

## **SEASONED EQUITY OFFERINGS An Empirical Investigation\***

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This study examines common stock price adjustments to announcements of underwritten common stock offerings. On average, a negative stock price change is observed, which is larger for industrials than for public utilities. Combination primary–secondary stock offerings and dual stock–bond offerings exhibit similar negative announcement effects. Combination offerings involving decreases in management shareholdings exhibit significantly larger negative announcement effects. Cross-sectional analysis of stock announcement returns indicates a positive relationship to firms' leverage changes, and a negative relationship to prior stock returns and (for industrials) to decreases in management shareholdings.

### **1. Introduction and review of literature**

Recent empirical research in corporate finance finds that corporate financing and capital expenditure decisions are often associated with price adjustments in firms' securities. This paper documents security price changes which occur on the announcement of seasoned equity offerings, investigates the circumstances surrounding their issuances and explores the possible causes of these price adjustments.<sup>1</sup>

Common stock offerings have two major impacts on a firm: (1) the increase in equity capital lowers the firm's leverage, and (2) the proceeds are generally used to finance capital expenditures. As indicated in the extant empirical literature, financial decisions which change firm leverage and revisions in capital expenditure plans are associated with qualitatively similar changes in

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<sup>1</sup>Other recent studies of stock offerings are Smith (1977), Korwar (1982), Asquith and Mullins (1986) and Mikkelsen and Partch (1986). This paper is an extension of the earlier Korwar study.

stock price.<sup>2</sup> In addition, stock offerings typically alter management's fractional ownership of a firm's stock. Recent empirical evidence indicates that changes in management stock ownership are associated with like changes in firm value.<sup>3</sup> Thus, stock price reactions to stock offering announcements can potentially be either positive or negative. A study of stock offering announcements and the associated changes in firm asset and capital structure will further our understanding of these relationships.

In the following analysis we examine: primary stock offerings, combination primary-secondary stock offerings, and dual primary offerings of stock and bonds. The different characteristics of these seasoned common stock offerings present an opportunity to separately test competing theoretical predictions which propose differing price reactions to common stock offerings. However, these theories which predict stock price adjustments to capital structure and capital expenditure changes that typically occur contemporaneously with stock offering announcements, are not mutually exclusive and give similar predictions in a number of cases.<sup>4</sup>

The Leland and Pyle (1977) signalling model predicts that changes in management stockholdings cause like changes in firm value.<sup>5</sup> Investors assume correctly that management is better informed about the expected future cash flows and that from a diversification standpoint, it is costly for managers to hold a significant fraction of firm stock. Thus, managers have incentives to hold large stock positions only if they expect the future cash flows to be high relative to the firm's current value. Rational investors will consider managers' fractional stock ownership to be a credible signal of firm value. Thus, a decrease in managements' fractional shareholdings, induced by a stock offering to outside investors, is a negative signal about firm value. This prediction is empirically supported in a study of initial public offerings of stock by Downes and Heinkel (1982).

In a second signalling model by Miller and Rock (1985), changes in outside financing are signals to investors of opposite changes in firms' current earnings.

<sup>2</sup> For example, see studies of capital structure changes by Masulis (1980a,b, 1983), Dann (1981), Dann and Mikkelsen (1984), Eckbo (1986) and Mikkelsen and Partch (1986) and a study of capital expenditure revisions by McConnell and Muscarella (1985). For a more comprehensive survey, see Smith (1986).

<sup>3</sup> For example, see Vermaelen (1984).

<sup>4</sup> In addition to the hypotheses mentioned below, stock offerings have the effect of decreasing senior securityholder risk-taking by decreasing leverage, without altering their promised compensation. This induces a wealth redistribution from common stock to debt, an issue analyzed in Galai and Masulis (1976). Korwar (1982) presents some limited evidence on straight bond returns which indicates that this effect is not large, though most of his bonds are issued by public utilities.

<sup>5</sup> In another signalling model, Ross (1977) posits compensation schemes which motivate managers to signal their inside information on firm value through like directional changes in leverage. The market interprets these as credible signals since weaker firms that falsely signalled would bear penalties in the form of higher expected bankruptcy costs. It follows that a stock offering, by decreasing leverage, sends a negative signal about firm value.

This prediction is derived from the firm's sources and uses of funds constraint assuming that investment decisions on average are unchanged. Thus, this model predicts a negative stock price reaction proportional to the dollar size of announced security offerings which should be larger for dual debt–common stock offerings than for the stock offerings alone.

In the Myers and Majluf (1984) adverse selection model, rational investors presume that on average managers approve stock offerings when, based on their superior information, they believe the stock is overvalued. This follows from the assumption that manager decisions are made on behalf of existing shareholders, who gain if additional stock is sold when it is overvalued and lose if additional stock is sold when it is undervalued relative to managers' superior information. Consequently, rational investors will lower their assessment of the stock's current value whenever a stock offering is announced. Much smaller announcement effects should be observed for offerings of straight debt. Thus, dual debt–common stock offerings should have smaller announcement effects than a stock offering of equal dollar value.

Agency theory models as developed by Jensen and Meckling (1976) predict that larger percentage shareholdings by management decrease the potential conflicts of interest between managers seeking to maximize their own utility and outside shareholders seeking to have share value maximized. Thus, any increase in outstanding shares, which decreases management percentage shareholdings, is predicted to have a negative impact on firm value and stock price. The larger the proportional size of the stock offering, the larger the predicted negative effect on the firm (assuming management does not subscribe to the offering), which is further exacerbated by management share sales, which often occur in combination primary–secondary stock offerings.<sup>6</sup>

Masulis (1983) observes that if managers adjust financial leverage to maximize firm value, changes in management information regarding a firm's expected cash flow is signalled to investors through changes in leverage, given that tax rates, expected bankruptcy costs and non-debt tax shields are relatively stable. This can be viewed as an extension of the DeAngelo and Masulis (1980) optimal capital structure model where changes in firms' expected cash flows induce positively correlated changes in optimal leverage levels. Thus, rational investors infer that a decrease in leverage, caused by an equity offering possibly coupled with a decrease in outstanding debt, is a negative signal of firm value.

All of these theories relating to capital structure consistently predict that stock offering announcements will lower stock prices; several predict that the decline is related to the proportional change in shares outstanding. Nevertheless, since predicted causes of these price changes are different, we can

<sup>6</sup>Stock offerings can also decrease management's relative voting power, assuming their voting rights are not in excess of 50% and that they are not purchasing additional shares.

empirically test these models by analyzing the relationships between the stock's announcement price change and various explanatory variables, e.g., changes in leverage, percentage of outstanding stock and the use of the equity offering proceeds. In addition, differences in market reactions to regulated public utility and industrial firm announcements of stock offering are examined. Pre-announcement data which can improve the market's ability to predict the forthcoming equity offering is also explored.

With respect to capital expenditure revision, a signalling model developed by Trueman (1985) predicts that capital expenditure increases will be accompanied by positive stock price reactions. Evidence on such reactions, however, is limited. In the only recent study, McConnell and Muscarella (1985) assume that managers are motivated to maximize current securityholder wealth through the acceptance of positive net present value investment projects. Thus, when a firm unexpectedly announces a capital expenditure increase, investors adjust its market value upwards; with a capital expenditure decrease, a downward adjustment occurs. McConnell and Muscarella find that on average stock prices rise approximately one percent with capital expenditure increases (treating last year's expenditure level as this year's expectation) and fall approximately one percent with capital expenditure declines. These findings suggest that the predicted negative stock price reaction to equity offering announcements can be partially offset by contemporaneous announcements of capital expenditure increases which are often made explicitly or implicitly.

