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An Examination of the Impact of Rule 50

Author(s): Richard L. Smith

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The Choice of Issuance Procedure and the Cost of Competitive and Negotiated Underwriting: an Examination of the Impact of Rule 50

RICHARD L. SMITH*

ABSTRACT

Previous research suggests that firms choose negotiated issuance over competitive despite its apparently higher net interest cost. This result is shown to arise partly from failure to correct for a selectivity bias in the choice of issuance procedures. Two stage analysis is used in a model that includes qualitative and limited dependent variables to re-estimate the net interest cost difference between competitive and negotiated issues. Results support the hypothesis that the choice of issuance procedure is consistent with shareholder wealth maximization. Examination of debt issues subject to Rule 50 of the Public Utility Holding Company Act indicates that the regulation, as applied, is not effective.

THE CHOICE of competitive or negotiated issuance procedure is not well understood. A number of researchers have examined the relative cost of the two alternatives (e.g., [2], [4], [5], [6], [8], [11]). The general conclusion is that negotiated issues are more costly except, possibly, during periods of uncertainty or where bidding is not active. In light of this conclusion, the propensity of managers to elect negotiation appears contrary to the interest of shareholders. This agency cost rationale for the choice is related to Clifford Smith's [9] conjecture on the propensity of issuing firms to use underwritten offerings despite evidence that rights issues are less costly. In this case, however, the argument is that the investment banker of a negotiated issue is able to make a side-payment sufficient to outweigh the manager's cost of using the relatively expensive procedure.¹ Empirical support for this view is provided by Bhagat and Frost [2]. Using OLS and GLS regression, they estimate the average cost advantage of competitive issuance for equity issues to be 1.29 percent of gross proceeds. Most studies of relative issuance cost employ similar OLS regression models or bivariate breakdowns or paired observations.

The purpose of this paper is to re-examine the evidence on choice of issuance procedure using an econometric approach that corrects for a limitation of previous research. The resulting model is used to evaluate the impact of Rule 50 of the

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¹ This cost includes the loss in value of manager-owned shares and any penalty that may result from shareholder dissatisfaction with the manager's choice of issuance procedure. See Smith [10] and Bhagat [1] for summaries of the results of previous research.

Public Utility Holding Company Act of 1935. Rule 50 requires regulated public utility holding companies to issue competitively unless a waiver is granted by the SEC.²

The benefits of negotiated issuance (relative to competitive) and the decision to negotiate rather than solicit bids are simultaneously determined. The propensity to negotiate depends on expected improvement in placement effectiveness. Thus, inclusion of a competitive/negotiated binary variable as an independent variable to explain net interest cost by ordinary least squares, or comparison of net interest cost by type of procedure, yields biased estimates of the effect. Explicit recognition of the interdependence between the net interest cost (NIC) equations and the selection equation is the point of departure of this paper. The model is a simultaneous equations model with a binary qualitative dependent variable (the selection of issuance practice) and limited dependent variables (NIC of competitive and negotiated issues). After correcting for the selectivity bias, issuers' choices of competitive or negotiated offering are generally consistent with shareholder wealth maximization. The evidence also indicates that Rule 50, as currently applied, does not materially impact net interest cost.

Section I describes the simultaneous equation system and explains the selectivity bias problem. The focus of the empirical analysis on public utility debt issues not subject to SEC Rule 50 or similar regulation favoring use of competitive bidding, is explained in Section II. Variables are defined and data are described in Section III. Section IV explains the simultaneous Probit estimation procedure and construction of the selectivity bias correction. Empirical results, including analysis of the impact of Rule 50, are presented in Section V. Section VI is the conclusion.

I. The Selection and Net Interest Cost Model

An issuing firm that seeks to raise capital by cash offer can employ either negotiated or competitive issuance. Managers, acting in the interest of shareholders, will select the alternative expected to minimize NIC. This cost includes investment banker fees, expenses borne by the issuer and, possibly, underpricing reflected in the re-offer yield.³ The issuing firm faces two prospective NIC levels depending on whether competitive or negotiated issuance is selected (holding investment banker characteristics constant). With the competitive/negotiated decision made, NIC depends on characteristics of the issuing firm and the investment banker, costs incurred by each and the economic climate.

Let NIC_{ni} and NIC_{ci} be the respective net interest costs under negotiated and competitive issuance for debt issue i . Depending on choice of issuance procedure, only one of the two is observed. Let P_i designate the reservation price beyond which the firm would select negotiation. The firm is expected to negotiate if

$$NIC_{ci} - NIC_{ni} > P_i$$

Thus, P_i is a reservation price which reflects the firm's demand for negotiated

² As recently modified, Rule 50b now incorporates aspects of shelf registration.

³ Bhagat and Frost [2] suggest that the proceeds of competitive issues may be subject to additional uncertainty. If so, this condition would be modified somewhat, but the analysis and conclusions of this paper are not affected.

issuance. The firm is expected to negotiate when the improvement in NIC exceeds the reservation price. If NIC_{ci} and NIC_{ni} are correctly measured to be net of all issuance costs, maximization of shareholder wealth implies $P_i = 0$. Omission of unobservable issuance costs and other factors could be reflected as a reservation price other than zero. Previous empirical evidence of a preference for negotiation implies $P_i < 0$.

