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Does financial advisor quality improve liquidity and issuer benefits in segmented markets? Evidence from the municipal bond market

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Abstract

Purpose – Using a unique sample of about 563,000 competitively bid municipal revenue bonds with financial advisors issued during the period 1998–2012, the purpose of this paper is to examine the role and influence of financial advisor quality in the municipal bond market.

Design/methodology/approach – The authors use a sample of about 563,000 competitively bid municipal revenue bonds with financial advisors issued during the period 1998–2012. The authors estimate a selection model where the authors identify the factors leading to the selection of a high-quality financial advisor. The authors then, using the inverse mills ratio from the first regression, estimate the association of high-quality advisor (and other factors) with the cost of borrowing.

Findings – The results suggest that high-quality financial advisors provide a credible signal to market participants about issue and issuer quality. This signal translates to a greater number of bids for issues that use high-quality financial advisors, resulting in improved liquidity and lower borrowing costs for these issues. The results also show that the beneficial effects obtained by using higher quality financial advisors are prevalent across all categories of issues such as for refunding and non-refunding issues, and for both insured and non-insured issues. The benefits are also generally observed for issues of most size categories. The results also suggest that the passage of the Dodd–Frank Act requiring mandatory registration of financial advisors and enhanced scrutiny has only increased the benefits to issuers from using higher quality financial advisors.

Originality/value – This paper differs from previous research in several important ways. First, the study is, to the authors' knowledge, the first study that explores the relationship between financial advisor quality and liquidity in the municipal sector. The authors show using higher quality financial advisors enhances liquidity for the issues by attracting a significantly large number of bids. Second, the sample is exclusively comprised of competitively bid revenue issues all of which rely on financial advisors. This enables us to examine more unambiguously the influence of financial advisor quality, without the confounding effects of issues without financial advisors. Third, time coverage (1998–2012) and size of the sample (roughly 563,000 bond issues) enables us to conduct varied sub-sample analyses with greater power since the resulting sub-sample partitions themselves are of very large size. This provides better and additional insights into the role of

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financial advisor quality. The more current data when compared to prior research enables us to examine the impact of financial advisor quality inter-temporally with special attention devoted to the period after passage of the Dodd–Frank Act.

Keywords Liquidity, Financial advisor, Municipal bond, Borrowing cost

Paper type Research paper

1. Introduction

The role of financial advisors in the municipal bond market has grown in importance significantly over the years, and has attracted attention from both regulators and academics (Forbes *et al.*, 1992; Johnson, 1994; Vijayakumar and Daniels, 2006; Allen and Dudney, 2010; Luby and Hildreth, 2014; Liu, 2015; Moldogaziev and Luby, 2016). Many of these articles show that using financial advisors provides benefits to issuers (Vijayakumar and Daniels, 2006; Moldogaziev and Luby, 2016), and that selecting a perceived higher quality financial advisor provides additional benefits to issuers (Allen and Dudney, 2010). This paper contributes to the existing literature by testing the potential for financial advisor quality or reputation to provide issuers with observable benefits, particularly, increased liquidity leading to lower borrowing costs. In addition, the analysis explores the reasons for and mechanisms by which reliance on higher quality financial advisors can lead to potential issuer benefits. We test for variations in benefits by issuer type, size of the issue and purpose or use of the funds. The Dodd–Frank Act of 2010 has increased regulatory requirements for municipal financial advisors requiring mandatory registration. In addition, the Securities and Exchange Commission has also been active in the regulatory process. Our analyses also examine if the Dodd–Frank Act and its provisions relating to financial advisors have led to changes, if any, in terms of benefits for issuers using higher quality financial advisors over time.

This paper differs from previous research in several important ways. First, our study is, to our knowledge, the first study that explores the relationship between financial advisor quality and liquidity in the municipal sector. We show that using higher quality financial advisors enhances liquidity for the issues by attracting a significantly large number of bids (Kessel, 1971; Amihud and Mendelson, 1986; Kleymenova *et al.*, 2012). Second, the sample is exclusively comprised of competitively bid revenue issues all of which rely on financial advisors. This enables us to examine more unambiguously the influence of financial advisor quality, without the confounding effects of issues without financial advisors. Third, time coverage (1998–2012) and size of the sample (roughly 563,000 bond issues) enables us to conduct varied sub-sample analyses with greater power since the resulting sub-sample partitions themselves are of relatively large size. The more current data, when compared to prior research, enables us to examine the impact of financial advisor quality inter-temporally with special attention devoted to the period after passage of the Dodd–Frank Act.

Our results show that using financial advisors that are perceived to be of higher quality provides benefits to issuers by significantly increasing the number of bids, and the prices, thus lowering borrowing costs for the issues. The benefits appear to be widely prevalent across major categories such as both refunding and new issues, and insured and uninsured issues. Additionally, our analysis shows that the passage of the Dodd–Frank Act of 2010 has only increased the benefits to issuers accruing from using higher quality financial advisors. Our results show that after the passage of the Act in 2010, issuer benefits from high-quality financial advisors have increased significantly.

The results provide potential explanations as to why using higher quality advisors lead to greater issuer benefits. Our findings, in conjunction with prior results observed in the literature, suggest that higher quality advisors provide signaling benefits, while serving monitoring and information asymmetry reduction roles that lead to issuer benefits.

The results also show that in segmented markets such as those for municipal bonds (Ang and Green, 2011; Pirinsky and Wang, 2011), regional rather than national reputation is far more important in examining financial advisor roles. The findings, thus, improve our understanding of the roles that financial advisors play and contribute to the literature relating to these issues. The rest of this paper is organized as follows. The next section explores the potential role of financial advisors as explored in prior literature and develops hypotheses. Sections 3 and 4 describe our empirical analyses and discuss results. The conclusion offers a summary of the findings and suggestions for further analysis.

2. Related literature

The role of financial advisors has been well described in prior research (Vijayakyumar and Daniels, 2006; Allen and Dudney, 2010; Luby and Hildreth, 2014)[1]. Vijayakyumar and Daniels (2006), borrowing from McLaughlin (1990), categorize financial advisor roles as falling under search, effort and evaluation. Financial advisors assist bond issuers in locating and selecting underwriters and bond counsel. They work to complete bond offers, seek higher bids and negotiate on the issuer's behalf. They assist issuers in evaluating offers from underwriters, advice on the offer strategy, and on the offer price, and other terms of the issue. In addition, they assist in negotiating the most favorable terms for issuers from the underwriters and the rating agencies, while ensuring that issuers disclose adequate information and fully comply with all disclosure, legal and regulatory requirements. Vijayakyumar and Daniels (2006) conclude that these activities result in increased monitoring and information asymmetry reduction roles for financial advisors, benefiting issuers through lowered borrowing costs, similar to those observed for financial advisors in the corporate sector (Allen *et al.*, 2004; Kale *et al.*, 2003). Allen and Dudney (2010) assert that higher quality financial advisors, because of their experience and presumed enhanced information, are better able to assist issuers in the functions discussed earlier and add more value to issuers in the form of lower borrowing costs. The authors also posit that higher quality financial advisors are more valuable to issuers for revenue issues, negotiated issues and non-rated issues because these issues are more complex and opaque.

