The Pricing of Underwritten Offerings and the Compensation of Underwriters

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Hans R. Stoll

Working Paper No. 1-72 Revised

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FOR FINANCIAL RESEARCH

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Past studies of new issues and secondary distributions have had two concerns. One has been with the cost of flotation and the efficiency of the underwriter in his market-making function [3], [5]. Another has been with the price effect of the offering and the efficiency of the marketplace in absorbing a large block of stock [1], [2], [4]. Both questions are examined in this paper and an attempt is made to determine whether any relationship exists between flotation cost and price behavior of underwritten issues.

In an efficient market, large distributions of stock should have no relative price effect other than that associated with information accompanying the offering. An efficient market contains many investors holding securities that are substitutes on the margin. By definition such a market is so large that no individual offering can effect the price merely because of its size. A finding that a large offering has a price effect not ascribable to information implies that the market is not perfectly efficient.

This paper is concerned with inefficiencies in the form of short run liquidity costs. A liquidity cost arises because of the difficulty of finding the other side of a transaction, and this will occur in a world without perfect knowledge where communication takes time and is costly. Such costs may be reflected in the commission charged by an intermediary that engages in a selling effort and is willing to inventory shares at its own risk while the other side is sought. They

may also be reflected in a temporary price decline that provides an incentive (in the form of a price increase subsequent to the offering) to other investors to hold the shares, if only on a temporary basis. A lower offering price (and therefore a greater potential price recovery) makes the offering easier to sell and reduces inventory and selling costs.

Empirically the liquidity effect is distinguished from price changes due to information about the fundamental value of the issue by the existence of a price recovery. A price decline may accompany a stock offering either because of the liquidity effect or because of new information. Only under the liquidity effect would one expect a price recovery after the offering, however. Underwriter compensation in the form of a commission (spread) is preferable to compensation in the form of a temporary price deviation since in efficient markets prices should deviate as little as possible from equilibrium.

The analysis of this paper is conducted over a relatively short period of time (20 trading days around the offering date) because emphasis is on the role of the underwriter and the way in which he charges for the services he performs.[1] All issues in the sample were registered with the SEC and therefore most information value accompanying the announcement of the issue is likely to have been reflected in the price prior to the time period examined here.

This paper considers in detail three decision variables of

the underwriter -- the commission (or spread), the offering price and whether or not the issue should be stabilized -- and examines the interrelationships of these variables, given the characteristics of the issue and the market. First, however, the data are described and the price effects and spread are each analysed separately.

II. THE DATA

This study examines 232 registered underwritten common stock offerings of industrial companies listed on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMSE).[2] New issues, secondary distributions and combinations of new issues and secondary distributions are considered. The period covered by the data is July 1, 1967 to June 30, 1970, a span during half of which the market was rising and during half of which the market was falling. The sample was restricted to issues of more than $1 million in which the underwriter made a firm commitment. No rights offerings, offerings in units or offerings with non-cash compensation were included.

The public offering data, such as date, issue size, spread, and price were taken from the Investment Dealers Digest Corporate Financing Directory. Stabilization data were obtained from the files of the Securities and Exchange Commission (SEC). The managing underwriter is required to report to the SEC whether or nor he engaged in stabilizing purchases during the offering. The amount of stabilizing activity was, however, not available -- only its existence or absence. Finally market closing prices for the tenth and first trading days before the offering and for the ninth trading day after the offering were collected both for the stock and for the Standard and Poor's Composite Stock Index.

The distribution of the sample by certain issue characteristics and by time period is presented in Table 1.

