Determinants of Municipal Disclosure and the Consequences of Dissemination

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Abstract

The municipal bond market is a unique laboratory in which to study the economic and political determinants of disclosure. This setting offers several advantages over those usually studied in the disclosure literature. First, the size, diversity, and regulatory structure of the market provide cross-sectional and time-series variation in disclosure incentives. Consistent with market demand for information influencing disclosure decisions, I document public disclosure increases in response to a positive shock to nonpayment risk that is exogenous to underlying credit quality. Second, although certain public disclosures, including financial statements, are contractually mandated in this market, enforcement is weak and regulatory oversight is limited to the anti-fraud provisions of the Securities Acts. Consistent with the notion that issuers withhold information to avoid incurring regulatory or reputational costs, I find disclosure decreases when a local economic shock increases risk. Third, in the wake of a number of high-profile defaults, regulators have attempted to improve transparency and disclosure in this market. My analysis shows that public disclosure increases in response to a regulator-imposed decrease in the cost of disseminating information, highlighting the importance of the disclosure delivery mechanism. I also present evidence that this shock to the cost of becoming informed helped improve retail trade liquidity. Overall, my findings support the role of market and political forces on disclosure.

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1 Introduction

The municipal bond market is an interesting setting in which to study disclosure incentives for several reasons. First, the market is economically important. State and local governments currently owe municipal bond investors over $3 trillion (nearly half of the $8 trillion owed to corporate bond investors). Municipal bonds finance the development of the public infrastructure that Americans use on a regular basis, including schools, roads, bridges, airports, hospitals, police and fire stations, water tunnels, and sewage plants.

Second, despite its size and diversity, limited regulatory oversight and low levels of financial disclosure characterize the municipal bond market. Grossman and Hart (1980) show that when disclosure is voluntary and costless, and lying is illegal, full disclosure is optimal. Conceptually, this theoretical regulatory structure aptly describes the municipal bond market. Unlike corporations, state and local governments are not subject to the registration and reporting requirements of the Securities and Exchange Commission (SEC). Therefore, the SEC cannot compel municipal financial statement disclosure. Municipal bond issuers are, however, subject to the anti-fraud provisions of the Securities Acts. The SEC has pursued numerous anti-fraud enforcement actions against municipalities and municipal officials for making materially misleading statements or omitting material facts from disclosures. This regulatory structure, in conjunction with issuer diversity, creates natural cross-sectional and time-series variation in disclosure incentives.

Third, the recent surge of high-profile municipal bankruptcies has renewed focus by the media and the SEC on the disclosure practices of state and local governments. The light regulatory touch notwithstanding, 29% of issuers in an average year in my sample fail to publicly file financial statements. What, then, are the costs of disclosure that preclude a full disclosure equilibrium? A commonly cited motivation for corporate non-disclosure is proprietary costs (Verrecchia, 1983). However, competitive concerns are less likely to be a powerful disincentive for governmental entities. In addition, although administrative costs may be burdensome, particularly for small issuers, many municipalities are subject to varying levels of state regulation that require the production of financial information (e.g., GAAP financial statements, audit requirements). These local laws generally grant issuers discretion over the release of financial data to the public. Thus, the municipal bond market is uniquely positioned to examine costs and benefits of public disclosure that are more difficult to

identify in other settings. Studying the economic determinants of municipal disclosure can also assist regulators and researchers in understanding the implications of altering these incentives (Watts and Zimmerman, 1986).

I examine how nonpayment risk and expected political costs interact to drive public disclosure decisions. Risk can have two countervailing effects on voluntary disclosure choice. First, risk increases investor demand for information. Municipal bonds are relatively safe investments, with historical default rates one tenth as large as those of corporate bonds. I hypothesize the relative safety of municipal bonds decreases investor demand for information and test whether an exogenous shock to nonpayment risk influences the supply of disclosure. Second, risk discourages disclosure if it increases the probability of incurring legal, regulatory (Zmijewski and Hagerman, 1981), or reputational costs. The unconditional probability of a municipality incurring legal or regulatory attention is low. However, during periods of fiscal distress, political and electoral incentives to manipulate accounting information are high (Johnson et al., 2006; Chen et al., 2011). I test whether the expected political costs of disclosure influence the supply of disclosure when fiscal distress induces risk.

Consistent with the notion that market demand for information is low when risk is low, I present univariate evidence that disclosure is positively correlated with risk. My analyses are based on a random sample of 17,519 municipal bonds issued by 1,434 issuers across 662 counties. The issuers include counties, schools, hospitals, nursing homes, toll roads, colleges, water and sewage providers, and housing projects. I use this heterogeneity to identify issue and issuer characteristics that impose risk on investors. These characteristics include project specificity, credit ratings, credit enhancements, call features, and repayment funds held in escrow. Based on my risk proxies, I find issuers of risky bonds file twice as many annual financial statements on average as issuers of less risky bonds. Cross-sectional regressions that control for other bond characteristics and state-level variation in disclosure confirm many of these correlations.

Although cross-sectional results are informative, risk characteristics and disclosure are likely endogenous, which makes drawing causal inference difficult. To better identify how disclosure responds to risk, I exploit two changes in the economic environment that increase the risks associated with certain bond issues. Because these changes apply to only a subset of the municipal issues in my sample, unaffected issues create a natural control group. This identification strategy allows for

a more robust test of the relationship between risk, expected political costs, and disclosure.

First, I examine the disclosure response of issuers of insured bonds to the late 2010 bankruptcy filing of municipal bond guarantor, Ambac. Bond guarantors agree to make principal and interest payments if an issuer defaults. This type of insurance is prevalent in the municipal bond market (approximately 60% of the bonds in my sample are insured) and reduces the risk of nonpayment to investors. Exposure to municipal bonds did not cause the financial distress of the guarantors. Instead, the exposure of the guarantors to risky mortgage-backed securities generated large losses. Therefore, the bankruptcy of Ambac was exogenous to any difference in credit quality between the municipal bonds they insured relative to uninsured bonds. Nonetheless, this bankruptcy decreased the value of bond insurance and increased the nonpayment risk associated with insured bonds. Investors subsequently re-focused their attention on the credit worthiness of the underlying securities.

I find that issuers of insured bonds respond to this demand for disclosure with increased supply. Controlling for time-invariant issue-level unobservable heterogeneity, new issuance, changes in credit quality, and changes in demographics, the propensity to file financial statements increases 4% and the propensity to file budgets increases 50% for insured bonds after the Ambac bankruptcy. Thus, holding the costs of disclosure constant, investor demand for information stemming from risk incentivizes municipal disclosure.

Second, I examine the disclosure effects of a negative shock to county-level per-capita income. A shock to local income affects the ability of municipalities to collect tax revenues and repay general purpose debt. Thus, a negative income shock increases the risk of nonpayment, simultaneously increasing investor demand for information and the expected political costs of disclosure. These political costs include the reputational costs of attracting negative attention from the public and the legal costs associated with attracting negative attention from regulators. Controlling for changes in demographics and bond characteristics as well as time-invariant effects for each issue, I find a negative shock to per-capita income is associated with a decrease in publicly available disclosure. In terms of economic magnitude, issuers are 8% less likely to file financial statements and 60% less likely to file a separate budget for the following year. Therefore, expected political costs outweigh the benefits of meeting investor demand for disclosure when fundamental credit risk increases.

This paper also examines the implications of reduced dissemination costs for both the supply of

disclosure and the willingness of retail investors to transact. The costs associated with publishing and broadly disseminating information to a diverse group of investors and potential investors may inhibit disclosure, particularly for small governmental entities (Bushee and Miller, 2012). I exploit the introduction of a free, electronic, centralized repository for municipal disclosures (similar to the SEC's EDGAR system for corporate disclosures). Prior to its implementation, issuers filed financial statements and material event notices with designated for-fee information repositories (e.g., Bloomberg). I provide novel evidence that the ability to reach a broader class of investors at lower cost through this system encourages disclosure. Controlling for bond characteristics and state-level variation in disclosure, I show issuers are 8% more likely to file financial statements and 3% more likely to file separate budgets in the new system, consistent with the delivery mechanism influencing disclosure choice.

Dissemination is also likely to have implications for the trading of municipal bonds. Oligopolistic dealers facilitate trading in the opaque, decentralized over-the-counter municipal bond market. In contrast to equity market specialists, bond dealers in many cases also serve as underwriters, and are well-informed about the fundamentals of the securities they hold in inventory. This informational advantage allows dealers to extract rents from less well-informed investors. Transaction costs in the municipal bond market decrease in trade size, and arise partly from the pronounced information asymmetry between market makers and retail investors (Green et al., 2007b). The implied markup on retail-sized trades in my sample is 40 basis points higher than the markup on institutional-sized trades. Given the predominance of retail municipal bond investors, this disadvantage is of particular economic importance.

Unlike dealers and institutional investors that have relatively low-cost access to tools such as Bloomberg, identifying, obtaining, and analyzing information is costly for retail investors. High search costs for fundamental information effectively endow market professionals with private information and discourage trading by retail investors, who recognize their informational disadvantage. Low-cost dissemination should help to limit the informational advantage of dealers over retail investors. Prior research documents that public dissemination of executed trade prices lowers transaction costs for investors (Edwards et al., 2007; Pagano and Röell, 1996; Goldstein et al., 2006) and reduces price dispersion (Schultz, 2012). Similarly, I expect public dissemination of financial statement data, which were previously more costly to access, to encourage retail investors to trade

and allow them to transact with dealers at prices closer to those at which institutional investors transact.

Because no temporal variation exists in the inception of the public disclosure repository, controlling for unrelated changes in liquidity and performing cross-sectional analyses to ensure the effects are attributable to dissemination is important. My empirical strategy addresses this issue in several ways. First, I exploit variation in the timing of disclosures, measuring the benefits of dissemination after the date of the first financial statement filing for each bond issue. Second, I employ a difference-in-difference design, benchmarking small trade markups (and small trade volume) against large trade markups (large trade volume) in the periods before and after dissemination. This design uses large traders, who had relatively low-cost access to financial disclosures before the dissemination mechanism changed, as a control group. Finally, I include a differential linear time trend to account for unrelated variation across groups over time.

My results confirm retail trade volume rises subsequent to the implementation of the continuing disclosure repository. Controlling for institutional trade volume, bond characteristics, and market-wide changes in risk, I document a 7% increase in retail trading volume after an issuer files in the new repository. This economically and statistically significant increase in liquidity is consistent with the notion that dissemination enhances visibility and willingness to transact (Bushee and Miller, 2012; Bushee et al., 2010).

Controlling for inter-dealer activity, trade volume, bond characteristics, and market-wide volatility, I find retail trade markups decrease by three basis points relative to institutional markups after an issuer discloses in the repository. However, the decrease attenuates and becomes statistically insignificant with the inclusion of differential time trends. Thus, I provide only weak evidence supporting the hypothesis that broad dissemination of financial statement information helps to reduce the premium prices uninformed investors pay relative to informed investors.

This paper seeks to develop a richer understanding of municipal disclosure incentives, but it also contributes more broadly to the disclosure choice literature. The municipal setting and regulatory structure offer some advantages over other settings in which the economic determinants (and consequences) of disclosure have been studied. First, by contrast with studies that compare private and public firms (Beatty et al., 2002) or firms across countries (Doidge et al., 2007), the municipal bond market provides natural variation in the costs of disclosure while holding the regulatory regime

across firms constant. I provide evidence that the benefits of disclosure for high-risk entities generally exceed the costs in a lightly regulated environment in which proprietary costs are low (Berger and Hann, 2007). My results also suggest that investor demand for information is a mechanism that drives the negative correlation between disclosure quality and bond insurance (Gore et al., 2004).

Second, the anti-fraud provisions distinguish the municipal bond market from unregulated markets such as hedge funds (Brown et al., 2008). These provisions may also create variation in disclosure when incentives to misreport or conceal information are high. I provide evidence that when risk is accompanied by expected political costs, the costs outweigh the benefits of disclosure. This finding lends support to the interpretation of the result in Waymire (1985) that managers of higher-risk firms are less likely to provide forecasts because of expected political costs.

Finally, evidence suggests the channel through which corporate managers choose to disseminate information has important economic consequences (Bushee et al., 2003). I provide complementary evidence that issuers respond to a market-wide enhancement of the disclosure delivery mechanism with increased supply of disclosure. This evidence supports the supposition of Healy and Palepu (2001) that technological innovation facilitates disclosure. I also provide evidence that low-cost access to fundamental information increases the participation of retail investors (Bushee et al., 2003) and, to a lesser extent, helps to level the playing field in terms of the prices that informed and uninformed investors pay (Schultz, 2012).

2 Setting

2.1 The Information Environment

Currently, over $3.7 trillion of municipal debt is outstanding, spanning 50 thousand different issuers and 1.5 million individual municipal bonds. These bonds finance general governmental operations and myriad projects, ranging from sewage to hospitals. Repayment sources are also diverse, ranging from property taxes to usage fees. Although the historical five-year default rate for rated municipal bonds is less than 1%, relative to a 7% five-year default rate for rated corporate debt, the default rate varies by issuer type. For example, Moody's notes hospitals and health service providers

account for 32% of defaults between 1970 and 2011.[1] Over this period, investors demanded more frequent disclosure from health care issuers and best practices emerged (Feldstein and Fabozzi, 2008). Evidence suggests that issuers responded to this demand with an increase in supply. Hospitals are the most consistent reporters in my sample, with some issuing quarterly or monthly financial data.