Consider, for example, a typical bond issue. Municipal bond issuers evaluate borrowing costs as a combination of the planned underwriter spread and the planned reoffering yield. For serial bond issues, this is referred to as the true interest cost (TIC). Underwriters bid on the serial issue with the expectation of selling the bonds at prevailing market prices in excess of their bid. Let R be the total market value of the issue, and let B represent the value of the bid. B is the number of dollars received by the local government in exchange for the promise to honor the debt commitment (Bierwag, 1976). The spread to the underwriters to cover operating costs and profits is then:

$$\delta = R - B. \tag{1}$$

The role of the financial advisor is to minimize δ, by maximizing B (or minimizing TIC) for the issuers[2]. Why does usage of higher quality financial advisors lead to more benefits for issuers? Prior research does not provide a rationale for this conclusion. We argue that benefits to issuers are derived from the credible information production and information asymmetry reduction roles that higher quality financial advisors provide.

Chemmanur and Fulghieri (1994) provide a detailed description of the roles that financial intermediaries play in informationally asymmetric markets. They show that financial intermediaries can contribute to reducing the adverse impacts of asymmetric information. The use of higher quality financial advisors may provide significant credible signals to market participants, leading to greater interest and a larger number of bids for the issue

from underwriting firms[3]. This, in turn, leads to greater liquidity and lower borrowing costs for the issuers.

Liquidity has been a topic of significant interest in the corporate sector. Starting with the pioneering work of Amihud and Mendelson (1986), several other studies (e.g. Constantinides, 1986; Vayanos, 1998) have established linkages between liquidity and asset prices[4]. Various measures of liquidity have been used in the corporate sector. Kleymenova *et al.* (2012), relying on the work of Gehr and Martell (1992) and Jankowitsch *et al.* (2006), specifically use the number of bids for an offering as a proxy for liquidity.

Liquidity is also extremely important in the municipal sector. State and local governments borrow money by issuing bonds. The municipal sector is not only informationally deficient but also highly illiquid. On average, municipal bonds trade only twice during their lifetime (Ang and Green, 2011). Governments who issue bonds and ordinary investors who buy those bonds may pay billions of dollars each year in unnecessary fees, transaction costs and interest expense due to the lack of both transparency and liquidity in the municipal bond market. The liquidity cost alone represents approximately $30bn per year on the current $2.9tn stock of outstanding bonds (Ang and Green, 2011).

Kessel (1971) provides theoretical and empirical evidence that in the municipal sector, the number of bids received in a competitive offering is inversely correlated with underwriter gross spread and reoffering yields. For the issuer of bonds, these effects are additive leading to lowered borrowing costs. Using Stigler's economics of information (Stigler, 1961, p. 213), Kessel (1971, pp. 728-729) argues that:

> […] underwriters possess specialized knowledge of what the customers they serve will pay for a prospective bond issue. This knowledge of customer preferences, that is, knowledge of the "market," is not the same for all underwriters; their knowledge of the preferences of their "good" customers is better than their knowledge of the preferences of indifferent or poor customers. This knowledge of the market, which is not known to any underwriter in its totality, is incorporated in the prices offered to issuers by underwriters when bids are submitted. Consequently, the larger the number of bids submitted, the greater the probability of discovering the underwriter in possession of the knowledge of who will pay the most for a prospective issue; this is apt to be the underwriter who submits the winning bid. Reoffering yields decline as bids increase, because bids constitute search by issuers for those buyers who most prize the bonds they have to sell. This search is intermediated by underwriters; and the more extensive the search, the higher the price realized.

The usage of higher quality financial advisors may be one way for issuers with competitively bid offerings to signal to market participants the quality of their issues. In the absence of such signal, a pooling equilibrium would be the outcome in the market with both lower quality issues and higher quality issues being charged the same higher borrowing costs. Relying on higher quality financial advisors is not costless to issuers. Although financial advisor fees in the municipal sector are relatively modest, they are not inconsequential. Thus, higher fees may be one deterrent for lower quality issuers in mimicking higher quality issuers and engaging the services of higher quality financial advisors. Reputation effects may also be at play. Financial advisors value their reputation and may not be willing to represent issues from lower quality issuers. The higher fees may simply represent a risk pricing mechanism based on the quality of the issue and reputational risk. As discussed previously, reputation is extremely important for high-quality financial intermediaries (Chemmanur and Fulghieri, 1994; Puri, 1999; Livingston and Miller, 2000). Allen and Dudney (2010) provide some evidence that this situation exists in municipal markets. Their results show that non-rated and lower rated issues use the services of higher quality financial advisors far less than rated or higher rated issues.

Financial market participants such as underwriters may, therefore, view a competitive offering with higher quality financial advisors as a credible signal about the quality of the issue. Increased credibility is also enhanced with the usage of higher quality financial

advisors because of the certification and monitoring roles that higher quality advisors can provide. This potentially increases liquidity by stimulating bidder interest and increasing the number of bids. It is the reduction in costs and increased liquidity that we seek to test in the following analyses.

3. Data and preliminary results

3.1 Data

Our sample consists of tax-exempt competitively bid municipal revenue bonds issued using the services of a financial advisor during the period 1998–2012. The data have been obtained from the IPREO Municipal Information Center database (IPREO). Our final working sample consists of 562,998 bonds for which data necessary for our analyses are available[5]. We exclude bonds with a maturity less than one year to reduce potential bias in the observed price.

Although financial advisors do service municipal clients across state lines, many typically concentrate their activity within a single state, and this is largely driven by the unique nature of the municipal bond market. One of the key elements is information about the issuer and access to the investor. Butler (2008), for example, finds that "local" investment banks are better positioned to access soft information about the issuer and the financial stability of the payee. Many municipal bond investors are local because the majority of states offer double tax exemptions (state and federal) on coupon payments to investors who are residents of the state where a bond is issued. This leads to considerable market segmentation in the municipal market where information about local conditions is likely to be more valuable (Pirinsky and Wang, 2011; Ang and Green, 2011). Information about local economic conditions is also likely to be more readily available to financial advisors who have built up reputations because of their expertise pertaining to local conditions and because of their bond issuance activities in particular states/regions.

For these reasons, our measure of financial advisor quality is based on state specific data. For each advisor, we use the percent of par value of issues handled by the financial advisor in that state in a particular year to develop a quality measure. If a particular advisor's proportion is greater than 90 percent in a particular state in a particular calendar year that advisor is coded 1 (i.e. high-quality advisor), all others zero. This approach to ranking financial advisors is a slightly modified measure to that used by Megginson and Weiss (1991)[6]. Table I provides a full description of this and all the other variables used in the study.

3.2 Descriptive statistics and univariate results

Table II shows the descriptive statistics for all variables in our sample. The average size (PAR) of the revenue bonds is \$2.7m with the average maturity being 10.7 years[7]. The average size of the revenue issues with a high-quality financial advisor is \$5.0m, significantly larger than \$2.5m for issues with a low-quality financial advisor. A *t*-test for differences across the two groups for size of the issue shows that the differences are significant ($p < 0.01$). Thus, smaller issues are more likely to have a lower quality financial advisor. The average years to maturity for issues with a high-quality financial advisor is 11.0 years against 10.7 years for issues with a lower quality financial advisor. The differences are again significant ($p < 0.01$). The mean yield (borrowing cost) for issues with a high-quality financial advisor is 3.75 percent, significantly ($p < 0.01$) higher than the mean yield of 3.72 percent for bonds issued with a low-quality financial advisor.

