make a definitive recommendation, it does aim to tee up these questions and provide policymakers with a framework for considering the trade-offs of a more robust muni CDS market.

This Note is the first academic article to provide a unified historical and market-based explanation for the lack of credit default swaps or other credit-hedge instruments in the municipal bond market. While there is no shortage of scholarly commentary on the municipal bond market⁷ or state and local government budget crises,⁸ no article to date has focused specifically on the credit risk posed by municipal bonds and the potential means of mitigating such risk.

3. Patrick Augustin et al., *Credit Default Swaps: Past, Present, and Future*, 8 ANN. REV. FIN. ECON. 175, 177 (2016).

4. *Id.*

5. Cate Long, *There Is No Municipal CDS Market*, REUTERS (Jan. 12, 2012), <http://blogs.reuters.com/muniland/2012/01/12/there-is-no-municipal-cds-market-treasurer-lockyer> [<http://perma.cc/QSX3-F6AF>].

6. *See infra* Part IV.

7. *See, e.g.*, William J. Casey & Owen T. Smith, *A New Look at Municipal Bonds—Disclosure Responsibilities in the Municipal Bond Market*, 50 ST. JOHN'S L. REV. 639 (1976); Charlotte W. Rhodes, *Living in a Material World: Defining “Materiality” in the Municipal Bond Market and Rule 15c2-12*, 72 WASH. & LEE L. REV. 1989 (2015); Steven L. Schwarcz, *A Minimalist Approach to State “Bankruptcy,”* 59 UCLA L. REV. 322 (2011).

8. *See, e.g.*, Dorothy A. Brown, *Fiscal Distress and Politics: The Bankruptcy Filing of Bridgeport as a Case Study in Reclaiming Local Sovereignty*, 11 BANKR. DEV. J. 625 (1995); M. Heath Frost, Comment, *States as Chapter 9 Bankruptcy Gatekeepers: Federalism, Specific Authorization and Protection of Municipal Economic Health*, 84 MISS. L.J. 817, 832-34 (2015); David Gamage, *Preventing State Budget Crises: Managing the Fiscal Volatility Problem*, 98 CALIF. L. REV. 749 (2010); Hunt, *supra* note 2; Melissa B. Jacoby, *Federalism Form and Function in the Detroit Bankruptcy*, 33 YALE J. ON REG. 55 (2016); David A. Skeel Jr., *States of Bankruptcy*, 79 U. CHI. L. REV. 677, 689-718 (2012).

In addition to tracing the reasons for the historical lack of a robust muni CDS market, this Note makes a number of novel contributions. It provides an overview of the mechanics, size, and state of the extant muni CDS market. It also argues that the current distressed conditions within the municipal bond market may be removing (or at least mitigating) some of the constraints that have historically limited the muni CDS market. It suggests a number of proposals that would help make the muni CDS market more robust (i.e., safer, more liquid, and more price-transparent⁹), while also discussing at length the costs and benefits of these proposals. Thus, a significant part of this Note's contribution is to inform policymakers (primarily at the federal level) who are deliberating the normative issue of supporting a more robust muni CDS market. Given the lack of academic treatment of this subject, Parts II and III rely heavily on industry reports and news articles. Part IV, which suggests reforms that can create a more robust market and evaluates the costs and benefits of these reforms, draws on relevant theoretical and empirical work in economics.

The rest of this Note proceeds as follows: Part I provides a brief overview of the mechanics of the muni CDS market. Part II explains the historical lack of credit risk instruments in the municipal bond market by looking at demand and supply dynamics while introducing the concept of informationally insensitive debt. Part III argues that the emergence of credit risk as an increasingly important risk factor counteracts some of the constraints identified in Part II and explains why CDSs are superior to alternative sources of credit hedging. Part IV considers a series of proposals that would create a more robust muni CDS market and weighs the pros and cons of muni CDSs becoming more widely used. Lastly, this Note concludes by situating muni CDSs in the current economic and policymaking environment.

I. Understanding the Muni CDS Market

A. *Muni CDS Market Mechanics*

This section lays out the mechanics of the muni CDS market as it currently exists. It touches on CDS economics, credit events, settlement, standardization and clearing, and arbitrage, all critical factors underlying the market.

9. Price transparency refers to the ability of market participants to discern the value of securities (or other items) being traded in a market. A more liquid market, with more trades and opportunities for market participants to gather data on the value of securities, is generally more transparent and will have lower costs associated with each transaction. See, e.g., Amy Edwards, Lawrence Harris & Michael Piwowar, *Corporate Bond Market Transaction Costs and Transparency*, 62 J. FIN. 1421, 1421-22 (2007); Lawrence Harris & Michael Piwowar, *Secondary Trading Costs in the Municipal Bond Market*, 61 J. FIN. 1361, 1362 (2006).

1. CDS Economics

CDSs are essentially a form of insurance. The protection buyer pays the protection seller a periodical premium (similar to an insurance premium) in return for protection against a credit event of the underlying debt instrument's issuer. If no credit event occurs over the duration of the CDS contract, only the premiums are exchanged between buyer and seller. If a credit event transpires, however, the protection seller compensates the protection buyer for the loss on the underlying bond (the protection seller pays the protection buyer the par value of the bond in exchange for a delivered bond).¹⁰ The protection buyer typically has the option to deliver a bond with a maximum maturity of thirty years.¹¹ Economically, this is equivalent to the protection seller paying an amount equal to the contract notional value minus the value of "deliverable" debt obligations issued by the reference entity (the municipality). This amount is also known as the "recovery value."¹²

2. Credit Events

As mentioned above, a CDS contract is settled upon the occurrence of a credit event. For muni CDSs, there are two types of credit event triggers: (1) failure to pay and (2) restructurings. Failure to pay is straightforward: It is "a failure to pay under an Obligation of the Reference Entity in accordance with the terms of the Obligation at the time of the failure."¹³ A restructuring refers to "a modification of the terms of an Obligation of the Reference Entity so as to delay or reduce the Reference Entity's payment obligation."¹⁴

3. Settlement

Traditionally, the default form of settlement in the muni CDS market has been physical settlement. In a physically settled transaction, upon the occurrence of a credit event, "[the] protection buyer delivers to the [protection seller] a par amount of Deliverable Obligations of the reference entity equal to the notional amount in return for a cash payment equal to the notional amount."¹⁵ As noted above, the protection buyer has the option of delivering

10. This proposition assumes physical settlement. If the transaction was cash settled, no bond would be physically delivered. See *infra* note 17 for further discussion on cash compared to physical settlement.

11. See SIVAN MAHADEVAN ET AL., CREDIT DERIVATIVES INSIGHTS: HANDBOOK OF CREDIT DERIVATIVES AND STRUCTURED CREDIT STRATEGIES 148 (2011).

12. INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT 57 (2013).

13. Lary Stromfeld, *Credit Default Swaps for Municipal Reference Entities*, CADWALADER, WICKERSHAM & TAFT LLP 10 (May 2008), http://www.sourcemediaconferences.com/BBDeri08/pdf/Lary_Stromfeld.pdf [<http://perma.cc/UJA9-H7DQ>].