The difference in NIC depends on costs incurred by the investment banker and the issuing firm as well as on characteristics of the issue, the issuing firm, the investment banker and the market. Measurable attributes of the issue and issuer include such factors as issue activity of the firm, risk class and callability features of the issue. Those of the investment banker include reputation and geographic orientation. Primary market characteristics of concern are the level and uncertainty of interest rates at the time of issue. These variables are argued by others to affect the availability of competitive bids.

Since the reservation price is unobservable, it is appropriately estimated on the basis of all factors bearing on issue cost. Thus,

$$P_i = \alpha_0 + \alpha_1 I_i + \alpha_2 B_i + \alpha_3 M_i + \epsilon_i$$

provides an approximation of the reservation price, where I_i and B_i are vectors describing the costs incurred and other characteristics of the issuer and investment banker, respectively, and M_i is a vector of contemporaneous market conditions. The error term, ϵ_i , is assumed to be $N(0, \sigma_\epsilon^2)$.

The issuing firm minimizes NIC by negotiated issue if:

$$NIC_{ci} - NIC_{ni} > 0$$

This criterion can be expressed as a Probit model where, if $C_i^* > 0$, issue i will be done by negotiation, and otherwise will be done competitively. Thus,

$$C_i^* = \beta_0 + \beta_1(NIC_{ci} - NIC_{ni}) - e_i \quad (1)$$

is the structural choice model. This model specifies interactions in the NIC effectiveness equations for competitive and negotiated issues. These are:

$$NIC_{ni} = \alpha_{n0} + \alpha_{n1} I_{ni} + \alpha_{n2} B_{ni} + \alpha_{n3} M_{ni} + u_{ni} \quad (2)$$

$$NIC_{ci} = \alpha_{c0} + \alpha_{c1} I_{ci} + \alpha_{c2} B_{ci} + \alpha_{c3} M_{ci} + u_{ci} \quad (3)$$

The error terms, u_{ni} and u_{ci} , are random residuals assumed to be $N(0, \sigma_n^2)$ and $N(0, \sigma_c^2)$. Equations (2) and (3) cannot be estimated directly due to a selectivity bias which causes u_{ni} and u_{ci} to be correlated with e_i . The empirical model to be estimated is a system of the three equations (1), (2) and (3).

II. Sample Selection

The primary data source is the SEC Registered Offering Statistics (ROS) file. All competitive and negotiated public utility debt issues from January 1, 1977 through April 4, 1985 comprise the initial sample.⁴ Since prior records in the ROS file are incomplete, 1977 is the starting point of the analysis.

⁴ Public utility debt issues are studied since the occurrence of competitive issues of non-public utility debt is not sufficient for empirical analysis. Examination of competitive and negotiated equity issues is the subject of future research.

Table 1
Competitive and Negotiated Debt and Equity Issues
by Industry

	Electric and Gas Utilities	Communications Utilities	Other Industries
Debt			
Negotiated	456	122	1889
Competitive	<u>230</u>	<u>48</u>	<u>21</u>
Pct. Competitive	33.5	28.2	1.1
Equity			
Negotiated	607	129	3475
Competitive	<u>48</u>	<u>0</u>	<u>4</u>
Pct. Competitive	7.3	0.0	0.1

Note: The table shows the number of debt and equity issues registered by utilities and other industries from January 1, 1977 through April 4, 1985 based on the SEC Registered Offerings Statistics file.

Table 1 is a summary of competitive and negotiated issuance practices for debt and equity issues of electric and gas utilities, telephone utilities, and industrial firms for the period under study. Competitive issuance is used predominantly for electric and gas utility debt issues and is used occasionally for telephone utility debt issues and for electric and gas equity issues. Other corporate use of competitive bidding for capital raising is rare.

The existence of federal and state statutes requiring or favoring competitive bidding is one reason for the high frequency of use by electric and gas utilities. At the federal level, Rule 50 specifies that the twelve SEC regulated public utility holdings companies and their subsidiaries must issue competitively unless a waiver is obtained prior to issue.⁵ A number of states have somewhat parallel legislation. California, for example, requires public utility debt issues to be done competitively but does not regulate equity issues.

Existence of such statutes complicates the analysis since the model must be estimated on a sample of issues where the choice is unregulated. To identify this sample, public utilities commissions and other regulatory authorities of the individual states were contacted. Based on information supplied, various issues are classified as federally regulated (Rule 50), state regulated or unregulated. To insure a clean analysis, only observations from states that were entirely unregulated are included in the data set. Table 2 provides the classification of issues by regulatory jurisdiction. As can be seen, waivers of Rule 50 are given frequently. Only debt issues offer a sufficient number of unregulated competitive issues to permit statistically valid analysis.

⁵ The twelve SEC regulated public utility holding companies are identified in footnote a of Table 2. All twelve and their subsidiaries were subject to Rule 50 for the entire period covered by this analysis.