The percentage of AAA revenue bonds is greater for the issues with a low-quality financial advisor (55 percent of AAA for issues with a low-quality financial advisor as against 47 percent for issues with high-quality financial advisors). Of the issues using high-quality financial advisors, 38 percent are insured in contrast to the 46 percent of the

Variable	Description
BIDNUM	Number of bids for the bond
CALL	Binary variable coded 1 if the bond is callable, else 0
D(1998–2012)	A series of binary variables indicating year of issue
DA	Binary variable coded 1 if the bond is A rated by S&P or Moody's, else 0
DAA	Binary variable coded 1 if the bond is AA (Aa) rated by S&P(Moody's), else 0
DAAA	Binary variable coded 1 if the bond is AAA (Aaa) rated by S&P(Moody's), else 0
DBBB	Binary variable coded 1 if the bond is BBB (Baa) rated by S&P(Moody's), else 0
DCITY	Binary variable coded 1 if the bond is issued by a city, else 0
DCOUNTY	Binary variable coded 1 if the bond is issued by a county, else 0
DFABD	Coded 1 if the financial advisor is also broker dealer, else 0
DFINADV	Binary variable based on the financial advisor's percent of par value issued in a state within a year. If the advisor's proportion is 90% or higher then 1, else 0
DNEW	Binary variable, coded 1 if the issue is new financing, else 0
DNR	Binary variable coded 1 if the bond is not rated, else 0
DRATING	Numerical values for Standard and Poor's or Moody's bond rating for the issue, lower values (1) denote higher (AAA) ratings
DSYND2	Binary variable coded 1 if the issue is syndicated, else 0
EDUC	Binary variable coded 1 if issue is for funding education, else 0
GP	Binary variable coded 1 if issue is for general purpose funding, else 0
HOUSE	Binary variable coded 1 if issue is for funding housing, else 0
IMR	Inverse Mills ratio obtained from first-stage probit regressions
INDEX	Bond Buyer Revenue Index value on issue date
INS	Binary variable, coded 1 if the issue is insured, else 0
LOGMAT	The natural log of the years to maturity of the bond
LOGSIZE	Natural log of par value of the issue
PAR	Par amount of individual serial bonds in the issue (in dollar millions)
RANK	Lead underwriter rank, coded 1 if the underwriter is a top 10 underwriter in that year, else 0
SAFE	Binary variable coded 1 if issue is for funding public safety projects, else 0
SIZE	Par amount of the entire issue (in dollar millions)
TRANSPORT	Binary variable coded 1 if issue is for funding transportation, else 0
UTIL	Binary variable coded 1 if issue is for funding utilities, else 0
WATER	Binary variable coded 1 if issue is for funding water and sewer, else 0
YIELD	Yield to maturity for the bond

Note: This table provides a description of all variables used in the study, arranged in alphabetical order

Table I.
Description of variables

issues using lower quality financial advisors being insured ($p < 0.01$). These comparisons suggest that issuers with insured revenue bonds engage the services of high-quality financial advisors less frequently. We also observe that 71 percent of the issues relying on the services of high-quality financial advisors are new issues, and 68 percent of the issues using lower quality financial advisors are new issues ($p < 0.01$). The data also show that the usage of high-quality financial advisors is associated with a greater number of bids: 7.7 average bids for high-quality financial advisors compared to 6.3 average bids for issues using lower quality financial advisors ($p < 0.01$). This suggests that issues with higher quality financial advisors may be perceived as having greater liquidity. Overall, our sample also appears well distributed across different regions, types of issuers such as cities, counties, as well as different purposes for the use of funds.

In an untabulated analysis of our data, we also find that uninsured revenue bonds benefit from the use of a high-quality financial advisor with lower yields (3.53 percent vs 3.58 percent for uninsured issues with lower quality financial advisors). Further, both refunding issues and new issues have significantly lower yields, 3.28 percent with high-quality financial advisors vs 3.34 percent with low-quality financial advisors for refunding issues, and for new issues 3.84 percent for issues with high-quality financial advisors vs 3.94 percent for issues with

Variable	Type	Mean	SD	Median	Minimum	Maximum
Panel A: full sample (all financial advisors, n = 562,998)						
Advisor, underwriter and syndication						
DFABD	Binary	0.32	0.47	0.00	0.00	1.00
DFINADV	Binary	0.10	0.30	0.00	0.00	1.00
DSYND2	Binary	0.99	0.10	1.00	0.00	1.00
RANK	Binary	0.21	0.41	0.00	0.00	1.00
Bond and issuer characteristics						
BIDNUM	Scale	6.42	5.23	5.00	1.00	33.00
CALL	Binary	0.15	0.36	0.00	0.00	1.00
DA	Binary	0.02	0.14	0.00	0.00	1.00
DAA	Binary	0.15	0.36	0.00	0.00	1.00
DAAA	Binary	0.54	0.50	1.00	0.00	1.00
DBBB	Binary	0.00	0.07	0.00	0.00	1.00
DCITY	Binary	0.30	0.46	0.00	0.00	1.00
DCOUNTY	Binary	0.12	0.33	0.00	0.00	1.00
DNR	Binary	0.28	0.45	0.00	0.00	1.00
DRATING	Scale	2.60	2.16	1.00	1.00	6.00
INDEX	Scale	5.12	0.46	5.11	0.49	6.48
INS	Binary	0.45	0.50	0.00	0.00	1.00
LOGMAT	Scale	2.14	0.75	2.30	0.00	3.74
MAT	Scale	10.72	6.38	10.00	1.00	42.00
PAR (millions)	Scale	2.74	7.13	0.88	0.00	351.00
SIZE	Scale	13.75	1.46	13.68	8.01	19.68
YIELD	Scale	3.72	1.09	3.90	1.00	11.00
Use of proceeds						
DNEW	Binary	0.69	0.46	1.00	0.00	1.00
EDUC	Binary	0.28	0.45	0.00	0.00	1.00
GP	Binary	0.26	0.44	0.00	0.00	1.00
HOUSE	Binary	0.02	0.13	0.00	0.00	1.00
SAFE	Binary	0.03	0.18	0.00	0.00	1.00
TRANSPORT	Binary	0.06	0.24	0.00	0.00	1.00
UTIL	Binary	0.05	0.21	0.00	0.00	1.00
WATER	Binary	0.24	0.43	0.00	0.00	1.00
Panel B: high-quality financial advisors (based on DFINADV = 1; n = 56,516)						
Advisor, underwriter and syndication						
DFABD	Binary	0.21	0.41	0.00	0.00	1.00
DFINADV	Binary	1.00	0.00	1.00	1.00	1.00
DSYND2	Binary	0.99	0.07	1.00	0.00	1.00
RANK	Binary	0.19	0.39	0.00	0.00	1.00
SYND_NUM	Scale	12.04	3.13	13.00	0.00	15.00
Bond and issuer characteristics						
BIDNUM	Scale	7.71	6.10	6.00	1.00	25.00
CALL	Binary	0.22	0.42	0.00	0.00	1.00
DA	Binary	0.01	0.10	0.00	0.00	1.00
DAA	Binary	0.12	0.33	0.00	0.00	1.00
DAAA	Binary	0.47	0.50	0.00	0.00	1.00
DBBB	Binary	0.00	0.02	0.00	0.00	1.00
DCITY	Binary	0.23	0.42	0.00	0.00	1.00
DCOUNTY	Binary	0.11	0.31	0.00	0.00	1.00
DNR	Binary	0.39	0.49	0.00	0.00	1.00
DRATING	Scale	3.11	2.35	2.00	1.00	6.00
INDEX	Scale	5.13	0.56	5.10	0.49	6.35
INS	Binary	0.38	0.48	0.00	0.00	1.00