14. *Id.*

15. *Id.* at 5.

any bond with a maximum maturity of thirty years and receiving par from the protection seller.¹⁶

Cash settlement is an alternative form of settlement that does not require the physical exchange of the underlying securities.¹⁷ With the latest International Swaps and Derivatives Association (ISDA) muni CDS protocol, cash settlement is now the market norm.¹⁸ In a cash settlement process, the payment from the protection seller to the protection buyer after a credit event is equivalent to the par value of the reference obligation (the municipal bond), minus the recovery rate. This value will equal the “market price” of the bonds at a set time after the credit event occurs. This market price is typically determined by soliciting quotes for the underlying bond from bond dealers in an auction-like process.¹⁹

4. Standardization & Clearing

Standardization of derivatives helps increase transactional efficiency—instead of renegotiating terms for every new derivative contract, standardization allows parties to agree to a set of rules and norms that apply to all contracts. Central clearing of derivatives, on the other hand, is aimed at reducing counterparty risk within the derivatives market. By forcing transactions to go through a central clearing house, central clearing allows for positions to be netted out across counterparties, reducing the risk that a large counterparty’s inability to unwind its positions properly would have substantial negative externalities for the rest of the market. After the financial crisis, standardization and central clearing were implemented for many derivatives, in part as a response to the havoc that Lehman Brothers’s failure wrought upon the financial system.²⁰

Muni CDS market participants aren’t legally obligated to adopt standardization or central clearing. Indeed, to the extent this market exists,

16. Mahadevan, *supra* note 11.

17. Note that cash settlement and physical settlement are economically equivalent. To see this, note that in a cash settlement process, the protection seller pays the protection buyer (notional) * (1-RR), where RR is the recovery rate. So if RR is lower, the seller has to pay more, which makes sense. In a physical settlement process, the protection seller pays to protection buyer cash equal to notional amount, in exchange for a par amount of deliverable bonds (market value = recovery value, or 1-RR).

18. ISDA is a trade association composed of broker-dealers and other market participants that provides internal market rules and protocols that market participants sign on to for purposes of standardization and transactional efficiency. In short, it helps the industry resolve collective action problems. See 2012 ISDA U.S. Municipal Reference Entity CDS Protocol, INT’L SWAPS & DERIVATIVES ASS’N (2012), <http://www.isda.org/2012MuniCDSProt/docs/2012%20ISDA%20U.S.%20Municipal%20Reference%20Entity%20Protocol.pdf> [<http://perma.cc/4UEF-D9P7>] [hereinafter *ISDA Protocol*].

19. Stromfeld, *supra* note 13, at 4.

20. Kimberly Summe, *An Evaluation of the U.S. Regulatory Response to Systemic Risk and Failure Posed by Derivatives*, 4 HARV. BUS. L. REV. ONLINE 76, 76 (2014), http://www.hblr.org/wp-content/uploads/2014/04/Summe_-_Regulatory-Response-to-Derivatives.pdf [<http://perma.cc/QXZ6-CYDJ>].

trades are conducted on a bilateral, over-the-counter basis. Nonetheless, there have been efforts to introduce a degree of standardization within the market. In particular, ISDA introduced a muni CDS protocol in 2012.²¹ This protocol specifies, among other things, mandatory cash settlement, rolling “look-backs” for credit events and succession events, standardized fixed-rate and three-month initial calculation periods, a recovery rate assumption of seventy-five percent for pricing purposes, an automatic trigger for a “Restructuring Credit Event,” and new or revised templates for different types of muni CDSs.²² Although market participants are not legally obligated to sign on to these protocols, they are incentivized to do so, especially if the largest market participants have already done so.²³

B. The Historical Lack of Credit Risk Instruments

Although the basic legal, operational, and economic structures exist for creating a robust market for hedging municipal credit risk, such a market does not exist. The historic lack of such a market can be explained through a combination of demand-side constraints, supply-side constraints, and the informational insensitivity of the municipal bond market.

1. Demand-Side Constraints

A number of demand-side market dynamics contribute to the public perception that municipal bonds are not credit-risk instruments. Municipal bonds have traditionally been held by private “retail” investors and not by hedge funds, which might be more likely to put on credit risk hedges.²⁴ The concentration of municipal bond demand in the private investor space is largely a function of these bonds’ tax-exempt status, which attracts wealthy individuals.²⁵ These investors also demand municipal bonds for their ability to deliver safe, attractive yields, especially in low interest-rate environments.²⁶

21. See *ISDA Protocol*, *supra* note 18.

22. Stromfeld et al., *ISDA March 2012 Supplement and Protocol: Updating Muni CDS*, Cadwalader Wickersham & Taft LLP (2012), <http://www.lexology.com/library/detail.aspx?g=2affc945-32b4-425f-b7de-ebab3fc3b65a> [<http://perma.cc/UDP6-WJSZ>].

23. In effect, these ISDA protocols function as standardized contracts that help with market coordination and transactional efficiency. If the dominant market players have signed on, smaller players will likely have to adopt the protocol in order to participate in the market.

24. Hedge funds are generally more sophisticated investors, have higher appetites for risk, and are more likely to use more sophisticated means of hedging (or alternatively, speculating on) a specific type of risk.

25. Nicole Bullock & Aline van Duyn, *California Treasurer Joins Debate on CDS*, FIN. TIMES (Mar. 31, 2010), <http://www.ft.com/content/887139c2-3d14-11df-b81b-00144feabd0?mhq5j=e6> [<http://perma.cc/GX6C-XBTG>].

26. See SEC. & EXCH. COMM’N, REPORT ON THE MUNICIPAL SECURITIES MARKET, at v (2012), <http://www.sec.gov/news/studies/2012/munireport073112.pdf> [<http://perma.cc/53UH-C6ZM>] (“Individuals, or ‘retail’ investors, directly or indirectly hold more than 75% of the outstanding principal amount of municipal securities. The municipal securities market traditionally has been described as a

Although there has been some recent rotation out of the household sector²⁷ into mutual funds and exchange-traded funds (ETFs), hedge funds are estimated to comprise only five percent of the municipal bond market.²⁸ The upshot is that municipal bond investors tend to hold these bonds to maturity, and these securities are not traded very frequently in the secondary market.²⁹ This also means that municipal bonds are less likely to be bought and sold for speculative purposes, which contributes to a lack of demand for credit-risk hedges. These factors, coupled with the historically low rate of defaults in the municipal bond market, mean that municipal bonds are typically thought of as tax and interest rate products—and not credit products requiring credit risk hedges.

2. Supply-Side Constraints

A number of factors have prevented the muni CDS market from flourishing on the supply side. For example, municipal bond issuers—who have influence over the broker-dealers who underwrite their bond issuances and who are also the likeliest suppliers of muni CDSs—are opposed to muni CDSs because they don't want to create the impression that their bonds are not safe.³⁰ Indeed, “The proliferation of the derivatives is angering treasurers around the country, who say the derivatives are sending a negative message and possibly driving up their costs of borrowing at a time when they need all the help they can get.”³¹ The fact that the municipal bond market is a relatively closed, insular market³² with a limited set of actors makes it even more likely that broker-dealers would be wary of angering these customers.

‘buy-and-hold’ market because many investors hold municipal securities until maturity. Indeed, following the initial distribution period, municipal securities trade infrequently.”)

27. The “household sector” includes non-profit organizations, domestic hedge funds, private equity funds, and personal trusts. See *Financial Accounts of the United States*, FED. RES., <https://www.federalreserve.gov/releases/z1/current/html/b101.htm> [<http://perma.cc/L9L3-UJ3U>].

