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Syndicate Size, Spreads, and Market Power during the Introduction of Shelf Registration

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ABSTRACT

The introduction of shelf registration in 1982 is used to examine the extent of price-taking behavior among investment banks. Changes in underwriting syndicates are compared with the concomitant adjustment in underwriting spreads and management fees. The evidence is consistent with higher organizing costs and/or market power in the underwriting syndicate. Evidence on the components of the spreads and syndicate composition during the introduction of shelf registration is also presented.

IN MARCH 1982, THE Securities and Exchange Commission (SEC) introduced shelf registration (Rule 415) to allow firms to sell securities as and when they see fit.[1] To qualify for this privilege, eligible firms file a blanket registration document that describes financing plans over the next two years. Its intent is to allow firms to escape redundant SEC filings in new security issues and still maintain full disclosure.

The shorter time to issue new securities under Rule 415 should induce strong changes in syndicate compensation and composition. Investment bankers no longer commit to deals (spreads charged and amounts subscribed) until just before the issue goes to market. As a result, uncertainty about actual market conditions is diminished. Also, by revealing their capital needs for two years, the issuing firm reduces the cost to the investment bankers of searching for deals.[2] This structural change in costs and uncertainty provides an interesting experiment. In particular, do the changes in spreads and commitments with shelf registration provide evidence of price influencing behavior among investment bankers? That is, are the investment bankers able to capture some of the cost savings with inflated spreads and larger participations in syndicates?

The existing literature on Rule 415 consists of empirical work relating the use of Rule 415 to various cost measures.[3] These measures capture the spreads paid and costs reflected in post-issue price movements. In the bond markets, researchers have considered the total interest cost, spreads, and yield to maturity. Kidwell, Marr, and Thompson [5, 6] examine the effects of Rule 415 by estimating a

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[1] SEC Securities Act Release No. 6499, 48 Fed. Reg. 52, 889 (1983). For the text of Rule 415, see 17 C.F.B. §230.415 (1984).

[2] See First Boston [2] for a discussion of the changes resulting from shelf registration.

[3] See Smith [12] for a full review of the relevant literature.

regression model that controls for the bond rating, issue size, call provisions, whether the issue is sinking fund debt, whether the issue was shelf registered, and the time to maturity. They find that the interest cost is lower for shelf-registered issues, reflecting increased competition among investment bankers.

Rogowski and Sorenson [9] examine the effects of Rule 415 on corporate bonds during the period from January 1981 through October 1983. They conduct tests similar to those of Kidwell, Marr, and Thompson [5] and find that Rule 415 has produced a significant decline in the reoffering yield and has caused investment bankers to use more bought deals and less syndication. Also, shelf registration appears to have made it more difficult for regional firms to compete. Poulsen and Marr [8], for example, note that the market shares of equity issues of regional firms have declined as a result of shelf registration.

The impact that Rule 415 has had on spreads is unclear. For example, Rogowski and Sorenson [9, p. 9] have shown that spreads are not significantly affected by shelf registration for new debt issues. On the other hand, Kidwell, Marr, and Thompson [5, 6] documented significant reductions in the spreads of debt issues with shelf registration. Moreover, the effects of Rule 415 on the compensation of investment bankers in different roles and on the number of bankers in a syndicate have not been examined. The purpose of this paper is to analyze data on syndicate size, selling concessions, underwriter spreads, and management fees to gain a better understanding of the issuing process and its costs.

I. Empirical Tests

A. *Data*[4]

Data were collected from public utility and corporate debt offerings between January 1982 and December 1983. This period provides a two-year window that contains the introduction of Rule 415. The sample issues were taken from Investment Dealer's Digest (IDD) *Directory of Corporate Financing* [4]. Debt sold in units with equity securities (stock or partnership interests) was ignored. For each firm, all spread information, the type and amount of debt used, and its rating were collected. Not all issues had a bond rating declared in IDD. Missing ratings were taken from Moody's Bond Record during the month of issue. If Moody's did not list a rating for the bond, one was assigned based on the yield to maturity of the bond in relation to the other bonds issued in the same month.[5]

A total of 816 straight debt issues for a variety of types of firms and industries were collected. Seven issues were offered on a best-efforts basis and were therefore excluded from the sample. Of the remaining 809 issues, 774 had complete information on selling concessions (737 also had a rating reported or assigned).