Table II.
Summary statistics

(*continued*)

Variable	Type	Mean	SD	Median	Minimum	Maximum
LOGMAT	Scale	2.19	0.73	2.30	0.00	3.69
MAT	Scale	11.01	6.34	10.00	1.00	40.00
PAR (millions)	Scale	5.03	10.30	2.08	0.00	250.00
SIZE	Scale	14.46	1.51	14.55	8.29	19.34
YIELD	Scale	3.75	1.08	3.92	1.00	8.25
Use of proceeds						
DNEW	Binary	0.71	0.45	1.00	0.00	1.00
EDUC	Binary	0.19	0.39	0.00	0.00	1.00
GP	Binary	0.31	0.46	0.00	0.00	1.00
HOUSE	Binary	0.01	0.12	0.00	0.00	1.00
SAFE	Binary	0.03	0.17	0.00	0.00	1.00
TRANSPORT	Binary	0.13	0.34	0.00	0.00	1.00
UTIL	Binary	0.04	0.19	0.00	0.00	1.00
WATER	Binary	0.23	0.42	0.00	0.00	1.00
Panel C: low-quality financial advisors (based on DFINADV = 0; n = 506,482)						
Advisor, underwriter and syndication						
DFABD	Binary	0.33	0.47	0.00	0.00	1.00
DFINADV	Binary	0.00	0.00	0.00	0.00	0.00
DSYND2	Binary	0.99	0.10	1.00	0.00	1.00
RANK	Scale	0.21	0.41	0.00	0.00	1.00
SYND_NUM	Scale	11.28	3.60	13.00	0.00	16.00
Bond and issuer characteristics						
BIDNUM	Scale	6.28	5.10	5.00	1.00	33.00
CALL	Binary	0.15	0.35	0.00	0.00	1.00
DA	Binary	0.02	0.14	0.00	0.00	1.00
DAA	Binary	0.16	0.36	0.00	0.00	1.00
DAAA	Binary	0.55	0.50	1.00	0.00	1.00
DBBB	Binary	0.01	0.07	0.00	0.00	1.00
DCITY	Binary	0.31	0.46	0.00	0.00	1.00
DCOUNTY	Binary	0.12	0.33	0.00	0.00	1.00
DNR	Binary	0.27	0.44	0.00	0.00	1.00
DRATING	Scale	2.54	2.13	1.00	1.00	6.00
INDEX	Scale	5.12	0.44	5.11	0.49	6.48
INS	Binary	0.46	0.50	0.00	0.00	1.00
LOGMAT	Scale	2.14	0.76	2.30	0.00	3.74
MAT	Scale	10.68	6.38	10.00	1.00	42.00
PAR (millions)	Scale	2.49	6.63	0.81	0.00	351.00
SIZE	Scale	13.67	1.43	13.60	8.01	19.68
YIELD	Scale	3.72	1.09	3.89	1.00	11.00
Use of proceeds						
DNEW	Binary	0.68	0.46	1.00	0.00	1.00
EDUC	Binary	0.29	0.45	0.00	0.00	1.00
GP	Binary	0.26	0.44	0.00	0.00	1.00
HOUSE	Binary	0.02	0.13	0.00	0.00	1.00
SAFE	Binary	0.03	0.18	0.00	0.00	1.00
TRANSPORT	Binary	0.05	0.22	0.00	0.00	1.00
UTL	Binary	0.05	0.21	0.00	0.00	1.00
WATER	Binary	0.24	0.43	0.00	0.00	1.00

Notes: This table reports the mean, standard deviation (SD), median, minimum and maximum values for all variables. Panel A reports the values for the full sample. Panels B and C report values for bond issues associated with high-quality and low-quality financial advisors, respectively. Variables are as defined in Table I

Table II.

lower quality financial advisors. Univariate observations for the number of bids, our proxy for liquidity, show that the usage of higher quality financial advisors leads to a significantly greater number of bids for both insured and refunding issues.

Our analyses of the univariate characteristics suggest that issuers and market participants alike respond to the quality of the financial advisor associated with a bond issue. While compelling, these findings are not definitive as there are several other factors that are also likely to affect the observed differences. Accordingly, we proceed with a multivariate analysis to isolate the factors that are most influential.

4. Multivariate tests and results

4.1 Model and control variables

Municipal managers, operating in the interest of the municipality they serve, seek to maximize the funds acquired through borrowing while reducing the cost of issuing debt. That is, managers seek advisors who are able to guide the issuer toward lower yields and greater liquidity. This choice is made internally by issuers, creating a self-selection bias. Specifically, in the case where the factors leading the issuer to select a high-quality advisor are omitted from the model and are also correlated with variables that are included in the model, an omitted variable bias on the estimated coefficients may result. In such a case, the independent variables will be correlated with the error term, thus, violating the basic conditions under which OLS yields unbiased estimators. For example, if there is a correlation between factors, such as issue size and the quality of the financial advisors, the coefficient on the financial advisor variable (DFINADV) in an ordinary least squares estimation with YIELD as the dependent variable may be biased. This selectivity bias may also be generated by other issue-specific characteristics such as rating, and call features, and may also be enhanced by issuer-specific characteristics.

Self-selection induced endogeneity can be remedied by estimating a proxy for the self-selection factors. Following Leuz and Verrecchia (2000), we model and control for the self-selection with two equations. The first estimated equation is a probit regression intended to generate a proxy for the issuer's self-selection decision to choose a given financial advisor. This first model takes the following general form:

$$f_i^* = \gamma' z_i + \varepsilon_i \text{ (financial advisor choice model)}, \tag{2}$$

where $f_i = 1$ if $f_i^* > 0$ and $f_i = 0$ otherwise, f_i^* as the issuer's unobservable benefits from choosing a high-quality financial advisor, f_i as the issuer's observed financial advisor choice, and z_i represents a vector of variables determining the decision to choose a high-quality financial advisor. The functional form of the estimated probit equation is as follows:

$$\text{DFINADV} = \alpha_0 + \beta_1(\text{LOGMAT}) + \beta_2(\text{LOGSIZE}) + \beta_3(\text{DNEW}) + \beta_4(\text{DRATING}) + \beta_5(\text{INS}) + \beta_6(\text{DFABD}) + e_i. \tag{3}$$

All variables are as defined in Table I. This model specifies that the choice of the high-quality financial advisor is endogenous and is influenced by issue-specific characteristics[8].