The remainder of this paper is organized as follows. First, the descriptive statistics of the seasoned equity offering sample are presented. Second, evidence is reported on the average announcement effects for the daily stock returns of the entire sample of primary, combination and dual offerings and for various subsamples. This is followed by a cross-sectional regression analysis of the announcement period stock returns and resulting parameter estimates are used to test the descriptive validity of the various theories described above.

## 2. Sample design and description

An initial sample of seasoned issues of common stock is identified from company announcements reported in the *Wall Street Journal Index* and the *Investment Dealer's Digest* over the period 1963–1980. The final sample satisfied the following selection criteria:

- (a) The common stock is listed on either the NYSE or AMEX at the offering announcement date, and remains listed for the following 61 trading days.
- (b) The date of the initial public announcement is unambiguously identified in the *Wall Street Journal*, Predicast's *F&S Index of Corporations and Industries*, or the *Registered Offering Statistics* (ROS) tape of the Securities and Exchange Commission (SEC). Shelf registrations are excluded.

- (c) No simultaneous announcements of preferred stock or warrant offerings occur.
- (d) The issue is an underwritten public offering. Rights offerings are excluded.
- (e) Secondary stock offerings (secondary distributions) not in combination with primary stock offerings are excluded.

Included in the sample are primary stock offerings, combination primary-secondary stock offerings where the managements' percentage shareholdings can change by more than the change in an individual share's fractional equity claim, and dual debt-equity offerings where small decreases in leverage can occur. Stock offerings are often reported in the *Wall Street Journal* several days prior to registration with the SEC. The public sale or 'issuance' date of the offering follows the initial announcement by a month, on average. The announcement date is taken to be the earlier of the registration date or the trading day preceding the day the *Wall Street Journal* reports the offering. While most offerings are negotiated firm commitment underwriting contracts, a number of public utilities chose underwriters through competitive bidding.

Table 1 presents the distribution of stock offerings by type of issuer, issue type, and calendar year of the 1963-1980 sample period. The final sample contains 972 primary stock offerings, 242 combination offerings, and 182 dual offerings. Of the overall sample, 1085 offerings are by NYSE listed firms and 321 are by AMEX listed firms. Stock offerings in the second half of the period dominate the sample, with the largest number of offering announcements occurring in 1971 and 1980.<sup>7</sup> Public utility offerings appear more frequently than industrial offerings in the period 1973-1979, even though they represent only a small fraction of NYSE/AMEX listed stocks. Nearly all public utilities in the sample are NYSE listed, all but one of the combination primary-secondary offerings are by industrial firms, and most dual offerings are by public utilities. The overall stock offering sample contains 690 issues by industrial firms and 716 issues by regulated public utilities.

Of 679 separate issuers of common stock, 546 are by industrial firms and 133 are by public utilities. Table 2, which shows the number of stock offerings made by these issuers over the sample period, indicates that of the 1406 announcements, 959 represent repeated offerings by individual issuers, of which 712 are made by regulated utilities. Of the 739 offerings by issuers making three or more public sales of stock within the sample period, 663 are by public utilities, and many of these repeated utility offerings occur within a year of each other. This evidence suggests that the market is more likely to anticipate offering announcements of repeated issuers which are primarily public utilities.

<sup>7</sup>The yearly frequencies of seasoned issues of stock by industrial firms are quite similar to those for initial public offerings of stock documented in Ritter (1984).

Table 1

Yearly common stock offering announcements by NYSE/AMEX listed industrial firms and regulated utilities.

Year	Total offerings	Industrial offerings				Public utilities offerings		
		Total	Primary	Combination <sup>a</sup>	Dual	Total	Primary	Dual
1963	4	2	1	0	1	2	1	1
1964	17	10	5	5	0	7	5	2
1965	11	11	5	6	0	0	0	0
1966	17	10	7	3	0	7	5	2
1967	27	24	10	13	1	3	3	0
1968	55	48	22	21	5	7	7	0
1969	51	38	18	19	1	13	11	2
1970	61	36	19	15	2	25	19	6
1971	154	109	44	58	7	45	25	20
1972	115	65	31	32	2	50	41	9
1973	62	16	12	4	0	46	41	5
1974	67	9	7	2	0	58	45	13
1975	117	33	22	8	3	84	59	24
1976	123	46	35	8	3	77	59	18
1977	91	20	4	6	10	71	60	11
1978	126	52	28	10	14	74	67	7
1979	110	44	25	10	9	66	63	3
1980	198	117	93	21	3	81	73	8
Total	1406	690	388	241	51	716	584	131

<sup>a</sup>Combination primary-secondary stock offerings were made entirely by industrial firms with the exception of one public utility offering in 1975.

Table 2

Number of equity offerings per NYSE/AMEX listed stock, 1963-1980.

Number of offerings per firm	Industrials			Public utilities		
	Firms (no.)	Offerings (no.)	(%)	Firms (no.)	Offerings (no.)	(%)
1	428	428	62	19	19	3
2	95	190	27	15	30	4
3	18	54	8	12	36	5
4	3	12	2	14	56	8
5	2	10	1	14	70	10
6	0	0	0	10	60	8
7	0	0	0	16	112	16
8	0	0	0	8	64	9
9	0	0	0	9	81	11
10	0	0	0	4	40	6
11	0	0	0	5	55	8
12	0	0	0	4	48	7
13	0	0	0	2	26	4
14	0	0	0	0	0	0
15	0	0	0	1	15	2
Total	546	694	100	133	712	101

Prospectuses are the source of the firm's planned use of offering proceeds. In 372 cases, firms plan to use the proceeds *exclusively* to refund outstanding debt, almost invariably short-term notes (hereafter 'Debt Reductions'). In 135 cases, firms plan to use the entire proceeds for capital expenditures (hereafter 'Capital Expenditures'). In 179 cases, the proceeds are to be used for both purposes (hereafter 'Mixed Uses'), and in the remaining cases the planned use of proceeds is unknown. Prior shareholder authorizations of new shares are taken from the *Wall Street Journal Index*.

Table 3 presents means and medians for the dollar size of the offering, percentage change in shares outstanding, book value of assets, leverage ratios immediately prior to the offering, and offer-induced changes in leverage. The firm's leverage ratio is defined as book value of current plus long-term debt divided by book value of current plus long-term debt plus market value of the common and preferred stock. When market value of preferred stock is unavailable, involuntary liquidation value is used. Information on book value of debt and book value of assets is taken from the annual *COMPUSTAT Industrial File* and various *Moody's Manuals*. The offer induced change in firm leverage is defined as

$$\Delta LEV = \frac{D + (1 - \alpha) \Delta D - \beta \Delta E}{D + P + E + (1 - \alpha) \Delta D + (1 - \beta) \Delta E} - \frac{D}{D + P + E},$$

where  $D$ ,  $P$  and  $E$  represent the pre-announcement market values of the debt, preferred stock and common stock, respectively,  $\Delta D$  and  $\Delta E$  represent the debt and stock offering proceeds respectively, and  $\alpha$  and  $\beta$  represent the portion of the debt and equity proceeds used to retire outstanding debt.

The dollar size of the common stock offerings by industrial firms has a mean of \$27.5 million and a median of \$14.4 million, while the size of offerings by public utilities has a mean of \$46.6 million and a median of \$35.8 million. In both cases, stock offerings typically represent a 10% to 12.5% increase in outstanding shares. The offering induced leverage change has mean and median values of  $-4.7$  and  $-3.6$  for industrials and  $-2.4$  and  $-2.8$  for public utilities. The leverage change in both samples is typically smaller for dual offerings in relation to primary stock offerings. The mean and median pre-offering leverage ratios are 0.30 and 0.26 for industrials and are both 0.52 for public utilities.