[4] I am indebted to Nancy Brauer, Don Schnedeker, Mark Schroeder, the reference librarians at Bechtel Information Services (Washington, D.C.), and the reference librarians at the SEC library (Washington, D.C.) for their help in locating the data for this study.

[5] The yield to maturity was compared to the yields of all rated bonds issued in the same month. If the bond's yield was similar to other bonds with a common rating, that rating was assigned. Ratings were not assigned to convertible bonds because the specific conversion features of each bond affect yields differently. See Sharpe [11, pp. 332–47] for a discussion of this point.

Five hundred ninety-six had a full reporting of the underwriters' spread (562 were also given a bond rating). Finally, for 610 the management fee was reported (576 were noted with a bond rating).

Next, for each issue, the prospectus filed by the firm with the SEC was collected. In the prospectus the firm may list its underwriters. From the prospectuses, underwriting syndicate members were available for 302 issues. Excluded firms were either (a) misfiled and unavailable or (b) only stated "plans for distribution" and did not list syndicate members.[6] No selling group information was found in the standard reporting sources.[7]

Summary statistics of the data are presented in Table I. For each of the spreads and syndicate sizes, the means of all issues, traditional issues, and shelf-registered issues are reported. For example, there were 276 shelf-registered issues and the average selling concession was 67 cents per $100.00 of debt. The 498 traditional issues cost 93 cents on average. Of the 809 total issues, selling concessions were available for 774 issues. The average spread for all reported issues was 83 cents per $100.00 of debt.

To see whether the variables are different in shelf and traditional issues, a difference-in-means test is reported in Table I. The t-statistic tests for the size of the traditional value less the shelf value. All spreads decline significantly with the use of shelf registration. The t-values for the managers', underwriters', and selling agents' spreads are 6.69, 6.40, and 4.18, respectively. This is consistent with significant cost savings with shelf registration. The number of underwriters and the extent of the managers' participations were found to have nonconstant variances between the shelf-registered and traditional issues (using an F-test with a five percent significance level), so Satterthwaite's [10] approximation for the degrees of freedom was used in calculating the significance of the t-values. No significant change in the size of the management group appeared. The size of the underwriting syndicate declined significantly with the use of Rule 415 (at the one percent level). Finally, the portion of the issue underwritten by the lead underwriters increased significantly with shelf registration, yielding a t-value of -2.37.

B. Spread Tests

In a traditional issue, the underwriters and issuing firm settle the terms of the underwriting agreement (except for the public offering price) before the day the registration becomes effective. In a shelf-registered issue, the terms of the underwriting agreement are set almost coincidentally with the issue going to market.[8] As a result, the terms of the traditional offer (e.g., the number of

[6] For traditional issues, the syndicate members (other than the managers) were unavailable for 98 of 412 issues. For the shelf-registered firms 115 of 184 syndicates were undocumented or only stated plans for distribution. Since a larger proportion of the shelf-registered issues was without syndicate information, this may induce a bias in the tests of the underwriting syndicate size.

[7] The underwriting syndicate information in the prospectus can be different from the actual syndicate. In particular, small investment banks declared as members of the underwriting syndicate in the prospectus may be passed over in the actual offering.

[8] See First Boston [2, p. 31].