Table 2
Competitive and Negotiated Debt and Equity Issues of Electric and Gas Utilities by Presence of Statutory Restriction Favoring the Use of Competitive Bidding

	Subject to Rule 50 ^a	Subject to State Regulation ^b	Issuance Not Regulated ^c	Reg. Status Uncertain ^d
Debt				
Negotiated	42	80	292	41
Competitive	95	42	88	5
Pct. Competitive	69.3	34.4	23.2	10.9
Equity				
Negotiated	19	90	406	92
Competitive	23	2	23	0
Pct. Competitive	54.8	2.2	5.4	0

Note: The table shows the number of debt and equity issues registered by electric and gas utilities from 1977 through April 4, 1985. Registration data are from the SEC Registered Offering Statistics file. Classification of issues by regulatory status is based on interviews with the SEC and numerous state regulatory authorities. Columns 1 and 2 include all issues of utilities subject to regulation. Consequently, these columns may include some unregulated issues. This rigid classification structure is to insure that column 3 data are entirely unregulated.

^a Includes all issues of the following twelve holding companies and their subsidiaries: Allegheny Power System, American Electric Power Company, Central and Southwest, Columbia Gas System, Consolidated Natural Gas, Eastern Utilities, General Public Utilities, Middle South Utilities, National Fuel Gas, New England Electric System, Northeast Utilities, Southern Company.

^b All issues of electric and gas utilities based in the following states: Alabama, California, Illinois, Maryland, Massachusetts, Nevada, New Jersey, North Carolina.

^c All issues of electric and gas utilities based in the following states: Arizona, Arkansas, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Montana, Nebraska, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Utah, Washington, Wisconsin.

^d All issues not otherwise classified.

III. Definition of Variables and Data Description

Table 3 provides an expanded description of the issue characteristics of electric and gas utilities. The unregulated issuance column indicates that, on average, the ratings of negotiated issues are lower than the ratings of issues done competitively. This difference is significant at the .05 level in a X^2 test. Also, the average re-offer yield of negotiated issues is significantly higher than that of competitive issues. There is little apparent difference between competitive and negotiated issues for the other factors summarized in the table. Other columns in the table indicate similar relationships. The main contrast is the tendency for Rule 50 competitive issues to be of generally lower ratings and to bear a higher re-offering yield. This contrast suggests that Rule 50 acts as a binding constraint,

Table 3

Summary Statistics for Competitive and Negotiated Debt Issues of Electric and Gas Utilities by Presence of Statutory Restriction Favoring Competitive Bidding

Description	Subject to Rule 50	Subject to State Regulation	Issuance Not Regulated	Reg. Status Uncertain
Negotiated Issues				
(1) Rating (Pct. of Issues)				
Aaa	2.9%	1.4%	5.4%	0.0%
Aa	22.9	28.2	15.9	30.3
A	11.4	53.5	44.2	27.3
Baa	60.0	16.9	29.5	21.2
Other	2.9	0.0	5.0	21.2
(2) Amount Offered (\$MM)	\$68.2 (48.0)	\$109.3 (68.2)	\$72.1 (34.9)	\$56.8 (37.8)
(3) Re-offering Yield (Pct.)	13.81% (2.05)	13.64% (4.27)	13.39% (2.81)	13.14% (2.80)
(4) Underwriter Spread (Pct.)	0.72 (0.40)	0.87 (0.70)	0.87 (0.53)	1.39 (0.13)
(5) Issuer Expense (Pct.)	0.38 (0.19)	0.27 (0.20)	0.46 (0.39)	0.45 (0.27)
Competitive Issues				
(1) Rating (Pct. of Issues)				
Aaa	0.0%	10.0%	2.3%	0%
Aa	14.8	60.0	38.6	25.0
A	31.8	27.5	42.0	50.0
Baa	53.4	2.5	17.0	25.0
Other	0.0	0.0	0.0	0.0
(2) Amount Offered (\$MM)	\$65.6 (30.8)	\$127.4 (60.7)	\$65.0 (32.5)	\$47.5 (35.9)
(3) Re-offering Yield (Pct.)	12.09% (2.99)	10.43% (2.94)	10.44% (2.53)	10.98% (3.38)
(4) Underwriter Spread (Pct.)	0.81 (0.48)	0.68 (0.19)	0.72 (0.18)	0.75 (0.19)
(5) Issuer Expense (Pct.)	0.36 (0.17)	0.21 (0.07)	0.40 (0.30)	0.36 (0.14)

Note: See Table 2 for data source and description of column headings. Figures are mean values except as indicated. Standard deviations are shown in parentheses.

forcing at least some issues to be done competitively. Analysis below addresses the economic impact of this constraint.

Endogenous variables include the binary choice variable, C_i , (with the decision to issue competitively designated as zero, and negotiated as one) and the conditional NIC variables NIC_{ni} and NIC_{ci} . Net interest cost is measured in two alternative ways:

1. yield to maturity computed on the basis of issue proceeds net of underwriter spread;
2. yield to maturity computed on the basis of issue proceeds net of underwriter spread and reported issuer expenses.

Since none of the findings is sensitive to the specification of NIC, only results using the latter definition are reported.⁶

Exogenous variables describing the issue include bond rating, maturity, call provisions and issue size. Bond rating (RATE) is restricted to interval scale where Aaa is defined as one, Aa as two, etc. Call provisions include a binary variable (CALL) which takes on the value one if callable, the first call premium (PREM) as a percent of par value and years to first call date (TCALL). For noncallable bonds, PREM and TCALL are assigned values of zero. Issue size (SIZE) is the log of real gross issue proceeds in thousands of 1967 dollars based on the monthly CPI.