Issuers of municipal securities are exempt from the majority of federal securities laws including the registration and reporting requirements of the Securities Act of 1933 and the Exchange Act of 1934, though they are subject to the anti-fraud provisions of both acts.[2] The SEC granted this exemption because of the financial expertise of institutional investors (the predominant holders of municipal securities in 1933) and the lack of perceived abuses in the municipal securities markets relative to corporate securities markets. Further, Congress was concerned constitutional issues could arise if municipal issuers were subject to federal regulation. Amendments to the securities laws have reinforced the exemption of municipal issuers from federal oversight. When Congress amended the Securities Act in 1995 to provide safe harbor to registered issuers' forward-looking statements, these protections did not extend to municipal issuers. Congress also excluded municipal issuers from the provisions of the Sarbanes-Oxley Act in 2002.

In response to market abuses and the increasing participation of retail investors, Congress amended the securities laws in 1975 by creating a self-regulatory organization, the Municipal Securities Rulemaking Board (MSRB), and granting it regulatory authority over municipal securities professionals. However, the MSRB does not have direct control over municipal securities issuers. Primary market disclosure (in the form of offering documents called "official statements") is now robust because the MSRB requires underwriters to obtain such documents to offer the securities to investors.

SEC Rule 15c2-12 (the broker-dealer rule) was promulgated in 1989 and modified in 1994. This rule limits market access for municipal securities issues to those offerings in which the issuer agrees to file annual financial disclosures to designated information repositories within a specified period (usually six to nine months).[3] The SEC considers the anti-fraud provisions to apply to these

[1] Data from Moody's March 7, 2012 default report titled "U.S. Municipal Bond Defaults and Recoveries, 1970-2011."

[2] The anti-fraud provisions apply to any information that is reasonably expected to reach investors and the trading markets. These laws prohibit any person from "making any untrue statement of material fact, or omitting any material facts necessary to make statements made... not misleading, in connection with the offer, purchase, or sale of any security."

[3] The rule applies to issuers (or obligated persons) that have over $1 million in debt outstanding. Offerings are

continuing disclosures. The rule does not prescribe the form or substance of continuing disclosures, but mandates the inclusion of "material information."[4] Breach of a continuing disclosure covenant does not constitute a technical default, and to my knowledge, no regulatory repercussions for failure to provide these disclosures have occurred. The lack of regulatory consequences for failure to file annual financial statements makes disclosure effectively voluntary for many issuers, inducing a great amount of heterogeneity in both the quantity and quality of available information.[5] A recent practitioner study documented that the rate of failure to file financial disclosures in 2009 was nearly 40% (Schmitt, 2011).

Though the MSRB does not have direct authority over municipal bond issuers, it has enacted some recent changes in an effort to enhance transparency. Specifically, the MSRB established an online continuing disclosure service via the Electronic Municipal Market Access (EMMA) system on July 1, 2009.[6] The stated objective of the web site is to provide information "free of charge... presented in a manner specifically tailored for retail, non-professional investors who may not be experts in financial or investing matters." Prior to July 1, 2009, financial statements were available through four for-fee information repositories (including Bloomberg) geared toward market professionals.[7] EMMA now serves as the sole official repository for issuers' continuing disclosure documents. These documents are available to the public at no charge (similar to the EDGAR database for corporate securities).

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exempt if the securities mature in less than nine months, possess variable rate tender features, or are sold to fewer than 35 sophisticated investors. In addition, issuers are permitted to file with designated state repositories (rather than a nationally recognized information repository) if debt outstanding is less than $10 million or the securities issued have less than eighteen months to maturity.

[4] In addition to annual reporting requirements, Rule 15c2-12 identifies eleven "material events" that must be disclosed within ten days of occurrence. These include (1) principal and interest payment delinquencies; (2) nonpayment-related defaults, if material; (3) unscheduled draws on debt-service reserves reflecting financial difficulties; (4) unscheduled draws on credit enhancements reflecting financial difficulties (5) substitution of credit or liquidity providers, or their failure to perform; (6) adverse tax opinions or other material events with respect to the tax status of the securities; (7) modifications to the rights of security holders, if material; (8) bond calls, if material, and tender offers; (9) defeasances; (10) release, substitution, or sale of property-securing repayment of the securities, if material; (11) rating changes; (12) bankruptcy, insolvency, receivership, or similar event of the obligated person; (13) consummation of a merger, consolidation, or acquisition involving an obligated person or the sale of substantially all the assets of the obligated person; (14) appointment of a successor or additional trustee. The legal remedy for a violation of this rule is usually a cease and desist order. Annual reporting is defined as "audited financial statements, when available, and operating data of the type included in the official statements."

[5] Because underwriters are regulated, disclosure is compulsory when new debt is issued.

[6] The Municipal Securities Rulemaking Board proposed this electronic repository in 2008. At the time of the proposal, the majority of the members of the MSRB were employees of the regulated entities (dealers). Comments received in response to the SEC request for comment were generally positive, though several market participants raised questions about logistical issues associated with implementing the system and the costs to institutional clients. Two of the existing designated filing repositories that the new system replaced wrote negative comment letters.

[7] The monthly cost of a Bloomberg terminal is approximately $1,800.

The SEC recently released a report citing the existence and timeliness of continuing disclosures by municipal entities as key areas of concern. In this report, SEC commissioner Mary Schapiro recommended legislative action to remove or modify the exemption of municipalities from registration and reporting requirements of the Securities Acts.[8] Oversight by the SEC is currently limited to the regulation of broker-dealers, enforcement of the anti-fraud provisions, and interpretive releases. The SEC generally initiates fraud cases because unlike private litigants, the SEC does not have to prove damages in conjunction with the purchase or sale of securities. Examples of enforcement actions taken by the SEC related to securities fraud violations in offering documents include the following: the state of New Jersey and the City of San Diego for misrepresenting the potential impact of the pension obligations on financial condition; Orange County (California) for failing to disclose material risks; and the City of Miami for failing to disclose a predictable impending cash-flow shortage. The SEC has also pursued bond issuers for filing materially misleading continuing disclosure documents. For example, the SEC pursued the Allegheny Health, Education, and Research Foundation under the anti-fraud provisions for materially overstating income in the foundation's continuing disclosures in the three years prior to declaring bankruptcy in 1998.

2.2 The Market Structure

The structure of the bond market is such that the concept of a "bid-ask spread" is slightly different from that observed in equity markets. In most equity markets, uninformed market-makers match buy and sell orders that arrive over time from anonymous traders (Easley and O'Hara, 1987). The market maker sells securities at a premium over "true" value and buys securities at a discount. This "bid-ask spread" serves as compensation for (1) order-processing costs (Roll, 1984), (2) inventory risk (Ho and Stoll, 1981), and (3) the cost of adverse selection incurred when transacting with better-informed traders (Glosten and Milgrom, 1985). The probability a trader is informed increases in trade size, causing quoted spreads to increase in size. Prior literature supports the role of accounting in reducing information asymmetry (Leuz and Verrecchia, 2000; Lang et al., 2012), thereby reducing the adverse selection component of spreads in equity markets.

By contrast, municipal bond dealers are well-informed about order flow as well as fundamental

[8]The SEC published the "Report on the Municipal Securities Market" on July 31, 2012. It is available at the following address: http://www.sec.gov/news/studies/2012/munireport073112.pdf.

information flow related to the securities they trade. This knowledge confers an informational advantage on dealers and reduces the expected cost of adverse selection. Spreads (or "markups" over the true value of the security) serve as compensation for the aforementioned costs of intermediation (order processing, inventory risk, and adverse selection) as well as an additional markup due to dealer market power (Kyle, 1985).

Larger orders receive better prices because institutional traders possess the sophistication to search for and accurately assess the fairness of the price quotes. By contrast, individual (retail) investors are likely to be disadvantaged in recognizing a "fair" price. Thus the ability of dealers to extract rents is greater in retail transactions.[9] A practitioner study found 667 dealer-to-customer sales in 2008 were executed above par after a distress or default notice was filed (Schmitt, 2009). Trades in principal amounts of less than $100,000 accounted for 65% of these transactions, illustrating the informational disadvantage of retail investors.

Several empirical studies confirm the negative association between transaction costs and trade size in the opaque, decentralized markets for corporate and municipal bonds (Green et al., 2007a; Harris and Piwowar, 2006). Transaction costs that decrease in trade size are particularly relevant in the municipal bond market because households account for 51% of municipal bond holdings.[10]

Unlike in equity markets, where pre-trade price quotations are continuously available and last-trade prices are easily accessible, transparency is far more elusive in the corporate and municipal bond markets. Dealers provide pre-trade quotations only upon request and real-time post-trade transaction reporting of corporate (municipal) bonds was not publicly available until 2002 (2005). Public dissemination of executed transaction prices (post-trade transparency) is a means of revealing information about price and leveling the playing field between customers and dealers. Several studies show post-trade transparency reduces the informational advantage of dealers and lowers transaction costs for corporate bond investors (Edwards et al., 2007; Goldstein et al., 2006; Bessembinder et al., 2006). Post-trade transparency in the municipal bond market reduces price dispersion, but has little effect on average transaction costs (Schultz, 2012). To my knowledge, the extent to

[9] Municipal bond dealers are required to register with the MSRB and are subject to a variety of sales practice, due diligence, and disclosure obligations. The National Association of Securities Dealers' Rules of Fair Practice (Article III, section IV) prohibits "excessive" markups (defined as sale price less purchase price) of more than 5%.

[10] Followed by mutual funds at 24% and insurance companies at 13%. Data as of September 2011. The Federal Reserve Flow of Accounts statistical release is available at the following address: http://www.federalreserve.gov/releases/z1/current/z1.pdf.

which fundamental accounting information (as distinct from transaction data) contributes to the informational advantage of dealers in the municipal bond market is unknown.

3 The Determinants of Disclosure

3.1 Hypothesis Development and Research Design

A vast literature examines the costs and benefits of corporate disclosure. Many of these costs are less likely to be important in the municipal setting. For example, fewer proprietary cost concerns exist (Verrecchia, 1983) and whether municipalities (or their officials) care about the secondary market liquidity of their securities (Diamond and Verrecchia, 1991) is unclear. Previous studies conducted in the municipal setting have documented associations between reporting quality and political competition (Feroz and Wilson, 1994), electoral incentives (Chen et al., 2011), local governmental form, debt levels (Robbins and Austin, 1986), and GAAP disclosure regulation (Gore, 2004). I investigate three potential incentives to publicly disclose: market demand stemming from exposure to risk, expected political costs, and the cost of dissemination.

Public demand from investors (Beatty et al., 2002) and analysts (Botosan and Harris, 2000) are important determinants of corporate disclosure quality. I expect demand for information to have important implications for municipal disclosure as well. Zimmerman (1977) examines the principal-agent relationship between politicians and their voters, and notes municipal disclosure is weaker than corporate disclosure partly because the demand for financial statements is lower. I posit this lack of demand stems partly from the perceived safety of municipal bonds. As long as expected costs (regulatory or otherwise) are low enough, issuers of riskier bonds will disclose more to meet demand. Municipal bonds are heterogeneous in terms of risk, which facilitates cross-sectional examination of the risk-disclosure relationship.

I model the probability of disclosure as a function of several issue and issuer characteristics using a logistic regression. Disclosure measures that are continuous in nature are regressed on various issue and issuer characteristics using ordinary least squares:

$$Disclosure_{i,y} = \alpha_1 + \alpha_2 Post\_EMMA_{i,y} + \alpha_j RiskCharacteristics_{j;i,y} + \alpha_n Controls_{n;i,y} + \varepsilon_{i,y}$$

$Disclosure_{i,y}$ measures the existence, quantity, and timeliness of the financial statements filed by the issuer of issue i in any year y, after the year of issuance. $RiskCharacteristics_{j;i,y}$, which I explain in detail in section 3.2, are issue and issuer characteristics that cause municipal bond investors to bear a greater degree of risk. For example, the full faith and credit (taxing power) of the issuing municipality supports repayment of general obligation (GO) bonds, making these the safest of municipal bonds. By contrast, project revenues secure repayment of project-specific bonds ("revenue bonds," e.g., airports, toll roads, hospitals). Because of the specificity of the repayment source, holders of revenue bonds bear more nonpayment risk than holders of general obligation bonds. Moody's notes that of the defaults between 1970 and 2011, only 7% were general obligation bonds (Tudela et al., 2012). Based on the hypothesis that risk and disclosure are positively correlated, I expect the coefficients on $RiskCharacteristics_{j;i,y}$ to be positive.

I also use the logistic regression above to measure the consequences of EMMA for the propensity to disclose. $Post\_EMMA_{i,y}$ is an indicator variable that switches to one if year y is after July 1, 2009. This variable captures the change in disclosure behavior of municipalities after the inception of EMMA relative to Bloomberg. The consequences of technological innovation are difficult to document in part because pinpointing a start date for the Internet is difficult. Because EMMA has a well-defined start date, this shock allows me to test the assertion that the Internet "reduced the costs of providing voluntary disclosures and presumably increased their supply" (Healy and Palepu, 2001). I expect α_2 to be positive.