28. Natalie Cohen & Roy Eappen, *Who Holds Municipal Bonds*, MUN. SEC. RES. (July 27, 2015), http://www.institutionalinvestor.com/images/519/94682/Holders_of_Municipal_Bonds_072715.pdf [<http://perma.cc/FB8M-N4SD>]. The authors assume that hedge funds represent ~\$200 billion of municipal bond holds. *Id.* at 2. \$200 billion divided by the 2015Q1 total amount of \$3.694 trillion equals approximately five percent.

29. SEC. & EXCH. COMM’N, *supra* note 26.

30. See, e.g., Nathaniel Popper, *Credit Default Swap Deals Unnerve California*, L.A. TIMES (Aug. 19, 2010), <http://articles.latimes.com/2010/aug/19/business/la-fi-california-swaps-20100819> [<http://perma.cc/5PFH-VZLH>].

31. See Ianthe Jeanne Dugan, *States Bristle as Investors Make Wagers on Defaults*, WALL ST. J. (Apr. 27, 2010, 12:01 AM), <https://www.wsj.com/articles/SB10001424052748704464704575208592421153342> [<http://perma.cc/44XX-4J6F>].

32. The market is closed on the demand side since demand is limited to investors who can benefit from the tax exemption. The market is closed on the supply side since it is limited to issuers who qualify for the tax exemption in the first place. George Friedlander, *US Municipal Strategy Special Focus*, CITI RES. MUNS. 3 (2014), <http://cdn.bondbuyer.com/media/pdfs/BBrandeis14-Friedlander-paper.pdf> [<http://perma.cc/4KLR-7RZE>].

Another reason why the muni CDS market has not flourished is the differential tax treatment of municipal bonds and muni CDSs. Muni CDS cash flows are not subject to the tax exemption of the underlying bonds, meaning that an investor wishing to replicate the cash flows of a municipal bond using a muni CDS and a treasury bond of similar maturity would be hard-pressed to do so.³³ In other words, muni CDSs that perfectly hedge the underlying bonds simply do not exist.

3. Information Insensitivity

The notion of informational insensitivity provides a theoretical explanation for why municipal bonds have not traditionally been as responsive to credit risk.³⁴ Information insensitivity refers to the notion that for certain “safe” securities (usually debt), the owner of the contract does not have an incentive to produce information about the entity that issued the contract.³⁵ Information insensitivity gives investors the peace of mind not to have to constantly monitor the assets backing these debt securities.³⁶ Because these informationally insensitive securities have the same value for a wide range of the issuer’s assets, the payout has a hockey-stick-like shape, where the kink represents the point at which markets begin to worry about the issuer defaulting (the debt then becomes informationally *sensitive*).

33. See THE HANDBOOK OF MUNICIPAL BONDS 655 (Sylvan G. Feldstein & Frank J. Fabozzi eds., 2008).

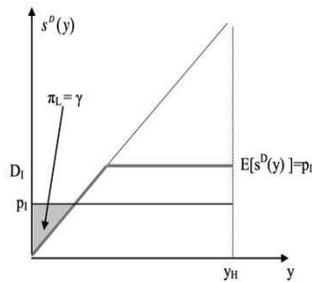
34. See generally Arthur W.S. Duff & David Zaring, *New Paradigms and Familiar Tools in the New Derivatives Regulation*, 81 GEO. WASH. L. REV. 677, 704 (2013) (“Information insensitivity’ means the securities are immune from information asymmetry or adverse selection when traded, and no trader has an incentive to create private information about the security.”).

35. Tri Vi Dang et al., *Ignorance, Debt and Financial Crises* (Yale Univ. & Mass. Inst. Tech., Working Paper, 2012), http://www.columbia.edu/~td2332/Paper_Ignorance.pdf [<http://perma.cc/QYH6-Z5YW>].

36. As John Cochrane explains:

In Gorton and Metrick’s vision, short-term debt is normally an “information-insensitive” security. When the bank is far from default, the value of its debt, especially short-term debt, is essentially the same for a wide range of values for the bank’s assets. Debt holders therefore don’t need to investigate the company’s finances. In turn, this feature means that the short-term debt of companies and banks far from bankruptcy is highly liquid. If I offer to sell you such debt, you don’t have to worry that I know something you don’t know, because nobody can really have much information about the value of such debt. As a result, bid-ask spreads, which derive from asymmetric information, are tiny.

John H. Cochrane, *Toward a Run-Free Financial System*, in ACROSS THE GREAT DIVIDE: NEW PERSPECTIVES ON THE FINANCIAL CRISIS 197, 206 (Martin Neil Bally & John B. Taylor eds., 2014).

Figure 1³⁷

Of course, many of the properties of the “truly” informationally insensitive debt described above do not apply to municipal bonds. Municipal bonds are typically not short-term debt, their bid-ask spreads are not vanishingly small, and as we have seen, they are not “safe” money-like debt instruments. The analogy, however, is instructive. Municipal debt may not be completely informationally insensitive, but it is at least not very informationally sensitive. As discussed above, investors typically hold municipal bonds to maturity without necessarily paying attention to the issuer’s (i.e., the municipality’s) underlying assets or other liabilities. Monoline insurance companies that insure these bonds contribute to their informational insensitivity—by wrapping their own credit ratings around municipal bond issuances, these companies reduce the incentives for investors to produce information about the underlying creditworthiness of the issuer.³⁸ Thus, municipal bonds are not particularly informationally sensitive until the market suspects that the issuer may be in danger of defaulting, pushing the bonds’ payoff towards the kink in the above figure.

III. Emerging Credit Risk in the Muni Market

The recent spate of municipal defaults may ease some of the hurdles to forming a robust muni CDS market. Operating from this presumption, this Part first argues that the incidence of local government fiscal crises, some of which have resulted in significant haircuts on the par value of municipal bonds through bankruptcy or other forms of debt restructuring, means that credit risk will likely play an increasingly important role in evaluating municipal bonds going forward. It then goes on to explain that, although investors are not

37. Dang et al., *supra* note 34, at 22 fig.8.

38. See, e.g., Viral V. Acharya et al., *On the Financial Regulation of Insurance Companies* (N.Y.U. Stern Sch. Bus., White Paper, 2009), <http://w4.stern.nyu.edu/salomon/docs/whitepaper.pdf> [<http://perma.cc/NRT8-XF7H>].

without means of hedging the interest rate and duration risk on municipal bonds, instruments that directly hedge credit risk are few and far between, especially given the significant challenges to short selling municipal bonds.

A. Credit Risk as an Emerging Risk Factor

The number of municipal defaults has increased substantially in recent years. Since November 2011, San Bernardino, CA, Stockton, CA, Jefferson County, AL, and Detroit, MI have filed four of the five largest municipal bankruptcies of all time, as measured by total obligations.³⁹ In Detroit, the largest U.S. city ever to file for bankruptcy, bondholders took significant haircuts. For example, unlimited tax general obligation bondholders recovered only seventy-three cents on the dollar whereas limited tax general obligation bondholders recovered a mere forty-two cents on the dollar.⁴⁰ In fact, holders of the city's lease bonds fared even worse, with only a twelve-percent recovery rate.⁴¹ In contrast, Detroit's pension holders experienced relatively minor haircuts.⁴² Puerto Rico experienced a severe fiscal crisis and, with no legal ability to access bankruptcy, ended up defaulting on its general obligations bonds, resulting in a thirty percent recovery rate for bondholders.⁴³ Cities like Chicago and Dallas have also been experiencing difficulties, with bankruptcy potentially on the horizon.⁴⁴

A confluence of factors produced these fiscal difficulties, which in turn eroded municipalities' ability to pay back their debt obligations. First, states and

39. Robert Slavin, *Why So Many Big Municipal Bankruptcies?*, FIN. PLANNING (Jan. 15, 2015, 5:15 PM), <http://www.financial-planning.com/news/why-so-many-big-municipal-bankruptcies> [<http://perma.cc/H6JM-V57V>]; see also Hunt, *supra* note 2, at 392-93 (noting the underlying causes of these bankruptcies).

