Indirect and direct subsidies for cost of government capital: Comparing tax-exempt bonds and Build America Bonds[1]

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Build America Bonds (BABs) were created by the American Recovery and Reinvestment Act of 2009 (ARRA) as a new form of municipal bonds to stimulate state and local government capital investment. Unlike traditional tax-exempt bonds, the interest income from BABs is taxable, but BAB issuers receive a direct subsidy from the federal government. In other words, this form of municipal bonds switches from the indirect subsidy through tax-exemption to the direct subsidy from federal government. Tax-exempt bonds are advantageous to investors who pay taxes, while BABs are more attractive to investors who do not pay taxes (e.g. foreign investors and pension funds). Our paper builds a model to compare the direct and indirect interest subsidies through the yields on traditional municipal bonds and BABs. Using a sample of the California primary market, we find that on average BAB has an interest rate of approximately 70 basis points (bps) lower than tax exempt bond and the implied tax rate for the marginal investor is 25 percent.

Direct and Indirect Subsidies

Government Subsidies are common place in federalist systems of government. Some government subsidies involve direct transfers of dollars from the federal government to the states,

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cities, or individuals. A direct subsidy is also called an income transfer. Examples of direct subsidies include Medicaid, transportation, and farm subsidies. Indirect subsidies result when tax treatment is modified to lower the price of a particular commodity or activity and thereby encourages consumption. Examples of indirect subsidies are the tax exemptions for mortgage interest and charitable donations.

The advantage of a direct subsidy is that the income can be targeted at the specific individuals needing the subsidy, potentially reducing the overall costs to government (Rosen 1992, p. 319; Gruber 2005, p. 541). An indirect subsidy benefits all individuals, even those who would have engaged in the behavior anyway. Often the challenge of direct subsidies is trying to identify the appropriate individual recipients while indirect subsidies are targeted to the market or a group of individuals. Indirect subsidies may be favored by politicians because indirect subsidies are tax expenditures that reduce revenues but generally are not reported explicitly in the budget.

Schwartz and Clements (1999) argue that the evaluation of government subsidies should consider transparency, cost effectiveness/control, and duration. Each of these considerations is now discussed.

1. Transparency results in clear associations between the benefits, beneficiaries, costs, and cost incidence. Direct cash subsidies are most transparent because they are tracked through the government budget and audits. However, cash is also enticing for fraud and abuse, particularly when the government does not have full information about public preferences or subsidy qualifications (Blackorby and Donaldson 1988).

2. A good subsidy is one that reaches the intended target group and also achieves "the objective at minimum cost in terms of their fiscal burden and efficiency losses" (Schwartz and Clements (1999, p. 138). Subsidy reform should consider whether it is possible to maintain the same policy objectives while reducing the cost of the program (for example Konstantinos and Fulton 2000). Cost control of subsidies is much easier when the costs are clearly identifiable. Therefore direct payments to a targeted group are easier to control as long as the eligibility conditions are easy to implement and enforce.
3. The duration of the subsidy may influence the effectiveness of the subsidy. Beneficiaries will react differently to long and short term subsidies. Schwartz and Clements (1999, p. 139) suggest that "effective subsidization over time requires periodic reassessments of the rationale for the subsidy, and, if needed, revision, retargeting, or elimination."

We now discuss these three points in the context of the traditional subsidy on municipal bonds. The subsidy on municipal bond is meant to reduce the borrowing costs of local governments to encourage investment in infrastructure and long term fixed assets. There is a legal question as to whether the federal government may tax bond interest on states or other jurisdictions within the states. Interest earned from bonds issued by states and localities has been exempt from federal taxation from the inception of the current federal income tax in 1913 (Sixteenth Amendment). However, the legal question of whether bonds issued by states and localities could be taxed by the federal government precedes the enactment of the sixteenth amendment. The earliest precedent regarding the tax exemption of municipal bonds at the federal level goes back to *McCulloch v. Maryland(1819,)* which established the "doctrine of intergovernmental tax immunity." Nevertheless, in *South Carolina V. Baker*, the US Supreme

Court noted in their decision that earlier cases had been overturned piece by piece over the previous century and ruled that state bond interest is not immune from federal taxation (see Pryde 1993). We assume that the ability of the federal government to tax has been resolved and that the decision to exempt municipal bond interest is therefore a policy decision to subsidize the borrowing costs of state and local governments.

