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Underwriter Compensation and Corporate Monitoring

ROBERT S. HANSEN and PAUL TORREGROSA*

ABSTRACT

Studies suggest that underwriting syndicates provide marketing services and certify the fairness of offer prices. We argue that syndicate lead banks also monitor manager effort, increasing the value of capital-raising companies. A given level of monitoring is associated with a given level of intrinsic value, so there is a "schedule" of certifiable offer prices, depending on the level of monitoring. Monitoring, marketing, and certification are, therefore, all legitimate syndicate functions. New evidence supporting the conclusion that syndicates provide corporate monitoring is presented.

PRIOR STUDIES SUGGEST THAT underwriting syndicates provide marketing and certification services for capital-raising companies. Marketing services include searching the primary market and compensating buyers for their costs of providing funds (see Kraus and Stoll (1972), Hansen and Pinkerton (1982), and Mikkelsen and Partch (1985)). For convenience, risk bearing is categorized as a marketing service. Certification is bearing the liability imposed by the Securities Act of 1933 for the "fairness" of the offer price. In this article we examine whether the lead investment banks of underwriting syndicates also provide monitoring of corporate managers and affairs. This idea is implicit in Easterbrook's (1985) theory that corporate payouts raise company value because they can elicit investment bank monitoring of the company.

In our theory, lead bank monitoring improves corporate performance and reduces agency costs, thereby raising the company's intrinsic value. In consequence, a given level of monitoring is associated with a given level of intrinsic value, resulting in the possibility of several certifiable offer prices. Top managers demand lead bank monitoring because it adds value. The behavior of their demand reflects that lead bank monitoring substitutes for other monitoring and that managers avoid monitoring out of self-interest. But we argue that avoidance of monitoring is publicly observed and will thus subject managers to potentially greater penalties than those that might be meted out as a result of lead bank monitoring. Therefore, we suggest that the substitu-

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tion effect dominates the agency effect, so that our theory predicts that syndicate compensation will be less when capital-raising companies have more monitoring in place.

To test our monitoring theory, we first construct a base regression model of the percentage compensation paid to syndicates (the spread) in 283 firm-underwritten industrial-equity offerings during 1978 to 1986. This model reproduces the finding reported in prior studies that spreads widen with unsystematic risk of the company's common stock, which is consistent with marketing and certification. We argue that this result is also consistent with lead bank monitoring. Thus, marketing, certification, and corporate monitoring, which are not mutually exclusive hypotheses, are jointly supported by this well-known result. The base regression model also contains the new result that syndicate spreads are "U-shaped" in offering size. We suggest this result may reflect diminishing returns to managing and coordinating large offerings and rising costs of risk bearing.

The base regression model is augmented with new variables that proxy for monitoring in place. We report that syndicate spreads narrow for offerings of larger companies. This is consistent with the conclusion that less monitoring is needed when the capital-raising company is better known (e.g., followed more intensively by security analysts). This result is also consistent with lower marketing costs because larger companies are more widely held, and with lower certification costs because larger companies have lower information asymmetry. We also report that spreads narrow as large buyers, including large institutions, purchase proportionally more of the offering. This is consistent with the conclusion that lead banks provide less monitoring when large buyers are among their clientele because those buyers provide corporate monitoring. This result also supports Hansen's and Pinkerton's (1982) hypothesis that large buyers reduce syndicate marketing costs. Thus, like the well-known result that fees increase with systematic risk, these results support the marketing, certification, and monitoring theories.

Empirical evidence that distinguishes the monitoring hypothesis is provided by including managerial ownership in the regression model. We show that syndicate spreads narrow as managerial ownership in the offering company expands. The marketing theory predicts no effect of managerial ownership on spreads and the certification theory predicts a positive effect of managerial ownership on spreads. This evidence and the reinterpretation of previous findings suggest that lead banks provide corporate monitoring. These findings also suggest that finance theory should explore further the influence of primary market monitoring on corporate behavior both prior to and at capital-raising events.

The article proceeds as follows. Section I discusses a theory of lead bank monitoring. Section II develops three hypotheses of the monitoring theory for the behavior of underwriter spreads. Section III describes the sample of equity offerings. Section IV develops the proxy variables used in the tests and discusses the specification of the base regression model. Section V reports the test results. The article concludes with Section VI.

I. A Monitoring Theory

Easterbrook suggests that lead bank monitoring of the manager-stockholder conflict is valuable because it overcomes the free-rider problem associated with individual stockholder monitoring: "When it issues new securities, the Company's affairs will be reviewed by an investment banker or some similar intermediary acting as a monitor for the collective interest of stockholders and by the purchasers of the new instruments." (Easterbrook (1984), p. 654.) In this section we develop a theory of how lead bank monitoring raises company value.

A. *The Value of Monitoring*

Company value is directly related to the total productive effort of its managerial labor force, which consists of directors, top level officers, divisional managers, and subsidiary officers and managers. Internal assessment mechanisms can raise company value by increasing managers' productive effort. Such mechanisms include top-down and bottom-up monitoring of managers by managers and the organization of the company's decision function (Fama and Jensen (1983)). But imprecise measurement of managers' efforts (due to bad judgement, moral hazard, or poor information) and managerial entrenchment limit the effectiveness of these and other internal assessment mechanisms.¹

Company value also depends on random factors that complicate the task of identifying how much value is generated by managers' effort and how much is due to chance. Such "noise" reduces the quality of assessments of the relationship between managerial effort and company value, giving managers more incentive to shirk (Ross (1973)).