Controls include issue size, coupon rate, bond age, and time remaining to maturity, total debt outstanding, and contemporaneous credit rating (Robbins and Austin, 1986). I account for demographic and economic characteristics at the county level using annual income and population data from the Bureau of Economic Analysis (BEA). Because each county may contain multiple issuers, standard errors are clustered at the county-level to account for any unobserved commonality. I also include year fixed effects to account for general time trends and an indicator variable equal to one if the issuer of issue i offers a new bond during year y, which captures compulsory reporting.

State regulations and transparency initiatives likely affect the public disclosure behavior of municipalities. Therefore, I include the BGA-Alper Integrity Index Rating for each state to capture the extent to which protections against political corruption have been enacted.[11] In alternate

[11]The Better Government Association is a civic watchdog group that produces a relative measure of each state's

specifications, I include state fixed effects to account for unobserved state-level heterogeneity in disclosure regulation.

My identification strategy relies on two economic shocks that alter the net benefits of disclosure for affected issuers. First, I exploit the bankruptcy of Ambac in November of 2010, which punctuated the financial distress of municipal bond guarantors. In addition to insuring municipal bonds, Ambac wrote insurance on sub-prime mortgage-backed securities, for which it was unable to pay claims. Thus, the distress of Ambac (and the other bond guarantors) was largely exogenous to the credit quality of municipal bond issuers themselves. It is possible that the general economic conditions (e.g., depressed home values) that led to defaults on sub-prime mortgages also affected the credit quality of municipal bond issuers. However, my analysis focuses on the disclosure response of insured issues relative to uninsured issues. It is unlikely that these economic changes asymmetrically affected the underlying credit quality of insured and uninsured bond issues.

The bankruptcy of Ambac decreased the value of bond insurance and increased the perceived risk of insured bonds. The aforementioned SEC report on the municipal securities market states the financial condition of the guarantors "impacted the market for municipal securities and renewed investor focus on the disclosure practices and underlying credit quality of municipal securities" Implicit in this statement is the notion that risk and disclosure are positively related. Because this shock increased demand for information, while leaving the expected costs of disclosing relatively unchanged, I expect issuers of insured bonds to re-evaluate their disclosure practices and increase the supply of disclosure.

To test whether a shock to demand increases disclosure, I estimate the following regression for issue i and year y:[12]

$$Disclosure_{i,y} = \beta_1 + \beta_2 Post\_Bankruptcy_{i,y} + \beta_3 Insured * Post\_Bankruptcy_{i,y} + \beta_{4;i} + \beta_{5;y} + \sum \beta_j Controls_{j;i,y} + \varepsilon_{i,y}$$

The variable of interest is the coefficient on $Insured * Post\_Bankruptcy_{i,y}$, capturing the change in disclosure after the bankruptcy of Ambac for issuers of insured bonds. If this exogenous shock

anti-corruption laws. States are evaluated on the basis of the strength of the following laws: Freedom of information, Whistleblower, campaign finance, open meetings, and conflict of interest. The 2008 BGA-Alper Integrity Index is available at http://www.bettergov.org/assets/1/News/BGA_Alper_Integrity_Index_2008.pdf

[12]This regression is estimated using ordinary least squares instead of logit because fixed-effects logit is known not to be consistent and partial effects are difficult to estimate (see Wooldridge, 2002).

to risk and demand for information induces issuers of insured bonds to disclose more than issuers of uninsured bonds, β_3 should be positive. This regression includes issue fixed effects to control for time-invariant unobserved heterogeneity and year fixed effects to account for time trends. I include all available time-varying control variables, including annual credit ratings, the age of the bond issue (in years), and the natural logarithm of county-level income and population to account for demographic changes. I also include an indicator variable equal to one if the issuer of issue i offers a new bond during year y. I estimate this specification using ordinary least squares with robust standard errors clustered at the county level.

The second shock I examine is a negative shock to credit quality. Tax revenues support the general obligations of local governments. Therefore, a negative shock to the income of local residents decreases revenue-generating capacity and increases nonpayment risk associated with general obligation bonds. Because investors face an increased risk of loss, demand for financial information from issuers of these bonds increases. Self-interested politicians, however, seek to maximize their own utility and can withhold information that can be reputationally damaging. In addition, the SEC can sue municipalities if voluntary disclosures omit or misstate a material fact. Because the incidence of litigation and incentives to misreport are greatest during periods of economic distress, issuers are likely to internalize the political cost of attracting regulatory attention and withhold information. Although the body of research examining how the threat of litigation affects corporate disclosure has produced mixed results, some evidence suggests the expected cost of litigation reduces incentives to voluntarily provide information (Rogers and Van Buskirk, 2009).

I test empirically whether the increased likelihood of incurring political costs outweighs the increased demand for disclosure. Anecdotal evidence suggests public municipal disclosure decreases in the face of financial distress. The City of Harrisburg, Pennsylvania, filed for bankruptcy protection in October of 2011, having failed to file annual financial statements in any of the three preceding years. After falling into technical default in 2008, the County of Jefferson, Alabama, was delinquent in its compliance with state-mandated disclosure requirements as of June 2010. In addition, a practitioner study released in 2011 documented that estimated disclosure-compliance rates decreased from 67% to 60% during the financial crisis (Schmitt, 2011).

To test how this simultaneous shock to risk and expected political cost influences disclosure, I estimate the following specification for issue i and year z:

$$Disclosure_{i,z} = \gamma_1 + \gamma_2 Negative_{i,z} + \gamma_{3;i} + \gamma_{4;z} + \sum \gamma_j Controls_{j;i,z} + \varepsilon_{i,z}$$

$Disclosure_{i,z}$ is the existence, quantity, and timeliness of financial statements filed by the issuer of issue i pertaining to year z. The variable of interest is the coefficient on $Negative_{i,z}$, which measures the disclosure response to a local negative economic shock in year z. I define a negative economic shock as a negative change in per-capita income as reported by the BEA between 2005 and 2010, which occurs in approximately 15% of issue-years. $Negative_{i,z}$ is an indicator variable equal to one in any county-year in which the change in per-capita income is less than zero. I again include issue fixed effects, year fixed effects, credit ratings, county-level demographic control variables, and estimate this specification using ordinary least squares. Robust standard errors clustered at the county level. If γ_2 is negative, the expected costs of disclosure following a local economic shock outweigh the benefits.

3.2 Sample, Empirical Proxies, and Descriptive Statistics

Municipal bond issuers can issue multiple bonds over time, with different features and for different purposes. These bonds are underwritten and sold in serial maturity, and each offering under a given bond contract is collectively referred to as a bond issue. I use the Thomson-Reuters SDC Platinum database to identify bond issues (or "deals") and the CUSIP numbers associated with each issue. I restrict the search to fixed-coupon bonds, in principal amounts over $1 million, issued by counties and their related special districts between January 1997 and June 2007.[13] I then randomly select all issues within 662 counties across 48 states for inclusion in my sample.[14] Each county in the sample has a variety of different issuers (e.g., general operations, schools, etc.) and each issuer issues many bonds. My final sample includes 1,434 issuers of 2,247 issues of 17,519 individual bonds.

Using the CUSIP numbers of the selected securities, I then hand-collect data on bond characteristics, ratings, and trading from Bloomberg from February 2005 through June 2012 (this time frame is designed to avoid the confounding effects of other changes in the information environment enacted by the MSRB prior to 2005). I collect financial statement filings from Bloomberg prior to June 30, 2009, and from EMMA after July 1, 2009.[15]

[13] Continuing disclosure covenants were required for all securities underwritten after July, 1995.

[14] None of the 14 counties in Vermont or 18 boroughs in Alaska had bonds outstanding with identifiable CUSIPs in the SDC Platinum database. Therefore, no observations for these two states are in my sample.

[15] After EMMA replaced Bloomberg as a recognized repository in 2009, Bloomberg hired a team of analysts to begin

Table 1, Panel A presents descriptive statistics for the characteristics of the bonds in my sample. The average bond is four years old with nine years remaining to maturity. The average credit quality of the bonds is AA-, offering coupon rates of 4.37% annually (unreported offering yields average 4.31% annually).

I measure disclosure in terms of the existence, quantity, and timeliness of post-issuance financial statement filings in Bloomberg and EMMA, respectively. My proxy for the existence of financial statements, $Filing\,Indicator_{i,y}$, is an indicator variable equal to one if the issuer of issue i files a financial statement in year y and zero otherwise. I define a year as July 1 through June 30 because the majority of state and local governments have June 30 year-ends. Because the budgeting process is informative in the municipal setting, I also include the presence of a separately filed budget, $Budget\,Indicator_{i,y}$, as a proxy for existence. My proxy for the quantity of financial statements, $Filing\,Count_{i,y}$, is the sum of the number of financial statements filed by the issuer of issue i during year y. For example, an issuer preparing quarterly statements will file four financial statements in a year. Finally, I measure the timeliness of reporting, $Reporting\,Lag_{i,y}$, as the number of days between period end and the report date of the first statement filed in year y. For ease of interpretation in regressions, I measure "Timeliness" as $Log(Reporting\,Lag_{i,y}) * -1$.[16]

Table 1, Panel B presents descriptive statistics of the disclosure measures for the issues in my sample, spanning 14,413 issue-years. On average, issuers in my sample file 1.1 sets of financial statements per year, approximately 6 months after year-end, containing an average of 163 pages. Approximately 29% of issuers in my sample fail to file financial statements in any given year, and 5% do not disclose at all over the sample period. Separately filed budgets are relatively uncommon, but occur more frequently for issuers of general obligation debt (7%) than revenue bonds (4%).

I identify seven "risk" characteristics for these bonds. Four of these characteristics are associated with the nature of the issuer. First, the full faith and credit of the issuing entity secures repayment of general obligation bonds, whereas project-specific revenues secure repayment of revenue bonds.

proactively collecting disclosure data by calling and e-mailing issuers as well as checking issuer web sites. Thus, the post-2009 filings that appear in Bloomberg are inconsistent with the pre-2009 filings and have not necessarily been officially filed with EMMA. Therefore, after July 1, 2009, I manually collect financial statement data from EMMA directly. I remove duplicate filings as well as filings that do not contain financial statements from both Bloomberg and EMMA.

[16] The Government Finance Officers Association awards state and local governments for excellence in financial reporting. Although this would be an objective measure of reporting quality, the latest program results available (as of November 2012) pertain to fiscal years ending in 2009, diminishing the usefulness of the measure in the latter half of my sample.

Nonpayment risk on revenue bonds ($Revenue_i$) is higher because of the specificity of the repayment source. Second, municipalities may choose to finance construction projects using certificates of participation (COP_i) rather than general obligation debt. Holders of certificates of participation effectively serve the role of lessor and are entitled to a share of lease revenues. Holders of certificates of participation bear more risk than general obligation bondholders. Third, bonds issued to finance not-for-profit hospitals ($Hospital_i$) are riskier than those issued to provide essential services (e.g., water and sewer). Fourth, nonpayment risk on low-rated and non-rated bonds ($Low_{i,t}$) is higher than for higher-rated bonds. I define low-rated bonds as those in the lowest quartile in my sample, which is all bonds rated below A+, including non-rated debt.

The remaining three risk characteristics relate to bond issue attributes rather than issuer attributes. A single issuer may have multiple issues outstanding that each differs in these attributes. First, a third-party corporation can guarantee the payment of principal and interest in the event the obligor defaults.[17] Insured bonds are safer than comparable uninsured bonds ($Uninsured_i$). Second, callable bonds ($Callable_i$) possess repayment risk and are more difficult to price. Third and finally, when a new bond issue replaces an outstanding bond issue ("refunding"), the cash to repay the holders of the refunded bond is held in escrow. These bonds are safer than non-refunded bonds ($Non\_Refunded_{i,t}$) because the funds for repayment have already been segregated.

I create indicator variables for each of these risk factors (coded "1" if the bond possesses the risk characteristic and "0" otherwise). To create a composite risk measure that captures the relative riskiness of a given bond, I sum these indicators. For example, a revenue bond issued by a hospital that is callable and uninsured is riskier than an insured general obligation bond.

3.3 Results

3.3.1 Univariate results

Table 2 Panel A provides univariate evidence that risky issuers disclose more than their lower-risk counterparts. Hospitals are the most frequent filers, filing two more financial statements annually than non-hospital issuers. Issuers of revenue bonds file 0.43 more financial statements than issuers of other types of bonds. Low-rated issuers file 0.5 more financial statements than higher-rated issuers.

[17] Of the insured bonds in my sample, MBIA insures 30%, Assured Guaranty insures 30%, Ambac insures 26%, and XLCA insures 9%. None of the remaining named insurers account for over 5% of the insured bonds.

In addition, issuers of uninsured, non-refunded, and callable bonds file more disclosures than issuers of insured, refunded, and non-callable bonds, respectively.

Table 2 Panel B provides univariate evidence that disclosure is close to monotonically increasing in the riskiness of an issuer's bonds. The majority of issue-years, 83%, fall into the middle three risk categories (two, three, or four risk characteristics). No issue in the sample possesses all seven risk characteristics. On average, issuers of the riskiest issues (six risk characteristics) file 2.5 more financial statements annually than issuers of the lowest-risk issues (zero risk characteristics). Because only 4% of issue-years in my sample fall into the lowest-risk and highest-risk tails, I also compare the filings of low-risk issues (one risk characteristic) to those of high-risk issues (five risk characteristics). On average, issuers of these high risk issues file 0.91 more financial statements annually than issuers of low-risk issues. These differences are both statistically and economically significant given the average issuer in my sample files 1.1 financial statements per year.