Table 1

Issue Distribution by Period, by Type of Issue, by Stabilization and by Exchange Listing

	7/67 - 12/68		1/69 - 6/70		
	NYSE	AMSE	NYSE	AMSE	
TYPE					
Primary	9	16	16	11	52
Secondary	25	35	31	18	109
Combination	4	31	9	27	71
STABILIZATION					
Stabilized	32	56	47	43	178
Not Stabilized	6	26	9	13	54

III. SHORT RUN PRICE PERFORMANCE OF UNDERWRITTEN ISSUES

Performance measures relating the offering price to prices before and after the offering, while controlling for the market, are calculated as follows

$$R\text{-}t = \frac{P_o/P\text{-}t}{M_o/M\text{-}t}, \quad R\text{+}t = \frac{P\text{+}t/P_o}{M\text{+}t/M_o}$$

where P_o is the offering price, P-t is the closing price t trading days before the offering, P+t is the closing price t trading days after the offering, and M refers to the value of the Standard and Poor's Composite Stock Index for the corresponding points in time.[3]

Table 2 presents average price performance figures for the issues in the sample classified by volatility. The measure of volatility is based on the market model of Sharpe [6] and is given by

$$\beta = \frac{\text{cov}[P_t/P_{t-1}, M_t/M_{t-1}]}{\text{var}[M_t/M_{t-1}]}$$

The value of β is calculated for the period June, 1959 to June, 1968, using monthly data.[4] The preponderance of high β stocks is due to the inclusion of AMSE issues and the possibility that new issues and secondary distributions occur in companies with higher than average β. Such companies are more likely to be expanding into new areas.

There is a statistically significant price decline before the offering both for the 10 day interval and the one day interval. The figures for R-1 indicate that, on the average, the offering price is set almost 2% below the previous day's closing price, and

Table 2

Mean, Market Adjusted Price Relatives and Standard Errors by Beta (β) Class

	OBS	R-10		R-1		R+9	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
β<1.24	69	.9843	.0067	.9867	.0025	.9988	.0081
1.24<β<2.0	95	.9779	.0068	.9819	.0026	1.0006	.0106
2.0 <β	68	.9623	.0098	.9821	.0027	.9815	.0113
All β	232	.9752	.0045	.9834	.0015	.9945	.0059

the discount does not appear to be associated with β. The ten day price decline tends to be greater particularly for high β stocks.[5] The post-offering price relatives are not significantly different from 1, but there is a tendency for the price to continue to drop.

These findings are consistant with earlier studies [1], [4] which found evidence of a significant pre-offering price decline. They are not necessarily inconsistent with market efficiency because the price decline may be due to a fundamental shift in the value of the stock. The fact that price did not recover after the offering

implies that the pre-offering price drop may have been justified.[6] However, this conclusion is based on average figures across many issue characteristics that may represent systematically different and offsetting tendencies. A more detailed analysis which considers the relationship of price changes with other variables is carried out in Sections V to VII.

IV. GROSS SPREADS OF UNDERWRITTEN ISSUES

The gross spread (GSP) -- the percentage difference between the price the underwriter pays for the issue and the offering price -- covers the origination costs, the costs of risk bearing and underwriting the issue, and the distribution costs.[7] Table 3 presents average spreads by type of offering and exchange listing. Even in the NYSE, spreads average 5.5% of the proceeds of the issue except for pure secondaries. These findings are in agreement with the SEC findings for a larger sample [5]. A block trade of equal size would have generated total commissions approximately equal to 2% before the introduction of a volume discount in December 1968 and 1.2% thereafter.[8] Admittedly, block trades involve fewer origination and distribution costs; but even in the case of secondary distributions that could be handled as block trades, the spread is over 4%.[9] These figures imply that the per share liquidity costs of these large offerings are considerably higher than those in ordinary round-lot transactions.

Table 3

Average % Gross Spreads and Standard Deviations by Type of Issue and Exchange

Offering Type	N Y S E			A M S E		
	OBS.	% Spread	S.D.	OBS.	% Spread	S.D.
Primary	25	5.56	1.44	27	6.24	.83
Secondary	55	4.69	.94	54	6.65	1.42
Combination	14	5.47	.64	57	6.54	1.56
$> \frac{1}{2}$ is Primary	10	5.49	.75	35	6.77	1.73
$> \frac{1}{2}$ is Secondary	4	5.42	.29	22	6.18	1.18

V. DETERMINANTS OF GROSS SPREAD

The gross spread negotiated between underwriter and issuer depends on a number of factors which include the characteristics of the company, the marketplace of the offering, the quality of the underwriter, and the like. Regression analysis is used to determine the relationship between gross spread (GSP) and relevant independent variables. Separate analyses are carried out for secondary issues (109), primary issues (52) and combination issues (71).