Table I

Descriptive Statistics[a]

Variable	Overall Mean/N	Shelf Mean/N	Traditional Mean/N	t-Value[b]	Difference Resulting from Shelf
Manager Fee (¢ per $100)	28.95/610	18.59/188	33.56/422	6.69**	Lower
Underwriter Spread (¢ per $100)	27.28/596	18.61/184	31.15/412	6.40**	Lower
Selling Concession (¢ per $100)	83.44/774	67.01/276	92.55/498	4.18**	Lower
Number of Managers	2.39/809	2.34/299	2.41/510	0.55	Fewer
Number of Underwriters[c]	42.67/302	33.37/68	45.37/234	3.14**	Fewer
Percentage of Issue Underwritten by Managers[c]	0.46/302	0.54/68	0.44/234	−2.37*	More of Issue

[a] Average syndicate composition, compensation (reported in cents per $100.00 of debt issued), and number of observations (N) for corporate debt offerings in 1982–1983 as reported in the IDD Directory of Corporate Financing. The number of managers, management fee, underwriting spread, and selling concession were published in the IDD Directory of Corporate Financing. The number of underwriters was taken from the prospectus filed with the SEC. The percentage of the issue underwritten by the managers is the fraction of the dollar value of bonds committed for in the prospectus by the managing investment bankers.

[b] The null hypothesis is that the mean traditional value less the mean shelf values is zero.

[c] Tests use Satterthwaite's approximation for degrees of freedom due to unequal variances between shelf and traditional values.

* Significant at the five percent level.

** Significant at the one percent level.

securities contracted and the spreads) are likely to be based upon cruder estimates of what market conditions will be. The investment banker may mitigate this effect by acquiring indications of interest during the registration period or by hedging. Notwithstanding these opportunities, there appears to be greater uncertainty for the investment banker in a traditional issue unless he or she undertakes costly actions to alleviate the risk.

Following Kidwell, Marr, and Thompson [5, 6] and Rogowski and Sorenson [9], control variables are needed for the bond rating, size, and whether the issue was shelf registered.[9] Also, I consider whether the issue was notes or convertible debt. The premise is that, since notes have a shorter life (less than ten years), their price variability is lower and they should be easier to sell and price. For convertible debt there is a contingent-claim feature that may require additional marketing skill and is more difficult to price. In addition, other variables that may influence spreads include (a) the success that the investment banker had with previous issues by the firm, (b) whether there are unemployed resources in the selling department of the investment bank, and (c) the exact specification of the indenture agreement and redemption restrictions. However, such variables are not generally observable. As a result, there may be an omitted-variables bias in the test results. For example, the exclusivity of shelf registration itself may simply proxy for an unknown variable.

Define the difference between the true and estimated spread as ϵ. ϵ is generated by misspecification and omitted variables. Let μ be the estimated selling concession. Following standard analysis of variance (ANOVA), μ_n is the change in the spread due to the use of notes. ϵ_n is the additional change in the spread resulting from the unobserved factors concomitant with the use of notes. Considering other factors to capture the use of shelf registration (μ_s), to include the effect of a bond rating of A or better (μ_r), to include issue sizes in the larger quartiles (μ_2, μ_3, μ_4), and to incorporate the effects from the use of convertible debt (μ_c), one can estimate the relation:

$$p_0 - p_s = \mu + (\textstyle\sum_{j=2}^{4} \mu_j I_{[j]}) + \mu_n I_{[n]} + \mu_s I_{[s]} + \mu_r I_{[r]} + \mu_c I_{[c]} + \tilde{\epsilon},$$

where

$$\tilde{\epsilon} = \epsilon + (\textstyle\sum_{j=2}^{4} \epsilon_j I_{[j]}) + \epsilon_n I_{[n]} + \epsilon_s I_{[s]} + \epsilon_r I_{[r]} + \epsilon_c I_{[c]}, \tag{1}$$

and where p_0 gives the public offering price and p_s is the selling agent purchase price. Since the values of the ϵ are unknown, each is treated as a random variable. If the observable variables capture the essence of the selling spread, there should be no bias from omitted variables ($E(\tilde{\epsilon}) = E(\epsilon) = 0$). Ideally, the ϵ would be normally distributed with zero mean and a common variance. Then $\tilde{\epsilon}$ would be normally distributed with zero mean and a variance given by the sum of the individual factor variances plus any correlation effects. If the ϵ's are well behaved, one can estimate the μ's with generalized analysis of variance (G-ANOVA) techniques to account for the unbalanced data. If shelf registration lowers costs and provides more accurate beliefs of the demand for the security at the time the