40. Tommy Chan, *BPG Fixed Income: Detroit One Year Later, States Bolstering Bondholder Protections*, ZIEGLER CAP. MGMT.: MKT. INSIGHT & RES. (2016), <http://www.zieglercap.com/Documents/Individual-Investor-Insights/Detroit-One-Year-Later-012016.pdf> [<http://perma.cc/9E9R-E9UJ>].

41. *Id.*

42. See Eighth Amended Plan for the Adjustment of Debts of the City of Detroit, *In re City of Detroit*, No. 13-53846 (E.D. Mich. Oct. 22, 2014), ECF No. 8045; Anne VanderMey, *Detroit Pensioners Approve Bankruptcy Haircut in Landslide*, FORTUNE (July 23, 2014), <http://fortune.com/2014/07/22/detroit-pension-bankruptcy> [<http://perma.cc/Z79X-CZCV>].

43. See, e.g., Heather Gillers & Nick Timiraos, *Puerto Rico Defaults on Constitutionally Guaranteed Debt*, WALL ST. J. (July 1, 2016, 6:42 PM), <http://www.wsj.com/articles/puerto-rico-to-default-on-constitutionally-guaranteed-debt-1467378242> [<http://perma.cc/5XM8-SYTG>]; Daniel Bases, *Puerto Rico's Defaulted Debt at Record Low as Recovery Rate, Legal Battle Weigh*, REUTERS (Mar. 20, 2017, 3:23 PM), <http://www.reuters.com/article/us-puertorico-debt-idUSKBN16R2B3> [<http://perma.cc/3H2N-RCHS>].

44. See, e.g., Ted Dabrowski & John Klinger, *Chicago's Total Debt More Than Triples to Over \$24b in 2015*, ILL. POL'Y (July 11, 2016), <http://www.illinoispolicy.org/chicagos-total-debt-more-than-triples-to-over-24b-in-2015> [<http://perma.cc/Z2RQ-LWCF>]; Mary Williams Walsh, *Dallas Stares Down a Texas-Size Threat of Bankruptcy*, N.Y. TIMES (Nov. 20, 2016), <http://www.nytimes.com/2016/11/21/business/dealbook/dallas-pension-debt-threat-of-bankruptcy.html> [<http://perma.cc/B6MT-FG5R>].

localities are still recovering from revenue lost because of the 2008 recession.⁴⁵ Second, reductions in federal spending have made state and local finances less even and predictable.⁴⁶ Third, municipalities' long-term pension, retirement, and healthcare expenditures continue to outpace revenue growth.⁴⁷ Fourth, a lack of infrastructure investment over time means that states have to borrow more just to keep up with capital deterioration.⁴⁸ Lastly, "[t]he near-total absence of serious consultation between federal and state fiscal policymakers has often obscured the long-term impact of expenditure cuts and revenue reductions."⁴⁹

Given the fiscal challenges facing state and local governments, credit risk will likely become a more important factor in the municipal bond market going forward. Under this scenario, what are the implications for the notion of municipal bonds as informationally insensitive debt? The fact that the full faith and credit pledge to general obligation debt holders was insufficient to prevent such debt holders from taking significant haircuts (in Detroit, for example)—coupled with the increasing legal protections afforded pensioners and other post-employment beneficiaries—suggests that investors holding municipal debt have a greater likelihood of not being paid back in full. In other words, municipal bonds may be becoming more informationally sensitive. Another factor that points in this direction is that fewer municipal bond issuances nowadays have a monoline insurance wrapping (i.e., an insurance company that insures the bonds) that allows the bonds to mirror the high credit ratings of the insurer.⁵⁰ One way for investors to cope with the increased information sensitivity and credit risk of municipal bonds is to turn to the muni CDS market.

B. *Alternative Sources of Hedging*

In theory, there are a number of alternatives to using CDSs to hedge the credit risk of municipal bonds. But these alternatives have a number of drawbacks that render the muni CDS a superior credit hedge. One possible alternative is short selling the municipal bonds themselves, which would allow

45. See, e.g., Oliff et al, *States Continue to Feel Recession's Impact*, CTR. ON BUDGET & POL'Y PRIORITIES 1 (2012), <https://www.cbpp.org/sites/default/files/atoms/files/2-8-08sfp.pdf> [http://perma.cc/5XZJ-WZ7E].

46. Iris J. Lav & Michael Leachman, *At Risk: Federal Grants to State and Local Governments*, CTR. ON BUDGET & POL'Y PRIORITIES (2017), <http://www.cbpp.org/research/state-budget-and-tax/at-risk-federal-grants-to-state-and-local-governments> [http://perma.cc/Z86G-ZG4S].

47. William G. Gale & Aaron Krupkin, *Financing State and Local Pension Obligations: Issues and Options*, BROOKINGS 7-8 (2016), <http://www.brookings.edu/wp-content/uploads/2016/07/PB-Pension-shortfalls-and-SL-budgets.pdf> [http://perma.cc/6D48-MVPC].

48. Elizabeth McNichol, *It's Time for States to Invest in Infrastructure*, CTR. ON BUDGET & POL'Y PRIORITIES (2017), <http://www.cbpp.org/research/state-budget-and-tax/its-time-for-states-to-invest-in-infrastructure> [http://perma.cc/9Q8H-QTQ7].

49. Ravitch & Volcker, *supra* note 2, at 3.

50. Paul Sullivan, *Municipal Bond Defaults Shake Up a Once-Sedate Market*, N.Y. TIMES (Apr. 22, 2016), <http://www.nytimes.com/2016/04/23/your-money/municipal-bond-defaults-shake-up-a-once-sedate-market.html> [http://perma.cc/AYX3-SYA4].

investors to directly profit from a decline in the price of a municipal bond.⁵¹ Unfortunately, a short side of the municipal bond market has not developed because of a number of legal and technical difficulties. First, since investors tend to hold municipal bonds to maturity, most bonds cannot be borrowed, which is a necessary step in the short selling process.⁵² Additionally, “short positioning municipal securities is rare because the Internal Revenue Service will not allow both a borrower and lender of a municipal security to claim a tax exemption,” and “[i]n effect, the lender of a municipal security would be trading tax exempt interest for taxable interest.”⁵³

To see the practical implications of this limitation, note that the holder of a short bond position must pay to the lender amounts equal to the interest that a holder of the bond being shorted would receive during this time period. Thus, for a corporate bond, if the holder of the bond would have received one dollar in interest, the holder of the short position pays the lender that same dollar in interest. For municipal bonds, however, if a holder of the bond would have received one dollar in tax-exempt interest, this might be equivalent to say \$1.30 in pre-tax interest. Since the borrower (short seller) cannot claim a tax exemption on this interest payment, they must pay to the lender \$1.30 instead of \$1 in interest, making this a very expensive and often inefficient position to take on.⁵⁴

The IRS also imposes additional reporting requirements on the parties participating in short selling municipal securities, which may discourage such activity *ex ante*.⁵⁵ Indeed, FINRA has found that “most municipal short positions are inadvertent and may result from branch or trading errors, duplicate transactions, the sale of a security in the process of a partial redemption or a partial call, or a delay in delivery of the securities from a counterparty.”⁵⁶ Thus, the most obvious means of hedging municipal bonds—short selling—is effectively not an option for investors.