Variables describing the issuing firm include expenses incurred to issue the bond, and amount of new issue activity over the period of study. Issuer expenses (IEXP) are reported costs of the issuing firm expressed in terms of their effect on NIC. These include only explicit costs and may be negatively biased relative to total issuer expenses. Amount of new issuer activity (ACT) is the log of the number of new debt and equity registrations filed by the issuing firm during the period of study.

Variables describing the investment banker are intended to proxy reputational differences. These include an investment banker size ranking and geographical representation. The investment banker's spread on the issue is included as a component of the dependent variable. Reputation (REP) is proxied by the interval ranking of each of the top fifteen investment bankers in dollar volume of underwritings in the year of issue. RDUM is a binary variable which takes the value one if the investment banker is in the top fifteen. Geographical representation (GEOG) is restricted to interval scale, ranging from one (national) to four (local). Classification of investment bankers according to this variable is established by the SEC.⁷ Investment banker spread (SPREAD) is the reported spread between gross and net issue proceeds expressed in terms of impact on NIC. The data source for REP and RDUM is the *Investment Dealers' Digest*. All other variables are derived from the ROS tape.

Variables describing the market at time of issue include the contemporaneous yield on Aaa rated public utility bonds, and the standard deviation of the Treasury Bond rate around the time of issue. The standard deviation of Treasury Bond rates (TVAR) is calculated using data for the month of issue plus the three preceding and three ensuing months. This calculation is based on monthly rates as reported on the CITIBASE Economic Data Base tape. The public utility bond rate (UBOND) is expressed as a percent based on monthly rates as reported in CITIBASE.

Several other studies, [4], [5], indicate that the number of competitive bids affects the competitive NIC level. This variable is not included in the analysis since information on the number of bids is unavailable. Further, it is expected

⁶ Since debt is generally issued at prices close to par value, the linear approximation of the yield to maturity is used to estimate NIC adjustments due to underwriter spread and issuer expenses.

⁷ The ROS tape reveals a number of inconsistencies in classification of individual investment bankers. These classification errors tend to bias the coefficients on GEOG toward nonsignificance.

that the number of competitive bids depends primarily on variables such as SIZE, UBOND and TVAR, which are included. Thus, omission of explicit bid information is not expected to limit the analysis.

IV. Estimation Method

Observable variables in the model include the choice of issuance procedure, the two limited NIC variables and the exogenous variables. Since NIC is hypothesized to depend on the selection of issue procedure, the model is a simultaneous system involving qualitative and limited dependent variables. Since the expected values of the error terms in (2) and (3) do not equal zero, the NIC equations (often reported in other studies as describing the difference in competitive and negotiated underwriting cost) cannot be estimated consistently by ordinary least squares.

A consistent estimation procedure has been developed by Lee [7], which can be applied to the problem addressed here. This procedure develops expressions for the means of the estimation errors, u_{ni} and u_{ci} , in (2) and (3). These expressions are used to adjust the error terms to yield zero means. The estimation procedure is two stage, where the first stage is by Probit and the second is OLS. The resulting selectivity bias adjusted (SBA) estimates of NIC_{ci} and NIC_{ni} can be used to estimate the difference in expected NIC and to re-estimate the selection equation without bias.

Substitution of the NIC equations, (2) and (3), into (1) yields a conventional reduced form Probit model.

$$C_i^* = \alpha_0 + \alpha_1 I_i + \alpha_2 B_i + \alpha_3 M_i + e^* \quad (4)$$

where the I_i , B_i and M_i vectors include all observable characteristics of the issue and issuer, investment banker and market.

Next, the NIC equations conditional on selection of issuance procedure can be consistently estimated using the distributional properties of (4).

Let $\Theta_i = \alpha_0 + \hat{\alpha}_1 I_i + \hat{\alpha}_2 B_i + \hat{\alpha}_3 M_i$. We designate $F(\Theta_i)$ as the cumulative distribution and $f(\Theta_i)$ as the density function of Θ_i , a standard normal random variable. Conditional on negotiated issuance, the NIC equation becomes:

$$NIC_{ni} = \alpha_{n0} + \alpha_{n1} I_{ni} + \alpha_{n2} B_{ni} + \alpha_{n3} M_{ni} + \sigma_{ie}^* \left(-\frac{f(\Theta_i)}{F(\Theta_i)} \right) + \eta_n \quad (5)$$

Where σ_{ie}^* standardizes the selectivity variable to have a variance of one. The competitive NIC equation becomes:

$$NIC_{ci} = \alpha_{c0} + \alpha_{c1} I_{ci} + \alpha_{c2} B_{ci} + \alpha_{c3} M_{ci} + \sigma_{2e}^* \left(\frac{f(\Theta_i)}{1 - F(\Theta_i)} \right) + \eta_c \quad (6)$$

where η_n and η_c , the selectivity bias adjusted residual errors, are $E(\eta_n | C_i = 1) = 0$ and $E(\eta_c | C_i = 0) = 0$.