A. The independent variables

The following exogenous (or predetermined) variables are utilized.

V is the logarithm of the dollar value of the offering in millions of dollars. The sign is expected to be negative because of economies of scale involved in underwriting larger issues.

β was defined above. It characterizes the riskiness of the company as it is reflected in the past systematic volatility of the market price. It is expected that riskier companies have higher spreads.

MVAR and MTRND attempt to take account of the behavior of the market as a whole as reflected in the Standard and Poor's 500 Stock Index. MVAR is the residual variance around a regression of the index against time calculated for the 12 months prior to the month of the offering. It measures the volatility of the market as a whole. A positive sign is expected. MTRND measures the percentage price change in the market index for the six months before the offering. A negative sign is expected.

EXCH is a dummy variable differentiating the two exchanges. The value is one if the issue is listed on the NYSE; zero otherwise. The sign is expected to be negative because spreads on NYSE issues are expected to be lower.

UW is a rating of underwriters by discrete integer intervals from one to four inclusive. For each underwriter the dollar value of equity offerings managed (solely or jointly) over the study period was calculated. The managers were then divided into four groups according to their average underwritings per year: group 1 -- over

$200 million per year; group 2 -- $100 to $200 million per year; group 3 -- $50 to $100 million per year; group 4 -- less than $50 million per year. Underwriters would be classified in a similar way if the number, rather than value, of all issues were used. The reason for this classification was to account for possible economies of scale in the underwriting business; that is, one would expect underwriters with a greater volume of business to charge a lower fee. Therefore, the sign is expected to be positive.

R-1 is the ratio of the offering price to the prior day's closing price, adjusted for the market.[10] The hypothesis advanced earlier suggests that R-1 may be correlated with GSP if this is the method by which a subsequent price recovery is brought about. If the use of a discount from the prior close ($R\text{-}1 < 1 \Rightarrow$ discount) is an alternative to a higher spread, the correlation between R-1 and GSP would be positive. On the other hand if difficult issues require both high spreads and large discounts, the correlation between R-1 and GSP would be negative.

I-1-10 is the market adjusted price relative for the period 10 days before the offering to the day before the offering. ("R" variables involve the offering price; "I" variables involve only market prices). It was judged useful to separate the price behavior in the 10 day period before the offering into two segments (R-1 and I-1-10) in order to determine whether effects on GSP are due to the

fact that the offering price is set away from the market price or to the drift in the market price.

B. The results

The regression results are in Table 4. The (partial) effect of each independent variable on GSP is discussed in turn.

Issue size (V). The coefficient of V indicates that there are statistically significant economies of scale in all issue types. The elasticity of the percentage gross spread (GSP) with respect to issue size (evaluated at the mean spread) is -.12 in the case of secondaries, -.08 in the case of primary issues, and -.11 in the case of combination issues.[11] This indicates that a one per cent increase in size produces a reduction in spread of about 10 basis points.

Underwriter class (UW). There also appear to be economies of scale for underwriters. In the case of secondaries and primaries, underwriters in class 4 charge spreads about 50 basis points higher than spreads in class 1. Spreads appear to increase much more rapidly in the case of combination issues. In addition to reflecting the lesser efficiency of smaller underwriters, this correlation probably also reflects the fact that the underwriter variable represents dimensions of issue quality not well reflected in other variables.

