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## Discussion

## Comment on "Tax-subsidized underpricing: Issuers and underwriters in the market for Build America Bonds" by Richard C. Green, Dario Cestau, and Norman Schürhoff



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The paper by Green, Cestau, and Schürhoff (GCS) analyzes a new government program, Build America Bonds (BABs), which allows municipalities to issue taxable debt in conjunction with a direct government subsidy to the issuer of 35% of the debt's coupon payments. The logic behind the BABs program was to encourage municipalities to begin work on shovel-ready projects by providing them access to a low-cost source of funds. The lower cost arose from the municipalities' access to a set of non-taxpaying investors, such as pension funds, endowments, and foreign investors, who previously had not invested in tax-exempt municipal bonds. The government hoped this would increase liquidity for BABs.

The GCS paper undertakes an empirical examination of liquidity and the underpricing of the BABs. In particular, it seeks to understand whether the precise form of the subsidy creates a strategic incentive for the BABs to be underpriced. The authors have three principal results. First, they find the BABs are not more liquid than conventional tax-exempt bonds—they are, in fact, less liquid. Second, the authors find that BABs are more underpriced than traditional tax-exempt bonds. Finally, the authors find that underpricing is negatively correlated with the gross underwriting spread, a finding that is supportive of the existence of strategic underpricing by issuers and underwriters. The paper ultimately concludes that the BABs program did not result in the issuance of bonds with higher liquidity, and that the underpricing of BABs is consistent with strategic behavior in which wealth is transferred from the government to issuers, dealers, or investors.

Turning first to the question of liquidity, the paper shows that BABs are not more liquid, and may in fact be less liquid, than traditional tax-exempt bonds. This is perhaps not surprising that Table 1 shows us that BABs have not really become an institutional market. Panel C of the Table shows that the median trade size is smaller for BABs than for tax-exempt bonds and that there are more trades in the BABs than in the tax-exempt bonds in the first 60 days after issuance. Even after the first 60 days, Panel D shows the trade size still remains smaller than that for tax-exempt bonds. These facts, coupled with the larger amount of flipping described in Panel C, suggests that the BABs do not trade in a predominantly institutional market. This is notable because increasing institutional liquidity was a goal for the BABs program. By crafting a particular tax exemption, the government hoped to reach a segment of the market that had not previously provided financing to municipalities. The data in Table 1 suggests that this effort was not completely successful.

While Table 2 shows that aggregate measures of bond liquidity are no higher for BABs than for tax-exempt bonds, Table 3 analyzes a more direct measures of liquidity, the bonds' trading costs. Here the authors estimate two specifications for

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trading costs: the trade-to-trade price change in a bond and the ratio of trade price to a benchmark price. Both specifications find that BABs were traded at higher cost, and thus had lower liquidity, than tax-exempt bonds. There are a number of things to note about these regressions. In the liquidity estimates for trades greater than 60 days after issuance, the bonds can have remarkably little trading, as seen by the probit/logit estimations in the right-hand columns of Table 2. These models estimate the determinants of whether or not there is a single trade in the bond. In the event that bonds trade little or not at all, the results from the cost regressions may be quite noisy. There are more precise methods that can be used to estimate liquidity. For example, Green et al. (2007) use a more elaborate system of linking trades together to arrive at an estimate of liquidity. While difficult to estimate, it would be useful to validate that the estimates in this paper do not differ materially from the estimates that would be obtained from a more complete measure of trading costs.

It should also be noted that the liquidity analysis in Tables 2 and 3 assesses not only the effect of a bonds' characteristics on liquidity, but also the mechanism by which the bonds are distributed and sold. Within dealer firms, tax-exempt bonds are sold from municipal bond desks, while BABs are traded from taxable bond desks. Tables 2 and 3 thus reflect the impact of the distribution mechanisms and clientele to which the bond is sold. In that sense, it would also have been useful to see a side-by-side liquidity comparison of taxable bonds and BABs, as they are presumably sold to a similar clientele. This would allow for a more precise estimate of the differential liquidity of the BABs.<sup>1</sup> For example, are BABs less liquid because they are taxable bonds or because they are a new class of financial product? However, Tables 2 and 3 do inform the question of whether the government was able to improve municipal market liquidity by facilitating the issuance of taxable bonds.