Expressions (5) and (6) are consistently estimated by regressing the observed gross interest costs on the exogenous variables and on the estimated values of the selectivity variables, $-f(\Theta_i)/F(\Theta_i)$ and $f(\Theta_i)/(1 - F(\Theta_i))$, respectively. These

equations can be solved for the unbiased expectations of NIC_{ci} and NIC_{ni} by substituting the α coefficients in (5) and (6) for the coefficients in (2) and (3). Results are used to estimate the difference in the expected NICs and to re-estimate the reservation price for negotiated issuance.

V. Empirical Results

Prior to developing the simultaneous equation estimates, tests were conducted to determine whether the sample of unregulated public utility debt issues exhibits the same apparent preference for negotiation that has been identified in previous studies. An OLS regression of NIC on exogenous variables, omitting TVAR and UBOND and including C as an exogenous variable, indicates an average interest rate difference of 1.86 percent between negotiated and competitive issues. Inclusion of the market characteristic variables causes the coefficient on C to become trivial and nonsignificant. The latter finding supports the conclusions of earlier studies, which find an advantage to negotiated issuance during periods of high and unstable interest rates.

The first step in the analysis is estimation of (4) by Probit. The results of this reduced form estimation are used to generate unbiased estimates of NIC effectiveness for competitive and negotiated issuance.⁸ Results are expressed in Table 4.

Next, the procedure described in Section IV is employed to construct the selectivity variables for the choice between competitive and negotiated issue. The selectivity variables are included in the second stage regressions of (5) and (6) to generate unbiased estimates of expected NIC. The selectivity bias adjusted (SBA) results are reported in Table 5. This table also presents OLS results unadjusted for selectivity.

The most interesting aspect of Table 5 is the effect of introducing the selectivity variable on estimated coefficients. For negotiated issues, inclusion of the selectivity variable reduces the coefficients on RATE and UBOND, the two most important explanatory variables, and increases the significance of a number of other coefficients. Most of the coefficients are signed consistently with expectations. In particular, the bond rating (RATE), call features (CALL, PREM, TCALL), the interest rate level (UBOND) and interest rate uncertainty (TVAR) all are positively related to NIC. Issue size (SIZE), which was expected to be negatively signed due to the effect of scale economies on SPREAD and IEXP, is, instead, positive but not significant. The issuer's total activity level since 1977 (ACT) is included because of the possibility of a relationship to SPREAD or IEXP. The coefficient is positive and highly significant. The reputational variables (REP, RDUM and GEOG) were expected to be related to NIC for negotiated issues, since, as suggested by Booth and Smith [3], the certification activities of reputable investment bankers are expected to yield a reduction of NIC. The

⁸ To evaluate the possibility that results are sensitive to inclusion of the shelf registration period beginning in 1982, the entire analysis was repeated on data excluding the shelf registration period. These results are consistent with results reported here, and are available from the author on request.

Table 4
Reduced from Probit Estimates
of the Selection Equation

Independent Variable	Coefficient	T-Value
Constant	-1.276	-0.68
RATE	0.173	1.68*
SIZE	0.033	0.18
ACT	-0.517	-2.97**
CALL	-0.639	-0.81
PREM	-1.768	-0.67
TCALL	-0.057	-1.14
REP	0.009	0.35
RDUM	-0.331	-1.13
GEOG	0.060	.43
TVAR	-0.137	-1.02
UBOND	0.285	5.88**
(-2) Log Likelihood Test		
	83.84**	

** = significant at .05 level.

* = significant at .10 level.

NIC Defined as net of SPREAD and IEXP

RATE = bond rating as an interval scale:
Aaa = 1, Aa = 2, etc.

SIZE = log of gross proceeds in 1967 dollars.

ACT = log of number of issues by the firm from 1977 through 1985.

CALL = 1 if callable, otherwise = 0.

PREM = first call premium as a percent.

TCALL = years to first call date.

REP = rank of investment bankers in top 15 by dollars issued for the year.

RDUM = 1 if in top 15 investment bankers, otherwise = 0.

GEOG = geographic orientation of investment banker: 1 = national, 2 = regional, etc.

TVAR = standard deviation of Treasury Bond yields around issue date.

UBOND = yield on Aaa utility bonds in month of issue.

IEXP = issuer expenses measured as effect on NIC.

SPREAD = underwriter spread measured as effect on NIC.

significant coefficient on GEOG is consistent with this view. Finally, the selectivity variable is significant at the .05 level, indicating the presence of a simultaneity problem between choice of issuance procedures and NIC.

Results for competitive issues are similar. In this case, however, the selectivity variable is not significant. Consequently the SBA results are similar to the OLS results. In contrast to negotiated issues, issue size (SIZE) has the expected

Table 5
Negotiated and Competitive Issue Net Interest Cost Estimates
(NIC defined as net of SPREAD and IEXP)