[9] See Kidwell, Marr, and Thompson [5, p. 191] and Rogowski and Sorenson [9, p. 11].

selling group is formed, the selling spread will decline. Hence, one would expect $\mu_s < 0$.

The same analysis applies for the underwriting and management spreads. If the dispersion of beliefs decreases with shelf registration, the underwriter is better off. Since Rule 415 dramatically shortens the lead time before the issue date, it should provide cost savings to the manager. The reduced filing requirements save resources in meeting potentially redundant requirements, particularly for firms that issue often. Since the firm has securities on the shelf, it is likely to be easier for the investment banker to choose a firm to target for employment. Alternatively, the tighter time schedule may increase the costs of setting up the syndicate and finding skilled bankers.

HYPOTHESIS 1: *The selling concession, underwriting spread, and management fee decline with the use of shelf registration, controlling for bond rating, issue size, and type of debt.*

Table II describes the results of tests of the effects on the selling concession, underwriting spread, and management fee. Equation (1) is estimated using the G-ANOVA procedure for each set of spreads. For the selling concession,the model explains forty-eight percent of the variation in the selling spreads. The R^2 for the underwriting spread and the management fee were forty-one and forty-eight percent, respectively. Individual F-tests show that all independent variables are significant at the five percent level (except for convertible debt with the management fee).

The results of Tukey, Bonferroni, and Scheffé tests of the effects of issue size unanimously confirm a significant difference in the mean spread between the first, second, and third quartiles ($\alpha = 0.05$). There was no significant difference in the spread between the third and fourth quartiles. Higher rated issues have significantly lower spreads. As well, the use of shelf registration causes a significant reduction in spreads.[10] The selling concession is lower by eighteen cents per hundred dollars of debt issued for shelf-registered bonds. Also, there is a ten-cent savings in the underwriters' spread and a twelve-cent savings in the management fee with shelf registration. Hence, the total savings to shelf registration is approximately forty cents per hundred dollars of debt issued. The evidence suggests that notes are less costly to sell, underwrite, and manage. Convertible debt requires larger concessions, spreads, and fees.[11]

The results show that shelf registration provides cost savings to the underwriter. The shorter time lag to the offering date may give finer estimates of

[10] These results, while providing information on the all-individual components of investment bankers' compensation, confirm those of Kidwell, Marr, and Thompson [6, footnote 34, p. 200 and Table 5, p. 201].

[11] One can expand the model and check for multiplicative interactions between all factors. The significant interactions for the selling concession ($\alpha = 0.05$) are issue size and bond rating, and size and the type of security. For the management fee they are issue size and bond rating, size and type of debt, size and registration method, and notes and convertible debt. Significant interactions for the underwriters' spread are size and rating, and notes and convertible debt. Since the use of shelf registration is restricted to larger firms with a healthy credit history, these effects are consistent with the model. All reported values have been adjusted for the effects of these significant interactions by including them in a second-stage G-ANOVA estimation.