Lead bank monitoring can add value in a number of ways. The lead bank's probe into company affairs produces new measurements and other information about managerial effort and internal assessment mechanisms. The bank may have new knowledge of the company's competitive posture and about the relationship between managerial effort and company value. The bank can monitor top management and lower management and may be able to better assess how noise affects company value. The lead bank provides a credible critique for the board of directors to use in assessing managerial effort and corporate value. Thus, lead bank monitoring gives managers the incentive to work harder and to decrease their perquisite consumption.

B. *The Demand for Monitoring*

While stockholders prefer "hard-nosed" monitoring because it raises share price, managers can often avoid the monitoring because it is too costly for stockholders to act collectively, and individual stockholders find monitoring

¹ Warner, Watts, and Wruck (1988) report evidence consistent with this inefficiency of internal assessment mechanisms over top managers.

more costly than the possible gain in their equity ownership. However, when managers seek capital from the primary capital market, they are not protected by this public-choice problem because the benefits and costs of lead bank monitoring are shared by existing stockholders on a pro rata basis. Nevertheless, managers' demand for lead bank monitoring depends on how it affects their personal benefits and costs. On one hand, they realize a gain in their fractional ownership claim of the value added from monitoring, and they may also benefit if existing monitoring inadequately rewards their effort and ability. On the other hand, they may incur costs like fewer perquisites, less prestige, demotion, harder work and, perhaps, being fired. However, it is difficult for managers to avoid these costs since they cannot hide a decision to not hire an underwriting syndicate from the public, or the choice of a lead bank that does not provide hard-nosed monitoring, or an attempt to alter the bank's review with excessive fees or access to other deals. Thus, managers' monitoring avoidance may invite even higher personal costs from monitoring by the managerial labor market and by the takeover market.²

When the company has sufficient other monitoring in place, managers' demand for lead bank monitoring will be less or, perhaps, nonexistent. Thus, as in-place monitoring declines, the managers' demand for lead bank monitoring should increase. Such a demand shift reflects the dominance of the "substitution effect" of lead bank monitoring for other monitoring mechanisms over the "agency effect" of managers' avoiding monitoring. This suggests the empirical implication that syndicate spreads should narrow when more monitoring is in place. It may be argued, however, that the substitution effect does not always dominate. Perhaps, for example, when there is little monitoring in place, some managers will seek to avoid lead bank monitoring even though they will face possible takeover-induced displacement. If such dominance of the agency effect is widespread, syndicate fees would be larger when the company has more monitoring in place.

C. The Supply of Monitoring

The issuing company's concerns about lead bank monitoring include whether the monitoring quality supplied is below what is promised and paid for and whether the bank will unfavorably exploit information gained from the review.³ So, without a sufficient contract enforcement mechanism, issuing companies may only pay for minimal monitoring, in which case only

² Top managers' moral hazard is not entirely resolved by primary market monitoring. For example, if top managers have complete hiring discretion over lead banks, then lead bank monitoring could shift away from monitoring top managers. However, lead banks' cooperation with managers is limited by their reputation capital. Also, top managers may avoid monitoring by not raising any funds.

³ For example, some monitoring benefits (e.g., a better decision function) are received in future cash flows, after the syndicate is paid. Although due diligence suggests that the syndicate interview managers, engineers, and the like (Fitzsimmons (1985)), it does not preclude minimal monitoring, nor biased monitoring that may favor one manager, or management team, over another. So the 1933 Act is not a source of monitoring quality insurance.

minimal monitoring will be supplied. Nevertheless, as we argue below, even in this case of little or no monitoring, the syndicate can still fully certify the offer price as fair. Alternatively, the company may simply forego monitoring altogether.

The company's concerns about the bank's moral hazard are bounded by the bank's historically acquired reputational capital for corporate monitoring. The importance to banks of their position in the hierarchical relationship among investment banks is well known (see Carter and Manaster (1990)). Banks receive quasi-rents from their reputations for hard-nosed monitoring. Capital suppliers and capital-raising companies recognize that any windfall gains a lead bank might get from shirking or abusing its monitoring role are unlikely to offset the losses to its reputational capital. Such losses may be in the form of lower quasi-rents to monitoring and in lost opportunities to manage future underwritings.

D. Monitoring versus Certification

Economists recognize that investment banks have reputational capital for certifying the fairness of the offer price (Beatty and Ritter (1986), Booth and Smith (1986), and Carter and Manaster (1990)). Certification requires that the offer price be consistent with public and hidden information, while monitoring, as we describe it, requires investigating the issuing company with the purpose of improving performance and disciplining errant managers which, in consequence, raises share price. Certification, therefore, is not monitoring, and vice versa. In particular, the bank can certify an offer price that is consistent with existing performance and agency costs. However, by adding value, lead bank monitoring raises share price to a new level that also is certifiable. So there may be many certifiable prices, so that for each level of corporate monitoring there is a different certifiable price. Our monitoring theory, therefore, recognizes that investment banks can have multidimensional reputations which in the present analysis contain both certification and monitoring components. Consequently, the bank's reputation for certification is not sufficient for ensuring monitoring contract performance.⁴

We have discussed how monitoring affects the relationship between company value, managers' effort, and random factors, while ignoring other factors, such as the competitive structure of the company's product and input markets. By abstracting from other determinants, we outlined a partial equilibrium theory of the demand and supply for lead bank monitoring. While we suspect that incorporating this monitoring theory into a broader model of the corporation can produce further insights, we do not pursue this task here. Instead, we turn our attention to empirical tests of the monitoring theory.