With respect to underpricing, a key implication of the authors' model is that BABs are more underpriced than tax-exempt bonds, all other things equal. The higher underpricing arises because of strategic behavior between the underwriter and issuer as they act in concert to maximize the value of the federal government coupon subsidy. Ascribing this underpricing to strategic behavior is a difficult empirical inference because, as Loughran and Ritter (2004) show, underpricing of new issues occurs for many reasons unrelated to tax-induced strategic behavior. BABs may be more underpriced simply because they are anticipated to be less liquid and more difficult to sell. The underpricing provides compensation to the underwriter for bearing risk and expending effort in placing the hard-to-sell security.

The charts depicted in the first two rows of Figure 1 tell an interesting story about the resolution of underpricing over time. For both the sample as a whole, and especially for those bonds with maturities greater than 20 years, the BABs show a pronounced tendency to rise in price over time, both for customer and interdealer trades. This rise in price constitutes an increase in the bonds' estimated markup or underpricing. The key result cited by the authors is that for tax-exempt bonds, the interdealer trade markups are substantially higher than the interdealer markups associated with tax-exempt bonds. This is the evidence the authors cite in favor of strategic underpricing. For the BABs, interdealer prices do not immediately move to their final level of underpricing. Rather they ramp up over a number of days. In the case of bonds maturing over 20 years, the ramp up continues for several weeks. This behavior is distinct from that of tax-exempt bonds, but it is not a prediction of the GCS model. It is not clear why dealers would trade at prices below the ultimate equilibrium price reflected in the market. One possibility is that the dealers' ability to extract rents, represented by the variable  $\phi$  in the model, varies over time. If this were the case, then we should see a relatively constant markup associated with the retail trades, but here too we see a gradual ramp up over time. This remains a puzzle, one that has not been discussed by the authors, that perhaps merits further examination.

Also, in estimating the underpricing regressions in Tables 3 and 4, it is not clear why the authors use the entire trading sample to estimate underpricing. Underpricing is a phenomenon one would expect to be quickly resolved when the bonds begin trading freely in the market, in a matter of days or perhaps weeks, as the results in Table 1 show. Because underpricing is calculated as the difference between the bonds' interdealer trading price and the re-offer price, extending the estimation period out in time may add more noise than explanatory power to the test. For bonds issued in mid-2009, the estimation period for underpricing is 18 months long, running through the end of December 2010. Over this period both the credit and the interest rate environment are likely to vary, decreasing the precision of the estimated underpricing.

As a final point with respect to liquidity, Seymour (2010) noted that BABs have become an important part of certain taxable bond market indices. He cites an example where taxable municipal bonds now form over 9% of the index by market value. He points out that this is a substantive change, resulting in institutional portfolio managers and ETFs (exchange traded funds) buying BABs to minimize tracking error relative to the relevant benchmarks. We know from the work of Harris and Gurel (1986) and others that inclusion in the index can improve the liquidity and raise the price of the security.<sup>2</sup> If this occurs, this could affect estimates of both liquidity and underpricing. Seymour (2010) also points out that pension funds and other institutional investors such as insurance companies, attempting to manage their long-dated liabilities, will find BABs particularly attractive. Perhaps this is one of the reasons, in addition to the relative yield curve argument cited in GCS, that the proportion of bonds issued at maturities greater than 20 years is higher for BABs than for tax-exempt bonds.

The final major finding of GCS is displayed in Table 8, which quantifies the cross-sectional relationship between underpricing and the gross underwriting spread. The correlation between the gross spreads and underpricing is more negative for BABs than for either tax-exempt or non-BABs taxable bonds, evidence consistent with the predictions of the authors' theory. It would have been helpful in assessing the economic importance of the authors' model to have an analysis

<sup>1</sup> It would have also been instructive to see a liquidity comparison of non-BABs taxable bonds and tax-exempt bonds for the same reason.

<sup>2</sup> See Elliott, et al. (2006) for a summary of research in this area.

of the actual dollar amount of both the excess coupon and the gross spread savings on a bond-by-bond basis. Because the inflated coupon, which is the source of the subsidy, is a direct cost to the issuer, they need to recoup the cost of the higher coupon through some other mechanism, such as a savings on the gross underwriting spread. If the gross spread savings are not high enough, the issuer would have been better off issuing either a normal tax-exempt bond or a BAB without the inflated coupon. The results presented in the paper would have been more helpful if they provided the reader with a sense of scale between the empirical cost of the subsidy and the recouped savings in underwriting costs. Of course, there may be other mechanisms through which the issuer recoups its costs from the underwriting dealer, but one suspects that the spread costs of the relevant deal would be an important component of any cost savings.