Even if a short-selling market existed for municipal bonds, credit default swaps would be a superior instrument for hedging credit risk. As the IMF notes in the sovereign bond and sovereign CDS (SCDS) space, SCDS are more efficient than short sales as a means of hedging credit risk because short selling

51. Much like short selling in the stock market, short selling a bond requires one to borrow a bond, sell it today, and buy it back at a later point in time (hopefully at a lower price). *See, e.g.*, Paul Asquith et al., *The Market for Borrowing Corporate Bonds*, 107 J. FIN. ECON. 155 (2013).

52. John Carney, *How to Profit from a Muni Bond Crisis*, CNBC (Feb. 10, 2011, 1:45 PM), <http://www.cnbc.com/id/41513958> [<http://perma.cc/LBE3-NMLS>].

53. Proposed Amendments to Rule 10b-10 and Proposed Rulemaking, 59 Fed. Reg. 12767, 12769 n.24 (Mar. 17, 1994) (codified at 17 C.F.R. pt. 240 (2017)) (citing I.R.C. § 6045(d) (2012)).

54. In other words, the fact that payment-in-lieu-of-interest here is not tax-exempt substantially increases the carrying cost of borrowing municipal bonds.

55. *See Municipal Securities Trading: Guidance Related to Firm Short Positions and Fails-to-Receive in Municipal Securities*, FINRA 5 n.1 (2015), http://www.finra.org/sites/default/files/notice_doc_file_ref/Notice_Regulatory_15-27.pdf [<http://perma.cc/4PVS-AUM8>].

56. *Id.* at 4.

necessitates a sufficiently deep market for borrowing the underlying bonds.⁵⁷ Additionally, during times of stress, short selling demand can overwhelm supply of the underlying bonds, and such loans may be recalled at any point.⁵⁸

To the extent investors hedge their municipal bond risk, they traditionally rely on Treasuries or Treasury futures to hedge interest rate risk.⁵⁹ Another possible alternative to using muni CDSs is shorting a muni ETF.⁶⁰ However, shorting ETFs may be logistically challenging—doing so requires finding someone to lend the ETFs and, since these ETFs are comprised of a large number of municipal bonds, shorting the ETFs themselves will not necessarily be a great hedge for the credit risk of any particular municipal bond. Another possibility might be to hedge municipal bonds using municipal bond futures. However, for a number of reasons, a deep market in municipal bond futures does not exist.⁶¹ Even if a deep futures market existed, futures would have both interest rate and credit risk embedded within them. To put on a pure credit risk hedge, investors would have to add an interest rate swap, which would be costly and significantly more complicated than just using a muni CDS.

IV. Unsheathing the Sword: Creating a Robust Muni CDS Market

Part IV considers the implications of creating a deeper market for muni CDSs. It first analyzes potential reforms to the muni CDS market that would make the market deeper, more liquid, and more robust, before discussing the opportunities and benefits that would arise from having a more robust muni CDS market. Finally, it analyzes the drawbacks and costs associated with such an outcome.

A. Potential Reforms

A number of options are available for creating a deeper and safer muni CDS market.⁶² For example, muni CDSs could be given the same tax benefits

57. INT'L MONETARY FUND, *supra* note 12, at 75.

58. *Id.*

59. THE HANDBOOK OF MUNICIPAL BONDS, *supra* note 33, at 350-51.

60. An ETF, or “exchange-traded fund,” invests in a wide variety of instruments (usually with a broader theme or focus) and are traded on exchanges, just like the shares of a company. See, e.g., William A. Birdthistle, *The Fortunes and Foibles of Exchange-Traded Funds: A Positive Market Response to the Problems of Mutual Funds*, 33 DEL. J. CORP. L. 69 (2008) (explaining the mechanics of ETFs). The largest municipal bond ETF is the iShares S&P National Municipal Bond Fund. See Carney, *supra* note 52.

61. The lack of a deep market in municipal bond futures can be attributed to the existence of well-established hedges (in particular, Treasuries and Treasury futures), a failure to embrace electronic trading, and market segmentation. See Patrick J. Cusatis, *An Analysis of the Failed Municipal Bond and Note Futures Contracts*, 28 J. FUTURES MARK. 656 (2008).

62. Safety here refers to reducing the negative externalities that could emerge from more widespread use of muni CDSs. These might include speculative behavior that raises the borrowing costs of municipalities, contagion effects, or even price spirals that result in a municipality defaulting on its debt payments. Although some of the reforms directed towards market safety may come at the

as the underlying bonds, muni CDS contracts could be centrally cleared, a ban on naked trading of muni CDS contracts could be instituted, investors could be required to disclose net long muni CDS positions, and temporary restrictions on muni CDS trading could be implemented in times of market stress. Taken together, these reforms may not be necessary or even sufficient for creating a fully functional muni CDS market, but they would likely improve upon today's virtually non-existent one.

1. Tax Equivalence with Muni Bonds

As previously suggested, a significant constraint on the growth of the muni CDS market is differential tax treatment received by muni CDSs and the underlying bonds. One way to cure this difference would be to change the tax code to treat the cash flows equally. This option is likely politically infeasible, as it would, of course, require legislation from Congress. The tax exemption on municipal bonds is justified by a policy desire to incentivize local infrastructure development.⁶³ Although a robust muni CDS market could lower borrowing costs and help spur infrastructure development, extending tax-exempt status to muni CDSs via legislation is probably a non-starter. Even if such a change could be codified in legislation, policymakers would have to consider the opportunity cost of forgone tax revenue. Although muni CDSs are only one percent of the cash market now, if symmetrical tax treatment allows the market to grow to the same relative size as the corporate and sovereign CDS markets (fifty percent of the approximately four trillion dollars cash market), the federal government could be giving up a substantial source of tax revenue.

2. Central Clearing

The remaining reforms would not require legislation and could in theory be implemented by the SEC. For example, the SEC could make a determination, pursuant to § 723(a) of Title VII of the Dodd-Frank Act, that muni CDSs should be centrally cleared and not traded on a bilateral, over-the-counter basis.⁶⁴ There are several key benefits to moving to a centrally cleared system, including a reduction of counterparty risk, netting of positions across counterparties, and sharing of extreme losses.⁶⁵ The additional safeguards that central clearing would provide to mitigate downside scenarios in the muni CDS

expense of liquidity, one could also argue that a safe market is a necessary first step to establishing a deep market.

63. Scott Greenberg, *Reexamining the Tax Exemption of Municipal Bond Interest*, TAX FOUND. (July 21, 2016), <http://taxfoundation.org/reexamining-tax-exemption-municipal-bond-interest> [<http://perma.cc/N4BS-VZY6>]. A federalism concern regarding the constitutionality of taxing municipal bonds was previously a powerful justification for the exemption. However, the Supreme Court repudiated this reasoning in *South Carolina v. Baker*, 485 U.S. 505 (1988).

64. 7 U.S.C. § 2 (2012).