⁴ Monitoring is also not auditing. The monitor has power to reward and discipline managers, whereas the auditor merely reports information.

II. Monitoring Hypotheses

The monitoring theory advanced in the previous section suggests that underwriting spreads should widen with lead bank monitoring effort and that more lead bank monitoring is demanded when less monitoring is in place. In this section we discuss three tests of this monitoring theory.

A. Firm Size

One determinant of the costs and benefits of lead bank monitoring is company size. Larger companies are better known by investors, which suggests that they will have more monitoring in place (e.g., they are followed by more security analysts). We therefore have Hypothesis 1.

Hypothesis 1: For underwritten equity offerings, the larger is firm size, the narrower is the syndicate spread.

Hypothesis 1 is also consistent with lower marketing costs and lower certification costs. In general, larger companies have wider ownership and are characterized by lower information asymmetry.

B. Managerial Ownership

A second important determinant of lead bank monitoring is managers' ownership. By increasing their ownership from a low level, managers better align their interests with stockholders' interests, thereby reducing their possible benefits from alternate monitoring sources (Jensen and Meckling (1976)). Moreover, increasing their ownership to a sufficiently higher level increasingly insulates managers from market discipline (e.g., the threat of takeover) and this further reduces their possible benefits from alternate monitoring sources (Stulz (1988)). This suggests that when companies raise capital, managers with lower ownership, and thus less monitoring in place, will demand more lead bank monitoring, *ceteris paribus*. This yields the following hypothesis:

Hypothesis 2: For underwritten equity offerings, the greater is managers' common stock ownership, the narrower is the syndicate spread.

Hypothesis 2 presumes a dominance of the substitution effect, that more lead bank monitoring is used when less monitoring is in place. Thus, while the dominance of the substitution effect is an empirical question, we emphasize here that hiring syndicates to raise capital exposes managers to monitoring that is, on balance, too beneficial to refuse.⁵

⁵ Of course, if the agency effect dominates, the monitoring theory predicts that spreads widen with managerial ownership. While this cannot be ruled out a priori, it suggests the counterintuitive result that more lead bank monitoring is demanded by companies that are already monitored more.

The behavior of managers' ownership is important because it can distinguish the monitoring theory from the certification theory. Because of information asymmetry effects, the certification theory suggests that spreads will be positively related to managerial ownership. In particular, with high managerial ownership, monitoring is less relevant since management is largely insulated from pressures from outside markets or alternatively has a considerable pecuniary incentive to maximize share value, but certification is more relevant since management's pecuniary incentives to cheat outsiders are greater. This suggests that underwriting syndicates can be expected to charge more for certifying the offer price at higher managerial ownership levels. Consequently, under this interpretation, the certification theory predicts that spreads will widen with managerial ownership while our monitoring theory suggests that spreads will narrow with managerial ownership. Taken together, the monitoring and certification theories suggest an ambiguous total effect of managerial ownership on the spread. However, a finding that managerial ownership has a negative effect on spreads indicates that the monitoring effects dominate the certification effects.

Managerial ownership is also important because it can empirically distinguish the monitoring theory from the marketing theory. For seasoned public offerings, managers typically do not purchase large portions of new offerings, so we see no marketing-cost implications for the managerial ownership variable.

C. Large Capital Suppliers

A third important determinant of lead bank monitoring effort is the extent of monitoring by its clientele. Large capital suppliers will provide more intensive monitoring since they must relinquish control over larger sums of wealth directly to managers. "New investors do not suffer under the collective choice disabilities of existing investors. They can examine managers' behavior before investing... New investors are better than old ones at chiseling down agency costs." (Easterbrook (1984), p. 654.) When the syndicate's clientele includes large buyers, lead investment banks can learn more about corporate performance from them or possibly infer it from the size of their stake in the deal, in which case less monitoring effort is required to maintain the lead bank's reputation.

Hypothesis 3: Equity offerings with larger buyers among the underwriting syndicate's clients should be associated with a narrower syndicate spread.

Large buyers among the syndicate's clients can also reduce syndicate expenditures for marketing services. For example, Hansen and Pinkerton (1982) report that non-underwritten rights offerings of common stock are significantly cheaper than underwritten common stock offerings because they are characterized by extremely large blockholders who purchase almost the

entire offering. Our monitoring theory, therefore, suggests another interpretation of the effect of large buyers on syndicate fees.⁶

III. The Sample

A sample of firm-commitment equity offerings is drawn from the population of seasoned, registered underwritten industrial common-stock offerings, whose nominal value exceeds \$5 million, during 1978–1986. The beginning year of 1978 is used because data are incomplete for earlier offerings. As reported on the SEC's *Registered Offerings Statistics* tape (1987), during this period there are 638 industrial firm-commitment offerings of common stock raising at least \$5 million (nominal and excluding proceeds from possible over-allotment options (see Hansen, Fuller, and Janjigian (1987))). This sample is reduced in this article to meet the following criteria.