The tax exemption on municipal bond interest is clearly an indirect subsidy that benefits any government who decides to issue debt that is eligible for the exemption. The nature of how this subsidy works is illustrated in the next section. As an indirect subsidy the total costs are not reported in the federal budget, thereby reducing transparency. However, the magnitude of the bond interest exemption subsidy is estimated and reported by the Office of Management and the Budget.[2]

Cost control is a concern for indirect subsidies and the exemption for municipal bond interest is no exception. Throughout much of the first part of the twentieth century, governments issued tax-backed bonds for general purposes. Through the seventies and early eighties local jurisdictions began to issue private purpose bonds backed with nontax revenues. Such transactions violated the intent of the subsidy and cost taxpayers millions of dollars. The Tax Reform Act of 1986 imposed cost controls by restricting the eligibility of private purpose bonds for the municipal bond interest exemption.

The exemption on tax exempt bonds has been in place since the federal income was first levied in 1913 and has been changed little except for excluding private purpose bonds from the

[2] Office of Management and the Budget, 2006 *Analytical Perspective, Budget of the United States Government, Fiscal Year 2007,*

subsidy. In 2009 it was time for policy makers to reassess and evaluate whether the tax-exemption on municipal bond interest is meeting the desired policy objectives in the most cost efficient way. An experiment with direct subsidies to municipal governments was launched.

Build America Bonds

The BAB program started in April 2009 with the American Recovery and Reinvestment Act. The interest on BAB bonds is not exempt from federal income taxes. Instead the federal government subsidizes local government's cost of borrowing by directly paying 35% of the issuers interest costs.[3] In contrast, interest earnings from tradition municipal bonds are exempt from federal taxation so the yields on tax-exempt bonds yields are lower.

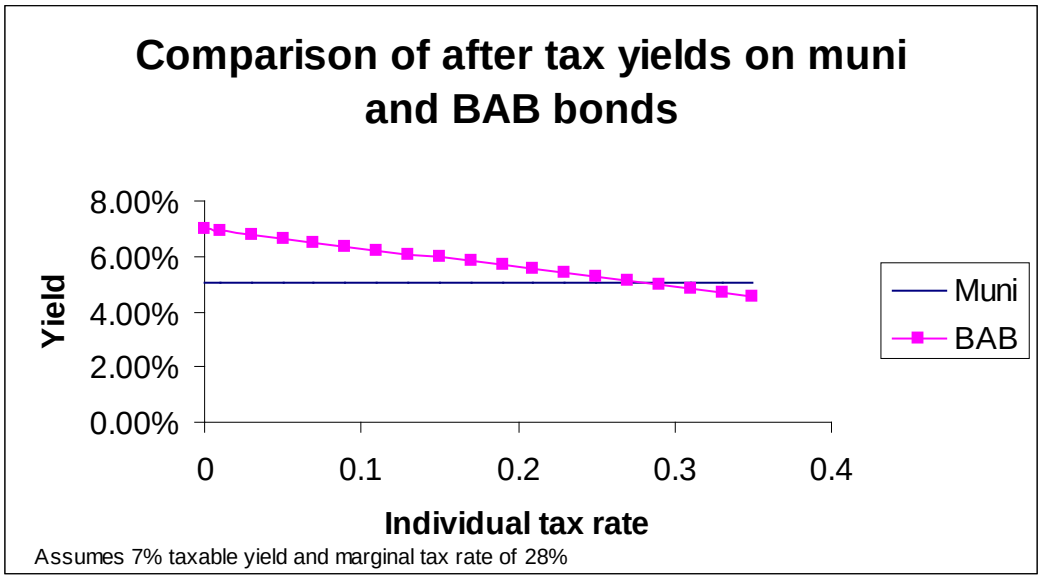
A key component of the BAB program is the direct subsidy of 35% of the interest costs of the bonds. The local government issuer of a BAB files a form with the US treasury for each semiannual interest payment. The BAB was a two-year experiment (2009 and 2010), although the Obama administration has proposed to make the program permanent. The current subsidy rate is 35% but will likely be lowered if the BAB program is extended.