The second estimation is intended to capture the link between the cost of capital and the decision to use a financial advisor of a certain quality. The second model takes on the following general form:

$$c_i = \beta' x_i + \delta f_i + \mu_i \text{ (cost of capital benefits model)}, \tag{4}$$

where c_i is the observed component of the issuers cost of capital, and x_i a vector of exogenous variables that impact the cost of capital[9]. This specification takes into account the endogeneity in the choice of a high-quality financial advisor and provides a measure of

the marginal effect of the decision to use a high-quality financial advisor. Estimation of high-quality financial advisor effects on the issuer cost of capital, which explicitly takes into account the influence of issuers selecting high- or low-quality financial advisors on the basis of both observable and unobservable heterogeneity, may be accomplished by a modified Heckman/Lee approach to sample selection (Heckman, 1976, 1979; Lee, 1978; Trost and Lee, 1984) which is capable of handling the discrete nature of the financial advisor data. We include in the second equation an additional term to account for the selectivity bias[10]. This term is the inverse Mills ratio (IMR), which can be obtained from the probit estimation of the first equation[11]. Including this term in the cost of capital model leads to consistent parameter estimates using OLS.

We then estimate the following model using ordinary least squares regression with YIELD as the dependent variable:

$$\begin{aligned}\text{YIELD} = {} & \alpha_0 + \beta_1(\text{LOGMAT}) + \beta_2(\text{PAR}) + \beta_3(\text{INDEX}) + \beta_4(\text{IMR}) + \beta_5(\text{DFINADV}) \\ & + \beta_6(\text{DRATING}) + \beta_7(\text{CALL}) + \beta_8(\text{INS}) + \beta_9(\text{DSYND2}) + \beta_{10}(\text{EDUC}) + \beta_{11}(\text{GP}) \\ & + \beta_{12}(\text{HOUSE}) + \beta_{13}(\text{SAFE}) + \beta_{14}(\text{TRANSPORT}) + \beta_{15}(\text{UTIL}) + \beta_{16}(\text{WATER}) \\ & + \beta_{17}(\text{DCITY}) + \beta_{18}(\text{DCOUNTY}) + \beta_{19-33}(\text{Y99}-\text{Y12}) + \text{FE}_{\text{State}} + e_i, \end{aligned} \quad (5)$$

with the IMR obtained from the probit estimation of (2), and all other variables are again as defined in Table I[12].

We expect that the coefficient of the DFINADV variable would be negative in our estimation using Equation (5), indicating a lower YIELD to issuers using the services of a high-quality financial advisor[13]. Vijayakumar and Daniels (2006) find that the use of an external financial advisor is associated with lower yields on primary market municipal bonds. The authors attribute their findings to the monitoring and information asymmetry reduction roles that financial advisors play in the issuance process. Our prior is that higher quality financial advisors have superior links to the market and through their reputation can garner more/better underwriting offerings thereby increasing the competitive bidding process, increasing liquidity and lowering interest costs. The usage of higher quality financial advisors acts as an implicit signal to market participants about the attractiveness of the issue[14]. This can be especially beneficial in municipal issues as issuers typically do not have the expertise on staff to handle bond issues independent of an advisor.

We construct variables based on prior research (e.g. Hendershott and Kidwell, 1978; Kidwell and Rogowski, 1983; Kidwell *et al.*, 1987; Feroz and Wilson, 1992), to control for factors that have been shown to influence the YIELD. As example, it is expected that YIELD will be positively related to LOGMAT, INDEX (bond-buyer index of municipal revenue bonds at time of issue, used to control for market-wide interest rate effects) and negatively related to credit quality as represented by the Standard and Poor's and/or Moody's bond ratings[15]. It is further anticipated that PAR is negatively related to YIELD reflecting economies of scale for the underwriter. CALL should be positively associated with YIELD reflecting greater return uncertainty due to reinvestment risk. Usage specific factors represented by EDUC, GP, HOUSE, SAFE, TRANSPORT, UTIL and WATER are also included as control variables given different risk profiles that may be associated with funds for varied application issued by entities with different functionalities. We also include a series of dummy variables for the year of issue and implement a state-level, fixed-effects estimation to address anticipated heterogeneity across states.

4.2 Probit regression results

Table III presents results of the first-stage probit regressions for the full sample with the dependent variable coded 1 if the issue has a high-quality financial advisor and 0, otherwise.

	Coef.	SE	*Z*-statistic	*p*-value
LOGMAT	(0.0821)	0.0033	(24.83)	< 0.001
LOGSIZE	0.2053	0.0017	118.78	< 0.001
DNEW	0.1695	0.0053	32.06	< 0.001
DRATING	0.0494	0.0014	35.34	< 0.001
INS	(0.0105)	0.0064	(1.64)	0.102
DFABD	(0.1854)	0.0057	(32.79)	< 0.001
Intercept	(4.1936)	0.0247	(169.59)	< 0.001
Model statistics				
Observations			557,328	
Loglikelihood			20,854	< 0.001
Psuedo-R^2			0.0583	

Table III.
Prediction of financial advisor quality (dependent variable: DFINADV)

Notes: This table reports coefficient estimates from a probit regression explaining the probability of selecting a high-quality financial advisor for the full sample of municipal revenue bonds. The dependent variable is coded 1 if the bond has a high-quality financial advisor, and is coded 0 otherwise. All variables are as defined in Table I

Overall, the model is significant ($p < 0.001$), and has reasonable explanatory power[16]. The results illustrate that for revenue bonds, larger issues, lower rated issues and new money issues are more likely to have high-quality financial advisors. On the other hand, issues with high-quality financial advisors are less likely to be associated with longer maturities, and issues where the financial advisor is a broker dealer. These patterns reported in Table III are also consistent for probit regressions estimated for our subsamples and consistent with our univariate observations.

4.3 Regression results – revenue bonds

Table IV shows estimation results of our models for revenue bonds. To test for differential effects based on different financial advisor quality, using YIELD as the dependent variable, we estimate separate regressions for partitions based on whether the bond is an insured or uninsured issue, and whether it is a new issue bond or a refunding revenue bond. All estimation results for revenue bonds appear well specified and the overall models are all significant at $p < 0.001$. The adjusted R^2 are also robust ranging from 0.74 to 0.79. The coefficient of the IMR variable is significant at $p < 0.001$. The significance of the coefficient of the IMR variable confirms the importance of controlling for the "treatment effect."

The variable of interest to us is DFINADV. The coefficient of DFINADV is negative and significant at $p < 0.001$ for the full sample and for all subsamples. Thus, controlling for self-selection bias, our results show that borrowing costs are lower when high-quality financial advisors are used. Financial advisors provide both certification and monitoring services. In a competitively bid offering, underwriters compete for bond issues and are selected on the basis of the lowest TIC bid offered. Financial advisors play a crucial role in forming the bidding syndicate of underwriters. The expertise of the financial advisors about local market conditions, issuer characteristics and institutional investor demand is a valued service leading to greater benefits for the issuer. In our sample, which consists of only tax exempt, competitive bid issues, we observe a significant market signal that financial advisor quality can translate into a significant reduction in issuer cost of capital.