65. INT'L MONETARY FUND, *supra* note 12, at 73.

market (the default of a large market participant, for example) could potentially help improve liquidity in the market itself. In the sovereign CDS context, there are concerns about the exposure of central clearinghouses to wrong-way risks.⁶⁶ However, these relate to the posting of margin (or collateral) in the same currencies as the underlying bonds are denominated in, which is not an issue in the muni CDS market.

3. Banning “Naked” Muni CDS Trading

Another regulation that the SEC could impose to improve the muni CDS market is to ban naked muni CDS trading to discourage speculative behavior.⁶⁷ One worry might be that investors would participate in a more robust muni CDS market to speculate on municipalities experiencing fiscal distress. This could be achieved through “naked” CDS trading, which is going long (i.e., buying a contract) on the CDS without owning the underlying bond—in effect, buying insurance on your neighbor’s house in the hope that it catches on fire. Banning naked CDS trading would mean that investors who want to purchase muni CDS contracts must have an offsetting position in the underlying municipal bond. The European Union, for example, has banned naked sovereign CDS trading for these and other reasons.⁶⁸ In particular, market participants can, with some limited market-making exceptions, buy protection on European sovereign debt only if they hold the underlying bonds or if they have exposures that are “meaningfully correlated” with the underlying bonds.⁶⁹

A regulator considering a ban on naked CDS trading as a means of promoting market stability must also evaluate the costs of such a ban. In particular, a ban on naked muni CDS trading could further detract from muni CDS market liquidity to the point where muni CDSs cease to properly function as hedges and indicators of implied credit risk.⁷⁰ In general, bans on short selling in other markets have been associated with reduced market liquidity, reduced price discovery, and increased price volatility.⁷¹ Ultimately, banning

66. *Id.* at 74. “Wrong-way risks” in the sovereign CDS context refers to “the fact that the posted initial margin and the default fund contribution would be in dollars or euros or in government securities denominated in those currencies. Such securities are the same as those underlying most of the SCDS contracts. So distress of a sovereign would create a vicious cycle (a realization of the wrong-way risk) by impairing the value of the collateral while at the same time increasing the risk in the SCDS contract, which would require more such collateral to be posted.” *Id.*

67. For example, SEC Regulation SHO deals with short selling bans with respect to equities. *See* Definition of “Short Sale” and Marking Requirements, 17 C.F.R. § 242.200 (2017).

68. “The prohibition is based on the view that, in extreme market conditions, such short selling could push sovereign bond prices into a downward spiral, which would lead to disorderly markets and systemic risks, and hence sharply raise the issuance costs of the underlying sovereigns.” INT’L MONETARY FUND, *supra* note 12, at 57. There is also concern that negative price spirals for sovereign debt and settlement failures could result from uncovered (naked) short selling and CDS protection buying. *Id.* at 72.

69. *Id.*

70. *Id.* at 57.

71. *Id.* at 71.

naked CDS trading is a fairly blunt instrument. The same purpose could be achieved by other reforms such as mandating better disclosure, central clearing, or posting appropriate collateral.

4. Mandating Disclosure of Muni CDS Positions

Indeed, mandating the disclosure of net long muni CDS positions (net short exposure to municipal bonds) is another regulation that the SEC could impose to discourage speculative behavior.⁷² Doing so would increase market transparency and likely discourage investors from taking long muni CDS positions (for fear that their competitors would know what positions they are taking). As with banning naked CDS trading, the regulatory trade-off is between reducing the negative externalities of muni CDSs and discouraging market activity.

5. Market “Circuit Breakers”

Regulators could also institute temporary restrictions on muni CDS trading when large price movements occur. The idea here is that CDSs may exacerbate a market-wide sell-off of a particular municipality’s debt (perhaps due to actual or rumored likelihood of default). To avoid the negative consequences of such a sell-off—which could range from substantially higher borrowing costs for the municipality to actually being forced to default if it is unable to roll over its debt—regulators could institute “circuit breakers” that kick in to halt trading after a substantial decrease in price. In the stock market, for example, the SEC in 2010 adopted a “revised uptick” or “circuit breaker” rule that restricted the short sale of a stock whose price had fallen by more than ten percent compared to its prior day closing price.⁷³ Although the SEC has not implemented such a rule with respect to the CDS market, the SEC has the authority to implement market-wide circuit breakers.⁷⁴ Another model that regulators could look towards is the circuit breaker rule in Europe, which applies to all financial instruments, including sovereign CDSs. The circuit breaker is triggered at the discretion of a regulatory body in the case of a significant price fall from the previous day’s close (ten percent for liquid shares and a threshold to be determined for other instruments). The circuit breaker implements a temporary short selling prohibition for the remainder of the day

72. For example, the SEC has authority to mandate disclosure of short sale positions in equities. See *Disclosure of Short Sales and Short Positions by Institutional Investment Managers*, 73 Fed. Reg. 61,678 (Oct. 17, 2008) (codified at 17 C.F.R. pts. 240 and 249).

73. 17 C.F.R pt. 242.

74. *Measures to Address Market Volatility*, SEC. & EXCH. COMM’N (July 1, 2012), <http://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletinhtml.html> [<http://perma.cc/RUR8-TWEJ>]; *Notice of Filing of Amendments No. 1*, SEC. & EXCH. COMM’N (2012), <http://www.sec.gov/rules/sro/bats/2012/34-67090.pdf> [<https://perma.cc/C98V-G6ZJ>].

and the following trading day, which can be extended for up to two more trading days in case of a further significant price fall.⁷⁵

B. Opportunities of a Robust Muni CDS Market

Should a robust muni CDS market exist, a number of opportunities and benefits could be realized. First, investors would have a means of directly (and relatively cheaply) hedging the emerging credit risk within the municipal bond market.⁷⁶ Second, a greater demand for muni CDSs would inevitably lead to greater supply and liquidity in the market, which would result in more price discovery and transparency. For example, CDSs that trade in liquid markets and are priced properly tend to provide better information about the default probabilities of the underlying bonds.⁷⁷ This in turn would allow the market to give municipalities a clearer signal of perceptions of actual or anticipated fiscal distress. One possible outcome is a bifurcated market, with substantial liquidity in certain single names that are experiencing distress but not in others. Indeed, this is the case for the sovereign CDS market.⁷⁸

Another potential benefit of enhanced liquidity in the muni CDS market is the possibility that increased availability of muni CDSs would make investors more willing to lend to municipalities or to lend at lower rates. Indeed, the emergence of the muni CDS market during the 2008 financial crisis had exactly that effect on municipal bond yields.⁷⁹ Another potential second-order effect is a more liquid secondary market for municipal bonds. Being able to buy CDS protection on the underlying bonds may make investors more likely to purchase municipal bonds on the secondary market.⁸⁰ And, if investors cannot engage in naked muni CDS trades, demand for the underlying bonds might also increase.

75. Regulation (EU) No. 236/2012 of the European Parliament and of the Council of 14 March 2012 on Short Selling and Certain Aspects of Credit Default Swaps, 2012 O.J. (L 86) 1, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:086:0001:0024:en:PDF> [<http://perma.cc/UQX7-XQAV>]; Press Release, European Commission, Regulation on Short Selling and Credit Default Swaps (Oct. 19, 2011), http://europa.eu/rapid/press-release_MEMO-11-713_en.htm [<http://perma.cc/9JPY-XXHY>].

76. See *supra* Section III.A.

77. See Lawrence Kryzanowski, Stylianos Perrakis & Rui Zhong, *Price Discovery in Equity and CDS Markets*, 35 J. FIN. MKTS. 21 (2017).