Table 4 displays the medians and interquartile ranges for firm's leverage ratios at fiscal year ends for the offering year and the five years preceding and following, broken down by issuer and type of issue. For industrial firms, the mean leverage reduction is completely offset within three years (years 0 through 2). For public utilities, the leverage reduction following the common stock offering (years 0 and beyond) appears to represent a long-term rather than a transitory capital structure change.

Table 3

Descriptive statistics of issuer and offering characteristics, means and medians (in parentheses) by category.

Sample category	Issue size (\$MM)	Change in shares (%)	Firm total assets (\$MM)	Pre-offering leverage (prior year)	Leverage change (%)
<i>Total sample</i>	37.7 (22.6)	12.5 (10.8)	1326 (539)	0.42 (0.47)	- 3.6 (- 2.9)
<i>Industrials</i>	27.5 (14.4)	14.2 (11.4)	666 (172)	0.30 (0.26)	- 4.7 (- 3.6)
Issue type					
Primary	36.5 (19.5)	14.8 (12.5)	949 (243)	0.32 (0.29)	- 5.1 (- 3.7)
Combination <sup>a</sup>	27.7 (14.7)	14.6 (11.6)	661 (168)	0.28 (0.24)	- 4.8 (- 3.7)
Dual <sup>a</sup>	26.1 (10.7)	10.4 (9.3)	725 (213)	0.46 (0.46)	- 2.6 (- 2.4)
Use of proceeds					
Capital expenditures	33.1 (15.9)	11.0 (10.5)	1113 (288)	0.35 (0.31)	- 1.6 (- 1.6)
Debt reductions	29.5 (17.7)	11.8 (10.2)	636 (275)	0.34 (0.30)	- 7.1 (- 6.4)
Mixed uses	21.3 (14.9)	12.5 (10.5)	349 (166)	0.23 (0.17)	- 5.6 (- 4.4)
<i>Utilities</i>	46.6 (35.8)	10.9 (10.3)	1898 (1145)	0.52 (0.52)	- 2.9 (- 2.8)
Issue type					
Primary	50.2 (39.0)	10.9 (10.2)	2081 (1305)	0.53 (0.52)	- 3.0 (- 2.9)
Dual <sup>a</sup>	30.5 (22.6)	11.1 (10.7)	1069 (780)	0.50 (0.52)	- 2.3 (- 2.3)
Use of proceeds					
Capital expenditures	56.0 (37.7)	9.4 (9.2)	3264 (1569)	0.47 (0.51)	- 1.1 (- 1.1)
Debt reduction	43.2 (28.5)	11.1 (10.7)	1821 (986)	0.54 (0.53)	- 3.2 (- 3.0)
Mixed uses	50.4 (48.9)	12.2 (11.4)	1554 (1930)	0.50 (0.51)	- 3.0 (- 2.8)

<sup>a</sup> These statistics are for the primary offering components of all the offerings.



Table 4

Mean and median (in parentheses) firm leverage ratios in years surrounding the stock offering.<sup>a</sup>

Sample category	Year	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
<i>Total sample</i>		0.54 (0.55)	0.54 (0.55)	0.54 (0.56)	0.54 (0.56)	0.54 (0.55)	0.52 (0.53)	0.52 (0.53)	0.52 (0.53)	0.52 (0.52)	0.51 (0.52)	0.50 (0.51)
<i>Industrials</i>		0.48 (0.47)	0.48 (0.48)	0.49 (0.49)	0.50 (0.50)	0.49 (0.50)	0.45 (0.45)	0.47 (0.47)	0.49 (0.48)	0.50 (0.48)	0.48 (0.48)	0.48 (0.48)
Primary		0.49 (0.47)	0.49 (0.48)	0.49 (0.49)	0.51 (0.52)	0.51 (0.52)	0.47 (0.47)	0.48 (0.48)	0.49 (0.48)	0.49 (0.48)	0.49 (0.48)	0.49 (0.48)
Combination		0.46 (0.46)	0.47 (0.46)	0.46 (0.48)	0.46 (0.47)	0.46 (0.47)	0.41 (0.41)	0.44 (0.44)	0.48 (0.46)	0.50 (0.47)	0.45 (0.47)	0.45 (0.45)
Dual		0.54 (0.60)	0.52 (0.57)	0.53 (0.58)	0.55 (0.57)	0.55 (0.60)	0.51 (0.55)	0.54 (0.56)	0.55 (0.56)	0.55 (0.58)	0.54 (0.58)	0.54 (0.55)
<i>Utilities</i>		0.56 (0.56)	0.56 (0.56)	0.57 (0.56)	0.57 (0.57)	0.57 (0.56)	0.55 (0.55)	0.54 (0.54)	0.54 (0.53)	0.53 (0.53)	0.53 (0.52)	0.52 (0.52)
Primary		0.56 (0.56)	0.56 (0.56)	0.57 (0.57)	0.57 (0.56)	0.56 (0.56)	0.55 (0.55)	0.55 (0.54)	0.54 (0.53)	0.53 (0.53)	0.53 (0.52)	0.52 (0.52)
Dual		0.57 (0.56)	0.57 (0.56)	0.57 (0.56)	0.57 (0.57)	0.57 (0.56)	0.56 (0.55)	0.54 (0.54)	0.54 (0.53)	0.53 (0.53)	0.53 (0.53)	0.51 (0.51)

<sup>a</sup>Based on fiscal year end figures for face value of short-term and long-term debt, involuntary liquidation value of preferred stock plus market value of common stock. The sample includes only firms with a full set of eleven yearly observations.

### 3. Security price responses to stock offering announcements

Common stock return behavior around the offering announcement date is studied using the 'comparison period return' approach developed by Masulis (1980a).<sup>8</sup> Daily stock return data are obtained from the Center for Research in Security Prices (CRSP) at the University of Chicago. The announcement period is defined as the stock offering announcement date as well as the following trading day, since the announcement could have occurred after the close of trading on event day zero. Each trading day is defined in event time by the number of trading days preceding or following the announcement date. The average daily return for the 60 trading days immediately following the announcement period is defined as the comparison period, and is presumed to estimate the stock's 'normal' rate of return given stationarity of the returns process.<sup>9</sup>

<sup>8</sup>Brown and Warner (1980, 1984) present evidence supporting the power of this methodology for non-clustered announcement dates.

<sup>9</sup>The offering induced change in leverage is assumed to have a negligible effect on a stock's expected return in the post-announcement period.

A portfolio daily return is calculated for each event day by taking an equally weighted average of individual securities' raw returns. The difference between the portfolio mean daily return over the announcement and comparison periods measures the average impact of stock offering announcements on security values. Its significance is tested by a one-tailed *t*-test of the difference in the above two means where the alternative hypothesis is that the announcement mean is less positive.<sup>10</sup> A Fisher sign test, which is insensitive to the influence of outliers, also is employed to assess the significance of this announcement effect. This non-parametric test is based on the signs of the differences in mean daily returns over the announcement and the comparison periods for each security in the sample. A *z*-statistic is computed using the normal approximation to the binomial distribution; the null hypothesis is that the announcement period mean daily return minus the comparison period mean daily return is equally likely to be positive or negative. Again, the alternative hypothesis is that the announcement period mean is less positive.<sup>11</sup>

Many of the following tables present time series samples of daily returns for two equally weighted portfolios of common stocks over a 42-day period surrounding offering announcement dates. Column 1 represents the event date. Columns 2 and 5 represent portfolio daily returns. Columns 3 and 6 represent average daily returns of the CRSP equally weighted market index, and columns 4 and 7 represent the percent of the stock portfolio having strictly negative daily returns. This data is followed by pre-announcement and post-announcement mean daily returns for the portfolio and market index and the percent of the stock portfolio's daily returns strictly negative. Deciles of the portfolio two-day announcement period returns follow.