The results also show that the coefficients of all of our control variables (i.e. INDEX, CALL, MAT, PAR and DRATING) are significant in the full sample, and generally retain the proper sign and significance across all subsamples[17]. For example, the coefficient of PAR is negative and significant for the full sample, indicating that borrowing costs are less for larger issues. Underwriters may factor in economies of scale when underwriting larger issues.

	Full sample		Insured issues		Uninsured issues		New issues		Refunding issues	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
LOGMAT	0.9647	< 0.001	0.8076	< 0.001	1.1318	< 0.001	0.9231	< 0.001	0.9751	< 0.001
PAR	(0.1040)	< 0.001	(0.0600)	< 0.001	(0.1925)	< 0.001	(0.0595)	< 0.001	(0.0352)	< 0.001
INDEX	0.5420	< 0.001	0.4589	< 0.001	0.6015	< 0.001	0.5181	< 0.001	0.5458	< 0.001
IMR	(0.5604)	< 0.001	(0.2697)	< 0.001	(0.8761)	< 0.001	(0.3750)	< 0.001	(0.0494)	< 0.001
DFINADV	(0.0355)	< 0.001	(0.0187)	< 0.001	(0.0160)	< 0.001	(0.0132)	< 0.001	(0.0288)	< 0.001
DRATING	(0.0022)	< 0.001	(0.0156)	< 0.001	(0.0773)	< 0.001	0.0026	0.180	0.0180	< 0.001
CALL	(0.0143)	< 0.001	(0.0358)	< 0.001	0.0011	0.714	(0.0443)	< 0.001	0.0475	< 0.001
INS	(0.0159)	< 0.001					(0.0409)	< 0.001	0.0418	< 0.001
DSYND2	0.0566	< 0.001	0.0126	0.076	0.0864	< 0.001	0.0487	< 0.001	(0.0018)	0.898
EDUC	0.0801	< 0.001	0.0720	< 0.001	0.1039	< 0.001	0.1259	< 0.001	0.0412	< 0.001
GP	0.0310	< 0.001	0.0313	< 0.001	0.0539	< 0.001	0.0555	< 0.001	0.0259	< 0.001
HOUSE	0.4461	< 0.001	0.3781	< 0.001	0.4723	< 0.001	0.4503	< 0.001	0.4463	< 0.001
SAFE	(0.0442)	< 0.001	(0.0256)	< 0.001	(0.0247)	< 0.001	(0.0428)	< 0.001	0.0821	< 0.001
TRANSPORT	0.0113	< 0.001	0.0214	< 0.001	0.0239	< 0.001	(0.0118)	0.007	0.0743	< 0.001
UTL	0.0081	0.032	(0.0520)	< 0.001	0.0739	< 0.001	(0.0183)	< 0.001	0.0623	< 0.001
WATER	(0.0295)	< 0.001	(0.0136)	< 0.001	(0.0424)	< 0.001	(0.0437)	< 0.001	0.0164	< 0.001
DCITY			(0.0041)	0.096	0.0211	< 0.001	0.0167	< 0.001	(0.0348)	0.020
DCOUNTY			(0.0517)	< 0.001	(0.0363)	< 0.001	(0.0298)	< 0.001	(0.0535)	< 0.001
Annual intercepts		Included		Included		Included		Included		Included
State fixed-effects		Included		Included		Included		Included		Included
Observations		546,140		244,522		301,618		374,847		171,293
Model sig.		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001
F-statistic		57,438		26,253		35,483		33,500		19,183
Adj-R^2		0.7685		0.7442		0.7862		0.7435		0.7928

Notes: This table reports OLS regression results for our full sample of revenue bonds, and for sub-sample partitions based on whether the bond is insured or uninsured, and whether the bond is a new issue or a refunding issue. IMR is the inverse mills ratio obtained from first-stage probit regressions estimated separately for the full sample and the subsamples. All other variables are as defined in Table I

Table IV. Second-stage OLS regressions for full sample and partitions (DV = YIELD)

The coefficients for issue type (i.e. EDUC, GP, HOUSE, SAFE, TRANSPORT, UTIL and WATER) are significant ($p < 0.05$), suggesting that the impact of these are not captured in the bond ratings and that the market may be segmented along issue type.

4.4 Dodd–Frank and subsequent period

The municipal market is often perceived as less transparent, with unhealthy practices such as pay-to-play relative to several other financial markets[18]. The Securities and Exchange Commission, and more specifically its municipal wing the Municipal Securities Rulemaking Board have been aware of these practices and have taken (and continue to take) several steps to mitigate many of these effects. The Dodd–Frank Act, passed to control for several harmful practices in financial markets, deals specifically with the role of financial advisors in municipal markets. The act has several provisions dealing with financial advisors and, for the first time, requires the registration of financial advisors with the Securities and Exchange Commission[19].

We study the effect of the passage of the Dodd–Frank Act on borrowing costs for issues that use high-quality financial advisors. Specifically, we examine if for the period after the passage of the act (for the year 2011 and later) whether borrowing costs for issues using high-quality financial advisors have been impacted. We create two new variables for this analysis. POST_DF is a binary variable set to 1 for years 2011 and 2012, and 0 otherwise. DFINADV_DF is an interaction variable computed by multiplying POST_DF and DFINADV. Both POST_DF and DFINADV_DF are added to all estimations. Results are reported in Table V[20].

	Full sample		Insured issues		Uninsured issues		New issues		Refunding issues	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
LOGMAT	0.9647	< 0.001	0.8076	< 0.001	1.1317	< 0.001	0.9240	< 0.001	0.9750	< 0.001
PAR	(0.1044)	< 0.001	(0.0599)	< 0.001	(0.1922)	< 0.001	(0.0599)	< 0.001	(0.0352)	< 0.001
INDEX	0.5403	< 0.001	0.4588	< 0.001	0.6015	< 0.001	0.5182	< 0.001	0.5458	< 0.001
IMR	(0.5634)	< 0.001	(0.2694)	< 0.001	(0.8748)	< 0.001	(0.3767)	< 0.001	(0.0493)	< 0.001
DFINADV	(0.0141)	< 0.001	(0.0158)	< 0.001	(0.0209)	< 0.001	(0.0117)	0.002	(0.0298)	< 0.001
POST_DF	(1.9706)	< 0.001	(1.6127)	< 0.001	(2.0199)	< 0.001	(1.9754)	< 0.001	(1.9471)	< 0.001
DFINADV_DF	(0.0136)	0.050	(0.2682)	< 0.001	0.0242	0.003	(0.0126)	0.152	0.0058	0.639
DRATING	(0.0025)	< 0.001	(0.0146)	< 0.001	(0.0772)	< 0.001	0.0025	0.188	0.0180	< 0.001
CALL	(0.0142)	< 0.001	(0.0355)	< 0.001	0.0012	0.702	(0.0444)	< 0.001	0.0475	< 0.001
INS	(0.0112)	< 0.001					(0.0410)	< 0.001	0.0417	< 0.001
DSYND2	0.0536	< 0.001	0.0124	0.080	0.0867	< 0.001	0.0487	< 0.001	(0.0019)	0.864
EDUC	0.0793	< 0.001	0.0721	< 0.001	0.1042	< 0.001	0.1259	< 0.001	0.0412	< 0.001
GP	0.0315	< 0.001	0.0314	< 0.001	0.0543	< 0.001	0.0553	< 0.001	0.0260	< 0.001
HOUSE	0.4457	< 0.001	0.3785	< 0.001	0.4725	< 0.001	0.4502	< 0.001	0.4463	< 0.001
SAFE	(0.0437)	< 0.001	(0.0257)	< 0.001	(0.0251)	< 0.001	(0.0427)	< 0.001	0.0821	< 0.001
TRANSPORT	0.0115	< 0.001	0.0211	< 0.001	0.0238	< 0.001	(0.0119)	0.007	0.0742	< 0.001
UTL	0.0092	0.015	(0.0521)	< 0.001	0.0740	< 0.001	(0.0184)	< 0.001	0.0623	< 0.001
WATER	(0.0297)	< 0.001	(0.0131)	< 0.001	(0.0417)	< 0.001	(0.0439)	< 0.001	0.0165	< 0.001
DCITY			(0.0037)	0.133	0.0205	< 0.001	0.0168	< 0.001	(0.0349)	< 0.001
DCOUNTY			(0.0517)	< 0.001	(0.0364)	< 0.001	(0.0297)	< 0.001	(0.0535)	< 0.001
Annual intercepts		Included		Included		Included		Included		Included
State fixed-effects		Included		Included		Included		Included		Included
Observations		546,140		244,522		301,618		374,847		171,293
Model sig.		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001
F-statistic		57,423		25,320		34,376		32,485		18,601
Adj-R^2		0.7685		0.7442		0.7862		0.7435		0.7928