Independent Variable	Negotiated Issues				Competitive Issues			
	OLS		SBA		OLS		SBA	
	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value
Constant	-2.816	-2.78**	-1.077	-0.93	-0.713	-0.98	-0.979	-1.21
RATE	0.331	6.88**	0.217	3.55**	0.387	7.96**	0.478	3.66**
SIZE	0.142	1.54	0.146	1.61	-0.111	-1.38	-0.087	-1.01
ACT	0.241	3.35**	0.486	4.46**	0.124	1.48	-0.153	-0.40
CALL	0.439	1.03	0.805	1.84*	0.125	0.36	-0.169	-0.32
PREM	0.045	2.68**	0.057	3.38**	0.041	3.41**	0.029	1.37
TCALL	0.045	1.14	0.077	1.90*	0.019	1.18	-0.015	-0.31
REP	0.002	0.13	0.005	0.35	-0.002	-0.22	0.001	0.12
RDUM	0.180	1.20	0.272	1.81*	-0.020	-0.17	-0.172	-0.74
GEOG	0.143	1.96*	0.143	2.00**	0.002	0.05	0.040	0.58
TVAR	0.167	2.52**	0.203	3.08**	0.029	0.35	-0.073	-0.46
UBOND	0.871	37.48**	0.714	12.29**	1.014	37.33**	1.187	5.08**
Selectivity Var.			0.015	2.94**			-0.008	-0.75
Adj R ²	.950		.952		.985		.985	

** = Significant at .05 level.

* = Significant at .10 level.

See Table 4 for definition of variables.

negative sign for competitive issues. Issuer activity (ACT) is not significant and reverses sign when the selectivity variable is introduced. The investment banker reputation variables are not significant. Also, unlike negotiated issues, interest rate uncertainty (TVAR) is not a significant explanatory variable for competitive issues. The call premium, which is significant in the OLS model, becomes nonsignificant in the SBA model. These results are indicative of a relatively simple new issue pricing relationship for competitive issues, based almost entirely on the bond rating and prevailing interest rate level.

Results from Table 5 can be used directly to evaluate the consistency of issuers' decisions with shareholder wealth maximization. This is done by solving the models reported in the table for the expected value of NIC, $\hat{NIC}$, for various issue classifications. Results by rating class are reported in Table 6. The actual NIC columns indicate that negotiated issue interest cost net of SPREAD and IEXP averages about 3 percent higher than competitive issue interest cost. This difference is similar for all Moody's rating classes. The NIC difference measured in this way is often cited as evidence that issuer preference for negotiation is paradoxical.

The next section of Table 6 concerns only issues that were actually done on a competitive basis. Average $\hat{NIC}$ by rating class is reported based on both OLS and SBA models from Table 5. Based on the OLS result, Table 6 indicates that for issues done competitively, $\hat{NIC}$ for competitive issuance is approximately equal to $\hat{NIC}$ for negotiation. This result controls for market factors, and issuer and investment banking characteristics that are not reflected in the simple comparison of average yields. But the OLS results are biased since they do not correct for the choice of procedure. This selectivity bias is corrected in the SBA results. These results indicate that, on average, issuers selecting competitive procedures had $\hat{NIC}$ levels that were 400 basis points lower than if they had selected negotiation. This difference is approximately constant across rating classes.

The last section of Table 6 concerns only issues that were actually done by negotiation. In contrast to the simple comparison of actual yields, both the OLS and SBA model results indicate that the negotiated $\hat{NIC}$ is generally comparable to, or somewhat better than, the competitive $\hat{NIC}$. For the SBA model, the average predicted NIC is 1.16 percent lower under negotiation. This difference in predicted NIC is systematically related to bond rating. Lower rated bonds exhibit the greatest expected savings under negotiation. It is in this range where negotiated issuance is expected to be most effective since certification and monitoring activities of the investment banker are relatively important for such issues (see Booth and Smith [3] and Smith [10]).

At least for this carefully selected sample of electric and gas utility debt issues not subject to Rule 50 type regulation, the choice of issuance procedure is consistent with shareholder wealth maximization, even without the selectivity bias correction. The correction for selectivity raises the expected yields under both competitive and negotiated procedures, but the conclusion that choice of issuance procedure is consistent with shareholder wealth maximization is strengthened. The average NIC differences for the SBA models are both statistically significant and correctly signed.

Table 6
Expected Average NIC by Rating Class and Issuance Procedure Used
(NIC defined as net of SPREAD and IEXP)

Bond Rating	Number of Issues	Actual NIC	Expected NIC of Issues Actually Done Competitively				Expected NIC of Issues Actually Done by Negotiation			
			OLS		SBA		OLS		SBA	
			NiC _c	NiC _n	NiC _c	NiC _n	NiC _c	NiC _n	NiC _c	NiC _n
Aaa	2	13	9.63 (4.06)	12.77 (3.12)	9.29 (4.91)	10.03 (0.65)	12.70 (3.41)	12.43 (3.03)	13.89 (3.89)	13.14 (2.61)
Aa	34	34	9.25 (1.51)	11.53** (2.88)	9.24 (1.66)	9.85 (1.89)	11.78 (3.19)	11.58 (2.84)	12.77 (3.78)	12.45 (2.41)
A	37	88	10.52 (2.63)	13.13** (2.83)	10.61 (2.64)	11.34 (2.94)	13.66 (3.08)	13.22 (2.75)	13.95 (3.52)	13.78 (2.36)
Baa	14	54	12.28 (2.91)	14.36** (2.68)	12.15 (2.61)	13.12 (2.91)	14.85 (2.93)	14.30 (2.60)	16.30 (3.29)	14.68 (2.29)
Other	0	10	—	13.23 (2.08)	—	—	13.72 (2.36)	13.05 (2.19)	15.17 (2.60)	13.39 (2.01)
Avg	87	199	10.29 (2.48)	13.17** (2.90)	10.29 (2.47)	11.01 (2.75)	13.60 (3.19)	13.17 (2.84)	14.89 (3.64)	13.73** (2.44)

** = difference in mean NIC for competitive and negotiated issues is significant at .05 level.

* = difference in mean NIC for competitive and negotiated issues is significant at .10 level.