- (i) The offering contained no secondary shares and there are no other securities jointly issued with the equity offering.
- (ii) The offering portion purchased by syndicate managers could be obtained from the offering prospectus, from the SEC's Washington D.C. office, or the Chicago office.
- (iii) The offering company had complete daily common stock returns for a 180-day period ending with the announcement and offering, as reported on the NYSE/ASE or NASDAQ CRSP tapes.
- (iv) Proxy statements could be obtained from *Corporate Microfile* (National Data Banks, St. Petersburg, Florida) or, in lieu of that, insider ownership was available from *Spectrum VI*, *Insider Holdings Survey* (Computers Directions Advisors, Inc., Silver Spring, Maryland), for the most recent semiannual report before the offering date.
- (v) Institutional ownership could be obtained from *Spectrum I*, *Investment Company Stock Holding Survey* and *Spectrum II*, *Bank Stock Holdings Survey* (Computers Directions Advisors, Inc., Silver Spring, Maryland), for the quarter before the offering date.
- (vi) Shelf offerings are removed from the sample.

Offerings containing secondary shares or shares jointly issued with other securities are excluded to remove the influence of other managerial incentives for selling common stock (see Mikkelson and Partch (1985)) and the possible impact on fees of joint offerings. The "Underwriting" section of the prospectus is used to identify the portion of the offering distributed by the lead banks, which are identified on the offering prospectus cover. Criterion (iii) is needed to estimate systematic and unsystematic risk. Criteria (iv) and

⁶ The company's long-run ownership structure is endogenous (see, for example, Jensen and Meckling (1976)). While on occasion the company's ownership structure may respond to possible use of the primary market we view such a response as being a second order of magnitude. Thus, in pricing the underwriting contract we treat the ownership structure of the company as exogenous.

Table I
Characteristics of and Underwriter Spreads
Paid in 283 Firm-Underwritten Industrial
Seasoned Common-Stock Offerings from
1978 to 1986

Offerings are identified from the SEC *Registered Offerings Statistics* tape. They contain no secondary shares and their offering prospectuses were found at the SEC in Washington D.C. or at the SEC regional office in Chicago. To be included in the sample the offering companies must have sufficient returns on the CRSP daily tapes, their managerial common-stock ownership levels must be available in *Corporate Microfile* or *Spectrum VI*, and their institutional common-stock ownership levels must be available in *Spectrum IV*. Offering size excludes any proceeds raised through the exercise of over-allotment options. Percentage offering size is number of shares in the offering divided by outstanding shares. Company size is measured by total assets. The equity beta is estimated from daily returns during the 100 trading days beginning 60 days after the announcement date using the market model, with a value-weighted index, and the standard error is the residual standard error from that regression. Syndicate compensation is measured as a percentage of offering size.

Panel A. Selected Characteristics		
	Mean	Median
Offering Size (\$MM) ^a	46.77	28.03
Offering Size (%)	16.96	14.88
Company Size (\$MM)	466.78	185.86
Equity Beta	1.23	1.21
Standard Error (%)	2.34	2.30
Syndicate Spread (%)	5.01	4.88

Panel B. Mean Spreads by Offering Size Category		
Offering Size (\$MM) ^a	<i>n</i>	Syndicate Spread (%)
5 to 9.99	36	7.01
10 to 19.99	60	5.82
20 to 34.99	70	4.90
35 to 49.99	41	4.44
50 to 99.99	44	3.99
100 and up	32	3.63

^a \$MM = millions of 1985 dollars, using the December Consumer Price Index.

(v) are needed to compute ownership of officers and directors and institutional stockholders. The *Registered Offerings Statistics* sample declined to 283 offerings primarily because of the demands of the above criteria. In addition, shelf offerings are removed because presumably managers did not choose monitoring for these, and as Denis (1991) argues, they needed little certification.

Table I reports selected sample characteristics. Throughout, offering size is measured in real (December 1985) dollars, using the Consumer Price Index

as the deflator. Panel A shows that the average offering raised \$46.8 million, representing a 16.96% expansion of outstanding common stock. Not revealed in Table I is that offering size ranged from \$5.6 million to \$337.3 million and, as a percent of the outstanding stock, from 1.5% to 49.6%. Systematic risk, or beta, is estimated from a "market model" regression of the company's daily common-stock return on the corresponding equally weighted daily NYSE/AMEX or NASDAQ composite-index return over the 120-trading-day period ending 60 days prior to the first announcement of the equity offering, as reported in the *Wall Street Journal Index*. The average beta is 1.23 and unsystematic risk, the residual standard error from the beta estimation regression, is 2.34% on average. The average offering has a syndicate spread of 5.01% and the average dollar spread is \$1.96 million.

Panel B reports the average syndicate spread by offering-size categories. Most offerings (72%) range from \$10 million to \$50 million. The spread narrows with offering size, which suggests scale economies in syndication. However, the declining fees in Table I do not hold firm size or other factors fixed. As we show below, the seeming scale economies of Table I give way to scale diseconomies for the largest offerings. The dependent variable in our regression tests is the syndicate spread.⁷

IV. A Test of Primary Market Monitoring

To test the hypotheses, the effects of company size, managerial ownership, and purchases of syndicate clients are examined in a linear regression model of syndicate spreads. We first discuss these variables. Then we discuss the base regression model.