### 3.1. *Evidence on differences in industrial firms and public utilities*

Since public utility's investment and financing decisions are highly regulated (e.g., stock offerings may require state utility commission approval, or the offering may be mandated if a rate increase is to be approved), their announcement effects are separately studied. Further, knowledge of current regulatory policy and the tendency of utilities to make repeated stock offerings suggests greater market anticipation of utility offering announcements and thus smaller stock price reactions.

Table 5 presents the time series of stock portfolio daily returns of industrial firms and public utilities for primary stock offerings. The results show that

<sup>10</sup> The standard *t*-statistic of the difference in means of two independent samples is used. The standard deviations for the announcement period and comparison period mean daily returns are calculated from the time series of portfolio daily returns over the two-day announcement period and the 60-trading-day comparison period, respectively. See Mood, Graybill and Boe (1974, p. 435) for further details.

<sup>11</sup> For further reference, see Hollander and Wolfe (1973, pp. 39–45).

Table 5

Common stock portfolio returns surrounding primary offering announcements of seasoned common stock by industrial firms and public utilities.<sup>a</sup>

Event day	Industrial firms ( $N = 388$ )			Public utilities ( $N = 584$ )		
	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)
-20	0.45	0.16	37	0.12	0.14	35
-19	0.39	0.17	42	0.10	0.15	37
-18	0.41	0.18	44	0.15	0.18	35
-17	0.19	0.10	41	0.06	0.16	38
-16	0.27	0.17	44	0.08	0.14	34
-15	0.14	0.17	43	0.11	0.13	35
-14	0.42	0.19	38	0.01	0.16	40
-13	0.40	0.12	43	0.05	0.12	37
-12	0.19	0.10	41	0.06	0.09	38
-11	0.38	0.10	42	0.08	0.07	35
-10	0.09	0.10	43	-0.05	0.07	40
-9	0.30	0.18	43	0.06	0.10	36
-8	-0.13	0.11	48	0.00	0.14	38
-7	0.16	0.12	45	-0.06	0.13	39
-6	0.51	0.19	38	0.06	0.08	38
-5	0.28	0.18	40	0.01	0.07	39
-4	0.11	0.14	46	0.03	0.10	39
-3	0.30	0.10	40	-0.03	0.06	42
-2	0.21	0.17	42	-0.07	0.06	40
-1	-0.08	0.17	49	-0.12	0.07	41
0	-2.20	0.05	71	-0.39	0.07	50
1	-1.05	0.01	58	-0.29	0.05	47
2	0.07	-0.00	48	-0.07	0.02	40
3	0.06	0.06	44	-0.11	0.04	43
4	0.15	0.05	44	0.04	0.10	39
5	0.11	0.02	50	-0.03	0.10	40
6	-0.14	0.01	51	0.01	0.09	40
7	-0.20	-0.02	48	-0.02	0.06	38
8	0.15	-0.02	41	0.09	0.05	39
9	-0.09	0.02	46	0.02	0.10	39
10	0.00	0.01	45	0.01	0.08	38
11	0.08	0.01	45	0.03	0.11	36
12	0.03	0.05	45	0.09	0.05	35
13	0.12	0.03	41	0.05	0.06	37
14	0.07	-0.00	46	0.02	0.05	35
15	0.35	0.10	40	0.03	0.06	34
16	0.02	-0.03	48	0.03	0.07	36
17	-0.05	-0.04	46	0.03	0.07	34
18	0.12	0.02	43	0.06	0.03	32
19	-0.06	-0.03	45	0.06	0.04	34
20	0.06	-0.03	44	-0.04	-0.03	36
21	-0.19	0.00	50	0.17	0.03	32

Table 5 (continued)

<i>Pre-announcement period<sup>b</sup></i>		
Portfolio mean daily return = 0.31%	Portfolio mean daily return = 0.05%	
(0.161)	(0.066)	
Market mean daily return = 0.17%	Market mean daily return = 0.11%	
(0.042)	(0.039)	
Percent of stock returns < 0 = 41.8	Percent of stock returns < 0 = 37.2	
(2.67)	(1.94)	
<i>Post-announcement comparison period<sup>b</sup></i>		
Portfolio mean daily return = 0.06%	Portfolio mean daily return = 0.02%	
(0.140)	(0.052)	
Market mean daily return = 0.04%	Market mean daily return = 0.06%	
(0.050)	(0.052)	
Percent of stock returns < 0 = 44.7	Percent of stock returns < 0 = 36.0	
(2.91)	(2.29)	
<i>Distribution of the portfolio announcement period returns</i>		
Decile	Industrial stock returns	Utility stock returns
10%	- 8.57	- 3.30
20%	- 6.58	- 2.18
30%	- 5.02	- 1.60
40%	- 4.01	- 1.08
50%	- 3.04	- 0.66
60%	- 2.13	0.00
70%	- 1.00	0.00
80%	0.00	0.80
90%	1.53	1.73

<sup>a</sup>Stock and portfolio returns are not adjusted for contemporaneous market effects.

<sup>b</sup>Pre-announcement and post-announcement periods are defined as the 60 trading days immediately preceding and following the announcement period. However, only the first 20 trading days of the 60-day pre-announcement and comparison periods are shown on the table. Standard deviations are in parentheses.

stock prices react negatively to announcements of planned sales of additional stock. While the average announcement period return for industrial firms is -3.25%, for public utilities it is a noticeably smaller -0.68%. This is consistent with the market anticipating public utility offerings to a greater extent than industrial and with smaller leverage changes found in the public utility sample. The observed negative announcement returns for the industrials and utilities have *t*-statistics of -11.3 and -24.2, respectively, which are statistically significant at the conventional 1% level in both cases. The two *z*-statistics for the sign tests also are significant at the 1% level, indicating that these negative portfolio announcement returns are not due to a few outliers, a

conclusion further supported by the deciles of the individual announcement period stock return distributions.

These results contrast sharply with the earlier results on capital structure changes. Masulis (1983) examines various types of exchange offers including issuance of common stock to retire debt or to retire preferred stock, and finds average announcement period stock returns of  $-9.91\%$  and  $-2.57\%$ , respectively. The primary stock offering announcement effect is much smaller in size than the debt exchange offer announcement effect even though a significant proportion of stock offerings is made to reduce short-term debt. Masulis (1980b), Dann (1981) and Vermaelen (1981) document average announcement period stock returns of approximately  $16\%$  for firm repurchases of common stock by tender offer. Dann reports that the mean and median size of the stock reacquired in these repurchases are  $14.6\%$  and  $11.9\%$  of shares outstanding respectively. Although the proportional change in common stock is very similar in magnitude for industrial stock offerings and tender offers (as seen from table 3), the average announcement period returns are very different, suggesting that some partially offsetting effect is occurring for primary stock offerings. A major difference between issuer exchange offers/tender offers and stock offerings, beyond the direction of the change in outstanding shares, is that the latter generally involves increases in capital expenditures, whereas the former do not necessarily involve capital expenditure decreases. (Exchange offers involve no necessary change in capital expenditures while tender offers are generally financed by both debt issuance and excess internally generated funds.) Thus, the evidence is consistent with a positive capital expenditure announcement effect partially offsetting the negative stock offering announcement. In addition, another difference between these events is the smaller size and duration of the stock offering induced leverage changes.