Standard deviations in parentheses.

Table 7 is a further examination of the results based on the level and volatility of interest rates at the time of issue. Actual NIC averages are consistently higher for negotiated issues regardless of the level or volatility of interest rates. OLS estimates for competitive issues indicate no statistically significant difference in mean yields, though, on average, competitive issuance was more expensive during periods of high interest rates and volatile interest rates. Using the SBA estimates, the means are significantly different during periods of high and low as well as stable interest rates. In each case the difference is consistent with the tendency to use negotiated issuance during periods of high and volatile interest rates. For issues done on a negotiated basis, OLS results in the table indicate a significantly lower cost of negotiated issues during periods of high interest rates, and nonsignificant but generally lower or equivalent costs during other periods. The SBA results, in contrast, indicate significantly lower costs of negotiation during periods of high and volatile interest rates.

The conclusion that emerges from Tables 6 and 7 is that the choice of issuance procedure is consistent with shareholder wealth maximization. Correcting for the selectivity bias in the OLS models yields even stronger results. For competitively done issues the average NIC saving is 0.40 percent. For issues done by negotiation the average saving is 1.16 percent. The saving from negotiation is greater for lower rated issues and also greater during periods of high and volatile interest rates.

Using the predicted values of (5) and (6), the structural form of the selection model is derived by estimating (1) by Probit. Results of that estimation do not have a straightforward interpretation that is unambiguous. The difficulty arises because the population of competitive and negotiated issues is unbalanced. As indicated in Table 2, only 23.6 percent of the 380 issues are competitively offered. One way to evaluate the impact of correcting for selectivity bias is to compare the classification success of the OLS and SBA models. These classification success results are reported in the top section of Table 8. The classification success of the SBA model is about the same as that of the OLS. A better way to look at the results is to calculate the expected average gain in NIC implied by the choice. This gain is calculated in the lower half of Table 8. The average NIC saving due to selection of issuance procedures implied by the OLS model is 0.305 percent. In contrast, the average NIC saving implied by SBA is 0.922 percent. Thus the SBA model classifications imply a choice process that is much more consistent with shareholder wealth maximization than is implied by the OLS model.

To evaluate the impact of Rule 50 on the choice of issuance procedure, Table 9 presents the expected NIC averages for regulated issuers by rating class. The comparison of actual NIC averages suggests that negotiated issues are significantly more expensive. In contrast, the OLS results suggest no significant differences for issues actually done competitively, though the average competitive rates are higher for each rating class. For issues done by negotiation, the OLS estimates indicate that negotiation is less costly, but the differences are not significant. The SBA average estimates are higher than the OLS estimates for both issue types and all rating classes, but relative cost estimates are similar to those based on OLS. The results indicate that choice of issuance procedure for

Table 7
Expected Average NIC by Issuance Procedure Used
Based on Level and Variability of Prevailing Interest Rates
(NIC defined as net of SPREAD and IEXP)

UBOND Rank	TVAR Rank	Number of Issues		Actual NIC		Expected NIC of Issues Actually Done Competitively				Expected NIC of Issues Actually Done by Negotiation			
						OLS		SBA		OLS		SBA	
						NiC _c	NiC _n	NiC _c	NiC _n	NiC _c	NiC _n	NiC _c	NiC _n
High		Comp.	17	127	14.74 (1.54)	15.00 (1.62)	14.71 (1.55)	14.40 (1.41)	15.95 (1.75)	14.96* (1.29)	14.96** (1.61)	17.19 (2.07)	15.23** (1.42)
Low			70	72	9.21 (1.04)	9.96** (1.57)	9.22 (1.03)	9.32 (1.96)	9.82 (1.14)	10.55** (0.91)	10.05 (1.59)	10.82 (1.74)	11.09 (1.42)
	High		33	110	12.49 (2.66)	14.33** (2.19)	12.49 (2.65)	12.34 (2.47)	13.44 (2.97)	13.18 (2.18)	14.79 (2.46)	16.20 (2.87)	14.72** (1.75)
	Low		54	89	8.94 (0.91)	11.74** (3.06)	8.95 (0.89)	9.07 (0.81)	9.53 (1.03)	10.33** (0.77)	12.13 (3.38)	13.26 (3.83)	12.51 (2.63)
	High		16	83	14.83 (1.54)	15.26 (1.61)	14.82 (1.53)	14.51 (1.37)	16.07 (1.73)	15.06* (1.26)	15.84 (1.83)	17.43 (2.11)	15.43** (1.37)
	Low		1	44	13.34 (—)	14.51 (1.56)	12.94 (—)	12.57 (—)	14.00 (—)	13.34 (—)	15.21 (1.71)	16.73 (1.94)	14.86** (1.43)
	Low		17	27	10.30 (1.20)	11.49** (0.87)	10.30 (1.13)	10.29 (1.14)	10.97 (1.21)	11.41 (1.08)	11.60 (0.82)	12.43 (0.93)	12.55 (0.63)
	Low		53	45	8.86 (0.69)	9.04 (1.10)	8.87 (0.70)	9.01 (0.65)	9.45 (0.83)	10.27** (0.65)	9.12 (1.15)	9.86 (1.35)	10.22 (0.96)

** = difference in mean NIC for competitive and negotiated issues is significant at .05 level.

* = difference in mean NIC for competitive and negotiated issues is significant at .10 level.