Table II

Syndicate Compensation[a]

Effect	Selling Concession (¢ per $100)/$N$ $R^2 = 0.48$	Underwriting Spread (¢ per $100)/$N$ $R^2 = 0.41$	Management Fee (¢ per $100)/$N$ $R^2 = 0.48$
Issue Size (in Millions)			
>40 (less)	—/157	—/97	—/114
40–75 (less)	104.72*/220	21.14*/167	30.12*/165
75–100 (less)	13.84*/193	6.29*/157	6.27*/157
>100	−2.72/167	−1.63/141	−0.85/140
Bond Rating			
A or better (less)	—/507	—/378	—/393
Baa+ or worse	−22.51*/230	−20.37*/184	−18.15*/183
Registration Method			
Traditional (less)	—/461	—/378	—/388
Shelf	18.23*/276	9.57*/184	12.13*/188
Debt Instrument Used			
Notes (less)	—/274	—/188	—/189
Regular	−47.11*/497	−13.07*/374	−15.28*/387
Convertible (less)	—/100	—/94	—/93
Regular	42.93*/637	19.71*/468	18.62*/483

[a] G-ANOVA results for differences in the selling concession, underwriting spread, and management fee (reported in cents per $100.00 of debt issued) for corporate debt offerings as reported in the IDD Directory of Corporate Financing, 1982–1983. Independent variables are quartiles of issue size, bond rating, registration method, whether the issue was notes, and whether the issue was convertible debt. All factors (except convertible for the management fee) are significant using an F-test at the five percent level. Also, the overall specification is significant at the five percent level with an F-test.

* Significantly different at the five percent level. The significance is assured by Tukey, Bonferroni, and Scheffé tests.

market conditions. If so, these savings are passed to the firm through decreased spreads. The results are consistent with the hypothesis that shelf registration lowers spreads and confirm earlier work by Kidwell, Marr, and Thompson [5, 6].

C. Syndicate Size Tests

The results of the last section show that Rule 415 provides cost savings that are passed to the issuing firm as lower spreads. This section addresses whether the decline in spreads suggests price-taking behavior among the investment bankers. The size of the underwriting and managing syndicates and the extent of participation by the lead underwriters are examined.

If the underwriters act as price takers, the cost savings from Rule 415 are completely bid away and flow directly to the issuing firm as lower underwriting spreads.[12] Neither the contract quantity nor the underwriters' profits change. The underwriters' lack of market power implies that any change in the spread due to the use of shelf registration (estimated with error as μ_s) equals the change in costs and beliefs that results from the use of shelf registration. On the other hand, if the underwriters are able to influence the spreads they receive (i.e., there are barriers to entry in becoming an investment banker and joining the under-

[12] Complete adjustment requires a continuum of traders. See Dubey [1].

writing syndicate), the fall in the spread is less than the actual cost savings that accrue to the underwriters.[13] Hence, the investment bankers will increase the level of their commitments, and the size of the underwriting syndicate will drop as individual underwriter participations increase.[14] The extent to which the participations change depends on the strength of the underwriters' influence and on the elasticity of demand for their services.

The analysis of the size of the underwriting syndicate is similar to that used in the determination of the spreads. The independent variables influence the size of the underwriting syndicate through their effects on the spread. A spread value for a given firm is uniquely associated with a syndicate size.

HYPOTHESIS 2: *The size of the underwriting syndicate, the number of managers, and the percentage of the issue underwritten by the managers do not change with shelf registration, controlling for bond rating, issue size, and type of debt.*

The G-ANOVA tests require constant variance across factor levels in the dependent variable. As was noted earlier, the constant-variance assumption does not hold for traditional versus shelf-registered issues for the size of the management group, the number of underwriters, and the extent of the manager participation. Nonparametric tests, while relaxing the assumption of normality, require similar restrictions on the shape of the distribution across factor levels. An alternative is to consider a series of t-tests using Satterthwaite's [10] approximation. One cannot completely attribute changes in the dependent variables to the individual factor levels; however, this procedure does illustrate some general phenomena.

Table III contains the results of the t-tests for the composition of the underwriting syndicate and the management group. It considers issue size in two groups, greater than and less than \$75,000,000 (the median size). On average, the underwriting syndicate is significantly larger for the large issues. Higher rated debt has larger syndicates—this is likely due to larger issue sizes from bigger, more creditworthy firms. The use of shelf registration reduces the underwriting syndicate by twelve members. Issues of notes do not alter the size of underwriting syndicates, while convertible debt requires significantly larger syndicates.