A. *The Proxy Variables*

Our first proxy for monitoring is company size, as measured by the market value of outstanding common stock one day before the offering announcement. Panel A of Table II shows that the median company size is less than half the mean company size. Not shown is that company size ranges from \$16.04 million to \$6,885.57 million (in 1985 dollars). Company value proxies for a number of possible monitoring variables (e.g., the number of security analysts following the company). Company value enters the spread regression in natural logarithm form, denoted $\ln\text{VALUE}$.

Managerial common-stock ownership for NYSE/ASE companies is obtained from the company's most recent proxy statement before the offering. For NASDAQ companies it is obtained from *Spectrum VI*. Managerial ownership is measured as a percentage of shares outstanding. Panel A shows that officers and directors held 12.49% of outstanding shares on average. Not

⁷ The spread is segmented into three components: a sales credit, an underwriting fee, and a management fee, which traditionally have fixed proportions of 60%, 20%, and 20%, respectively (see Grant (1985)). Due to this fixed proportions tradition, an analysis of these components would not produce results that differ markedly from an analysis of the spread.

Table II
Means, Medians, and Pearson Correlation
Coefficients of the Explanatory Variables
Used to Test the Monitoring Hypotheses

The sample contains 283 firm-underwritten industrial seasoned common-stock offerings from 1978 to 1986. Offerings are identified from the SEC *Registered Offerings Statistics* tape. They contain no secondary shares and their offering prospectuses were found at the SEC in Washington D.C. or at the SEC regional office in Chicago. To be included in the sample the offering companies must have sufficient returns on the CRSP daily tapes, their managerial common-stock ownership levels must be available in *Corporate Microfile* or *Spectrum VI*, and their institutional common-stock ownership level must be available in *Spectrum IV*. Variable definitions are: VALUE = market value of outstanding common stock the day before the offering announcement, in millions of 1985 dollars; BOARD = percent equity ownership of the offering company's officers and directors; INST = percent institutional equity ownership of the offering company; and DIST = percent of offering distributed by syndicate managers.

Panel A. Means and Medians				
	VALUE (\$MM)	BOARD (%)	INST (%)	DIST (%)
Mean	466.77	12.49	34.59	37.41
Median	185.86	8.61	33.60	29.49
Panel B. Pearson Correlation Coefficients				
	INST	DIST	VALUE	
BOARD	-0.34	0.10	-0.15	
INST		0.10	0.38	
DIST			0.02	

shown is that managerial ownership ranges from just below 1% to 83.8% and is below 45% for over 95% of the sample companies. In the spread regression managerial ownership enters nonlinearly, as suggested by the monitoring hypothesis, in natural logarithm form, denoted $\ln \text{BOARD}$.

Because data revealing the purchases of large syndicate clients are not obtainable, two variables that presumably are correlated with these purchases are used. The first proxy is institutional ownership of the company, which proxies for purchases by institutions from the syndicate. Institutional ownership is measured as a percentage of outstanding shares before the offering and is denoted INST. Panel A reports that prior to the offering institutions held 34.59% on average (range of 0.01% to 90.5%) of outstanding common stock.

The second proxy is the fraction of the offering distributed by syndicate managers, as reported in the "Underwriting" section of the offering prospectus. This proxy, denoted DIST, reflects direct purchases from syndicate managers, or for the account of lead managers, or both. In addition to proxying for purchases of large clients, DIST may proxy for effects other than

reduced monitoring needs and lower selling effort. Perhaps, for example, syndicate managers have a larger stake in the offering because they perceived it to be particularly profitable. While this explanation, and possibly others, may also have some truth, they are not mutually exclusive from the monitoring rationale. Panel A reveals that, on average, 37.41% of the offering was distributed by syndicate managers (range of 10% to 100%).

The portions distributed by syndicate managers and institutional ownership are relatively large but Panel B reports they are not highly correlated. This suggests that these variables do not reflect the same sets of large buyers.

B. The Base Regression Model

The above discussion has abstracted from other factors relevant to the determination of syndicate spreads. To account for these factors we now specify a "base" regression model of syndicate spread whose design draws from previous models. This base model contains proxy variables that reflect marketing and certification services.

$$\text{SPREAD}_i = \beta_0 + \beta_1 \text{BETA}_i + \beta_2 \text{STDERR}_i + \beta_3 \ln \text{SIZE}_i + \beta_4 \text{SIZE}_i + \eta_i, \quad (1)$$

where, for offering i ,

SPREAD = the percentage spread,

BETA = common-stock beta estimated with daily returns using the market model,

STDERR = residual standard error from the beta estimation regression,

lnSIZE = natural logarithm of offering size,

SIZE = offering size, and

η = the error term,

and the standard assumptions hold.

Marketing costs include expenditures for bearing inventory risk, searching for buyers, clearing trades, and keeping records. Prior studies report that syndicate spreads widen for the distribution of riskier securities (Hansen and Pinkerton (1982), Bhagat and Frost (1986), Booth and Smith (1986), and Hansen (1988)). To register inventory risk-bearing costs this article follows these studies and includes in the base model both the systematic and the unsystematic risk of the company's common stock, respectively denoted BETA and STDERR. The marketing theory suggests each variable should have a positive impact on SPREAD; $\beta_1 > 0$ and $\beta_2 > 0$.