Standard deviation in parentheses.

Table 8
Evaluation of Structural Form of Selectivity Model
(NIC Defined as Net of SPREAD and IEXP)

	Classification Success			
	OLS		SBA	
	#	%	#	%
Expected/Actual				
C/C	48	16.8	60	21.0
N/N	<u>160</u>	<u>55.9</u>	<u>149</u>	<u>52.1</u>
Correct	<u>208</u>	<u>72.7</u>	<u>209</u>	<u>73.1</u>
C/N	39	13.6	50	17.5
N/C	<u>39</u>	<u>13.6</u>	<u>27</u>	<u>9.4</u>
Incorrect	<u>78</u>	<u>27.3</u>	<u>77</u>	<u>26.9</u>
Correct minus Incorrect	<u>130</u>	<u>45.5</u>	<u>132</u>	<u>46.2</u>
	Improvement in Expected Yield Per Issue			
	OLS		SBA	
Expected/Actual				
C/C	0.045		0.193	
N/N	<u>0.324</u>		<u>0.913</u>	
Gain	0.369		0.106	
C/N	-0.026		-0.112	
N/C	<u>-0.038</u>		<u>-0.072</u>	
Loss	<u>-0.064</u>		<u>-0.184</u>	
Net Gain	<u>0.305</u>		<u>0.922</u>	

Note: C = Competitive, N = Negotiated.

Rule 50 securities is generally consistent with the objective of minimizing NIC. However, these findings differ somewhat from those reported in Table 6. For the nonregulated issues in Table 6, the SBA results indicate that the average saving of issuers using competitive issuance is fairly large. In contrast, Table 9 indicates a trivial average saving for competitive issuers and a somewhat larger saving for negotiated issuers. Apparently, the regulation does cause a shift in the choice, but issuers that can significantly benefit from negotiation generally appear able to obtain waivers from the SEC. Given that Rule 50 affects only those issues where the choice has little impact on NIC, it appears to be unnecessary.

VI. Conclusion

Previous literature generally recognizes a paradoxical preference for issuing firms to select negotiated issues despite apparently higher net interest cost. Based on a screened sample of electric and gas utility bonds that are not subject to regulation, such as Rule 50, that favors competitive issuance, the choice of issuance procedure is found to be consistent with shareholder wealth maximization. Application of the empirical model to issuers subject to Rule 50 indicates

Table 9
Rule 50 Securities Expected Average NIC by Rating Class and Issuance Procedure Used
(NIC Defined as Net of SPREAD and IEXP)

Bond Rating	Number of Issues	Actual NIC	Expected NIC of Issues Actually Done Competitively				Expected NIC of Issues Actually Done By Negotiation			
			OLS		SBA		OLS		SBA	
			NIC _c	NIC _n	NIC _c	NIC _n	NIC _c	NIC _n	NIC _c	NIC _n
Aaa	0	1	—	15.81	—	—	15.81	15.37	16.37	15.73
Aa	13	4	—	—	—	—	—	—	—	—
			11.43 (2.51)	12.18 (3.07)	11.66 (2.86)	11.48 (2.45)	12.04 (2.99)	12.67 (3.26)	13.10 (3.41)	12.87 (2.54)
A	28	4	—	12.74	—	—	12.01	12.86	13.31	13.05
			11.27 (2.89)	12.74 (2.48)	11.60 (3.15)	11.37 (2.91)	12.01 (3.30)	12.51 (2.71)	13.31 (2.86)	13.05 (2.04)
Baa	47	7	—	16.01**	—	—	12.96	16.97	17.58	16.43
			12.42 (3.04)	16.01** (1.54)	12.56 (3.22)	12.43 (2.95)	12.96 (3.35)	16.31 (1.55)	17.58 (1.61)	16.43 (1.23)
Other	0	1	—	15.57	—	—	—	13.37	13.97	13.30
			—	15.57 (2.66)	—	—	—	13.12	—	—
	88	17	—	14.30**	—	—	14.71	14.23	15.24	14.57
			11.91 (2.94)	14.30** (2.66)	12.12 (3.15)	11.95 (2.88)	12.52 (3.28)	14.71 (2.93)	15.24 (3.06)	14.57 (2.36)

that the regulation tends only to affect issues where the NIC difference is expected to be small. Thus, the regulation, as currently applied, appears unnecessary.

This study differs from previous studies of the competitive/negotiated decision by correcting for a selectivity bias in ordinary least squares models of the expected net interest cost of competitive and negotiated issues. It is argued that selection of issuance procedure and the observed yields are simultaneously determined. To estimate expected net interest cost correctly, it is necessary to adjust for the selectivity bias using a two-stage Probit model. The selectivity-bias-adjusted expected net interest cost estimates indicate that issuers tend to choose between competitive and negotiated issuance to minimize net interest cost. These results are in sharp contrast to most previous studies and appear to resolve the paradox of issuer choice of competitive versus negotiated procedures.

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