One stated purpose of the BAB program is to expand demand for municipal securities beyond investors in the high tax brackets. Equation 2 demonstrates the relationship of the tax exempt yield and a taxable yield on an otherwise equivalent bond. The marginal tax rate is

[3] Another type of BAB, tax credit BAB, provides a federal subsidy through tax credit equal to 35% of bond interest costs to investors. However, no bond issue so far has taken this option. ARRA also created Recovery Zone Bonds that enjoy a federal subsidy equal to 45% of bond interest costs.

defined as the implicit tax rate that makes the marginal investor indifferent between buying a taxable bond and a tax-exempt bond. The net benefit of an individual investor depends on the individual tax rate relative to the implicit tax rate. This relationship is illustrated in Figure 1. The after-tax yield on a traditional tax exempt bond is determined by the implicit tax rate (in this case 28%) and does not change based on the individual tax rate. The BAB bonds are taxable and therefore the after tax rate depends on the individual tax rate. Figure 1 demonstrates that investors in the high tax brackets (more than 28%) will prefer traditional muni bonds. Investors like governments, foreigners, and others in low tax brackets (less than 28%) will prefer the BABs. The purpose of BABs is to create demand for municipal bonds from these investors in the low tax brackets. One indicator of success is that $78 billion was issued in the first year of the BAB program.

Figure 1



Literature

Although the BAB program is reshaping the municipal bond market and has attracted much attention, only a few related academic studies have been published due to recent start of the BAB program. There are three articles that are directly related to the current study.

Robbins and Simonsen (2010) provide an overview of BAB as an innovative financing mechanism and review the BAB market in the first nine months since the first BABs were issued. They also estimate that the lifetime federal subsidy amount to BABs issued in 2009 and 2010 will reach $63.8 billion. Furthermore, they reveal that foreign investors have increased their holdings of taxable municipal securities, including BABs.

The United States Treasury Department (2010) compared BAB to tax-exempt bonds published by the same issuer in the same day. They found that BAB can generate interest savings and the savings are positively related to the years to maturity. The yield curve they constructed reveals that BAB lowers the yield at issue by 31 basis points for a 10 year bond, and 112 for a 30 year bond. They also found that the underwriting cost for issuing BAB is decreasing to a level comparable to that of traditional tax exempt bond.

Ang, Bhansali and Xing (2010) use a nonlinear model to compare BAB yields to hypothetical yields calculated using discount rates that capture the default risk of the bonds. Their national sample of BAB issues indicates a saving of 54 basis points of issuing BABs instead of tax exempt bonds. They also compare the costs of BABs to those of Treasuries and corporate bonds. For tax free investors who are mainly institutions, a BAB issue has a yield of 116 basis points higher than that of comparable Treasuries and 88 basis points higher than that of

comparable highly rated corporate bonds. However, for individual investors facing the highest individual income tax rate, the yield rate of BABs is lower than tax-exempt bonds.

The current study differs from previous studies in two perspectives. First, both U.S. Treasury Department (2010) and Ang, Bhansali and Xing (2010) treat each issue in serial bonds as an individual observation and use data from secondary market trades. The current study examines the True Interest Cost (TIC) of the whole bond. For issuers' perspective, TIC can more precisely reflect their actual borrowing costs. Second, in addition to assessing the borrowing cost difference between BABs and traditional tax exempt bonds, the current study also estimates the implied tax rates for marginal investors of BABs. Third, we also provide a comparison of the issuance costs of BABs and traditional municipal bonds.