3.3.2 Logit results

Table 3 documents the associations between disclosure and issuer characteristics, controlling for other bond features that could influence the interpretation of the univariate results described above. I find that many of the aforementioned risk characteristics maintain their positive correlation with the existence, extent, and timeliness of disclosure. The coefficients on revenue bonds and certificates of participation are largely insignificant, with the exception of the likelihood of filing a budget, which is significantly negative for revenue bonds and significantly positive for certificates of participation. General purpose governments, by nature, are most likely to make use of the formal budgeting process, which drives this negative relationship. Issuers of revenue bonds are timelier in the filing of financial statements, likely due to the complexity of compiling information for general purpose financial statements. Hospital issuers are 11% more likely to disclose and are 78% more timely in filing. Whereas the coefficient on credit rating is insignificant in the logistic regressions, the OLS regressions indicate the quantity and timeliness of filings significantly decrease in credit quality. I also find the issuers of uninsured bonds are 4% more likely to disclose and are 15% more timely than other issuers. The coefficients on non-refunded and callable bonds are generally positive but insignificant.

Consistent with prior research (Robbins and Austin, 1986), I find the existence, quantity, and

timeliness of disclosure are positively related to debt levels, issue size, and county population. Disclosure also increases in the year of a new bond issue, because reporting is compulsory in these years; however, these filings are as timely as other filings. Finally, bonds issued via competitive sale require more information than negotiated sales. Issuers that choose competitive sales continue to publicly disclose more information than those that choose negotiated sales.

State-level anti-corruption laws have a positive effect on the propensity to disclose financial statements, but an insignificant effect on the extent and timeliness of disclosure. The inclusion of state fixed effects suggests the state regulatory environment is an important determinant of disclosure choice for general purpose county governments.[18] The inclusion of state fixed effects strengthens the negative association between disclosure and revenue bonds and the association between disclosure and certificates of participation becomes negative. These results suggest state regulatory environments focus on disclosures of general purpose governments rather than special purpose governmental entities. Some general purpose governments are required to incur the costs of preparing financial statements irrespective of public dissemination. If these requirements are not imposed on special purpose issuers, these issuers incur relatively high administrative costs to comply with public disclosure covenants. Hospital bond issuers continue to be significantly more likely to disclose and more timely than non-hospital issuers.

I confirm that disclosure increased after the 2009 introduction of EMMA (see Figure 1 and Table 3). Controlling for important issuer and issue characteristics, I document a statistically and economically significant 8% increase in the probability of filing financial statements and a 3% increase in the probability of filing a separate budget. I also document an average increase of 0.55 disclosures per year and a 15% increase in timeliness. These results suggest EMMA was effective in increasing the supply and quality of disclosure, consistent with what one would expect when the cost of dissemination decreases.[19]

[18] Results are similar for the propensity to file a budget, however these results should be interpreted cautiously because state fixed effects cause 14 states to be dropped from the analysis due to lack of variation in budget filing.

[19] 15% of issuers in my sample have less than $10 million in debt outstanding and would have been permitted to file financial statements with state information repositories rather than national repositories such as Bloomberg prior to 2009. As a robustness check, I exclude these issuers from the analysis; Results are unchanged.

3.3.3 Disclosure response to economic shocks

I find evidence in Table 4 that issuers respond to an exogenous increase in risk with increased disclosure (the coefficient on $Insured * Post\_Bankruptcy_{i,y}$ is positive). I find issuers of insured bonds are 3 percentage points more likely to file financial statements and budgets after the 2010 bankruptcy of Ambac. Three percentage points represents a 5% increase over the unconditional probability of filing financial statements and a 50% increase over the unconditional probability of filing a separate budget. This economically significant increase suggests market demand for disclosure is an effective mechanism to incentivize disclosure in the absence of regulation.

Table 5 provides evidence that issuers are less likely to file financial statements when per-capita income declines. The coefficient on $Negative_{i,z}$ is negative in all specifications. I find issuers are 6 percentage points less likely to issue financial statements pertaining to years in which per capita income decreases. Relative to the mean propensity to disclose, 6 percentage points is approximately a 7% decrease. Thus, the possibility of incurring regulatory or reputational costs discourages voluntary disclosure by municipalities. Issuers are 4 percentage points less likely to separately file budgets for the year following the downturn (representing a 60% decrease relative to the mean propensity to file a budget). This negative relationship suggests municipalities avoid providing forward-looking information when the likelihood of regulatory repercussions is high. In addition, the number of disclosures decreases by 14% and I find an insignificant decrease in the timeliness of the reports filed. Alternate measures of local economic condition, including county-level foreclosure rates and housing price indices from CoreLogic produce similar, though less significant results.

4 Consequences of Dissemination

4.1 Hypothesis Development and Research Design

Broad dissemination of corporate disclosures through the business press and investor-relations firms broadens investor bases and improves liquidity (Bushee et al., 2010; Bushee and Miller, 2012). By reducing the cost of information acquisition, I expect low-cost dissemination of disclosure via the Internet to encourage participation by retail investors. In addition, dissemination of municipal infor-

mation should heighten investors' awareness of the existence of investment opportunities (Merton, 1987).

To measure how retail trade volume (relative to institutional trade volume) changes after disclosing in EMMA, I estimate the following regression at the bond-year level:

$$SmallVolume_{b,y} = \eta_0 + \eta_1 Post\_Disclosure_{b,y} + \eta_2 Post\_EMMA_{b,y} + \eta_3 LargeVolume_{b,y} + \sum \eta_j Controls_{j,b,y} + \varepsilon_{b,y}$$

$Post\_Disclosure_{b,y}$ is an indicator variable equal to one after the first time the issuer of bond b discloses in EMMA. EMMA was available to accept disclosures after July 1, 2009. However, many issuers did not file disclosures in the system until 2010 or 2011 (and some have not disclosed at all as of 2012). Therefore, in addition to a $Post\_EMMA_{b,y}$ variable that captures market trends after 2009 but prior to filing in EMMA, I include an indicator that switches to one after the date of an issuer's first disclosure in EMMA, $Post\_Disclosure_{b,y}$. The coefficient of interest is η_1, the average difference in retail trade volume after disclosures are disseminated. A positive coefficient indicates an increase in retail trade volume.

High costs of information acquisition deter small (retail) investors, who are most likely to benefit from broad dissemination (Bushee et al., 2003). By contrast, large (institutional) investors already had relatively low-cost access to systems that disseminated disclosures. As the information sets of retail and institutional investors align, I expect the markups charged to retail investors to converge upon those charged to institutional investors.

To estimate how relative dealer markups change after disclosing in EMMA, I employ a difference-in-difference design, measuring the relative markups on small and large trades before and after disclosure in EMMA. This design uses large trades as a control group over which to measure the effects of dissemination on small trades. Any market-wide changes that occur after 2009 that are unrelated to the information repository would need to affect retail and institutional investors differentially to explain my results. I estimate the following regression at the transaction level:

$$Markup_{b,t} = \theta_0 + \theta_1 Post\_Disclosure_{b,t} + \theta_2 Small * Post\_Disclosure_{b,t} + \theta_3 Post\_EMMA_{b,t} + \theta_4 Small * Post\_EMMA_{b,t} + \sum \theta_j Controls_{j,b,t} + \varepsilon_{b,t}$$

This design also exploits temporal variation in disclosures filed in EMMA using an indicator that switches to one after the issuer of bond b first discloses in EMMA, $Post\_Disclosure_{b,t}$. $Small_{b,t}$ indicates a retail-sized trade, and $Small * Post\_Disclosure_{b,t}$ interacts the two. The coefficient of

interest is θ_2, which captures the incremental effect of disclosing in EMMA on retail trade markups relative to the effect on large trade markups. A negative coefficient indicates a convergence of retail and institutional trade markups and reduced informational advantage of dealers with respect to retail investors.

The difference-in-difference design relies on the assumptions that the treatment has the same effect in all years and that the two groups (small and large trades) follow parallel trends in the pre-period. To relax the first assumption, I include year fixed effects and a linear time trend. To relax the second assumption, I include differential year fixed effects and differential linear trends, which allow for the possibility that these two groups (small trades and large trades) differ across time. I also include controls for small trade size and large trade size in all regressions to account for the possibility that changes in trade size within these two partitions cause markups to change after EMMA. Finally, I control for changes in differential markups after 2009 that are unrelated to disclosure in EMMA. $Small * Post\_EMMA_{b,t}$ controls for differential market trends after 2009, but prior to disclosing in EMMA.

Both of these regressions include controls for issue size, coupon rate, bond age, time remaining to maturity, call features, insurance status, tax-exempt status, refunding status, source of repayment, total debt outstanding, and contemporaneous credit rating (Green et al., 2010; Harris and Piwowar, 2006). I account for demographic and economic characteristics at the county level using annual data from the BEA and cluster standard errors at the county level to account for any unobserved county-level commonality. Consistent with prior research, I include an indicator variable for bonds issued in large states (California, Florida, New York, Pennsylvania, and Texas; Schultz, 2012). I control for general changes in municipal market conditions and volatility by including the daily level of the 10-Year AAA General Obligation Index (the average time to maturity for the bonds in my sample is nine years). This index is a benchmark for daily municipal yield change and is widely used by market participants. I also include the quarterly level of municipal bond issuance to account for any effect the primary market has on the secondary market.[20] To avoid capturing confounding transparency events, the pre-period begins in 2007 and the post-period ends in 2011 in all regressions.

Volume regressions include controls for annual retail trade volume on a random sample of 100

[20] I obtain these data from the Securities Industry and Financial Markets Association.

corporate bonds to account for trends specific to bond trading over the sample period. Corporate bonds likely encountered similar economic change over my sample period, but experienced no dramatic changes in transparency. Markup regressions control for bond-year trade volume and the time of day (AM/PM). These regressions also include controls for the number of same-day inter-dealer trades to account for dealer competition. Finally, I include an indicator equal to one if the bond was issued by a top ten underwriter to account for the strength of the dealer network.

4.2 Empirical Proxies and Descriptive Statistics

The primary objective of these empirical tests is to measure the change in retail trade volume and transaction costs on retail-sized trades *relative* to institutional-sized trades after disclosures are publicly disseminated. Transaction-level data provided by the MSRB include a per-bond price (expressed as a percentage of the principal amount of the security), the principal amount of the bond traded, a date and time stamp, and an indicator of whether the trade was a dealer sale to a customer, a dealer purchase from a customer, or an inter-dealer trade. The MSRB data do not reveal the identity of the dealer reporting the transaction or the number of dealer quotes solicited.

I measure trade volume as the proportion of trade days in a given bond-year in which at least one customer trade occurs. I exclude inter-dealer trade activity from this analysis. To ensure trading has stabilized after issuance, I exclude all trades that occur within four weeks of bond issue. When a bond is issued during year y, the proportion of trade days is measured over the remaining trade days in the year. Although many studies in equity markets measure zero return days over shorter windows, the extreme illiquidity of the municipal bond market makes annual observations most appropriate. I measure small and large trade volume in bond b during year y separately as

$$\begin{aligned} Small\,Volume_{b,y} = &\quad 100 * [Small\,Trade\,Days_{b,y}/Trading\,Days_y] \\ Large\,Volume_{b,y} = &\quad 100 * [Large\,Trade\,Days_{b,y}/Trading\,Days_y] \end{aligned}$$

$Small\,Trade\,Days_{b,y}$ measures the number of days in a year in which at least one small trade occurs. $Large\,Trade\,Days_{b,y}$ measures the number of days in a year in which at least one large trade occurs. $Trading\,Days_y$ is the number of trade days in year y in which bond b is outstanding. Small trades are more common than large trades, but neither is very frequent (see Table 1). On average, three small trades and 0.7 large trades occur per year, though the median is much lower at zero small

and large trades annually. Because the volume measurement is highly skewed, I use the log form of trade volume in all regressions:

$$\begin{aligned} Small\,Volume_{b,y} = &\quad ln\left(1 + 100 * [Small\,Trade\,Days_{b,y}/Trading\,Days_y]\right) \\ Large\,Volume_{b,y} = &\quad ln\left(1 + 100 * [Large\,Trade\,Days_{b,y}/Trading\,Days_y]\right) \end{aligned}$$

The MSRB data do not distinguish retail trade execution from institutional trade execution. Therefore, I use market convention to distinguish between these two types of trades. Trades of \$100,000 in principal value, known as a "round lot," are more likely to be executed by institutional customers (e.g., mutual funds and insurance companies) than retail (individual) customers. The mean large trade size in my sample is \$536,000 and the median is \$150,000. Consistent with prior research, I define small trades as those under \$100,000 in principal value and large trades as those over \$100,000, inclusive (Edwards et al., 2007; Schultz, 2001). The median size of a small trade in my sample is \$25,000, which is more likely to be a retail transaction than an institutional transaction.