Prior studies also suggest that STDERR proxies for the "rental" cost of syndicate certification reputation (Bhagat and Frost (1986) and Denis (1991)). This measure of unsystematic risk is plausibly correlated with the market's uncertainty about the true value of the company's common stock. A positive impact of STDERR on SPREAD is, therefore, also predicted by the certification theory.

The monitoring theory suggests a new interpretation for the positive effect of STDERR on SPREAD. When valuation outcomes are subject to greater random variation, the relationship between company value and managerial effort is more difficult to assess and managers are more likely to shirk. Thus, more monitoring effort is required for the same quality assessment between value and effort. When the uncertainty about the true value of the company's common stock is greater, the company can benefit from more lead bank monitoring.

Prior studies also report that syndicate spreads narrow for larger offerings, concluding that significant scale economies are present (Smith (1977), Hansen and Pinkerton (1982), Bhagat and Frost (1986), Booth and Smith (1986), and Hansen (1988)). Such economies appear evident in Table I. However, these studies do not hold company size fixed and they do not examine if syndicate spreads are "U-shaped" in offering size, which would suggest scale diseconomies for larger offerings. The possibility that spreads may be U-shaped is raised by Bhagat's and Frost's (1986) finding of U-shaped *total flotation costs* (syndicate spread plus offering company expenses plus underpricing) for utility offerings. To allow for a possible U-shaped spread, the base model includes both the natural logarithm of offering size and offering size. If spreads are U-shaped they must first narrow then widen, as offering size expands, reaching a minimum within the sample range of offering size (i.e., below \$337 million). This implies the following conditions.

The SPREAD minimizing offering size, denoted SIZE*, satisfies,

$$\frac{\partial \text{SPREAD}}{\partial \text{SIZE}} = \beta_4 + \frac{\beta_3}{\text{SIZE}^*} = 0, \quad (2)$$

where ∂ denotes the partial derivative. In addition, at SIZE*,

$$\frac{\partial^2 \text{SPREAD}}{\partial^2 \text{SIZE}} = -\frac{\beta_3}{(\text{SIZE}^*)^2} > 0. \quad (3)$$

Equations (2) and (3) imply that $\beta_3 < 0$ and $\beta_4 > 0$. For the scale diseconomies to be relevant, the empirical estimates of β_3 and β_4 suggest that we must also find that SIZE* is in the sample range,

$$\text{SIZE}^* = -\frac{\beta_3}{\beta_4} < \$337,000,000. \quad (4)$$

V. The Results

In this section we first report the results from estimating the base regression model. The monitoring hypotheses are then tested by separately adding

lnBOARD, INST and DIST to the base regression model. Then the joint impact of all three variables is examined.

A. The Base Model

Parameter estimates for the base regression model are reported in model (1) of Table III. Syndicate spread is not significantly related to systematic risk. One explanation for the lack of a relationship between systematic risk and spread is that BETA may be measured with error. Prior studies, for example, report mixed findings for systematic risk on syndicate spread (see Bhagat and Frost (1986) and Booth and Smith (1986)). All remaining independent variables have the correct sign and are statistically significant at the 1% level.

The positive impact of unsystematic risk on the spread jointly supports the conclusions that syndicates are compensated for inventory risk bearing, certification of the offer price, and corporate monitoring. The negative coefficient on lnSIZE shows that as offering size expands, spreads narrow at a decreasing rate, which is consistent with the presence of scale economies. Moreover, the positive coefficient on SIZE shows that the spread widens linearly as offering size expands, which is consistent with our suggestion that management diseconomies may also be present. As we show below, as offering size increases the scale economies initially dominate, so the spread initially narrows. However, as offering size increases so do the diseconomies, so spreads widen for larger offerings. Consequently, model (1) shows the new result that syndicate spreads are U-shaped.

B. The Monitoring Hypotheses

The positive effect of company size on the spread in model (2) is consistent with the conclusion that larger firms require less monitoring effort on the part of the syndicate. To the extent that company size is correlated with other possible proxies for monitoring (e.g., the number of analysts following the company), this result supports the monitoring hypothesis. The positive company size effect is also consistent with larger companies requiring less selling effort and offer price being less costly to certify.⁸

The results in model (3) show that syndicate spreads are wider for issuing companies with smaller managerial ownership, all else being the same, including company size. This is consistent with the monitoring theory in which more managerial ownership reduces the manager-stockholder conflict, reducing the lead bank's monitoring effort. Moreover, it is consistent with our emphasis on the dominance of the substitution effect of monitoring over the agency effect. This result does not support the view that syndicate spreads

⁸ Increasing offering size or reducing company size is an increase in relative offering size, *ceteris paribus*. Thus, the results in models (2) to (6) are consistent with Mikkelsen and Parth (1985), who find a positive effect of relative size on spreads paid in secondary common-stock sales.