Data

To examine our research question, the primary market information of long term bonds issued in California between April 1, 2009 and March 31, 2010 was attained from the Office of California Treasurer. This paper focuses on the California bond market, as it is the largest tax exempt bond and BAB market. According to Robbins and Simonsen (2010), almost one fourth of BABs were issued by California government entities. Our focus is on the comparison between traditional muni bonds and BABs with fixed interest rates so we omit from the sample 119 certificates of participation/ leases, 382 notes and commercial papers. We further drop 149 variable-rate bonds and nine Tax Credit Bonds (TCBs) and three Recovery Zone Economic Development Bonds (RZEDBs).[4] The TCBs and RZEDBs face different tax and subsidy

[4] During this one year period, 1392 bonded securities were issued by government entities in California.

treatment than Build America Bonds (BABs), general taxable bonds or tax exempt bonds, and including these bonds will complicate the analysis.

The relevant sample of CA bonds for the study is 730 bonds. In order to assure the accuracy of TIC information from the original dataset, we also calculate the TIC of each individual bond issue based on the information recorded in the issue's official statement extracted from MSRB.COM. Unfortunately, the missing information of the original dataset and official statements required that 229 bond issues be dropped, leaving 501 bond issues in our final sample.

Method

Bond interest rate, measured with the True Interest Cost (TIC), is modeled as a function of market interest rate, federal tax treatment, bond attributes, issue's underlying credit rating, and bond type dummy variables:

Equation 1

TIC=f(market interest rate, federal tax treatment, bond attributes, bond type dummy variables)

Table 1 provides a discussion of the definition and the expected signs of variables that are included in this analysis. Bond Buyer Index 20 is used to measure the market interest rate. Most variables measuring bond attributes are commonly used in the studies of municipal bond interest cost and thus deserve no further explanation. A set of dummy variables are included in the regression to control for debt classifications as defined by their payment sources. We employ the

original categories used by California State Treasurer's Office: conduit revenue bond, general obligation bond, limited tax obligation bond, pension obligation bonds, public enterprise revenue bond , public lease revenue bond , revenue bond (Pool) , sales tax revenue bond , special assessment bond , tax allocation bond, and other bond.

According to their taxable and subsidy status, bonds in our sample can be divided into three groups: tax exempt, BABs and general taxable.[5] Tax exempt bonds refer to bonds that have their interest income exempt from the federal income tax and enjoy no tax credit benefit. BABs refer to bonds that are subject to federal tax but are subsidized under the Build America Bond program. General taxable bonds refer to bonds that are taxable but receive no federal subsidy.

If the subsidy for BABs is designed to be equivalent to the implicit subsidy on tax exempt bonds, then the after-tax return rate of a BAB should be equal to the interest rate of a comparable tax-exempt bond for the marginal investor such that:

Equation 2

$$r_{bab}(1-\tau) = R_e$$

where r_{bab} is the before-tax interest rate of BABs; τ represents the federal income tax rate for the marginal BAB investor; and R_e refers to the interest rate of tax exempt bond. An important purpose of the current study is to calculate the implied tax rate of BABs. From Equation 2, we find the following formula to calculate the implied federal income tax rate for the marginal investor:

[5] Our sample has excluded TCB, RZEDB and contains no Alternative Minimum Tax (AMT) bonds.

Equation 3

$$\tau = 1 - \frac{R_e}{r_{bab}}$$

Once we have estimated the average interest rate for BABs and tax-exempt bonds, we are able to calculate the implied tax rate of the marginal investor. Likewise, we can estimate the implied tax rate for general taxable bonds. We use the regression model parameters estimated in Equation 1 to estimate the true interest costs (TIC) for taxable bonds, BABs, and tax-exempt muni bonds. These yields are then used to calculate the implicit tax rates using Equation three.

Summary statistics

Table 2 reports the descriptive statistics of variables included in our analysis by tax and subsidy treatment. Tax exempt bonds account for approximately 80 percent (404 issues); BABs account for about 15 percent (74 issues); general taxable bonds account for about five percent (23 issues) of our sample. Furthermore, all BABs are direct payment BABs, and the sample contains no tax credit bonds. The distribution of bonds by tax and subsidy treatment is similar to the nationwide distribution found by Robbin and Simonsen (2010).[6]

The true interest cost (TIC) of tax exempt bonds on average is 518.3 basis points, about 72 percent of that of BABs (714.9 basis points) or 70.5 percent of that of taxable bonds (735.1 basis points). If BABs in the sample are comparable (in terms of characteristics such as years to maturity, principal amount, credit quality, etc.) to tax exempt bonds, the implied tax rate would