The extent of illiquidity in the secondary market for municipal bonds makes measurement of transaction costs difficult. However, transaction-level data allow relatively direct measurement of the difference between a security's "true" value and its selling price. I assume dealers transact with one another at a fair price. For each day in which at least one inter-dealer trade and at least one customer trade occurs, I take the average price at which dealers transact with one another and measure markup (or markdown) as the basis point difference between this benchmark and the price at which customers purchase (or sell) the same security on the same day.

Sometimes dealers take more than a day to shift bonds in and out of inventory around customer trades. Therefore, if no inter-dealer match exists for a customer trade on a given day, I extend the window seven calendar days to find an inter-dealer match. For example, if a customer purchases \$25,000 of a security on date t and no inter-dealer transaction occurs on this date, I look backwards seven days to find an inter-dealer trade (e.g., a dealer acquiring the security from the inventory of another dealer to fill the customer order). If a customer sells \$25,000 of a security with no immediate match, I look forward seven days to find an inter-dealer trade (e.g., a dealer subsequently selling the bond to another dealer to remove it from his inventory). Formally, I measure markup (in basis points) on any customer transaction on date t in bond b as:

$$Markup_{b,t} = Trade\,Sign_{b,t} * 10,000 * ln\left[\frac{CustomerPrice_{b,t}}{InterdealerPrice_{b,t}}\right]$$

$Trade\ Sign_{b,t}$ is a buy/sell indicator equal to 1 if the trade is a customer purchase, -1 if the trade is a customer sale, and 0 if the trade is inter-dealer. My estimates of dealer markup are similar to those documented in prior research (Edwards et al., 2007). The mean (median) markup on small trades is approximately 127 (117) basis points (bps), whereas it is 78 (55) bps for large trades (see Table 1). The mean (median) markup on very large trades (over five million dollars) is only 9 (6) bps. These statistics confirm prior evidence that large orders receive better prices (closer to inter-dealer prices) than small orders do. I address the skewness in trade markups by Winsorizing at the 5% (95%) level in all regressions.

Table 1 also shows the average markup on customer purchases is 60 basis points higher than the markdown on customer sales. This difference is driven by the structure of the bond market. The majority of dealers hold long bond positions because shorting bonds is difficult and uncommon. Therefore, dealer incentives to keep security prices high cause the bid-ask spread to be asymmetric around the mean. This asymmetry helps to illustrate the market power of municipal bond dealers.

4.3 Results

Consistent with prior literature, riskier bonds are associated with higher trade markups (Table 2, Panel A). These differences are strongly significant for all risk characteristics except certificates of participation. Notably, markups on callable bonds are 65 basis points higher, low-rated bonds are 40 basis points higher, and hospital bonds are 39 basis points higher than their lower-risk counterparts. Table 2, Panel B presents complementary univariate evidence that markup is monotonically increasing in risk. Small trade markups on the highest risk bonds are a statistically significant 133 basis points higher than the lowest risk bonds.

However, risk and trade volume do not appear to exhibit predictable associations. In general, riskier bonds trade more often than less risky bonds (with the exception of uninsured and callable bonds, which trade less often than their less-risky counterparts). High-risk bonds (five risk characteristics) trade 1.32% more frequently than low-risk bonds (one risk characteristic). However, the highest-risk bonds (six risk characteristics) trade 0.38% less frequently than the lowest-risk bonds (zero risk characteristics).

Figure 2 shows retail trade volume increases after the introduction of EMMA in 2009, particularly for very small trades (under $25,000). By contrast, trade volume on larger (institutional) trades

does not appear to vary over the sample period. Table 6, Panel A, Column (1) corroborates this observation and documents an 8% increase in retail trade volume after disclosing in EMMA, controlling for the level of institutional trade volume and other bond characteristics. Institutional and retail trade volumes are significantly positively related. Larger issues, older bonds, bonds with longer maturities, and insured bonds trade more frequently. Consistent with a positive relationship between risk and trade volume, trading decreases in credit rating and is higher for revenue bonds and certificates of participation. Bonds issued in larger states and by a top ten underwriter trade more frequently. Column (2) controls for market-wide changes occurring after 2009 but prior to disclosing in EMMA, and documents a 7% increase in retail trade volume subsequent to filing in EMMA. These results are consistent with an increase in retail trading that is attributable to disclosure in EMMA.

Regression results in Table 6, Panel B confirm markups increase in risk. Larger markups characterize bonds secured by project revenues, certificates of participation, non-refunded, and callable bonds. Markups increase in higher interest-rate environments and decrease in credit rating. Markups decrease in issue size and aggregate municipal bond issuance. Consistent with prior research, markups do not demonstrate predictable correlation with trade volume (Edwards et al., 2007). Markups are larger when the bonds pass through more dealers to reach a customer, and markups are lower when a top ten underwriter distributes the bond issue. These results verify the strength of a dealer's network is a powerful determinant of trade markups.

After I control for bond characteristics, the positive coefficient on $Small_{b,t}$ confirms markups on small trades (those less than \$100,000) are significantly larger than on large trades (by approximately 44 basis points). Figure 2 visually corroborates the negative correlation between trade size and markups. It also highlights the convergence of retail markups toward those of institutional-sized trades after the inception of EMMA. The difference between the median markup on very small trades (those under \$25,000) and very large trades (those over \$250,000) decreases from 125 basis points in 2006 to 60 basis points in 2012. In addition, this figure shows small trades and large trades appear to follow similar trends in the pre-EMMA period.

Column (1) of Table 6, Panel B, shows a 10 basis point *increase* in markups charged on large trades (a 13% increase over the mean markup on large trades of 78). Because my hypotheses do not intend to test the aggregate effects of dissemination, I make no ex-ante predictions as to the effects of

EMMA on institutional trade markups (I merely predict retail and institutional trade markups will converge as their information sets converge). However, this positive coefficient is consistent with an attenuation of the dealers' informational advantage, causing dealers to require compensation for the risk of adverse selection by privately-informed institutional investors (Kim and Verrecchia, 1994).

Consistent with expectations, Columns (1) and (2) document a statistically significant nine basis point reduction in retail trade markups (relative to institutional trade markups) after disclosing in EMMA. This evidence supports the notion that dissemination causes retail trade markups to converge toward institutional trade markups. In untabulated results, I ensure serial correlation is not driving the results, by re-running the regressions with all variables aggregated at the county level (Bertrand et al., 2004).[21] The inclusion of differential year fixed effects in Column (3) and differential linear trends in Column (4) attenuate the effect of dissemination. In these specifications, the coefficient on $Small * Post\_Disclosure_{b,t}$ remains negative but becomes insignificant.

Columns (5) through (8) control for changes in differential markups after 2009 that are unrelated to disclosure in EMMA. The coefficient on $Small * Post\_Disclosure_{b,t}$ attenuates to three basis points in Columns (5) and (6). This coefficient suggests that despite the general convergence in institutional and retail trade markups in the Post-EMMA period, issuers that disclose in EMMA experience an incremental convergence. The inclusion of differential year fixed effects and differential linear time trends in Columns (7) and (8) further attenuate the coefficient, which becomes insignificantly negative. Thus, I provide only weak evidence of a convergence of retail and institutional trade markups attributable to low-cost dissemination of financial information.

5 Conclusions and Future Research

5.1 Conclusions

I use the municipal bond market as a laboratory in which to study disclosure incentives in a limited regulation environment. I provide evidence that when the likelihood of regulatory scrutiny is low, voluntary disclosure increases in risk. However, when risk and expected political costs simultaneously increase, disclosure decreases. I attribute this decrease to the possibility of attracting negative regulatory or reputational attention.

[21] The coefficient on $Small * Post\_Disclosure_{b,t}$ is nearly unchanged at -9.54 and is significant at the 1% level.

I also contribute to our understanding of the effects of technological innovation. I document that enhancing the delivery mechanism for financial disclosure has important implications for both issuers and investors. I provide novel evidence that reducing the costs of dissemination, through an EDGAR-like mechanism, increases the supply of disclosure and increases the participation of retail investors. These increases are statistically and economically significant.

5.2 Future Research

Future research can make progress in developing our understanding of the role (if any) of financial disclosure in conferring an informational advantage on municipal bond dealers. This paper focuses on a specific information channel available to issuers and financial statement users. The advantages of this channel include objective measurement of disclosure, investor-focus arising from compliance with disclosure covenants, and federal regulatory attention. I plan to integrate disclosure via municipal web sites and rating agency reports to develop a more complete measure of transparency. Such a composite measure can be used to compare the markups on transparent issuers' bonds to similar non-transparent issuers' bonds.

Additional sources of heterogeneity characterize the municipal bond market that are unexplored in this paper. For example, certain types of municipal bond issuers are required to register with the SEC (these are not included in my analysis). Comparison of issuers subject to disclosure regulation to similar unregulated issuers could contribute to our understanding of the effects of SEC regulation. This dichotomy can also be used to measure the effect of concealing adverse changes in financial condition.

Appendix: Definitions of Variables

Variable	Definition
AAA GO Yield	Daily quoted yield on the Municipal Market Investors (MMA) AAA 10-year General Obligation Consensus Index. The data is submitted by thirty institutions, and the MMA AAA Median represents the mid-point between the "bid" and "ask," based on a "Natural 'AAA' GO credit" with Maryland GO used as a general guide. This is the benchmark rate against which municipal securities are most often compared.
Afternoon Trade	An indicator equal to one if the customer trade occurs in the afternoon to account for time-of-day effects.
Age	Years between the issue date of the bond and the date of the observation, rounded.
Municipal Bond	A certificate of debt issued by a state or local government or their agencies.
Budget Indicator	An indicator equal to one if the issuer of issue i files a separate budget in year y, and zero otherwise.
Callable	A feature that allows the issuer to redeem the bond prior to the specified date of maturity.
Certificate of Participation (COP)	A type of financing (usually for a construction project) in which the investor effectively serves the role of lessor and is entitled to a share of lease revenues, rather than the bond being secured by those revenues.
Competitive Sale	An issuer advertizes bonds for sale (including terms of sale) to potential underwriters. The bonds are awarded to the bidder offering the lowest interest cost. Results in lower underwriting spreads than the alternative form of sale, negotiated sale.
Continuing Disclosure	The formal filing of financial statements (or other operating data) subsequent to the year of issuance, as required by the continuing disclosure covenant included in issuer official statements. These statements are found in Bloomberg (a designated information repository) prior to June 30, 2009 and in EMMA after July 1, 2009 through June 30, 2012.
Corporate Bond Benchmark	Proportion of trade days (in percentage terms) in which at least one retail trade was executed for a random sample of 100 corporate bonds issued prior to 2007 and outstanding in 2012.
Credit Rating	Calculated as the annual average credit rating across rating agencies, where a credit rating of "D" is coded as "1," increasing to a rating of AAA, coded as "24." Non-rated issues are coded as "0."
EMMA	The Electronic Municipal Market Access system, operated by the Municipal Securities Rulemaking Board. This web-based system makes offering documents, issuer financial statements, secondary trade data, event notices, and credit ratings available to the public free of charge. References to "EMMA" in this paper relate to the continuing disclosure service enacted on July 1, 2009.
Filing Count	The number of financial statements filed by the issuer of issue i in year y.

Appendix (Continued)

Variable	Definition
Filing Indicator	An indicator equal to one if the issuer of issue i files at least one financial statement in year y, and zero otherwise.
General Obligation Bond (GO)	A bond secured by the full faith and credit, including the taxing power, of the local government.
Hospital	Many not-for-profit community hospitals use the municipal market to access capital. The revenue projections of hospital projects are more difficult to analyze than those of more vanilla governmental services (e.g., water projects).
Income	Average per-capita income at the county level, annual basis.
Insured	Bond is insured by a municipal bond guarantor (insurance agency).
Issue (or, Deal)	A collection of bonds in serial maturity issued on the same date for the same purpose.
Issue Size	Natural logarithm of the size of the bond issue.
Large State	Five states account for a large proportion of municipal bonds outstanding. These include: New York, Pennsylvania, Texas, California, and Florida
Low-Rated	"Low" credit ratings are those in the lowest quartile in my sample, A+ and below.
Markup	The percentage difference between a customer purchase (or sale) price and the average price of inter-dealer transactions (expressed in basis points). Formally, $Markup_{b,t} = Trade\,Sign * 10,000 * ln\left[\frac{CustomerPrice_{b,t}}{InterdealerPrice_{b,t}}\right]$
Negative	An indicator variable equal to one in any county-year in which the change in per-capita income is negative.
Negotiated Sale	An underwriter is selected by the issuer to purchase the bonds. The underwriter, in turn, sells the bonds to customers. The terms of the bonds are tailored to meet the demands of the underwriter's clients, as well as the needs of the issuer.
New Issue	An indicator equal to one if the issuer issued new bonds in a given year. Because underwriters are regulated, disclosure is compulsory in that year.
Page Count	The total number of pages across all financial statements filed by the issuer of issue i in year y.
Population	County population, annual basis.
Post_Bankruptcy	An indicator variable equal to one after the 2010 bankruptcy of bond guarantor Ambac.
Post_Disclosure	An indicator set to one after an issuer has disclosed in EMMA for the first time.
Post_EMMA	An indicator variable set to one after July 1, 2009, when the continuing disclosure service of the MSRB's Electronic Municipal Market Access (EMMA) system became effective.
Quarterly Issuance	The quarterly dollar value of aggregate municipal bond issuance, obtained from the Securities Industry and Financial Markets Association.