Table III

Syndicate Spread Ordinary Least Squares Parameter Estimates

The sample contains 283 firm-underwritten industrial seasoned common-stock offerings, from 1978 to 1986. The offerings are identified from the SEC *Registered Offerings Statistics* tape, they contain no secondary shares, and their offering prospectuses were found at the SEC in Washington D.C. or at the SEC regional office in Chicago. To be included in the sample the offering companies must have sufficient returns on the CRSP daily tapes, their managerial common-stock ownership levels must be available in *Corporate Microfile* or *Spectrum VI*, and their institutional common-stock ownership levels must be available in *Spectrum IV*. The regression form is

$$\text{SPREAD}_i = \beta_0 + \beta_1 \text{BETA}_i + \beta_2 \text{STDERR}_i + \beta_3 \ln \text{SIZE}_i + \beta_4 \text{SIZE}_i + \beta_5 \ln \text{VALUE}_i \\ + \beta_6 \ln \text{BOARD}_i + \beta_7 \text{INST}_i + \beta_8 \text{DIST}_i + \eta_i,$$

where SPREAD = percentage syndicate spread; BETA = common stock beta; STDERR = residual standard error from the beta estimation regression; lnSIZE = natural logarithm of offering size; SIZE = offering size in \$ millions; lnVALUE = natural logarithm of market value of common stock; DIST = percent of offering distributed by syndicate managers; lnBOARD = natural logarithm of percent of managerial equity ownership; and INST = percent institutional equity ownership of the offering company. The *t*-statistics are reported in parentheses. Variance inflation factors (VIFs) for model (6) are reported in Panel B, where the VIF of regressor *j* is $1/(1 - \rho)$, and ρ is the multiple correlation coefficient from regressing variable *j* on all remaining independent variables in the regression model.

Panel A. Ordinary Least Squares Parameter Estimates							
Parameter	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	
β_0	7.455* (21.957)	9.475* (17.222)	9.787* (17.133)	9.447* (18.241)	9.707* (17.661)	10.085* (18.826)	
β_1	0.078 (0.873)	0.047 (0.524)	0.042 (0.467)	0.099 (1.133)	0.027 (0.292)	0.076 (0.887)	
β_2	0.408* (4.894)	0.404* (4.796)	0.399* (4.758)	0.303* (3.590)	0.383* (4.603)	0.271* (3.282)	
β_3	-1.347* (-14.560)	-0.809* (-6.195)	-0.822* (-6.323)	-0.701* (-5.458)	-0.828* (-6.430)	-0.730* (-5.825)	
β_4^a	0.924* (6.148)	0.993* (6.581)	0.987* (6.577)	0.919* (6.268)	0.966* (6.492)	0.883* (6.168)	
β_5	—	-0.594* (-7.649)	-0.609* (-7.850)	-0.542* (-7.150)	-0.569* (-6.054)	-0.538* (-7.230)	
β_6	—	—	-0.080** (-2.001)	—	—	-0.110* (-2.883)	
β_7	—	—	—	-0.012* (-4.550)	—	-0.013 (-4.876)	
β_8	—	—	—	—	-0.006* (-3.104)	-0.005* (-2.938)	
Adj R^2	0.72	0.72	0.72	0.74	0.73	0.76	
F	148.54	145.62	123.34	133.43	126.74	107.66	
Panel B. Variance Inflation Factors from Model (6)							
(6)BETA	STDERR	lnSIZE	SIZE	lnVALUE	lnBOARD	INST	DIST
1.52	1.80	8.25	3.84	5.49	1.17	1.74	1.05

^a Parameter β_4 is reported times 10^2 .

* *p*-value $\leq 1\%$, ** *p*-value $\leq 5\%$ (two-tail tests).

should widen with managerial ownership due to possible adverse selection effects involving insider managers.⁹

The finding of a negative effect of ownership on spreads differentiates the monitoring theory from the certification and marketing theories. Recall that certification predicts that spreads should widen with board holdings. Thus, while the negative effect of board holdings on the spread does not reject certification, it empirically distinguishes monitoring from certification. Because syndicate selling costs in public offerings are not related to board holdings in any obvious way, this evidence also empirically distinguishes monitoring from marketing.¹⁰

Model (4) contains the first large-buyer variable, INST, which has a significantly negative impact on underwriter spread. This supports the conclusion that lead banks provide less monitoring effort when large buyers, institutions in particular, are among their clientele. Moreover, this result is consistent with Hansen's and Pinkerton's (1982) idea that larger buyers reduce the syndicate selling expenses.

Model (5) contains the second large-buyer variable, i.e., distributions by the lead banks, and it shows that spreads are smaller when these distributions are larger. This also lends support to the monitoring hypothesis. In effect, lead banks "free ride" on the monitoring implicit in their buyers' willingness to take larger stakes in the offering. As with the interpretation of the negative coefficient on INST, the negative effect of DIST on spreads is also consistent with the view that large buyers reduce selling costs.

Model (6) includes all the new monitoring variables and explains 76% of the cross-sectional variation in the spreads. Including the monitoring variables does not diminish the significance of the base regression variables. Moreover, each monitoring variable remains significant (p -value ≤ 0.01) and the order of magnitude of their coefficients are not changed.¹¹ These results support the conclusion that the large-buyer variables register the benefits of separate monitoring effects. Model (6) also shows that the spread is U-shaped in offering size. Figure 1 depicts the spread curve, holding all the other non-SIZE variables at their respective means. The spread initially narrows,

⁹ Such adverse selection effects may instead appear in the announcement price reactions to equity offerings. We regressed measures of the two-day-announcement abnormal returns on lnBOARD and obtained insignificant results. This does not support the adverse selection hypothesis.