Exchange (EXCH). In the case of secondaries, spreads are significantly lower on the NYSE (by 1.24 percentage points); but

Table 4

Determinants of Spread (GSP), Regression Results

(t values in parentheses)

Independent Variables	Secondaries	Primaries	Combination
V	-.6268(5.466)	-.4787(2.708)	-.7000(3.682)
UW	.1743(1.8061)	.1783(1.291)	.3812(2.851)
EXCH	-1.2358(5.0831)	-.0356(.104)	-.5108(1.288)
BETA	-.0453(.3136)	-.0710(.216)	-.3821(1.715)
MTRND	-.3024(2.1563)	-.0120(.058)	.0639(.291)
MVAR	.0702(1.1329)	.0544(.599)	-.0056(.067)
I-1-10	-1.7235(1.1616)	5.4251(2.360)	1.2482(.624)
R-1	-13.5792(3.187)	-9.6926(1.346)	-12.6078(2.202)
CONSTANT	24.9175(5.141)	10.8252(1.442)	18.3544(2.999)
r^2	.6038	.3309	.3417
MEAN GSP	5.659%	5.914	6.333
n	109	52	71

the same effect is not observed for primaries and is only observed in a weak form in the case of combination issues. These somewhat divergent results may be explained by the possibility that AMSE issues involving new stock are not more difficult to sell than NYSE issue involving new stocks because of the public's desire to hold new issues of smaller companies.[12] Strict secondaries, on the other hand, are more difficult to sell on the AMSE partly because of the lesser liquidity of that marketplace and partly because AMSE secondaries usually involve selling by insiders and founders which gives the appearance of a loss in confidence in the company by individuals that should know. Not nearly as many NYSE issues involve selling of a large proportion of the company by a founder or other insider.

Past volatility (β) In the case of secondaries and primaries, systematic risk of the stock appears not to have an effect on the spread. In the case of combination issues the effect (which is not quite statistically significant by the usual standards) is opposite of what had been expected. Riskier stocks have lower spreads. This is possible if investors in this segment of the market are risk preferers or if this association reflects a positive skewness of returns for which investors are willing to pay.

Market trend and market variability (MTRND, MVAR) Of these variables only MTRND has a significant coefficient and this occurs

only in the case of secondaries. The sign is as expected: a rising market reduces spreads.

Preoffering Price relative (I-1-10). The market adjusted price relative spanning day -10 to day -1 (where day 0 is the offering day) has opposite effects on the spreads of primaries and secondaries. This is the only variable for which signs are not consistent across issue types. Only in the case of primaries is the coefficient statistically significant, however. The positive sign there appears to reflect the fact that an issue whose price has already risen may be more difficult to sell (holding constant the degree of underpricing and other variables). Therefore a higher spread is required. Conversely an issue which declined in price may be easier to sell. The latter appears to be the case: The average price relative for the period from 10 days to 1 day before the offering is .987 (across the 52 strict primary issues). In the case of secondary distributions the average is 1.000.

Offering price relative (R-1). The sign on the market adjusted price relative for the period from day-1 to the offering indicates that higher spread and larger discounts tend to go together. The relationship is statistically significant in the case of secondary and combination issues,and the elasticity of GSP with respect to R-1 is on the order of -2 (evaluated at means). This implies that that a 1% decrease in the offering price is associated with a 2% increase in the percentage gross spread. The coefficient of R-1

is not statistically significant in the case of primary issue, but this may in part be due to the lack of variability of R-1 in this sample.[13]

An attempt was made to determine if the factors affecting GSP affect R-1 in the same way by regressing R-1 on the remaining independent variables.[14] No variables are statistically significant except EXCH in the secondary sample. The coefficient there indicates that discounting of the offering price from the prior closing price is approximately 1% greater on the AMSE than on the NYSE (holding constant other characteristics of the issue). The lack of significance of the other variables, particularly issue size, is surprising. The observed correlation between GSP and R-1 does not appear to be due primarily to common factors captured by the variables in this study. A possible explanation for the correlation is a bargaining factor independent of the characteristics of the issue and market with the result that issues in which a large spread is negotiated also tend to be priced at a larger discount.

VI. Post-Offering Price Behavior and the Role of Stabilization

This section seeks to determine whether the post offering price change is related to the way in which the spread is set. The hypothesis is that the post-offering price change is negatively related to the deviation of the spread from "normal" -- "low" spread followed by price increases, "high" spreads, by price declines. One might expect such a relation of the correlation between GSP and R-1 occurs because the offering price is set away from equilibrium. Then the return to equilibrium should be observed after the offering. A second factor which may influence the post offering price change is whether or not the issue is stabilized.