[6] They found that roughly 15 percent of the new issues were BABs, and another five percent are subject to regular federal income tax.

be 28 percent (1-518.3/714.9) for the marginal investor of BABs. Likewise, the implied tax rate would be 29.5 percent for the marginal investor of general taxable bonds. Furthermore, after the subsidy, BABs can save issuers 54 basis points (518.3-714.9*0.65), a saving at the scale as found in Ang, Bhansali and Xing (2010). However, as discussed below, the three categories of bond issues differ from each other in many characteristics. Thus, the implied tax rates that are estimated without controlling for the characteristics of bond issues are biased.

Among the three categories by tax treatment and subsidy, BAB has the longest maturity and largest principal amount. On average BABs mature after 27.7 years from their issuance, while tax exempt bonds have years to maturity of 22.93 and tax exempt bonds have a maturity of 15.91 years. BABs have an average principal amount of 146,000,000, which is larger than the 51,300,000 for tax exempt bonds or the 18,400,000 for general taxable bonds.

The majority (around 89 percent,) of the bond issues has at least one underlying credit rating, and the remaining 11 percent are unrated. Thirty-nine percent and forty percent of the bond issues in our sample are rated respectively with an A and AA.[7] BABs have significantly better credit quality than other categories, with 77 percent rated an AA or AAA. General taxable bonds (excluding BABs) have lowest credit ratings among the three categories.

Around seventy-four percent of the bond issues are callable; eight nine percent are sold through negotiation. Twenty seven percent are insured. And twenty-five percent are issued to refund previous debt outstanding. Compared to tax exempt bonds, BABs are less likely to be insured, callable, or issued for refunding purpose. Only twelve percent of BABs went to the

[7] All credit ratings referred in this article include their sub-categories at the notch level. For example, the A dummy category includes bonds rated as A-, A and A+.

market with insurance, compared to 27 percent of tax exempt bonds. Less than one percent (one issue) of BABs is issued for refunding purpose, compared to 30 percent of tax exempt bonds and 17 percent for general taxable bonds. Sixty nine percent of BABs were issued with a call option, smaller than 76 percent for tax exempt bonds but larger than the 48 percent for general taxable bonds.

Results

Table 3 presents the results of the regression in Equation 1. All the variables behave as expected and have the expected signs, except for the callable dummy variable.

Holding everything else constant, the competitive sale method can generate a significant saving of 61 basis points. Ceteris paribus, bonds that are issued to refund prior bond issues are sold at an interest rate of 33 basis points lower than those that are not for refunding purpose. The variable of insurance has the expected sign but is statistically insignificant, suggesting that private insurance was unable to lower the interest rate of insured bonds. However, this is not unexpected. Since the subprime crisis, it has been documented that bond insurance may not be able to save issuer interest cost (Denison 2009; Liu, 2009). Callable has an unexpected negative sign, but is statistically insignificantly.

Most credit rating variables, except “A”, are statistically significant. The coefficients of this set of variables indicate that a higher credit rating leads to a lower interest rate. For example, AAA dummy variable has a significant coefficient of -1.352, suggesting that on average the interest rate of AAA-rated bonds is 135.2 basis points lower than that of unrated bonds. On the other hand, bonds rated with BBB have to pay an interest rate of 124 basis points higher than

unrated bonds. The interest rate for unrated bonds lies between A-rated bonds and BBB-rated bonds.

Our focal variables, BAB and general taxable dummy variables have the expected positive signs. All else held constant, BABs and general taxable bonds on average have an interest rate of approximately 173 and 253 basis points than tax exempt bonds respectively. However, the cost of BABs has not taken into consideration the federal subsidy to issuers.

Table 4 presents implied tax rate associated with BABs and tax exempt bonds. We first calculate the implied tax rate for BABs using the raw TIC values. As reported on the upper panel of Table 4, the implied tax rate is 28 percent for the marginal investor of BABs:

$\tau = 1 - R_{\downarrow}e/r_{\downarrow}bab = 1 - (5.193\%)/(7.149\%) = 0.28)$ *and*

and 29 percent for general taxable ($\tau = 1 - R_{\downarrow}e/r_{\downarrow}bab = 1 - (5.193\%)/(7.351\%) = 0.29$).