The result that the underwriting syndicate has fewer members with shelf registration may be interpreted as evidence in support of the notion that the investment bankers have market power. If the spread decline is less than the cost savings from shelf registration, powerful investment bankers can increase their commitments to enjoy the inflated spreads. Alternatively, the fewer syndicate members may simply reflect the fact that the time restrictions with a shelf-registered issue make larger syndicates more expensive.

Table III also displays the results of the t-tests for the size of the management group. Larger issues have significantly more managers. Higher rated bonds and convertible debt have significantly fewer managers. Finally, the registration method and whether the issue was notes have an insignificant effect on the

[13] See Foster [3] for a sequential search model of investment banker actions.

[14] See Mañan [7], Theorem 3, for a derivation of this result in a linear oligopoly game. This effect appears in Foster [3] as well.

Table III

Syndicate Composition[a]

Variable	Underwriter		Manager		Proportion	
	Mean/N	t-Value	Mean/N	t-Value	Mean/N	t-Value
Issue Size (in Millions)						
<75	31.55/155	−7.24**[b]	1.98/442	−8.04**	0.55/155	5.70**
>75	54.39/147		2.87/367		0.38/147	
Bond Rating						
A or better	46.99/167	2.27*[b]	2.53/536	2.79**[b]	0.50/167	2.18*
Baa+ or worse	38.92/115		2.17/236		0.43/115	
Registration Method						
Traditional	45.37/234	3.13**[b]	2.41/510	0.54	0.44/234	−2.37*[b]
Shelf	33.37/68		2.34/299		0.54/68	
Notes						
Regular	41.88/224	−0.78[b]	2.43/551	−1.22	0.47/224	1.05[b]
Notes	44.94/78		2.82/258		0.44/78	
Convertible						
Regular	44.80/226	2.09*[b]	2.54/672	6.01**	0.45/226	−1.79
Convertible	36.33/76		1.64/137		0.51/76	

[a] t-Tests for the manager and underwriter participation levels in corporate debt offerings during 1982–1983 as reported in the IDD Directory of Corporate Financing and the Prospectus. The number of underwriters, the number of managers, and the percentage of the issue underwritten by the lead managers is contrasted. The basic effects are the issue size (greater or less than the median), bond rating, registration method, whether the issue was notes, and whether the issue was convertible debt. N denotes the relevant number of observations. The null hypothesis is that the difference between the first listed effect and the second equals zero.

[b] Tests use Satterthwaite's approximation for degrees of freedom due to unequal variances between treatments.

* Significant at the five percent level.

** Significant at the one percent level.

number of managers. Since the number of managers did not decline significantly, these results support price-taking behavior among the lead underwriters. This makes more plausible the belief that shelf registration discourages large syndicates, yet the investment bankers are competitive.

Finally, Table III illustrates the changes in the manager's involvement as underwriter. Smaller issues have a significantly greater influence from the lead underwriters. There is no significant effect for the bond rating. Shelf-registered issues have a significantly higher commitment from the lead underwriters, and the type of debt issued has no effect on manager participation. Thus, the same number of managers are absorbing the effects of a smaller underwriting syndicate.

II. Summary

This paper illustrates the importance of shelf registration on investment bankers' actions. The results show that Rule 415 has provided the investment banking industry with substantial cost savings and that the investment bankers passed at least a portion of the savings to the issuing firm through reduced spreads. The changes in syndicate size are also consistent with price-taking behavior, assuming

that the timing of shelf-registered issues makes assembling large underwriting syndicates more costly. If there is no change in the cost to administering the syndicate with the shorter time limits, the evidence is consistent with price influencing behavior among underwriters.[15]

[15] This effect may be even stronger if actual underwriting syndicates are systematically smaller than those declared in the prospectus, or, for those issues where the prospectus did not report syndicate members, the underwriting syndicate is consistently smaller.

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