To test the above hypothesis, the following regression is estimated:

$$R+9 = a_o + a_1 U + a_2 STAB + e,$$

the variable, U, is the difference between the actual and estimated gross percentage spread (GSP). The estimated GSP, for each of the three issue types, is based only upon those variables shown in Table 4 with t value above one.[15] The variable, STAB, takes on the value one if stabilizing purchases were made by the managing underwriter and zero if no such stabilizing purchases were made. The results are in Table 5.

Neither U nor STAB is statistically significant in the case of

Table 5

Post-Offering Price Behavior, Regression Results

(t value in parentheses)

Dependent variable is R+9

Independent	Secondaries	Primaries	Combination
U	-.0145 (1.874)	.0004 (.028)	-.011 (.974)
STAB	-.0631 (3.617)	-.0208 (.749)	-.0500 (1.624)
CONS	1.0455 (67.96)	1.0178 (42.68)	1.0240 (38.12)
r^2	.1096	0.0	.0244

primary and combination issues. This may in part reflect the relative lack of significance of R-1 in the previous regression (Table 4) and in part the small sample size and lack of variability in some variables.

In the case of secondary distributions, the hypothesis tends to be supported. The market adjusted price relative is negatively associated with deviations of the spread from "normal." A spread one percentage point below normal implies a price increase 1.45 percentage points above normal. (Significantly different from zero at the 94% level of confidence). The stabilization variable is highly significant and negative indicating that stabilized issues have a price relative 6 percentage points lower than non-stabilized issues. This may reflect the fact that issues are only stabilized if prices tend to fall during the offering. It is difficult to understand,however, why the managing underwriter purchases stock to shore up a falling price. How is this profitable for him? This is particularly surprising in view of the fact that stabilized issues have lower gross spreads. Another explanation is the possibility that stabilizing purchases are made to cover overallotments made before the offering at the offering price. However one would generally expect overalloted issues to rise in price and not to require stabilization. Unfortunately data on overallotments are not available.

VII. Other Test of Market Efficiency

A. Serial correlation of prices

If the way in which the issue is marketed causes the price to deviate temporarily from equilibrium, one should be able to observe a negative correlation between price relatives before and after the offering date. This negative correlation is quite evident in the case of primary and combination issues. The correlation coefficient between R+9 and R-10 is -.33 in the case of primary issues and -.23 in the case of combination issues. This correlation is not however due to any interaction of R+9 with spread, and the relationship appears to be independent of where the spread is set.[16]

The relative significance of R-1 and I-1-10 (which are the two components of R-10) in explaining variations in R+9 is also revealing.

Primary Issues: $R+9 = \underset{(1.358)}{-.7599}\ R\text{-}1 - \underset{(2.282)}{.4041}\ I\text{-}1\text{-}10 + \underset{(3.683)}{2.1497}$ $\quad r^2 = .0805$

Combination Issues: $R+9 = \underset{(1.136)}{-.5897}\ R\text{-}1 - \underset{(1.716)}{.3000}\ I\text{-}1\text{-}10 + \underset{(3.443)}{1.8586}$, $\quad r^2 = .0300$

The pre-offering market price change is more significant than R-1, a variable which is more readily influenced by the underwriter.

This may be due to the fact that news of the impending offering causes the market price to overreact in one direction or another with the price return (in either direction) being observed subsequent to the offering.

In the case of secondaries, on the other hand, very little correlation of price relatives is observed,[17] and decomposition of R-10 into R-1 and I-1-10 reveals nothing.[18] The lack of results may be due to an interaction of included with omitted variables that would bias the findings. This problem is not as severe in the case of primary and combination issues since, as already indicated, price action there appears to be more independent of other variables. To be perfectly general, R+9 was regressed against GSP and all other variables listed on Table 4 and on STAB. In such a regression the negative relationship of price relatives before and after these offering is observed. The relationship is between R+9 and I-1-10 (not with R-1) and is significant at 93% level of confidence. The only other independent variables which are statistically significant are GSP and STAB.[19]

These results, although not strong, tend to imply that prices deviate from equilibrium and that the deviation occurs even before the offering price is set. This deviation is not readily observable in the case of secondaries because of the interaction of price and non-price variables.