Appendix (Continued)

Variable	Definition
Refunded	A bond issue that is refinanced before the first call date (usually to obtain a lower interest rate). The proceeds of the new bond issue are held in escrow to repay bondholders when the refunded bonds become callable.
Reporting Lag	The number of days between period end and the first time a financial statement is filed by the issuer of issue i in year y.
Revenue Bond	Bond backed by revenues from a specific source.
Risk Characteristic	I identify seven issue and issuer characteristics that cause investors to bear a higher degree of risk. These issuer characteristics include: revenue bonds, certificates of participation, not-for-profit hospitals, and low-rated bonds. Issue-specific characteristics include: uninsured bonds, non-refunded bonds, and callable bonds.
Small	An indicator variable set to one if a transaction is retail-sized (principal amount of bonds traded less than \$100,000; see Harris and Piwowar, 2006).
State Integrity	The Better Government Association (BGA)-Alper Integrity index captures the extent to which each state has anti-corruption laws in place. States are evaluated on the basis of the strength of the following laws: Freedom of information, Whistleblower, campaign finance, open meetings, and conflict of interest.
Taxable	Bond subject to federal taxation.
Time to Maturity	Years between the date of the observation and bond maturity, rounded.
Timeliness	Measures the timeliness of the first report filed by the issuer of issue i in year y relative to period end. Formally, $Timeliness_{i,y} = Log(Reporting\,Lag_{i,y}) * -1$.
Top Underwriter	The largest ten lead managers by volume in the SDC Platinum Database between 1997 and 2007. These include: RBC Capital Markets, Robert W Baird & Co, Piper Jaffray, JP Morgan, UBS, Morgan Keegan, Roosevelt & Cross, Citigroup, Banc of America Securities, and Commerce Capital Markets.
Volume	The proportion of trade days in a given year in which at least one trade occurs in a security (expressed in percentage terms); volume is measured separately for retail-sized and institutional-sized trades. Formally, $Small\,Volume_{b,y} = 100 * [Small\,Trade\,Days_{b,y}/Trading\,Days_y]$ $Large\,Volume_{b,y} = 100 * [Large\,Trade\,Days_{b,y}/Trading\,Days_y]$

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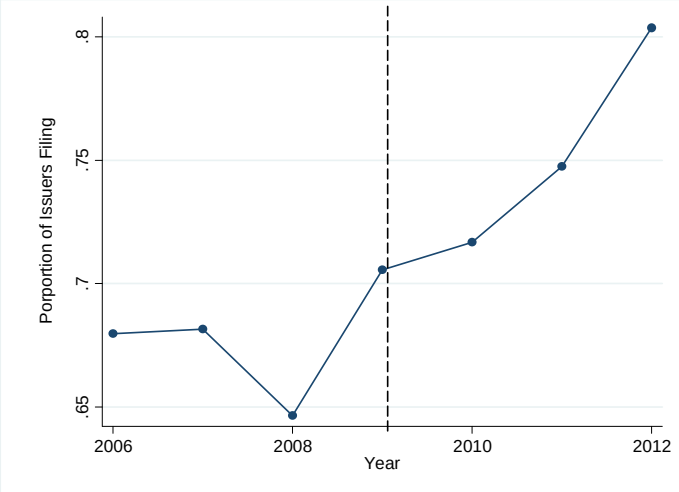
Figure 1: Disclosure and a Shock to the Dissemination Mechanism

Panel A depicts the annual proportion of issues in which the issuer files at least one financial statement throughout my sample period. Panel B depicts the mean number of filings made per issue-year throughout my sample period. I define an issue-year as July 1 through June 30, consistent with the fiscal year-end of most governmental entities. I obtain all filings up to June 30, 2009 from Bloomberg and all filings after July 1, 2009 (the first day of fiscal year 2010), from EMMA (the electronic filing repository).

Panel A: Proportion of Issues for which Financial Statements are Filed



Panel B: Financial Statement Filing Count

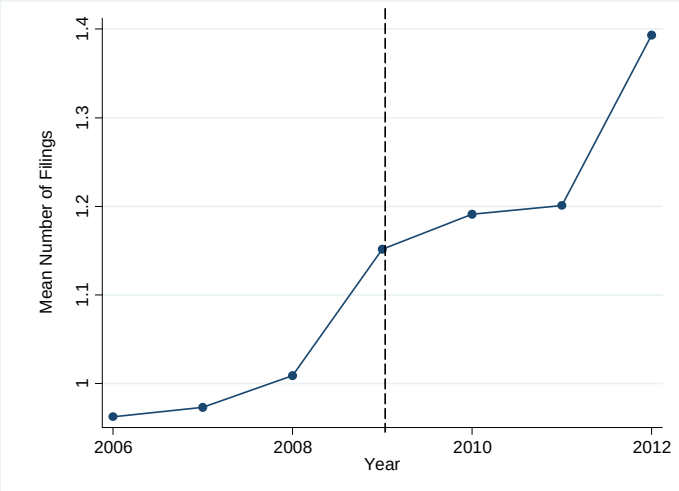
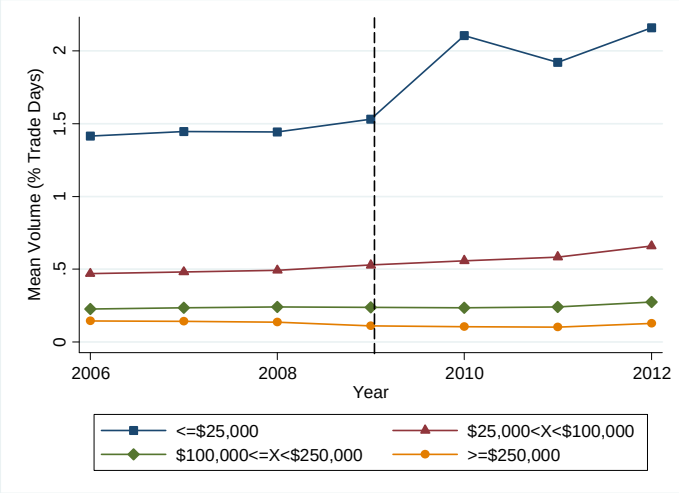


Figure 2: Liquidity across Trade Size Groups and a Shock to the Dissemination Mechanism

Panel A depicts trade volume across four size categories throughout my sample period. I define trade volume as the proportion of trading days during the bond-year in which a customer transaction of a given size occurs. Panel B depicts the median trade markup across the same four size categories. I define trade markup as the percentage difference in price paid by investors relative to inter-dealer transactions in the same bond. The smallest two size categories, trades less than or equal to $25,000 and trades between $25,000 and $100,000, are assumed to be executed by retail (small) investors. The largest two size categories, trades between $100,000 (inclusive) and $250,000 and trades over $250,000 (inclusive), are assumed to be executed by institutional (large) investors. I define a bond-year as July 1 through June 30, consistent with the fiscal year-end of most governmental entities. Therefore, all trades executed after July 1, 2009 (the first day of fiscal year 2010), occur in the post-EMMA (electronic repository) period.

Panel A: Trade Volume



Panel B: Trade Markups

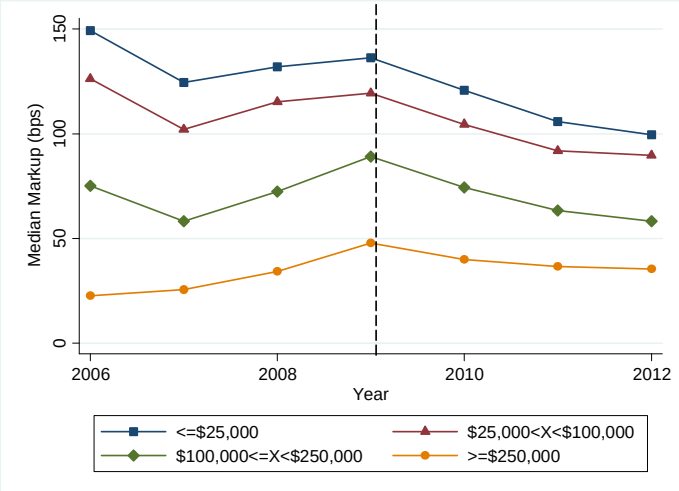


Table 1: Descriptive Statistics

Panel A summarizes the characteristics of the bonds themselves. The unit of observation is a bond-year. Bond age is the elapsed time since the date of issuance, rounded to the nearest year. Years to maturity is the amount of time remaining until the maturity date, rounded to the nearest year. Credit rating (when available) is calculated as the annual average credit rating across rating agencies, where a credit rating of "D" is coded as "1" increasing to a rating of AAA coded as "24." Non-rated bonds are coded "0." A credit rating of 21 corresponds to a AA- from Standard & Poors. When an issuer's bond offering is underwritten, ten to twenty serial maturity bonds (each identified by CUSIP number) are usually issued at one time as part of a "deal" (or issue). Bond size is the average size of these individual bonds and issue size is the size of the entire issuance. Debt outstanding is the amount of debt an issuer has outstanding as of December 31, 2011. Coupon rate is the stated annual rate at the time of issuance. Panel B summarizes the annual reporting behavior of issuers between 2005 and 2012. The unit of observation is an issue-year. Proportion of Issuers Filing is the percentage of issuers filing at least one financial statement in a given year (Filing Indicator is an indicator variable set to one financial statements are filed by the issuer of issue i in year y, and zero otherwise). Budget is an indicator equal to one in any year in which a separate budget is filed. A "GO Issuer" is a general purpose issuer whose bonds are secured by the taxing power of the jurisdiction. Filings per Year captures the number of post-issuance financial reports filed with Bloomberg / EMMA during the year (an issuer filing interim reports will have greater than one, an issuer filing one annual report will have one, and some issuers will file nothing). Reporting Lag captures the delay between period end and the filing of the relevant report. Reporting Lag is only populated in the event a financial statement is filed. Total Page Count captures the total number of pages filed in a year (if no report is filed, Page Count is missing). Panel C summarizes the trading characteristics of the bonds in my sample. I collect all secondary trade data (which is available after January 2005) for bonds issued prior to July 2007 and outstanding through July 2012. I define secondary trading as all transactions occurring at least 28 days post-issuance and I define a bond-year as July 1 through June 30, consistent with the fiscal year-end of most governmental entities. "Small" trades are defined as any trade under \$100,000 and "Large" trades are those above \$100,000, inclusive (Harris and Piwowar, 2006). Transaction-level data provided by the MSRB indicate whether the trade was dealer-dealer, dealer-customer, or customer-dealer. Prices reported by the MSRB are quoted as a percentage of par. Customer trades include purchases and sales (and exclude inter-dealer transactions). Markups are measured at the transaction level and volume is measured at the bond-year level. Markup and annual trade volume are measured as follows:

$$Markup_{b,t} = Trade\,Sign * 10,000 * ln\left[\frac{CustomerPrice_{b,t}}{InterdealerPrice_{b,t}}\right]$$
$$Small\,Volume_{b,y} = 100 * [Small\,Trade\,Days_{b,y}/Trading\,Days_y]$$
$$Large\,Volume_{b,y} = 100 * [Large\,Trade\,Days_{b,y}/Trading\,Days_y]$$

Table 1 (Continued)

Panel A: Bond Characteristics						
	N	Mean	Std. Dev.	Q1	Median	Q3
Age (Years)	143,191	4.43	2.58	2.00	4.00	6.00
Years to Maturity	143,191	9.03	5.75	5.00	8.00	12.00
Rating	124,002	20.80	4.73	20.79	21.89	22.85
Coupon Rate	143,029	4.37	0.69	4.00	4.25	5.00
Bond Size ($ millions)	142,835	2.87	9.09	485.00	1.10	2.71
Deal Size ($ millions)	143,146	45.30	67.40	9.62	23.30	53.30
Debt Outstanding ($ millions)	143,011	448.00	866.00	31.20	124.00	472.00
Bonds	17,519					
Issues (Deals)	2,247					
Issuers	1,434					
Counties	662					
States	48					

Panel B: Financial Statement Filing Statistics						
	N	Mean	Std. Dev.	Q1	Median	Q3
Financial Statement Filing Indicator	14,413	0.71	0.45	0.00	1.00	1.00
Budget Filing Indicator (GO Issuers)	6,534	0.07	0.28	0.00	0.00	0.00
Budget Filing Indicator (Non-GO Issuers)	7,879	0.04	0.21	0.00	0.00	0.00
Filings per Year	14,413	1.14	1.46	0.00	1.00	1.00
Reporting Lag	10,293	189	155	160	196	246
Total Pages Filed	5,282	163	138	68	136	211