There are several questions that arise when considering the estimation in Table 8. First, the data analyzed in the table include all trades in any particular deal, including both customer/dealer and interdealer trades. It is not clear why the authors chose to include customer/dealer trades in this table. Because the proxy for a bond's underpricing is the difference between the interdealer price and the re-offer price, not the difference between a customer/dealer price and the re-offer price, it would seem that the customer trade should be removed from the estimations in the table. To the extent there is more customer trade for BABs than tax-exempt bonds, it could serve to bias the correlation results. Second, it is also not clear why the authors chose to not to include in Table 8 variables they found to be significant in explaining underpricing as shown in Table 6. A number of variables in Table 6, such as whether the offering was competitive, whether the bond had a fixed coupon, and whether the bond was insured, were shown to be significant and perhaps warrant inclusion in the regressions of Table 8. Finally, it is not clear why the authors chose to remove any transactions that occurred at the re-offer price, nor is it clear how frequently these trades occur. Such transactions indicate a dealer's willingness to trade at a lower price, perhaps because either (a) there was some institutional feature of the market that forced them to trade at that price, or (b) the dealers believed that the re-offer price was the long-run market-clearing price. In either case, more explanation is required before such data should be deleted.

As the authors note, there is no obvious theory that explains the cross-sectional relationship between gross spread and underwriting fees. They could be either complements (in the case of compensation for bonds that are difficult to place) or substitutes (in the case of a fixed cost of underwriting). The last column of Table 8 does provide some important evidence on this point. To the extent that BABs are in fact sold in the same manner as taxable bonds, and present no other distinguishing characteristics to investors as compared to taxable bonds, the more negative association between gross spread in underwriting costs for BABs relative to taxable bonds provides strong support of the authors' theory of strategic underpricing.

More broadly, the GCS paper speaks to a number of issues related to the design of the BABs subsidy. Though increasing the liquidity of the market was an explicit goal of the government's BABs program, the paper demonstrates that BABs do not have higher liquidity than normal tax-exempt bonds, and that this goal was not met. However, as Ang et al. (2010) show, the BABs program did lower municipalities' cost of funds with the measured savings between 49 and 78 basis points, depending on the bond's maturity. If this cost savings did not come from higher liquidity, one may inquire about the source of the lower financing costs. One possibility is the explanation of Merton (1987), in which required rates of return on securities are affected by the number of holders of the security and the prevalence of issuer-specific information. The BABs program broadened the investor base of municipal securities, a fact which is supported not only by the Seymour (2010) article cited above, but also by the substantial amounts of BABs sold to foreign investors (Slavin (2012)).

When looked at through this lens, perhaps the liquidity results of GCS are not that surprising. To the extent that BABs tapped a new market of taxable investors who had limited experience in analyzing municipal credits, one might expect that the liquidity of such a market would, at least initially, not be very high. The skills needed to analyze municipal credits are distinct from the skills for analyzing corporate and or structured finance credits. Furthermore, the information structure of the municipal market is notoriously poor. The requirements for disclosure in this market are limited and much less stringent than for the corporate bond market, where the Securities and Exchange Commission has promulgated an extensive public disclosure regime. It may be that the poor liquidity in the BABs market is simply a consequence of a high degree of asymmetric information between experienced dealers and buyers with little knowledge of this market.

The opaqueness and market structure of the municipal market has recently been the subject of calls for improvement on the part of both the GAO (Government Accountability Office, 2012a, and 2012b) and the Securities and Exchange Commission (Securities and Exchange Commission, 2012.) They seek improvements in both the information structure of the market, including improved offering and periodic disclosure, as well as more transparency in the secondary market for trading bonds. The results of GCS inform this discussion in the sense that a market with better transparency and more information might more readily respond to the policy tools at hand. As the municipal market now stands, the information structure is so poor that broadening the investor base may have a limited effect on the liquidity of the market. In addition, limited transparency may make the distribution cost of bonds so high that even attempts at improving the liquidity in the market, such as was done in the case of the BABs program, fail to succeed because of the high degree of market power in the hands of the dealers. Thus, the benefits associated with improvements in this market may ultimately accrue to the dealers who can extract rents from both issuers and investors.

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