B. Role of issue size in price movements

One expects liquidity costs to be associated with the size of the issue. If these costs are not fully reflected in the spread, they may show up as temporary price fluctuations. Neither R-1 nor R+9 is, however, correlated with size. (See discussion of R-1 in section V and footnote 16). Thus neither the discount of the offering price from prior closing price nor the post-offering price change is related to issue size. This implies that costs associated with size are captured by the spread and that price deviations which exist are related to other factors.

VIII. CONCLUSIONS

The study is concerned with the efficiency of the underwriter in bringing together buyers and sellers when large quantities of stock are involved and with the marketing strategies he uses.

A. Market efficiency

(1) On the average the gross spread accurately represents total underwriter compensation. The level of the spread, which averages above 5.5% across all issue types, indicates that the liquidity cost of large transactions is considerably greater than in the case of smaller transactions (where the total commission to buyer and seller is about 2%). Despite the fact that issues are priced at a discount from the previous closing price, there is no average tendency for prices to recover and no average direct or indirect supplement to underwriter compensation.

(2) In individual offerings the spread may not be an accurate measure of underwriter compensation since a trade-off can exist between the spread and the post-offering price change. Effective compensation may be reduced by inventory losses or augmented by price appreciations of the inventory or by customer goodwill. In the case of secondary distributions a negative correlation between spread and post-offering price change exists which implies that

the underwriter is able to anticipate the price change or cause it to arise. In a perfectly efficient market (without transactinn costs) neither would be possible and the offering price would be set at the equilibrium value of the stock.

(3) In the case of all issue types there is a negative dependence in successive price relatives, and this supports the possibility that the offering price is not at equilibrium. In an efficient market price changes are not serially correlated.

(4) The relative lack of association of R-1 and R+9 implies that the observed discount reflects an information effect. The fact that larger discounts also imply larger spreads suggests that the information is associated with greater uncertainty which necessitates a larger spread.

(5) The lack of correlation between R-1 or R-9 and issue size implies that inefficiencies are not related to issue size but to other characteristics of the issue or the underwriter which were not observed.

B. Underwriter strategy

Two strategies causing the issue to be priced away from the equilibrium price may be followed by the underwriter. One strategy, presumably favored by the issuer, would set the offering price too high causing the issue to be sold on a price discriminating basis. Anxious buyers would buy on the first day and less anxious buyers

would be brought in over time with price reductions and greater selling effort. The underwriter would presumably receive a greater than normal commission to compensate him for the higher costs. The proceeds to issuer of this procedure would be enough greater to warrant the higher commission.

A second strategy, presumably favored by the underwriter, would set the offering price too low thereby bringing about quick sale of the issue. Since the underwriter would experience lower costs and might be able to benefit favored customers in this way, he would be willing to accept a less than normal commission.

In the case of secondary distributions the observed negative association between U and R+9 is consistent with both strategies. The fact that R+9 averages slightly less than one implies that the price discrimination strategy is employed slightly more frequently. The fact that R+9 is not significantly correlated with R-1 is inconsistent with both strategies because R-1 is the price variable most easily influenced by the underwriter.

Existing evidence on the pricing strategy is as mixed as these results. The second strategy appears to be followed in the case of unseasoned new issues [7] and block trades [2]. The first strategy appears to be used in the case of secondary distributions [4].[20]

Stabilization is related to the post offering price change, particularly in the case of secondary distributions, and such activity

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[1]Longer run price effects are examined in [1], [4].

[2]The existence of a secondary market prior to the offering provides a standard against which the offering price can be compared. Unseasoned new issues would have posed a much more difficult problem.

[3]No dividends were paid during the intervals studied.