Table V.
Second-stage OLS regressions for full sample and partitions (DV = YIELD) with POST_DF and DFINADV_DF

Notes: This table replicates Table IV with the inclusion of POST_DF and DFINADV_DF. All other variables are as defined in Table I

Results for DFINADV in Table V are consistent with those reported in Table IV, providing additional support for the assertion that borrowing costs are lower where high-quality financial advisors are retained. The coefficient on POST_DF is negative and significant at $p < 0.001$ for the full sample and all subsamples, suggesting that YIELD is lower across all segmentations in the post Dodd–Frank period. The coefficient on DFINADV_DF is negative and significant at $p = 0.05$ for the full sample. The coefficient on DFINADV_DF is also negative and significant ($p < 0.001$) for insured issues, suggesting that the passage of the Dodd–Frank Act had a magnifying effect on the association between DFINADV and YIELD. The estimated coefficient on DFINADV_DF for uninsured issues is positive and significant ($p = 0.003$), suggesting that, following the implementation of the Dodd–Frank Act provisions, the inverse association between DFINADV and YIELD moderated. Our results indicate that Dodd–Frank had no discernable effect on YIELD in the case of new issues and refunding issues.

Taken together, our results provide evidence that the passage of the Dodd–Frank Act likely has had an impact on municipal borrowing costs, lowering them overall. Borrowing costs for issues that use high-quality financial advisors are significantly lower than those issues that do not use higher quality advisors. However, our results also suggest that the Act's effect across different issue classifications, for example, insured vs uninsured, was not uniform.

4.5 Liquidity

We also explore the effect of higher quality financial advisors on the liquidity faced by issuers. An increase in bids is associated with higher levels of liquidity (Kleymenova *et al.*, 2012),

and is potentially associated with lower borrowing costs (Kessel, 1971). As the quality of financial advisor may be interpreted by market participants as an endorsement of the underlying quality of the issuer, higher quality financial advisors are expected to be associated with greater liquidity for the issue[21]. We use the number of bids on the issue as a measure of liquidity and test the strength of the liquidity assertion by replacing YIELD in Equation (5) with the number of bids (BIDNUM). Results of this estimation are reported in Table VI.

Table VI provides evidence that, across the full sample and across all classes of issues, higher quality financial advisors are associated with higher levels of BIDNUM. This result supports the notion that those issues associated with higher quality financial advisors attract a significantly higher number of bids and are perceived as more liquid. In untabulated results, we replicate this analysis and include a POST_DF variable. Across all classes of issues, the estimated coefficients on DFINADV and POST_DF are positive and significant. Therefore, not only is liquidity enhanced through the use of a high-quality financial advisor, but it was also enhanced through the regulatory framework established through the Dodd–Frank Act.

5. Conclusions

This study examines the benefits of using high-quality financial advisors for competitively bid municipal revenue bonds that all use the services of a financial advisor. Overall, our results indicate beneficial effects for revenue bond issuers using the services of high-quality financial advisors.

	Full sample		Insured issues		Uninsured issues		New issues		Refunding issues	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
LOGMAT	(0.0723)	< 0.001	(0.1664)	< 0.001	0.0389	0.008	(0.1595)	< 0.001	0.0947	< 0.001
PAR	0.8701	< 0.001	0.7138	< 0.001	0.8409	< 0.001	0.8493	< 0.001	0.7917	< 0.001
INDEX	0.1340	< 0.001	0.5237	< 0.001	(0.0949)	0.003	0.1092	< 0.001	(0.1760)	< 0.001
IMR	0.9031	< 0.001	0.7423	< 0.001	0.1601	0.114	0.3958	0.266	1.5519	< 0.001
DFINADV	0.6373	< 0.001	1.4720	< 0.001	0.5912	< 0.001	0.4921	< 0.001	0.9696	< 0.001
DRATING	(0.0265)	< 0.001	(0.1052)	< 0.001	0.0210	0.101	(0.0893)	< 0.001	0.0432	< 0.001
CALL	0.4590	< 0.001	0.4877	< 0.001	0.4102	< 0.001	0.4560	< 0.001	0.4473	< 0.001
INS	(0.5819)	< 0.001					(0.5502)	< 0.001	(0.7134)	< 0.001
DSYND2	2.4343	< 0.001	2.8332	< 0.001	1.6767	< 0.001	2.4328	< 0.001	2.9548	< 0.001
EDUC	(0.3110)	< 0.001	(0.1017)	0.036	(0.0350)	0.551	(0.2230)	< 0.001	(0.2716)	< 0.001
GP	(0.3232)	< 0.001	(0.0009)	0.975	(0.5518)	< 0.001	(0.4043)	< 0.001	0.3467	< 0.001
HOUSE	(1.0097)	< 0.001	0.6776	< 0.001	(1.8603)	< 0.001	(0.5725)	< 0.001	(3.1315)	< 0.001
SAFE	(0.2226)	< 0.001	(0.3500)	< 0.001	(0.2160)	< 0.001	(0.3496)	< 0.001	0.1691	0.025
TRANSPORT	(0.7676)	< 0.001	0.7800	< 0.001	(2.4654)	< 0.001	(0.4091)	< 0.001	(0.9862)	< 0.001
UTL	(0.1093)	< 0.001	(0.9442)	< 0.001	0.7977	< 0.001	0.1699	< 0.001	(0.2554)	< 0.001
WATER	(0.1274)	< 0.001	(0.0942)	0.002	(0.0132)	0.665	(0.2063)	< 0.001	0.5084	< 0.001
DCITY			0.0836	< 0.001	(0.4169)	< 0.001	0.2010	< 0.001	(0.8089)	< 0.001
DCOUNTY			0.7626	< 0.001	(0.4326)	< 0.001	0.3005	< 0.001	(0.0840)	0.034
Annual intercepts		Included		Included		Included		Included		Included
State fixed-effects		Included		Included		Included		Included		Included
Observations		546,140		244,522		301,618		374,847		171,293
Model sig.		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001
F-statistic		2,546		1,547		1,360		1,768		685
Adj-R^2		0.1289		0.1401		0.1510		0.1433		0.1091

Notes: This table replicates Table V with the inclusion of BIDNUM as the dependent variable. All other variables are as defined in Table I

Table VI. Second-stage OLS regressions for full sample and partitions (DV = BIDNUM)

Our results suggest that using higher quality financial advisors may lead to greater liquidity. Such effects are pronounced across various sub-sample categorizations and across most issue sizes. In addition, we observe that the passage of the Dodd–Frank Act of 2010 has increased the benefits to issuers using high-quality financial advisors.