However, these results have not considered the premia associated with factors other than tax and subsidy treatment and thus are biased. Another set of more sophisticated estimates based on the regression results is reported in the lower panel of Table 4.

Based on Equation 1, we estimate the TIC for BABs, general taxable bonds and tax exempt bonds with the average characteristics by setting all variables (except BAB and General Taxable dummy variables) at their mean values. The estimated TICs are 6.93 percent, 7.73 percent and 5.20 percent respectively for BABs, general taxable bonds and tax-exempt bonds. Thus, the implied tax rate for the marginal investor of BABs is approximately 25 percent ($\tau = 1 - R_{\downarrow}e/r_{\downarrow}bab = 1 - (5.2\%)/(6.93\%) = 0.25$). The implied tax rate for the marginal investor of general taxable bonds is about 33 percent ($1 - (5.183\%)/(7.73\%) = 0.33$) . This

implied general taxable rate for general taxable bonds is two percent lower than the 35 percent marginal tax rate for tax payer at the highest tax basket and comparable to the implied tax rate found in Atwood (2003)

To determine whether BABs save issuers interest costs, we further compare the actual interest rate of issues (after-subsidy interest rate) of BAB to that of tax-exempt bonds. The results are also presented in Table 4. Based on the raw value of TIC, it is found that BABs have a lower after-subsidy interest cost of 54 basis points lower than that of tax exempt bonds. After controlling for the difference of other factors by setting all other variables at their mean values, the estimated saving is even larger. Issuers can save 70 basis points (5.20-6.93*0.65) by issuing BABs instead of tax exempt bonds. This saving is larger than that found in Ang, Bhansali and Xing (2010),

Policy implications

The BAB program has expired, but the debate over the merits of the program continue. Our study has some very important policy implications for the debate. First, it provides an estimate for the appropriate federal subsidy rate. Our analysis of CA bonds indicates that the BAB program currently provides a larger subsidy to local governments than the implicit subsidy through tax-exempt bonds. Based on our sample of CA, the implied tax rate we estimated is also the neutral subsidy rate at which bond issuers will be indifferent between issuing tax exempt bonds and BAB at the current market situation. It provides an empirical foundation for the magnitude of the neutral federal subsidy rate.

Second, it provides evidence that on average BAB reduces interest costs to the issuer. It suggests that at the current 35% federal subsidy rate, issuers will be better off by issuing BAB instead of tax exempt bonds. Policy makers need to decide what level of subsidy (if any) is appropriate. The BAB program, with a direct payment to the issuer, permits policy makers to set the subsidy rate at a generous rate (35%), a neutral rate (28%) or a lesser rate. Such direct payments are transparent because they are tracked as a budget line item. There is more research to be done to examine how the wealth transfer effects are distributed among federal government, issuers, and different type of investors.

As with any direct subsidy, it is critical that proper controls are in place to prevent fraud and misuse of the BAB program. Issuers should be required to provide appropriate documentation of approved subsidy payments. Transfers of cash necessitate regular audits and constant oversight. Fraudulent claims by healthcare providers to the Medicare system illustrate the potential incentives to abuse cash transfers. A caveat to setting the subsidy rate too high is it provides an opportunity for underwriters to extract higher fees that issuers are willing to pay with a portion of the subsidy. Adequate competition among under writers and/or proper regulation must be maintained to reduce the temptation of underwriters to inflate issuance fees.