It also should be noted that the announcement effects of primary stock offerings are biased towards zero because they can be anticipated in varying degrees. For example, equity issues appear to occur more frequently following sustained stock price run-ups, announcements of major new capital expenditures and stockholder approvals of authorizations of new equity issues.

Table 5 also shows evidence that firms issue common stock following significant increases in stock prices. This is indicated by an average daily portfolio return for industrials and public utilities over the 60-day pre-announcement period of  $0.31\%$  and  $0.05\%$ , in contrast to  $0.06\%$  and  $0.02\%$ , respectively, for the 60-day post-announcement period. For the industrial firms, both stock and market daily returns appear to exhibit more pronounced run-ups in the pre-announcement period. Thus, the sizable positive stock returns preceding the announcement appear to be attributable in large part to high market returns for this period and also indicate that the pre-announcement stock returns exhibit a selection bias, which is the primary reason for using a post-announcement comparison period. This evidence of both an

average stock market gain and an average individual stock price rise prior to stock offerings is also consistent with evidence found by Taggart (1977) and Marsh (1979).<sup>12</sup>

### 3.2. *Cancellations*

Announced stock offerings are not always completed; in this sample, 28 proposed offerings are cancelled. In more than half of these case, the stated reason is a drop in the stock's market price in the period following the stock offering announcement. This sample provides corroboration that offering announcements release negative information concerning these firms' common stock prices. Using a two-day period to capture the price effect of the announced cancellation, an average daily stock return of 1.2% is observed, compared to an average offering announcement period return of -2.03% for the same stocks. To the extent that the cancellation announcement is interpreted by investors as merely a postponement of the issue, this cancellation effect would be predicted to be smaller than the announcement effect. Nevertheless, the important observation to be made here is that the cancellation announcement has a statistically significant *positive* price impact on the stock, indicating that not issuing the stock is positive information to the market.

### 3.3. *Relationships with other capital structure changes and other characteristics*

To analyze the causes and effects of primary stock offerings, the sample is separated by type of issuer, exchange listing, use of proceeds, pre-offer leverage relative to its prior four-year average, the size of the proportional change in outstanding shares, the pre-announcement stock price changes and by whether or not the firms have obtained additional stock authorization over the prior year. Table 6 presents stock portfolio announcement and comparison period average returns, percentage of stocks in a portfolio having negative announcement period returns, and test statistics for various classifications of the sample. The average common stock price reaction to the offer announcement is consistently negative and statistically significant at the 1% level in nearly all subsamples using both parametric and non-parametric tests.

The evidence in table 6 offers some interesting insights into the stock price reactions to primary offerings. Larger pre-announcement stock price run-ups are associated with larger stock price drops on the offering announcement. Proportionally larger changes in outstanding shares are associated with larger announcement returns for industrial firms and smaller announcement returns for public utilities. Average stock offering announcement effects are smaller for

<sup>12</sup> Behavior of common stock returns around the public offering date of the issue is being studied in a separate paper.

industrial firms if the firm has received stockholder authorization to increase outstanding shares in the prior year. However, the firm's pre-offering leverage ratio relative to its previous four-year mean does not appear on average to affect the announcement return.

The use of proceeds in both the industrials and utilities has no significant effect on average announcement returns. This may reflect the fact that most cases of debt reduction involve replacing short-term debt incurred funding recent capital expenditure projects where these short-term borrowings are likely to be renewed to finance additional capital expenditures. Thus, this use of proceeds may more appropriately be interpreted as an indirect form of capital expenditure financing.

Table 6

Primary stock offering announcement effects for various portfolios of common stock, 1963–1980.

Sample category	Mean two-day portfolio returns			Fraction of stock returns < 0	
	Announcement period (%)	Comparison period <sup>a</sup> (%)	<i>t</i> -value	Announcement period (%)	<i>z</i> -value
<i>Industrials</i> (388)	– 3.25	0.11	– 11.27	80.0	– 12.18
Exchange listing					
NYSE (255)	– 3.04	0.11	– 12.47	80.8	– 10.46
AMEX (133)	– 3.64	0.12	– 9.40	79.7	– 6.33
Use of proceeds					
Debt reductions (55)	– 3.84	0.10	– 9.47	87.3	– 5.80
Mixed uses (55)	– 2.52	0.08	– 8.77	80.0	– 4.72
Capital expenditures (63)	– 3.75	0.16	– 11.39	87.3	– 6.17
Pre-offer leverage relative to its historical average					
Low leverage (150)	– 3.55	0.06	– 10.38	81.3	– 7.35
High leverage (131)	– 3.65	0.15	– 10.28	82.4	– 7.95
Proportional change in shares outstanding					
Above median (175)	– 3.67	0.04	– 9.04	81.1	– 7.64
Below median (176)	– 2.87	0.06	– 11.90	77.8	– 8.44
Pre-announcement stock run-up					
Above median (194)	– 3.90	0.09	– 8.33	85.6	– 10.34
Below median (194)	– 2.59	0.03	– 21.72	75.3	– 6.89
Stock authorizations in the prior year (49)	– 2.73	0.14	– 6.70	73.5	– 3.00

Table 6 (continued)

Sample category	Mean two-day portfolio returns			Fraction of stock returns < 0	
	Announcement period (%)	Comparison period <sup>a</sup> (%)	t-value	Announcement period (%)	z-value
<i>Public utilities</i> (584)	-0.68	0.06	-24.20	67.0	-7.53
Exchange listing					
NYSE (574)	-0.69	0.04	-23.12	67.2	-7.51
AMEX (10)	0.01	0.07	-0.14	50.0	-0.63
Use of proceeds					
Debt reduction (244)	-0.85	0.03	-15.38	69.7	-5.25
Mixed uses (101)	-0.66	0.12	-14.21	65.3	-3.48
Capital expenditures (30)	-0.59	0.04	-6.88	70.0	-2.19
Pre-offer leverage relative to its historical average					
Low leverage (259)	-0.90	0.06	-26.23	66.2	-5.03
High leverage (325)	-0.51	0.03	-16.36	68.1	-5.60
Proportional change in shares outstanding					
Above median (273)	-0.55	0.03	-15.58	65.2	-4.30
Below median (274)	-0.86	0.01	-25.15	70.8	-6.28
Pre-announcement stock run-up					
Above median (292)	-1.00	0.07	-16.49	70.9	-6.91
Below median (292)	-0.35	0.03	-12.65	63.0	-3.75
Stock authorizations in the prior year (56)	-1.19	0.06	-16.77	75.0	-3.47

<sup>a</sup> The comparison period represents trading days +2 to +61 in event time.

While it is tempting to draw inferences from a comparison of the mean two-day announcement period returns of these subsamples, it would be premature to do so without controlling for potentially important differences in characteristics across the stock offering sample. This question is pursued more fully in section 4.

### 3.4. Combination primary-secondary common stock offerings

An important question involves whether primary stock offering announcement effects differ qualitatively from those of combination primary-secondary stock offerings, especially when members of senior management or the board of directors are selling a portion of their shareholdings. However, regardless of



whether or not the secondary offering involves management/board member share sales, pure secondary offerings have been found by Mikkelsen and Partch (1985a) to exhibit negative common stock announcement returns, averaging  $-2.87\%$  for the entire sample of secondary offerings and  $-2.57\%$  for registered secondary offerings not including management. This suggests that combination offering announcements should exhibit larger negative effects than primary offering announcements. The explanation for this is that the typical primary offering component of a combination offering in this sample is of similar size and induces a change in firm leverage similar to the sample of primary industrial offerings (see table 3); yet the combination offerings also include a secondary offering component exhibiting its own negative announcement effect.