[4]For the purpose of this calculation M is the Fisher Combination Index. In the case of some stocks, data for the entire period were not available. I am grateful to Marshall Blume and Frank Husic for providing me with these calculations.

[5] Figures for the price decline over the 30 calendar days before the offering are close to the decline over the 10 trading day period.

[6]That is the price may be justified in that it reflects bad news. The fact that bad news systematically accompanies underwritten offerings may suggest inefficiencies in the information dissemination process. For example, offerings may occur when insiders have information leading them to believe the stock is overvalued. I wish to thank Irwin Friend for making this point.

[7]See [3].

[8]Both buyer and seller pay commissions in block trades and the figure given refers to the sum of the two. In underwritten offerings only the seller pays a commission.

[9]Block trading has, partially as a result of these cost differences, grown much more rapidly in recent years. See [2]

for a discussion of the costs of block trading. Scholes [4] argues, however, that commissions on secondary distributions are only 2%.

[10] For issues sold after the market closes on the offering day, it would have been appropriate to make the comparison with the market closing price on the offering day. Since the time of the offering was unavailable, the previous day's close was used.

[11] Elasticity, $E = \frac{\partial GSP}{\partial S} \cdot \frac{S}{GSP} \doteq \frac{\partial \ln GSP}{\partial \ln S}$. S is the dollar size of the issue, and V = ln S. Therefore $E \doteq \frac{\partial GSP}{\partial V} \cdot \frac{1}{GSP} = \frac{-.63}{5.7} = .12$, and $\frac{-.48}{5.9} = .08$, and $\frac{-.70}{6.3} = -.11$.

[12] See [7] for a discussion of the price performance of unseasoned small new issues.

[13] The mean price relative is .985 and the variance carried to the third decimal is .000.

[14] The regression results follow. R-1 is dependent variable. Numbers in parentheses are t values.

	Secondaries	Primaries	Combination
V	-.001(.36)	+.002(.71)	-.001(.12)
UW	+.001(.28)	-.001(.27)	+.001(.40)
EXCH	+.012(2.15)	-.002(.33)	+.004(.47)
BETA	+.001(.30)	-.009(1.31)	-.001(.28)
MTRND	+.002(.53)	+.008(1.85)	+.003(.72)
MVAR	-.001(.36)	-.002(.81)	+.001(.45)
I-1-10	-.058(1.70)	-.029(.61)	-.009(.22)
CONSTANT	+1.021(20.51)	.957(15.24)	.949(15.29)
r^2	.018	.008	0.0

[15]Re-estimation with fewer independent variables did not change any of the remaining coefficients.

[16]As Table 5 indicates there is no association of R+9 and the unexplained element of spread, U. Similarly, no association exists if R+9 is regressed directly on GSP (holding other variables constant).

[17]The correlation between R+9 and R-10 is -.07.

[18]The regression is

$$R+9 = \underset{(.361)}{.1229}\ R\text{-}1 - \underset{(.765)}{.0913}\ I\text{-}1\text{-}10 + \underset{(2.572)}{.9665}, \quad r^2 = .003$$

[19]The regression (for secondary distributions) is

$$R+9 = \underset{(1.973)}{-.0153}\ GSP - \underset{(.363)}{.0037}\ V + \underset{(.389)}{.0030}\ UW + \underset{(.121)}{.0026}\ EXCH - \underset{(.576)}{.0064}\ BETA$$

$$- \underset{(.762)}{.0086}\ MTRND + \underset{(.672)}{.0034}\ MVAR - \underset{(1.789)}{.2097}\ I\text{-}1\text{-}10 - \underset{(.668)}{.2311}\ R\text{-}1$$

$$\underset{(4.038)}{-.0774}\ STAB + \underset{(3.877)}{1.6563}, \quad R^2 = .1044$$

In the case of primary and combination issues the coefficient of I-1-10 is slightly more significant and larger, the coefficient of GSP is totally insignificant and the coefficient of STAB is much less significant. No new variables become significant.

[20]Scholes does not discuss underwriting strategy explicitly but the results in his Tables 3 and 7 tend to imply that the first strategy is followed.

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