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Table 1: Variable Description and Expected Sign

Variable Name	Description	Expected sign
1.Dependent Variable: TIC	True interest cost. It is the internal rate of return of all series of a bond issue and widely used as a measure of the interest cost to the issuer.	
2. Tax and subsidy status		
BAB	A dummy variable indicating whether a bond is a Build America Bond; BAB=1, otherwise=0	+
General taxable	A dummy variable indicating whether the interest income from a bond are subject to federal income tax (excluding Build America Bonds, Tax Credit Bonds and Recovery Zone Economy Development Bonds) ; Coded as 1 if the interests of a bond issue are subject to federal income tax and 0 otherwise.	+
3. BBI20	Bond Buyer 20 Index, reported by the Bond Buyer based on the weekly average of market yields of 20 general obligation bonds that mature in 20 years. It is a widely accepted benchmark for the municipal bond market interest rate.	+
4. Bond Issue and Issuer Characteristics:		
Competitive	A dummy variable for the method of sale via competitive bid, coded as 1 if the issue was sold through competitive bidding and 0 if it was via a negotiated sale.	-
Callable	A dummy variable indicating that a bond is callable, being coded as 1 if the bond is callable and 0 otherwise.	+
Refunding	A dummy variable. Bonds that are issued for the purpose of refunding previous debt outstanding are coded as 1.	-
log_year	The natural logarithm of the par amount (in million $) of a bond issue. The average life (in years) of all series of the bond.	+
Bond Rating	A set of dummy variables indicating the underlying credit rating of the bond. They include BBB dummy, A dummy, AA dummy, AAA dummy and unrated. The reference group is unrated bond. When a bond has split ratings, the higher bond credit is used. Bonds with higher credit ratings have a lower interest rate.	
Log_principal	The natural logarithm of the par amount (in million $) of a bond issue.	-

Bond Type	The bond type fixed effect is used in the model. The following types by payment sources are included: conduit revenue bond, general obligation bond, limited tax obligation bond, pension obligation bonds, public enterprise revenue bond , public lease revenue bond, revenue bond (Pool) , sales tax revenue bond , special assessment bond, tax allocation bond, and other type of bonds.	

Table 2. Summary statistics

	Tax exempt (N=404)	BAB (N=74)	General taxable (N=23)	Full sample (N=501)
TIC	5.183	7.149	7.351	5.573
	(1.541)	(0.981)	(2.127)	(1.700)
log_principal	16.61	17.70	15.73	16.73
	(1.512)	(1.470)	(1.677)	(1.574)
log_year	3.021	3.309	2.527	3.041
	(0.527)	(0.163)	(0.754)	(0.525)
BBI20	4.495	4.431	4.510	4.486
	(0.251)	(0.239)	(0.264)	(0.251)
BBB_dummy	3%	4%	4%	4%
A_dummy	41%	27%	52%	39%
AA_dummy	37%	61%	22%	40%
AAA_dummy	6%	7%	4%	6%
Competitive	13%	7%	0%	11%

Insured	27%	12%	9%	24%
Refunding	30%	1%	17%	25%
Callable	76%	69%	48%	74%

Note: Standard Deviations are reported in parentheses

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Table 3: Regression results

VARIABLES	TIC
BAB[1]	1.725***
	(0.131)
General taxable[1]	2.530***
	(0.211)
BBI20	0.717***
	(0.168)
log_year	1.683***
	(0.098)
log_principal	-0.097***
	(0.034)
A_dummy[2]	-0.249
	(0.190)
AA_dummy[2]	-0.650***
	(0.186)
AAA_dummy[2]	-1.352***
	(0.243)
BBB_dummy[2]	1.240***
	(0.266)
Competitive	-0.607***
	(0.137)
Insured	-0.071
	(0.127)
Refunding	-0.325***
	(0.107)
Callable	-0.093
	(0.107)
Constant	-0.624
	(0.940)
Observations	501
R-squared	0.7261
Adj. R-squared	0.7134
Type of bond fixed effect	√

Note: 1. Reference group: tax-exempt bonds; 2. Reference group: unrated bonds; 3. Standard errors in parentheses;4. *** p<0.01, ** p<0.05, * p<0.10

Table 4. Estimates of implied tax rates and savings

		TIC	Implied tax rate	After-subsidy TIC	BAB saving after subsidy
Raw TIC					
	Tax exempt	5.183		5.183	
	General taxable	7.351	29%	7.351	
	BAB	7.149	28%	4.647	-0.536
Estimated TIC (setting variables to the sample means)					
	Tax exempt	5.2		5.2	
	General taxable	7.73	33%	7.73	
	BAB	6.93	25%	4.504	-0.696