Table 7 presents common stock portfolio returns for two subsets of combination offerings: those which do not involve any known sales of stock by management and combinations which do. The former portfolio exhibits a negative and statistically significant announcement period return of  $-2.22\%$ , with an associated  $t$ -statistic of  $-25.7$  (representing negative stock returns for 77% of the portfolio with an associated  $z$ -statistic of 6.6); while the latter portfolio, where management sales are involved, exhibits a much larger negative announcement period return of  $-4.54\%$  with an associated  $t$ -statistic of  $-20.0$  (representing negative stock returns for 89% of the portfolio with an associated  $z$ -statistic of 5.9). The  $t$ -statistic for the difference between these two portfolio announcement period returns is 26.4 which is statistically significant at the 1% level. Since these combination offerings are composed almost entirely of industrial firms, a comparison of these results with those of primary industrial offerings (as reported in table 5) is useful. The primary offerings have *larger* negative announcement returns than combination offerings which do not involve senior management or board member share sales. While table 3 indicates that combination offerings are of somewhat smaller size than primary offerings, this result appears to be at variance with the evidence of Mikkelsen and Partch that secondary offerings not involving management also have negative announcement effects. When combination offerings do involve management sales of stock, implying a relatively greater decrease in management's fractional ownership in firm equity than is the case with pure primary offerings, the announcement period returns are noticeably more negative than those exhibited by either combination offerings not involving management sales or primary industrial offerings. This result is consistent with the predictions of the Jensen and Meckling and Leland and Pyle models.

### 3.5. *Dual debt-common stock offerings*

Dual offerings of straight debt and common stock can have potentially different announcement effects from primary common stock offerings, as noted

Table 7

Common stock portfolio returns surrounding combination primary-secondary offering announcements of seasoned common stock, 1963-1980.<sup>a</sup>

Event day	Offerings without management share sales ( <i>N</i> = 186)			Offerings with management share sales ( <i>N</i> = 56)		
	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)
-20	0.38	0.11	44	0.21	0.11	41
-19	0.60	0.19	41	0.06	0.12	44
-18	0.76	0.09	35	0.35	0.12	41
-17	0.34	0.15	45	-0.01	0.11	52
-16	0.01	0.12	49	0.26	0.15	40
-15	0.83	0.16	34	0.81	0.10	31
-14	0.13	0.09	48	-0.03	0.02	52
-13	0.36	0.21	48	0.47	0.14	37
-12	0.17	0.15	44	0.56	0.31	39
-11	0.19	0.12	46	0.11	0.23	38
-10	0.13	0.24	47	0.70	0.22	38
-9	0.02	0.09	48	-0.57	0.11	45
-8	-0.23	0.07	52	-0.27	0.10	55
-7	0.04	0.14	45	-0.29	0.08	49
-6	0.22	0.04	45	0.33	0.04	38
-5	0.47	0.08	44	0.57	0.15	46
-4	0.23	0.13	44	0.17	0.16	46
-3	-0.19	0.07	44	0.57	0.16	45
-2	0.02	0.14	51	0.91	0.26	32
-1	-0.25	0.10	47	-0.15	0.18	48
0	-1.21	0.10	60	-2.69	0.02	80
1	-1.01	0.08	58	-1.88	-0.00	66
2	0.41	0.10	42	-0.06	0.07	50
3	0.06	0.06	44	-0.18	0.04	52
4	0.14	0.05	45	-0.09	-0.02	46
5	0.10	0.09	43	0.17	0.05	45
6	0.04	0.02	46	0.69	0.03	33
7	-0.03	-0.08	47	0.13	0.09	50
8	0.17	-0.07	47	0.58	-0.01	41
9	0.21	-0.04	45	0.12	-0.04	45
10	0.17	-0.03	45	-0.28	-0.06	43
11	0.11	-0.01	42	0.32	-0.06	36
12	0.03	0.12	46	-0.32	0.09	50
13	0.25	0.08	40	0.11	-0.10	52
14	0.33	0.14	41	-0.47	0.15	46
15	-0.01	0.06	46	0.23	0.24	46
16	0.13	0.01	41	-0.23	-0.05	43
17	0.11	0.06	43	0.05	0.07	41
18	0.37	0.16	37	0.19	0.11	46
19	0.22	0.13	45	0.10	0.02	54
20	0.23	0.06	45	0.44	-0.02	32
21	-0.36	-0.05	48	-0.41	-0.06	48

Table 7 (continued)

<i>Pre-announcement period<sup>b</sup></i>			
Portfolio mean daily return =	0.30%	Portfolio mean daily return =	0.37%
	(0.261)		(0.392)
Market mean daily return =	0.16%	Market mean daily return =	0.16%
	(0.059)		(0.095)
Percent of stock returns < 0 =	42.8	Percent of stock returns < 0 =	41.1
	(4.36)		(7.64)
<i>Post-announcement comparison period<sup>b</sup></i>			
Portfolio mean daily return =	0.08%	Portfolio mean daily return =	0.11%
	(0.217)		(0.351)
Market mean daily return =	0.04%	Market mean daily return =	0.04%
	(0.056)		(0.096)
Percent of stock returns < 0 =	44.4	Percent of stock returns < 0 =	43.1
	(3.19)		(6.45)
<i>Distribution of the portfolio announcement period stock returns</i>			
Decile	Stock returns for offerings without management sales	Stock returns for offerings with management sales	
10%	- 8.38	- 10.51	
20%	- 5.90	- 8.60	
30%	- 4.44	- 5.86	
40%	- 3.65	- 5.02	
50%	- 2.36	- 4.07	
60%	- 1.51	2.85	
70%	- 0.30	- 2.26	
80%	0.70	- 1.69	
90%	3.46	1.12	

<sup>a</sup>Stock and portfolio returns are not adjusted for contemporaneous market effects.

<sup>b</sup>Pre-announcement and post-announcement periods are defined as the 60 trading days immediately preceding and following the announcement period. However, only the first 20 trading days of the 60-day pre-announcement and comparison periods are shown on the table. Standard deviations are in parentheses.

earlier. Median face values for debt offerings by industrial firms and public utilities were \$32.5 million and \$35 million, respectively, which typically represented twice the dollar value of the equity component of a dual offering. There can also be differences in floatation costs between primary and dual offerings of similar size. However, an analysis of the uses of debt and equity proceeds in dual offerings indicates that in most cases debt offering proceeds are used to retire short-term borrowings, while equity offering proceeds are used for capital expenditures, as they are in primary stock offerings.