Panel C: Trading Statistics						
	N	Mean	Std. Dev.	Q1	Median	Q3
Small Trade Size	857,703	26,984	18,240	10,000	25,000	40,000
Large Trade Size	206,350	535,627	1,699,412	100,000	150,000	325,000
Price	1,064,053	100.42	8.61	97.96	101.00	105.27
Customer Trades Per Bond-Year	125,712	3.59	7.87	0.00	1.00	4.00
Small Customer Trades Per Bond-Year	125,712	2.95	7.18	0.00	0.00	3.00
Large Customer Trades Per Bond-Year	125,712	0.70	2.07	0.00	0.00	0.00
Volume (%)	125,712	1.69	3.75	0.00	0.40	1.98
Small Volume (%)	125,712	1.39	3.43	0.00	0.00	1.59
Large Volume (%)	125,712	0.34	1.03	0.00	0.00	0.00
Markup (bps)	360,164	117.12	150.60	31.03	103.32	186.67
Markup Small Trades (bps)	290,219	126.46	159.56	43.78	117.18	196.50
Markup Large Trades (bps)	69,945	78.40	96.40	12.76	54.77	125.77
Markup - Purchase (bps)	261,306	134.51	146.71	50.57	126.98	202.03
Markup Small Trades - Purchase (bps)	219,262	141.98	153.41	64.93	138.71	208.88
Markup Large Trades - Purchase (bps)	42,044	95.54	96.06	20.13	84.38	153.91
Markup - Sale (bps)	110,313	74.57	189.09	13.52	49.92	115.58
Markup Small Trades - Sale (bps)	79,324	82.28	213.52	18.72	53.80	128.70
Markup Large Trades - Sale (bps)	30,989	54.85	100.24	10.04	35.86	84.27

Table 2: Risk Characteristics

Panel A provides univariate statistics of annual financial statement filings, by risk characteristic. These characteristics include the following: Revenue bonds, certificates of participation, not-for-profit hospitals, low-rated, uninsured, non-refunded, and callable bonds. Columns (1) and (2) summarize the number financial statements filed annually for issuers of bonds in my sample that possess these characteristics (Risk=1). The unit of observation is an issue-year. Columns (3) and (4) summarize disclosures for issuers of bonds that do not possess these characteristics (Risk=0). Column 5 presents the significance of the difference between the Risk=1 group and the Risk=0 group. The risk characteristics are further defined in the Appendix. Panel B provides univariate statistics of annual financial statement filings according to the composite number of risk characteristics each bond in the sample possesses (revenue bond, certificate of participation, hospital, low-rated, uninsured, non-refunded, and callable). Column (5) measures the significance of the difference between low-risk (0 or 1 risk characteristics) and high-risk (5 or 6 risk characteristics) bonds. Panel C provides univariate small trade (those less than $100,000 in par value) statistics, by risk characteristic. Columns (1)-(5) summarize small trade volume (the proportion of days in year y in which a small trade is executed in bond b) for each group. Columns (6)-(10) summarize markup on small trades for bonds in each group. These observations are at the transaction level. Panel D provides univariate small trade statistics according to the composite number of risk characteristics each bond in the sample possesses. Columns (5) and (10) measure the significance of the difference between low-risk (0 or 1 risk characteristics) and high-risk (5 or 6 risk characteristics) bonds.

Panel A: Disclosure Statistics by Risk Characteristic

Risk Characteristic	(1)	(2)	(3)	(4)	(5)
	Filing Count				
	Risk=1		Risk=0		Diff
	Mean	Obs	Mean	Obs	
Revenue	1.4	6,214	1.0	8,195	0.4***
COP	1.1	1,305	1.2	13,104	-0.1**
Hospital	3.2	604	1.1	13,805	2.1***
Low_Rated	1.5	3,320	1.0	11,093	0.5***
Uninsured	1.3	5,646	1.0	8,763	0.3***
Non_Refunded	1.2	13,282	1.0	1,127	0.1***
Callable	1.2	11,958	1.0	2,451	0.1***

Panel B: Disclosure Statistics by Number of Risk Characteristics

No. of Risk Characteristics	Filing Count				
	Mean	Median	SD	Obs	
0	0.8	1.0	0.5	4	
1	0.9	1.0	0.9	664	
2	0.9	1.0	0.8	3,223	
3	1.0	1.0	1.0	4,630	
4	1.1	1.0	1.3	4,085	
5	1.7	1.0	2.5	1,434	
6	3.3	2.0	3.7	369	
7	N/A	N/A	N/A	N/A	
T-Test (0=6)					2.5*
T-Test (1=5)					0.9***

Table 2 (Continued)

Panel C: Trading Statistics by Risk Characteristic

Risk Characteristic	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Small Trade Volume (%)					Small Trade Markup (bps)				
	Risk=1		Risk=0		Diff	Risk=1		Risk=0		Diff
	Mean	Obs	Mean	Obs		Mean	Obs	Mean	Obs	
Revenue	1.7	51,872	1.2	73,840	0.5***	140	153,011	112	137,208	28***
COP	1.9	16,553	1.3	109,159	0.6***	122	57,103	128	233,116	-6***
Hospital	3.1	4,253	1.3	121,459	1.7***	161	29,065	123	261,154	39***
Low_Rated	1.7	18,080	1.3	107,632	0.4***	158	60,434	118	229,785	40***
Uninsured	1.2	36,341	1.5	89,371	-0.2***	131	71,161	125	219,058	7***
Non_Refunded	1.4	115,705	1.3	10,007	0.1*	128	272,211	99	18,008	29***
Callable	1.0	41,786	1.6	83,926	-0.6***	141	226,616	76	63,603	65***

Panel D: Trading Statistics by Number of Risk Characteristics

No. of Risk Characteristics										
	Small Trade Volume (%)					Small Trade Markup (bps)				
	Mean	Median	SD	Obs		Mean	Median	SD	Obs	
0	1.2	0.0	2.9	2,777		52	34	60	222	
1	1.1	0.0	2.8	25,357		74	51	84	17,174	
2	1.5	0.0	3.4	50,797		96	85	93	77,727	
3	1.5	0.0	3.5	33,626		134	128	200	123,826	
4	1.3	0.0	3.6	9,812		149	145	143	44,370	
5	2.4	0.0	6.7	2,861		171	175	138	13,385	
6	0.8	0.0	1.7	482		184	190	144	13,515	
7	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	
T-Test (0=6)					-0.4***					133***
T-Test (1=5)					1.3***					119***

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Determinants of Disclosure

In this table, I examine the relationship between issue and issuer characteristics and disclosure. Columns (1)-(6) are logistic regressions in which the dependent variable is a binary disclosure characteristic of issue i in year y. Columns (7) through (10) are OLS regressions. The sample consists of a random sample of bonds issued before July 1, 2007, with the year defined as July 1 through June 30, consistent with the majority of governmental entities' fiscal years. The dependent variable in Columns (1) and (3) are indicators equal to one if a financial statement is filed by the issuer of issue i in year y, and zero otherwise. Column (2) presents the marginal effects of the logistic regression coefficients in Column (1). The dependent variables in Columns (4) and (6) are indicators equal to one if a separate budget is filed by the issuer of issue i in year y, and zero otherwise. Column (5) presents the marginal effects of the logistic regression coefficients in Column (4). The dependent variables in Columns (7) and (8) are the number of continuing financial disclosures filed by the issuer of issue i in year y and Columns (9) and (10) are the negative log of the number of days between period end and the filing date of the first relevant financial report. I include an indicator variable, Post_EMMA, equal to one for all years after the July 2009 introduction of the electronic repository. Indicator variables are set to one if a bond possesses the following risk characteristics: is a revenue bond, a certificate of participation, a hospital bond, is not guaranteed by a bond insurer, or is not refunded. An indicator variable set to one if the issuer of issue i issues new debt during year y, "New Issue", absorbs compulsory reporting. I also include an indicator equal to one if the underwriter is one of the top 10 underwriters by volume, and an indicator if the bid process was competitive. I include issuer controls for debt outstanding and issue-level controls for the size of issuance and the associated coupon rate. The state-level BGA-Alper Integrity index is included in Columns (1), (4), (7), and (9) to capture the extent to which each state has anti-corruption laws in place. State fixed effects to control for state-level variation in regulation are included in Columns (3), (6), (8), and (10). Time-varying controls include time to maturity, bond age, credit rating (Not Rated=0, AAA=24), county population, county income, the annual average level of the AAA-GO yield curve during year y, and year fixed effects. Robust standard errors clustered at the county level are reported in parentheses.

Table 3 (Continued)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Filing Indicator			Budget Indicator			Filing Count		Timeliness	
		Logit	MFX	Logit	Logit	MFX	Logit	OLS	OLS	OLS	OLS
Post_EMMA	+	0.43***	0.08	0.54***	0.80***	0.03	0.96***	0.55***	0.64***	0.15***	
		(0.14)		(0.15)	(0.29)		(0.29)	(0.13)	(0.14)	(0.03)	
Revenue	+	-0.18	-0.03	-0.39***	-0.70***	-0.03	0.55	0.04	-0.02	0.13***	0.14***
		(0.12)		(0.13)	(0.19)		(0.39)	(0.05)	(0.06)	(0.03)	(0.03)
COP	+	0.24	0.04	-0.56***	1.08***	0.06	-0.45*	-0.07	-0.20**	0.00	-0.07
		(0.20)		(0.20)	(0.28)		(0.26)	(0.07)	(0.08)	(0.04)	(0.05)
Hospital	+	0.65***	0.11	0.78***	0.06	0.00	0.12	1.78***	1.89***	0.78***	0.79***
		(0.22)		(0.24)	(0.47)		(0.48)	(0.37)	(0.38)	(0.11)	(0.10)
Rating	-	0.01	0.00	0.01	-0.03	-0.00	-0.06	-0.08***	-0.02*	-0.02***	-0.02***
		(0.02)		(0.02)	(0.06)		(0.06)	(0.03)	(0.01)	(0.00)	(0.00)
Uninsured	+	0.21**	0.04	0.08	0.32	0.01	0.19	0.11*	0.12*	0.15***	0.18***
		(0.10)		(0.10)	(0.22)		(0.23)	(0.06)	(0.07)	(0.04)	(0.04)
Non_Refunded	+	0.14	0.03	0.16	-0.22	-0.01	-0.15	0.09	0.12*	0.07**	0.03
		(0.18)		(0.16)	(0.28)		(0.25)	(0.06)	(0.06)	(0.03)	(0.03)
Callable	+	0.06	0.01	0.08	0.09	0.00	0.25	-0.05	-0.03	-0.02	0.01
		(0.11)		(0.11)	(0.25)		(0.27)	(0.06)	(0.06)	(0.03)	(0.03)
Log (Debt)	+	0.18***	0.04	0.17***	0.11	0.00	-0.03	0.08***	0.08***	0.05***	0.04***
		(0.04)		(0.04)	(0.09)		(0.10)	(0.02)	(0.02)	(0.00)	(0.01)
Log (Size)	+	0.13**	0.03	0.14***	0.06	0.00	-0.10	0.05*	0.06**	-0.00	-0.02
		(0.05)		(0.05)	(0.11)		(0.10)	(0.03)	(0.0239)	(0.01)	(0.01)
Log (Income)		-0.39	-0.08	-0.06	0.42	0.02	1.04	0.07	-0.05	-0.02	-0.01
		(0.27)		(0.34)	(0.76)		(0.82)	(0.17)	(0.18)	(0.08)	(0.08)
Log (Population)	+	0.13**	0.03	0.10	-0.05	-0.00	0.05	0.06**	0.01	0.02	0.00
		(0.06)		(0.06)	(0.16)		(0.20)	(0.03)	(0.03)	(0.01)	(0.01)
Age		0.03	0.01	0.01	-0.09	-0.00	-0.13**	-0.03	-0.03	-0.02*	-0.02***
		(0.03)		(0.03)	(0.06)		(0.07)	(0.02)	(0.02)	(0.01)	(0.01)
Time to Maturity		-0.01*	-0.00	-0.01*	-0.02	-0.00	-0.02	0.01	0.01*	0.01***	0.00**
		(0.01)		(0.01)	(0.02)		(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
New Issue	+	0.37***	0.07	0.40***	0.23	0.01	0.51***	0.08**	0.07*	-0.02	0.01
		(0.09)		(0.08)	(0.17)		(0.17)	(0.04)	(0.04)	(0.02)	(0.02)
Top Underwriter		0.11	0.02	0.07	0.08	0.00	0.25*	-0.05	-0.09*	-0.04*	-0.03
		(0.09)		(0.09)	(0.15)		(0.13)	(0.04)	(0.05)	(0.02)	(0.02)
Competitive Sale	+	0.36***	0.07	0.10	0.65***	0.03	0.37	0.01	-0.04	-0.09***	-0.07**
		(0.11)		(0.12)	(0.18)		(0.26)	(0.04)	(0.06)	(0.03)	(0.03)
State Integrity		0.02***	0.00		-0.00	-0.00		0.00		-0.00	
		(0.01)			(0.02)			0.01		0.00	
Year Fixed Effects		YES		YES	YES		YES	YES	YES	YES	YES
State Fixed Effects		NO		YES	NO		YES	NO	YES	NO	YES
Observations		13,720		13,720	13,720		12,714	13,720	13,720	9,322	9,322
Pseudo R-squared		0.093		0.145	0.089		0.203	0.148	0.169	0.288	0.341
Chi-Squared		332.4		2376.5	132.7		356.48				

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Disclosure and a Shock to Nonpayment Risk

This table presents ordinary least squares regressions that test the relationship between disclosure attributes and a shock to the nonpayment risk associated with insured bonds (relative to uninsured bonds), induced by the bankruptcy of municipal bond guarantor Ambac. The sample consists of randomly selected issues, issued before July 1, 2007. The year is defined as July 1 through June 30, consistent with the majority of governmental entities' fiscal year-ends. The dependent variables are as follows: (1) an indicator variable set to one if a financial statement is filed during year y, and zero otherwise; (2) an indicator variable set to one if a budget is filed during year y, and zero otherwise; (3) the total number of financial statements issued by the issuer of issue i during year y; (4) conditional upon financial statement filing, the negative log of the number of days between period end and the date the first report is filed during year y. Post-Bankruptcy is an indicator variable equal to one after July 1, 2010 (Ambac declared bankruptcy in November). The variable of interest is the interaction term $Insured{*}Post\_Bankruptcy$, which captures the disclosure response of issuers of insured bond issues after the Ambac bankruptcy. Age is the number of years since issuance. Log(Income) is the natural logarithm of per-capita income, and Log(Population) is the natural logarithm of the population of the county in which the issuer of issue i is domiciled in year y. Rating is the mean credit rating across rating agencies for issue i in year y (Not Rated=0, AAA=24). Issue and year fixed effects are included in all regressions and robust standard errors are clustered at the county level.