78. INT'L MONETARY FUND, *supra* note 12, at 62.

79. *Short-Selling on States Can Pay Off*, N.Y. TIMES (Oct. 3, 2008, 7:20 AM), <http://dealbook.nytimes.com/2008/10/03/short-selling-on-states-can-pay-off> [<http://perma.cc/KUW2-ECU5>] (“After the insurance companies that specialized in municipal bonds became troubled, credit-default swaps emerged as an alternative form of insurance. Even though municipalities rarely default on their bonds, the insurance was popular because it made municipal bonds seem utterly foolproof. That sense of heightened security made the bonds easier to sell, lowering communities’ borrowing costs.”).

80. For some academic support of the idea that liquidity in the CDS market can enhance liquidity in the corresponding bond markets, see Giovanni Calice et al., *Liquidity Spillovers in Sovereign Bond and CDS Markets: An Analysis of the Eurozone Sovereign Debt Crisis*, 85 J. ECON. BEHAV. ORG. 122 (2013), and Batchimeg Sambalaibat, *A Theory of Liquidity Spillover between Bond and CDS Markets*, J. FIN. (forthcoming 2018), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2404512 [<http://perma.cc/8MSJ-DMZ6>].

If, however, the vast majority of municipal bond investors remain retail, hold-to-maturity types, these second-order liquidity effects may be muted because they are unlikely to sell the bonds after purchase.

Another potential benefit of a robust muni CDS market is that it could act as a substitute for the decline in the monoline insurance market for municipal bonds. As mentioned in Part III, monoline insurers such as Municipal Bond Insurance Association, Guaranty Municipal Co., and American Municipal Bond Assurance provide an insurance “wrapping” for municipal bond issuances that allows the bond to take on the insurer’s credit rating.⁸¹ During the financial crisis, however, many monoline insurers experienced financial difficulties.⁸² In 2008, nearly half of all newly issued municipal bonds carried monoline insurance, compared with less than seven percent by 2015.⁸³ Thus, muni CDSs could act as an alternative means for investors to insure against municipal bond defaults and also as a hedge against the potential future failure of monoline insurers that continue to insure municipal bonds.

A more robust muni CDS market with greater price transparency and price discovery could also enable state and federal policymakers to incorporate muni CDS spreads into their oversight and risk monitoring of distressed municipalities. For a number of reasons, CDS spreads should provide a more accurate measure of potential risk of default than bond yields. First, bond yields are a function of many other factors besides credit risk, including the risk-free rate, maturity date, and call provisions. Additionally, if municipal bonds are somewhat informationally insensitive,⁸⁴ muni CDS spreads could be more sensitive to relevant information, especially if hedge funds (also known as the “smart money”) actively participate in the muni CDS market. Ultimately, deriving default probabilities (from a purely mathematical perspective) from CDS spreads is easier than using bond yields because CDSs are less complex than the underlying bonds.

However, there may be reason to doubt that even a robust muni CDS market could act as an accurate leading indicator of a municipality’s fiscal distress. Certainly, the market as it currently exists is not capable of sending accurate signals. As Matthew Holian and Marc Joffe note, “the applicability of CDS implied default probabilities to the municipal market is greatly limited, however, by the fact that CDS trades against a relatively small number of municipal issuers, and trading volume is low even for those issuers for which

81. See *supra* Section II.C.

82. See Carney, *supra* note 52; Sgarlata Chung, *Municipal Securities: The Crisis of State and Local Government Indebtedness, Systemic Costs of Low Default Rates, and Opportunities for Reform*, 34 CARDOZO L. REV. 1455, 1498 (2013).

83. Cooper J. Howard & Rob Williams, *How the Municipal Bond Insurance Market Has Changed Since the Great Recession*, CHARLES SCHWAB (Aug. 6, 2015) (citing THE HANDBOOK OF MUNICIPAL BONDS (Sylvan G. Feldstein & Frank J. Fabozzi eds., 2008)), <http://www.schwab.com/public/schwab/nn/articles/How-the-Municipal-Bond-Insurance-Market-Has-Changed-Since-the-Great-Recession> [<http://perma.cc/8JTZ-WW2C>].

84. See *supra* Section II.C.

CDSs are available.”⁸⁵ CDS markets in general may not be a good leading indicator of an impending crisis. For example, in the lead-up to the financial crisis, indexes of CDSs on mortgage-backed securities (in particular, the ABX index) traded at normal levels until the crisis hit.⁸⁶ The same phenomenon (convergence of spreads and then a sudden divergence or blowing out) occurred in the sovereign CDS market before the Eurozone sovereign debt crisis.⁸⁷

C. Drawbacks of a Robust Muni CDS Market

Although the creation of a robust muni CDS market could have many benefits, it also presents a number of potential challenges. For example, there is a risk that speculating hedge funds will constitute the majority of buyers in the muni CDS market. This risk would be mitigated, but not eliminated, by a regulation that bans naked muni CDS trading.⁸⁸ Nonetheless, there is evidence that CDS markets attract speculative traders, and the muni CDS market is probably not immune from this phenomenon.⁸⁹

Additionally, a more robust muni CDS market could potentially transmit negative market sentiment and raise borrowing costs for municipalities at a faster rate. In the worst case scenario, this could even result in defaults taking place earlier than they would have otherwise, as lenders are driven away by perceptions that a municipality’s finances are shaky.⁹⁰ There is evidence of this mechanism playing out during the 2008 financial crisis:

In the case of New Jersey, someone bought five years’ worth of default protection on the state’s debt in mid-July, on a day when the price edged to \$41,000, from \$40,000, for \$10 million worth of bonds. (Traders do not have to own the bonds to buy the related swaps.) The price then floated up gently until mid-September, when suddenly Lehman Brothers declared bankruptcy, Merrill Lynch was sold and A.I.G. had to be bailed out by the Federal Reserve, all in the space of a few days.

Instantly, investors everywhere were risk averse, and the price of a five-year swap on New Jersey’s debt jumped to \$84,000 for \$10 million in bonds. For the

85. See Matthew J. Holian & Marc D. Joffe, *Assessing Municipal Bond Default Probabilities* 17 (MPRA Paper No. 46728, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2258801 [<http://perma.cc/UQD8-NS9J>].

86. Ingo Fender & Martin Scheicher, *The ABX: How Do the Markets Price Subprime Mortgage Risk?*, BIS Q. REV., Sept. 2008, at 67, 69, fig.1.

87. Alessandro Fontana & Martin Scheicher, *An Analysis of Euro Area Sovereign CDS and Their Relation with Government Bonds* 28 fig.2 (European Cent. Bank, Working Paper No. 1271, 2010), <http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1271.pdf> [<http://perma.cc/Y43G-8P2Y>].

88. See *supra* Section IV.A.

89. Martin Oehmke & Adam Zawadowski, *The Anatomy of the CDS Market*, 30 REV. FIN. STUD. 80, 81 (2017) (“Whereas hedging motives are reflected to a comparable extent in bond and CDS trading volume, speculative trading, which is likely to be more sensitive to the relative liquidity advantage of the CDS market, is concentrated in the CDS market.”).

90. *Short-Selling on States Can Pay Off*, *supra* note 79.

buyer in mid-July, that is a jump in value of more than 100 percent in just two months.⁹¹

It is important to note that this occurred in a very thinly traded market where just one transaction could move market prices. Nonetheless, a more liquid muni CDS market creates another means through which negative market sentiment—or in the worst-case scenario, a full-on panic—could adversely affect municipalities.