Table 8 separately presents common stock portfolio returns for dual offerings by industrial firms and public utilities. Announcements of dual offerings are associated with a negative and statistically significant two-day portfolio

Table 8

Common stock portfolio returns surrounding announcements of dual offerings of straight debt and common stock, 1963–1980.<sup>a</sup>

Event day	Industrial firms ( <i>N</i> = 51)			Public utilities ( <i>N</i> = 131)		
	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)	Portfolio returns (%)	Average market returns (%)	Negative stock returns (%)
-20	-0.31	0.15	50	-0.02	0.08	42
-19	-0.16	0.19	48	-0.11	0.14	38
-18	0.57	0.17	46	0.10	0.18	37
-17	0.66	0.24	34	0.03	0.03	41
-16	0.44	0.25	36	0.27	0.18	37
-15	-0.09	0.21	46	0.09	0.16	33
-14	0.75	0.29	36	0.19	0.12	25
-13	0.21	0.35	40	-0.16	0.03	45
-12	0.55	0.36	40	0.10	0.02	38
-11	0.20	0.11	34	0.13	0.09	38
-10	-0.15	0.20	52	0.21	0.17	33
-9	0.10	0.33	43	0.12	0.14	33
-8	0.34	0.30	34	0.25	0.13	34
-7	-0.08	0.34	50	0.16	0.13	34
-6	-0.29	0.19	47	-0.07	0.27	41
-5	0.12	0.13	37	0.06	0.16	35
-4	0.89	0.21	27	-0.04	0.11	37
-3	0.48	0.21	37	0.10	0.09	40
-2	0.14	0.24	33	-0.11	0.03	44
-1	-0.09	0.17	47	0.17	0.01	37
0	-1.71	0.21	75	-0.50	0.09	56
1	-0.97	0.14	57	-0.58	0.04	50
2	-0.15	0.20	47	-0.13	0.06	43
3	0.21	0.21	43	-0.01	0.15	45
4	-0.01	0.22	45	-0.18	0.10	47
5	-0.18	0.21	39	0.19	0.12	33
6	0.66	0.21	39	0.13	0.14	36
7	0.21	0.18	41	-0.30	0.07	46
8	0.54	-0.04	31	0.25	0.18	30
9	0.70	0.13	31	0.49	0.23	27
10	-0.05	0.28	43	0.02	0.12	38
11	-0.19	0.17	47	0.15	0.14	31
12	-0.22	0.02	45	-0.07	0.15	38
13	-0.04	0.08	39	-0.15	0.09	44
14	-0.03	0.03	37	0.12	-0.01	33
15	0.07	0.06	45	0.11	0.01	39
16	-0.16	0.32	51	0.05	-0.05	34
17	0.43	0.20	29	0.29	0.06	31
18	-0.06	0.03	51	-0.01	0.11	34
19	0.66	0.05	47	0.09	0.08	34
20	-0.43	0.15	41	-0.23	0.08	43
21	0.30	0.12	33	0.13	0.08	28

Table 8 (continued)

<i>Pre-announcement period<sup>b</sup></i>		
Portfolio mean daily return = 0.27%	Portfolio mean daily return = 0.06%	
(0.388)	(0.115)	
Market mean daily return = 0.22%	Market mean daily return = 0.09%	
(0.092)	(0.075)	
Percent of stock returns < 0 = 41.2	Percent of stock returns < 0 = 37.1	
(6.77)	(3.81)	
<i>Post-announcement comparison period<sup>b</sup></i>		
Portfolio mean daily return = 0.06%	Portfolio mean daily return = 0.03%	
(0.324)	(0.143)	
Market mean daily return = 0.09%	Market mean daily return = 0.07%	
(0.097)	(0.071)	
Percent of stock returns < 0 = 42.6	Percent of stock returns < 0 = 36.5	
(6.64)	(4.9)	
<i>Distribution of the portfolio announcement period stock returns</i>		
Decile	Industrial stock returns	Utility stock returns
10%	- 6.82	- 4.45
20%	- 4.49	- 3.16
30%	- 4.02	- 1.92
40%	- 3.57	- 1.23
50%	- 2.86	- 0.87
60%	- 1.99	0.00
70%	- 1.01	0.00
80%	0.00	0.71
90%	1.31	1.69

<sup>a</sup>Stock and portfolio returns are not adjusted for contemporaneous market effects.

<sup>b</sup>Pre-announcement and post-announcement periods are defined as the 60 trading days immediately preceding and following the announcement period. However, only the first 20 trading days of the 60-day pre-announcement and comparison periods are shown on the table. Standard deviations are in parentheses.

return of -2.68% and a *t*-statistic of -12.7 for industrial firms (representing negative stock returns for 84% of the sample with an associated *z*-statistic of 4.9), and with a less negative, but statistically significant, two-day portfolio return of -1.08% and a *t*-statistic of -20.8 for public utilities (representing negative stock returns for 68% of the sample with an associated *z*-statistic of -4.28). These results are similar in magnitude to the earlier results for primary stock offerings and also appear to be consistent with the Dann and Mikkelsen (1984) findings that straight debt offering announcements are associated with statistically insignificant negative common stock portfolio returns. However, these results do not appear to be consistent with the Miller and Rock prediction of a larger announcement effect for dual offerings over primary stock offerings which results from the dual offerings' raising larger levels of outside funds. The table also documents a large stock price run-up for dual

offerings of industrial firms and a much smaller price run-up for dual offerings of public utilities, as is the case of primary stock offerings.

The ten dual offerings of convertible debt and common stock in the sample, all made by industrial firms, are also examined. These offerings exhibit announcement period portfolio returns of  $-3.17\%$ , compared with two-day comparison period mean returns of  $0.06\%$ . The associated  $t$ -statistic is  $-9.07$ , which indicates that the announcement effect is statistically significant but does not appear distinguishable from that of primary stock offerings.

#### 4. Analysis of individual announcement period stock returns

In order to fully assess the potential causes for stock price reactions to stock offering announcements, a linear regression model is estimated for individual announcement period stock returns. Two types of explanatory variables are used in this model: (1) variables which control for differences in the market's ex-ante assessment of a firm's likelihood of making a common stock offering, and (2) variables which affect the magnitude of the stock price reaction, as predicted by the extant theoretical literature. Variables used to control for differences in ex-ante likelihoods of stock offerings are:

- (a) the common stock's price run-up over the pre-announcement three-month period as measured by its cumulative return (*RUNUP*);
- (b) the price run-up in the CRSP equally weighted stock market index over the three-month pre-announcement period as measured by its cumulative return (*MRUNUP*);
- (c) the frequency of prior equity offerings approximated by an indicator variable for whether or not the firm had made one or more common stock offerings in the previous year (*D2*);
- (d) whether or not the firm had sought and obtained additional common stock authorization in the year preceding the offering announcement, measured by an indicator variable (*D3*);<sup>13</sup> and
- (e) whether or not the firm's leverage ratio at the year end preceding the offering is greater than the average leverage ratio over the prior four fiscal year ends, as measured by an indicator variable (*D4*).

The basis for inclusion of these five variables in the regression model follows. Both the run-up in the CRSP equally weighted stock market index and the stock itself over the pre-announcement period, as documented in tables 5, 7 and 8, suggest that these variables are used by the market in predicting stock offering announcements. This also is consistent with the evidence obtained by Marsh (1982) from estimating a predictive model of a firm's debt-equity choice. However, the predictive power of these two variables for stock offerings

<sup>13</sup>See Marsh (1982) for other evidence on the predictability of stock offerings.

is likely to be limited given the small fraction of stocks with price run-ups which make stock offerings. Further, there is also reason to believe that a relatively large price run-up (in a sample of stocks where most exhibit some price run-up) may be a predictive variable of firms *not* making a stock offering. This follows because these pre-announcement stock price increases are on average associated with a significant lowering of firm leverage and as a result decrease the likelihood that firms find it optimal to further decrease their leverage ratios by selling additional stock. Thus, for these high price run-up stocks, stock offering announcements should be less anticipated, which would cause larger negative stock reaction.