	(1) Filing Indicator	(2) Budget Indicator	(3) Filing Count	(4) Timeliness
Insured * Post_Bankruptcy +	**0.035****	**0.036****	**-0.006**	**-0.02**
	(0.016)	**(0.017)**	**(0.051)**	**(0.04)**
Age	0.025***	0.005	0.048***	0.02*
	(0.007)	(0.005)	(0.018)	0.01
Log (Income)	-0.165	-0.071	0.027	-0.13
	(0.180)	(0.129)	(0.389)	(0.29)
Log (Population)	-0.062	0.225	0.452	0.59
	(0.235)	(0.145)	(0.626)	(0.40)
Rating	0.006	0.007**	-0.008	-0.01
	(0.006)	(0.003)	(0.015)	(0.01)
New Issuance	0.028**	0.007	0.060*	-0.01
	(0.013)	(0.008)	(0.033)	(0.01)
Issue Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Issue-Year Observations	13,763	13,763	13,763	9,352
Number of Issues	2,145	2,145	2,145	1,971
R-squared	0.025	0.014	0.019	0.041

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Disclosure and Shocks to Local Economic Condition

This table presents ordinary least squares regressions that test the relationship between disclosure attributes and a negative shock to local per-capita income. The sample consists of a random sample of bond issues, issued before July 1, 2007. The year is defined as July 1 through June 30, consistent with the majority of governmental entities' fiscal years. The dependent variables are as follows: (1) an indicator variable set to one if a financial statement is filed pertaining to year z, and zero otherwise; (2) an indicator variable set to one if a budget is filed for year z+1, and zero otherwise; (3) the total number of financial statements issued by the issuer of issue i pertaining to year z; (4) conditional upon financial statement filing, the negative log of the number of days between the report date pertaining to year z and the fiscal year-end of the entity, averaged across filings. I evaluate the effects for general obligation bonds ("GO"), which are backed by the taxing power of the issuer). Negative is an indicator variable equal to one in any year between 2005 and 2010 in which the BEA reports a negative change in per-capita income for the county in which the issuer of issue i is domiciled. Age is the number of years since issuance. Log(Income) is the natural logarithm of per-capita income, and Log(Population) is the natural logarithm of the population of the county in which the issuer of issue i is domiciled in year z. Rating is the mean credit rating across rating agencies for issue i in year z, where zero is a non-rated issue and 24 is a AAA-rated issue. Issue and year fixed effects are included in all regressions. Robust standard errors clustered at the county level are reported in parentheses.

		(1) Filing Indicator	(2) Budget Indicator	(3) Filing Count	(4) Timeliness
Negative	+/-	**-0.057****	**-0.043***	**-0.136****	**-0.05**
		(0.028)	**(0.025)**	**(0.053)**	**(0.04)**
Age		-0.006	-0.023	-0.010	0.05***
		(0.009)	(0.03)	(0.018)	(0.02)
Log (Income)		-0.100	-0.030	-0.174	-0.89*
		(0.244)	(0.189)	(0.466)	(0.52)
Log (Population)		0.089	0.475	0.805	0.98*
		(0.294)	(0.340)	(0.556)	(0.58)
Rating		0.025**	0.0125**	0.027*	0.02
		(0.011)	(0.005)	(0.015)	(0.02)
Bond Type		GO	GO	GO	GO
Issue Fixed Effects		YES	YES	YES	YES
Year Fixed Effects		YES	YES	YES	YES
Issue-Year Observations		4,540	4,545	4,540	3,746
Issues		825	825	825	815
R-squared		0.010	0.077	0.010	0.055

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Trading and a Shock to the Financial Statement Dissemination Mechanism

The dependent variable in Panel A is the natural logarithm of the proportion of days during year y in which at least one retail-sized (small) trade is executed in bond b ($Small\,Volume_{b,y}$) between 2007 and 2012. The sample consists of randomly selected bonds issued before July 1, 2007, with the year defined as July 1 through June 30, consistent with the majority of governmental entities' fiscal year-ends. The variable of interest is $Post\_Disclosure$, an indicator equal to one after the first time the issuer of bond b reports in EMMA. $Post\_EMMA$ captures the change in small trade volume after July 1, 2009, for all bonds before disclosing in EMMA. I include the natural logarithm of the proportion of institutional-sized trades in bond b during year y as a benchmark. I also include indicators set to one if the bond is a revenue bond, is a certificate of participation, is uninsured or non-refunded, is subject to federal taxation, or is issued in New York, Pennsylvania, Texas, California, or Florida. I also include an indicator if the bond was underwritten by a top ten underwriter. Market-wide controls include the average annual yield on the benchmark AAA 10-year General Obligation Index, the average proportion of trade days for a random sample of 100 corporate bonds, and the annual issuance of municipal bonds (not reported). Bond characteristics include contemporaneous credit ratings measured on an annual basis (Not Rated=0, AAA=24), the bond age, time remaining to maturity, and the natural logarithm of the size of the bond issue. County-year economic controls (coefficients not reported) include the natural logarithm of annual total debt outstanding, per-capita income, and population. Robust standard errors (in parentheses) are clustered at the county level.

The dependent variable in Panel B, $Markup_{b,t}$, is the implied dealer markup charged on a customer trade executed in bond b on date t between 2007 and 2012, Winsorized at the 5% level. Each observation is a customer trade matched to a corresponding inter-dealer trade. The primary variable of interest in each column is the interaction of $Small * Post\_Disclosure$, capturing the incremental effect of disclosure on small trades (less than \$100,000). $Post\_EMMA * Small$ captures the change in small trade volume after July 1, 2009, for all bonds before disclosing in EMMA. On a bond-day basis, I control for the extent of dealer intermediation and the size of small and large trades (not reported). I also include indicators set to one if the bond is a revenue bond, is a certificate of participation, is uninsured or non-refunded, is subject to federal taxation, or is issued in New York, Pennsylvania, Texas, California, or Florida (not reported). I also include an indicator if the bond was underwritten by a top ten underwriter. On a daily basis, I include the level of the benchmark AAA 10-year General Obligation Index, and on a quarterly basis, I include the dollar value of new municipal bond issuance. Bond characteristics include contemporaneous credit ratings measured on an annual basis, bond age, time remaining to maturity at the time of trade, the natural logarithm of the size of the bond issue, and the annual trade volume (the number of days in the year in which the bond trades). County-level economic controls include the natural logarithm of annual total debt outstanding, per-capita income, and population (coefficients not reported). Columns (1) and (5) include year fixed effects, and Columns (3) and (7) include separate year fixed effects for small and large trades. Columns (2) and (6) include a linear time trend variable, and Columns (4) and (8) include a separate linear time trend variable for small and large trades. Robust standard errors (in parentheses) are clustered at the county level.

Table 6 (Continued)

Panel A: Trade Volume and Financial Statement Dissemination			
		(1)	(2)
Post_Disclosure	+	**0.08*** **	**0.07*** **
		(0.02)	**(0.02)**
Post_EMMA			0.18***
			(0.05)
Revenue		0.07***	0.07***
		(0.01)	(0.01)
COP		0.09***	0.09***
		(0.02)	(0.02)
Rating		-0.00*	-0.00
		(0.00)	(0.00)
Uninsured		-0.07***	-0.07***
		(0.02)	(0.02)
Non_Refunded		0.06*	0.05
		(0.03)	(0.03)
Callable		-0.08***	-0.08***
		(0.02)	(0.02)
AAA GO yield		-0.00	0.24***
		(0.02)	(0.05)
Age		0.04***	0.03***
		(0.00)	(0.00)
Time to maturity		0.02***	0.02***
		(0.00)	(0.00)
Log (Issue Size)		0.10***	0.10***
		(0.01)	(0.01)
Log (Debt)		0.01**	0.01**
		(0.01)	(0.01)
Corporate Bond Benchmark		0.01***	-0.01**
		(0.00)	(0.00)
Large State		0.05***	0.05***
		(0.02)	(0.02)
Top Underwriter		0.02*	0.02*
		(0.01)	(0.01)
Large Trade Volume	+	0.83***	0.83***
		(0.02)	(0.02)
Economic Controls		YES	YES
Observations		100,707	100,707
R-squared		0.366	0.367

Table 6 (Continued)

Panel B: Trade Markups and Financial Statement Dissemination									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	+	43.7***	44.1***	35.9***	53.5***	45.1***	45.7***	42.0***	54.0***
		(1.2)	(1.2)	(1.9)	(2.0)	(1.3)	(1.3)	(1.5)	(2.2)
Post_Disclosure		10.4***	5.8***	4.3***	-1.2	6.3***	1.2	4.3***	-1.2
		(1.6)	(1.5)	(1.6)	(1.5)	(1.6)	(1.5)	(1.6)	(1.5)
Small*									
Post_Disclosure	**-**	**-8.5*** **	**-9.0*** **	**-1.0**	**-0.3**	**-3.4*** **	**-3.5*** **	**-1.0**	**-0.6**
		(1.0)	**(1.0)**	**(1.8)**	**(1.5)**	**(1.3)**	**(1.3)**	**(1.8)**	**(1.4)**
Post_EMMA						15.2***	7.6***		0.7
						(2.6)	(2.0)		(2.1)
Small*Post_EMMA						-6.4***	-7.1***	-6.1***	1.3
						(1.3)	(1.3)	(2.2)	(1.8)
Revenue	+	6.6***	6.5***	6.6***	6.5***	6.6***	6.5***	6.6***	6.5***
		(1.6)	(1.6)	(1.6)	(1.6)	(1.6)	(1.6)	(1.6)	(1.6)
COP	+	6.6***	6.8***	6.6***	6.8***	6.6***	6.8***	6.6***	6.8***
		(2.0)	(2.1)	(2.0)	(2.1)	(2.0)	(2.1)	(2.0)	(2.1)
Rating	-	-1.7***	-1.8***	-1.7***	-1.8***	-1.7***	-1.8***	-1.7***	-1.8***
		(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Uninsured	+	-2.4	-2.4	-2.5	-2.4	-2.4	-2.4	-2.5	-2.4
		(1.9)	(2.0)	(1.9)	(2.0)	(1.9)	(2.0)	(1.9)	(2.0)
Non_Refunded	+	17.4***	17.5***	17.5***	17.6***	17.5***	17.6***	17.5***	17.6***
		(5.0)	(5.1)	(5.0)	(5.1)	(5.0)	(5.1)	(5.9)	(5.1)
Callable	+	17.3***	17.1***	17.3***	17.1***	17.3***	17.1***	17.3***	17.1***
		(2.0)	(2.0)	(2.0)	(2.0)	(2.0)	(2.0)	(2.0)	(2.0)
AAA GO yield	+	13.9***	21.5***	14.0***	21.5***	14.0***	22.1***	14.0***	22.0***
		(2.0)	(1.9)	(2.0)	(1.9)	(2.0)	(2.0)	(2.0)	(2.0)
Age		-3.3***	-3.2***	-3.3***	-3.1***	-3.3***	-3.2***	-3.3***	-3.2***
		(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Time to maturity		3.5***	3.5***	3.5***	3.5***	3.5***	3.5***	3.5***	3.5***
		(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Log (Issue Size)	-	-0.9	-0.6	-0.9	-0.6	-0.9	-0.6	-0.9	-0.6
		(0.8)	(0.9)	(0.8)	(0.9)	(0.8)	(0.9)	(0.8)	(0.9)
Trade Volume	-	0.2***	0.2***	0.2***	0.2***	0.2***	0.2***	0.2***	0.2***
		(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Inter-Dealer Trades	+	0.7***	0.7***	0.7***	0.7***	0.7***	0.7***	0.7***	0.7***
		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Top Underwriter	-	-3.3**	-3.1**	-3.3**	-3.1**	-3.3**	-3.1**	-3.3**	-3.1**
		(1.3)	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)
Year Fixed Effects		YES	NO	YES	NO	YES	NO	YES	NO
Differential Year FE		NO	NO	YES	NO	NO	NO	YES	NO
Linear Time Trend		NO	YES	NO	YES	NO	YES	NO	YES
Differential Trend		NO	NO	NO	YES	NO	NO	NO	YES
Economic Controls		YES	YES	YES	YES	YES	YES	YES	YES
Observations		321,503	321,503	321,503	321,503	321,503	321,503	321,503	321,503
R-squared		0.225	0.222	0.225	0.222	0.225	0.222	0.225	0.222

*** p<0.01, ** p<0.05, * p<0.1