¹⁰ If managers can reduce spreads with bargaining power, like larger ownership, an econometric "identification" problem can arise, and we can't rule out that the falling fees may reflect this cost effect. This argument requires monopoly rents in spreads but we know of no evidence of this. We examined a closely related hypothesis: that syndicates lower spreads when managers own more to obtain future business of managers' secondary sales, which is more likely if managers have larger stakes. In the year after the offering announcement, the *Wall Street Journal Index* and the *Wall Street Journal* report for our sample four underwritten secondary sales, only one of which was by company managers.

¹¹ The variance inflation factor for independent variable j , reported in Table III, is computed as $1/[1 - \rho]$, where ρ is the multiple correlation coefficient from regressing independent variable j on all of the remaining independent variables.

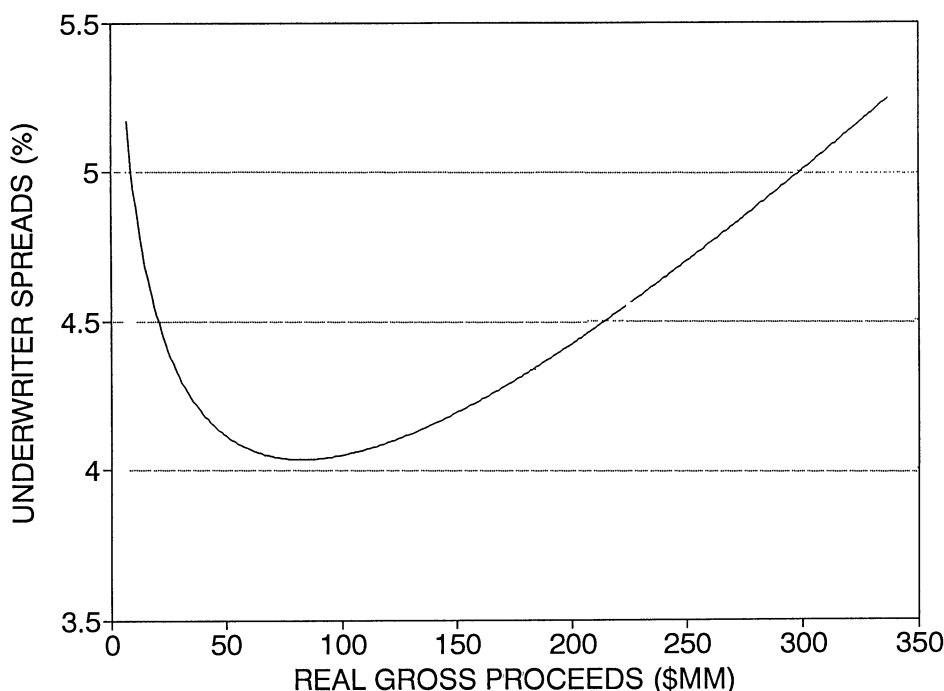


Figure 1. Expected syndicate spread for the sample of offerings, as a function of offering size. Offerings are identified from the SEC *Registered Offerings Statistics* tape, they contain no secondary shares, and their offering prospectuses were found at the SEC in Washington D.C. or at the SEC regional office in Chicago. To be included in the sample the offering companies must have sufficient returns on the CRSP daily tapes, their managerial common-stock ownership levels must be available in *Corporate Microfile* or *Spectrum VI*, and their institutional common-stock ownership levels must be available in *Spectrum IV*. The spread is estimated with parameters from model (6) of Table III, by allowing offering size to range from the sample minimum to the sample maximum (\$7 million to \$337 million), with all non-size independent variables held at their respective sample means. Thus, Figure 1 plots the function $\text{SPREAD} = 6.53 - 0.7295\ln\text{SIZE} + 0.0088\text{SIZE}$, where $\ln\text{SIZE}$ = natural logarithm of offering size and SIZE = offering size in \$ millions.

reaching a minimum at $\text{SIZE}^* = \$83$ million, and then widens for larger offerings. We suggest that this new finding of eventually widening spreads reflects possible diminishing search capability of marginal banks, rising costs of managing and coordinating larger syndicates, and increasing risk premiums.

VI. Conclusion

Two important roles for underwriting syndicates include marketing the offering and certifying that prices investors must pay are fair. This article draws on Easterbrook's (1984) idea and advances a theory where syndicates

also provide monitoring of corporate management and affairs. We suggest syndicate lead banks have reputational capital for monitoring and that this monitoring raises the intrinsic value of the company's common stock, so that there is a locus of certifiably fair offer prices. Consistent with this, prior evidence and new evidence presented here support the conclusion that monitoring, marketing, and certification are all legitimate syndicate functions. More importantly, we provide new evidence that empirically differentiates monitoring from marketing and certification. Our study, therefore, supports the conclusion that primary markets monitor corporate managers. These results therefore suggest that primary market participants monitor corporations when they seek capital, and by implication, when they undertake policies that will impact the likelihood of raising capital. This suggests that the emerging theory of corporate financing should explore further the active role of primary markets in disciplining capital-raising companies.

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