Another potential concern is that even in a market that is generally liquid, the market for individual single-name CDSs may be quite small, which could allow a single bad actor (a hedge fund, for example) to force a municipality into default. This concern would be somewhat mitigated by regulations, specifically the ban on naked muni CDS trading, mandated disclosure of net long muni CDS positions, and automatic circuit breakers for significant drops in price.⁹² These proposals could work in tandem to discourage excessive speculation and provide a backstop to severe price drops. Compared with the corporate bond and corporate CDS markets, muni CDSs may be less likely to cause a default of the issuer entity. In contrast to a corporation, which typically issues both stock and debt, a municipality does not issue any stock. Thus, even if a hedge fund had a very negative view of a city's finances that it chose to express through long muni CDS positions, it could not couple this view with a short stock position and directly drive the municipality into bankruptcy.⁹³ It might, in theory, be able to raise the municipality's borrowing costs so much that the municipality could not roll over its debt.

Another concern that policymakers should consider is the possibility that broader use of muni CDSs could increase the risk of contagion between municipalities. In financial crises, correlations among financial instruments tend to increase towards one hundred percent, and muni CDSs or the MCDX index could be a means of amplifying negative shocks across the municipal bond sector.⁹⁴ In other words, market participants might infer broader weakness within the municipal bond sector from stress in any particular municipality, and muni CDSs could be a means of transmitting this information contagion across municipalities. In the sovereign context, an IMF study did not uncover much empirical evidence of contagion but did note that "SCDSs tend to adjust more rapidly to new information during periods of stress, though not typically at other times."⁹⁵ The IMF also found that residual volatility in a given European country's CDS spreads could be explained by volatility in other Euro-area CDS

91. *Id.*

92. *See supra* Section IV.A.

93. *Id.*

94. *See, e.g.,* Leonidas Sandoval & Italo De Paula Franca, *Correlation of Financial Markets in Times of Crisis*, 391 *PHYSICA A: STAT. MECHANICS & ITS APPLICATIONS* 187 (2012) (investigating the phenomenon of correlated volatility across markets).

95. INT'L MONETARY FUND, *supra* note 12, at 58.

spreads.⁹⁶ However, this phenomenon could be explained by the interconnectedness of Euro-area economies and in particular, their banking sectors. Unlike in the European or sovereign context, economic and financial linkages among distressed municipalities might not be quite as high, which limits spillover effects and contagion risks.

A new risk that would be created by a more robust muni CDS market is the deterioration of the creditworthiness of a large muni CDS protection seller. During the financial crisis, for example, AIG's role as a seller of CDS protection contributed to its financial distress, which also led to distress in the broader financial system.⁹⁷ This form of counterparty credit risk could be mitigated, however, by reforms such as central clearing of muni CDSs and requiring counterparties to post appropriate collateral.

Relatedly, CDSs played a substantial role during the financial crisis (partly through AIG) and may still be viewed, perhaps correctly, as financial "weapons of mass destruction."⁹⁸ Should we really be encouraging more use of these potentially dangerous financial instruments? In particular, should we be worried that the risks associated with letting hedge funds use muni CDSs as tools of speculation would be greater than their possible benefits? There is reason to believe that hedge funds' participation in the muni CDS market could have some offsetting benefits. As Michael Corkery and Matt Wirz observed, hedge funds are a source of liquidity as individual investors get more skittish. In return, they often want higher interest rates and more financial information from municipal officials than such officials are accustomed to providing. And hedge funds are not shy about pushing for improved disclosure and financial discipline.⁹⁹

With a more robust muni CDS market, hedge funds would also be more likely to invest in the underlying bonds. In the sovereign context, however, CDS trading is concentrated among broker-dealers, non-dealer banks, and security firms, with hedge funds playing a relatively small role.¹⁰⁰

Another cause for worry is the potential conflicts of interest that could arise with broker-dealers underwriting municipal bonds while also writing CDSs on the same instruments.¹⁰¹ There is some evidence that this may have

96. *Id.*

97. Henry Sender, *AIG Saga Shows Dangers of Credit Default Swaps*, FIN. TIMES (Mar. 6, 2009), <http://www.ft.com/content/aa741ba8-0a7e-11de-95ed-0000779fd2ac> [<http://perma.cc/KR2L-ABF5>].

98. John Chapman, *CDS: Modern Day Weapons of Mass Destruction*, FIN. TIMES (Sept. 11, 2011), <http://www.ft.com/content/1c81df8-d4b9-11e0-a7ac-00144feab49a> [<http://perma.cc/E6EZ-6PDB>].

99. Michael Corkery & Matt Wirz, *Hedge Funds Are Muscling into Munis*, WALL ST. J. (Nov. 11, 2013, 8:01 AM), <https://www.wsj.com/articles/hedge-funds-are-muscling-into-munis-1384213290> [<http://perma.cc/L9L3-UXCE>].

100. INT'L MONETARY FUND, *supra* note 12, at 61.

101. See generally Nicholas S. Di Lorenzo, Note, *Defining a New Punctilio of an Honor: The Best Interest Standard for Broker-Dealers*, 92 B.U. L. REV. 291 (2012) (discussing the

taken place at Goldman Sachs. In particular, ProPublica reported that, in 2008, Goldman sold CDS protection on California debt to clients at the same time that it collected underwriting fees on the bonds, noting that “[t]he company may have hoped to parlay the swaps market into more activity in municipal bond trading, which is traditionally light because muni investors tend to hold the bonds to maturity.”¹⁰² While investment banks are not necessarily prohibited from acting as both underwriters and market makers in financial securities with opposite cash flows, such a strategy at best gives the appearance of a conflict of interest and at worst recalls the questionable Abacus deal Goldman facilitated during the financial crisis.¹⁰³

Conclusion

As state and local governments experience higher levels of fiscal distress in the years to come, credit risk will become an increasingly important component of the municipal bond market. Muni CDSs provide a means of directly hedging against this credit risk. Although muni CDSs currently exist as a financial instrument, the market for them is essentially non-existent. This Note considered a number of potential reforms that could create a more liquid and robust muni CDS market, while also weighing the costs and benefits of such an outcome. Ultimately, more theoretical and empirical research is needed to help quantify these costs and benefits and provide policymakers with more precise regulatory recommendations. In addition, policymakers should consider the extent to which, in a worst-case scenario, the municipal bond and CDS markets could be a source of systemic risk during a financial crisis. As the 2008 financial crisis showed, financial innovation without appropriate regulation can have dire consequences, both for the financial system and the economy at large.

potential conflicts of interest that arise in the broker-dealer and the effect of recent SEC regulations on the subject).

102. Sharona Coutts, *Goldman Sachs Urged Bets Against California Bonds It Helped Sell*, PROPUBLICA (Nov. 11, 2008, 2:05 AM), <http://www.propublica.org/article/goldman-sachs-urged-bets-1109> [<http://perma.cc/S4RT-URJS>].

103. Press Release, Sec. & Exch. Comm’n, SEC Charges Goldman Sachs with Fraud in Structuring and Marketing of CDO Tied to Subprime Mortgages (Apr. 16, 2010), <http://www.sec.gov/news/press/2010/2010-59.htm> [<http://perma.cc/9MTS-KTAJ>].