Our results are consistent with the usage of high-quality financial advisors being perceived as a credible signal of issue quality. High-quality financial advisors provide certification and monitoring benefits that the market considers valuable leading to lowered borrowing costs for issuers. While financial advisory services are not costless, our results suggest that issuers may obtain real economic benefits from using high-quality financial advisors. More research examining contract forms and fees for financial advisors should be useful in this regard. Our results have implications for both issuers and regulators. For issuers, our results suggest that financial advisor quality makes a difference. Thus, issuers need to pay attention to the level of experience financial advisors have in their selection process. From a regulatory perspective, our results suggest that regulations relating to financial advisors under the Dodd–Frank Act seem to have beneficial effects for issuers. Further research examining the impact of specific provisions relating to financial advisors may help understand the impact of these regulations better.

Notes

1. Vijayakyumar and Daniels (2006) draw on literature contained in Moak (1982), Feldstein and Fabozzi (1987), Cobbs *et al.* (1993), Lamb *et al.* (1993), Petersen (1993), Johnson (1994), Temel (2001), Robbins (2002), Larson *et al.* (2002) and Robbins and Simonsen (2003) in providing an exposition of the role and functions of financial advisors in the municipal sector.
2. Bierwag (1976, pp. 1175-1177) first reported a standard model of municipal bond pricing using true interest costs and used in the subsequent literature. Our conceptual underpinnings relating to the role of the financial advisor in the bond issuance process are consistent with Bierwag (1976).
3. Puri (1999) also develops a model that shows that high reputation financial intermediaries have significant incentives to develop and maintain their reputation leading to higher certification standards and higher prices for issuers. Livingston and Miller (2000), and several other articles (e.g. Carter and Manaster, 1990; Johnson and Miller, 1988), provide empirical validation results consistent with theoretical predictions.
4. See also Amihud (2002), Pástor and Stambaugh (2003), Acharya and Pedersen (2005), Sadka (2006), Chen *et al.* (2007) and Bushman *et al.* (2010).
5. Also, some of the regression models employ slightly smaller sample sizes because of missing information relating to a few of our variables.
6. Results using a 75 percent proportionality coded as one produced similar results. We also tested a national ranking of financial advisor quality. In this ranking we allocated financial advisors into top 10 and top 25 based on the total par value of issues across the country in each year. However, as previously explained financial advisors operate in more local/regional markets, and this is not represented in a national variable ranking. Results with the national measure (not reported here but available with the authors) are inconsistent. This is in line with results presented by Allen and Dudney (2010).
7. Each municipal bond issue typically consists of a number of bonds each with its own CUSIP, maturity and par value. Each unique CUSIP in an issue is considered a separate bond and used as such in our analyses. Also, in our analyses, SIZE is the total dollar value for the entire serial issue, while PAR is the par value of each separate bond in the serial issue.
8. Vijayakumar and Daniels (2006) state that financial advisors can mitigate underwriter monopsony power. This makes sense so long as the financial advisor is not the underwriter, as Clarke (1997) finds higher interest costs when the financial advisor serves as the underwriter. He attributes this result to the inherent conflicts of interest present in this scenario. We include the dummy variable DFABD defined as whether the financial advisor is also broker dealer to control for this.

9. The approach described herein has been used extensively to examine a variety of problems where selection bias is an issue. For example, see Leuz and Verrecchia (2000) and Covitz *et al.* (2003).

10. The term "treatment effect" refers to the causal effect of a binary (0–1) variable on an outcome variable of scientific or policy interest. Idson and Feaster (1990) is an excellent example of the "treatment effect."

11. See Maddala (1983, pp. 121, 357) for more details.

12. See Flannery and Houston (1999, p. 26) for a discussion about interpreting the significance of the sign of the coefficient of the inverse mills ratio.

13. Municipal bond issues are often structured with a combination of term and serial maturities (i.e. a portion of the principal matures each year). Coupon rates often vary by maturity and so too does the yield. Our dependent variable is the reoffering yield for each bond individually. Rather than aggregate the bonds into issues with varying maturities and yields our models are run on the individual bonds within the issue. This allows us to observe the individual maturities and other features distinct to the individual bond. To test the hypothesis that yields and bidding activity are affected by the perceived quality of the financial advisor, we run selection corrected regression measures of financial advisor quality, issue/issuer quality and control variables on the initial yield of new issues. Several model specifications are tested, and all regressions include robust standard errors.

14. It is also possible that for competitive offerings (which is what our sample consists of) higher quality financial advisors can better bridge the information gap existing between issuers and underwriters making the issue more attractive to underwriters.

15. In cases where the bonds are split-rated by Standard and Poor's and Moody's, we retained the Standard and Poor's bond rating. However, subsequently, we repeated our analyses excluding the split-rated bonds from the sample. The results are similar to the results reported in the paper.

16. The probit regression results reported here are for the full sample. We estimate probit regressions not just for the full sample but also separately for each of our subsamples, namely, insured and uninsured issues, new issues, refunding issues and for our size-based partitions (results not reported here but available with the authors). The IMRs from these estimations for the subsamples are used in the corresponding second-stage regressions for the subsamples. Regression results for these subsamples are consistent with results reported here.

17. All results reported throughout the paper use significance values based on two-tailed tests. We follow this more conservative approach, even though we do specify directional hypotheses for some of our variables that would permit us usage of one-tailed tests.

18. Butler (2008) and several other articles have examined these issues with reference to the municipal market.

19. Rules requiring mandatory registration were made effective only fairly recently. However, market participants have been fully aware that such rules were in the works and had been lobbying extensively in various forms to influence these rules both before and immediately after the passage of the Dodd–Frank Act.

20. The inclusion of binary variables for year and the fixed-effect estimation to control for state-level effects is maintained in the results reported in Table V.

21. This result is consistent with the interpretation provided by Kessel (1971) as to why greater number of bidders leads to lower borrowing costs for issuers. Using Stigler's (1961) information framework, Kessel (1971) argues that with a larger number of bids there is increased probability that particular underwriters with more knowledge of market and demand factors for the issue are likely to bid, and in fact submit the winning low borrowing cost bid. Increased number of members in the bidding syndicate may also be serving similar purposes.

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