Inclusion of  $D2$  is based on the observation that a number of public utilities make frequent stock offerings which are likely to be anticipated to a greater extent by the market. The fourth predictive variable  $D3$  takes on a value of one when shareholder approval of additional authorizations of shares outstanding occurs in the year prior to the offering announcement. This is observed to occur in approximately 10% of the offering sample, suggesting that shareholder authorizations could also be used by the market in predicting stock offerings. The last variable,  $D4$ , is based on the presumption that a firm has a relatively stable target leverage ratio and that a significant deviation from it should be a useful predictor of an offsetting adjustment. This target leverage ratio is calculated from book value figures where the average of the prior years' leverage ratios is usually based on four years, but due to data limitations can be as low as two years. Marsh (1982) finds that this variable is useful in predicting whether a debt or equity issue will be sold. For each of the variables used to predict future stock offerings, the larger its value, the more likely an offering announcement and hence the smaller the negative announcement return (with the exception of stock price run-up where a larger announcement return is possible).

The explanatory variables based on theoretical considerations are:

- (a) the percentage change in the shares of common stock outstanding ( $\Delta SHR$ );<sup>14</sup>
- (b) the changes in the firm's financial leverage ( $\Delta LEV$ );
- (c) the stock's total risk measured by the variance of the stock's return over the 60 trading days preceding the announcement period ( $VAR$ ); and
- (d) whether the secondary offering component of a combination offering involves management share sales, measured by an indicator variable ( $D1$ ).

The percentage increase in shares outstanding is proportional to the decrease in management's fractional ownership of shares (given no change in actual shareholdings) and, as such, predicts a fall in firm value according to both the

<sup>14</sup> Only the proceeds of the stock offering which go to the corporate issuer are included. Thus, in combination offerings, the proceeds from the secondary offering are excluded.

Jensen and Meckling agency theory and the Leland and Pyle signalling theory. The predictions of both these theories imply that the larger the percentage rise in shares outstanding, the greater the negative stock price reaction.<sup>15</sup> These two models likewise predict more negative stock announcement returns if management is actually selling shares by participating in combination primary-secondary offerings.

Offering induced changes in firm leverage are predicted to generally signal like directional changes in the firm's future earnings, if managers are making capital structure decisions so as to maximize securityholder wealth (though at times, changes in non-debt tax shields, expected bankruptcy costs and marginal tax rates can also be a cause for leverage change). This theoretical argument predicts that on average larger leverage declines should be related to larger drops in firm earnings, and therefore, to larger drops in stock price.

If a stock's rate of return variance acts as a proxy for the market's uncertainty about the value of the firm's current assets, then according to the predictions of the Myers and Majluf adverse selection model, as this uncertainty rises, so does the magnitude of the market's negative reaction to a given stock offering announcement. Thus, higher return variance is predicted to be related to larger negative stock returns.<sup>16</sup>

In the following ordinary least squares estimations, industrial and public utility offerings are separated because their stock prices are likely to be affected differently by stock offering announcements. The dependent variable in these regressions is the announcement period stock return in percentage form (unadjusted for the market).<sup>17</sup> Note that a stock offering which lacked information on one or more explanatory variables is excluded from the estimation process. This condition required the exclusion of all cancelled offerings.

The evidence in table 9 indicates that most of the explanatory variables used to predict stock offering announcements lacked discriminatory power. The one variable which is both statistically significant (for the industrial sample) and has a positive parameter estimate as predicted is *MRUNUP*. The other predictive variable with a statistically significant parameter estimate, *RUNUP*,

<sup>15</sup>This variable may also act as a proxy for offering proceeds which is the appropriate explanatory variable in the Miller and Rock analysis. Given its high correlation to  $\Delta SHR$ , it is not included in the regressions.

<sup>16</sup>The portion of the stock offering proceeds used for capital expenditures was also considered as an explanatory variable. Only highly insignificant parameter estimates were obtained. Stock return variance was alternatively measured with post-offer announcement returns with no significant change in results. The run-up variables were alternatively measured without the returns on events days -10 to -1. The resulting parameter estimates were quite similar to those using the full 60 days. Weighted least squares estimates were also obtained which were qualitatively similar to the OLS estimate. The weights were based on the stock return variance over the pre-announcement period.

<sup>17</sup>These regressions were also estimated using the announcement period return minus the return on the CRSP equally weighted market index. The results were substantially unchanged.



Table 9

Regression estimates for announcement period stock returns (*t*-statistics in parentheses).

$$RET = \alpha_0 + \alpha_1 \Delta SHR + \alpha_2 \Delta LEV + \alpha_3 VAR + \alpha_4 RUNUP + \alpha_5 MRUNUP + \alpha_6 D1 + \alpha_7 D2 + \alpha_8 D3 + \alpha_9 D4.^a$$

	$\alpha_0$	$\alpha_1$	$\alpha_2$	$\alpha_3$	$\alpha_4$	$\alpha_5$
Industrials ( <i>N</i> = 301)	-1.64 (-2.28)	-3.08 (-0.76)	5.85 (0.85)	-29.38 (-1.19)	-0.03 (-2.93)	0.03 (1.85)
	-1.87 (-2.74)	-3.48 (-0.86)	6.15 (0.91)	-22.86 (-0.94)	-0.04 (-3.02)	0.03 (2.10)
	-1.89 (-2.76)	-5.80 (-1.84)	—	-22.48 (-0.93)	-0.04 (-3.03)	0.04 (2.07)
	-2.10 (-3.31)	—	9.81 (1.87)	-24.50 (-1.02)	-0.04 (-3.01)	0.04 (2.12)
Utilities ( <i>N</i> = 426)	-0.37 (-0.84)	9.95 (3.16)	22.52 (2.21)	-53.77 (-2.41)	-0.06 (-4.07)	0.01 (0.80)
	-0.36 (-0.92)	9.98 (3.17)	22.37 (2.20)	-53.99 (-2.50)	-0.06 (-4.11)	0.01 (0.83)
	-0.46 (-1.18)	9.30 (2.97)	21.30 (2.09)	-52.29 (-2.42)	-0.05 (-3.94)	0.01 (0.56)
	$\alpha_6$	$\alpha_7$	$\alpha_8$	$\alpha_9$	$\bar{R}^2$	<i>F</i> -value
Industrials ( <i>N</i> = 301)	-1.16 (-1.91)	1.65 (1.29)	-0.27 (-0.32)	-0.47 (-1.00)	0.07	3.38
	-1.24 (-2.07)	—	—	—	0.07	4.64
	-1.27 (-2.11)	—	—	—	0.07	5.40
	-1.18 (-1.98)	—	—	—	0.07	5.42
Utilities ( <i>N</i> = 426)	—	-0.42 (-1.74)	-0.30 (-0.74)	0.06 (0.24)	0.07	4.95
	—	-0.41 (-1.73)	—	—	0.07	6.52
	—	—	—	—	0.07	7.20

- <sup>a</sup>*RET* = two-day announcement period stock return (%),  
*ΔSHR* = proportional change in outstanding shares of common stock,  
*ΔLEV* = offering induced leverage change,  
*RUNUP* = cumulative stock return over the 60 days prior to the offering announcement date,  
*MRUNUP* = cumulative market return over the 60 days prior to the offering announcement date (based on the CRSP equally weighted index),  
*VAR* = stock return variance over the 60 days preceding the offering announcement,  
*D1* = dummy variable for combination offerings involving sale of shares by management,  
*D2* = dummy variable for shareholder authorizations in the prior year,  
*D3* = dummy variable for firms making one or more stock offerings in the prior year,  
*D4* = dummy variable for firms with a larger leverage ratio at the fiscal year end preceding the offering compared to the average leverage ratio in the prior four fiscal year ends.

has a sign consistent with a large price gain making a stock offering less likely and hence more of a surprise when it is announced. This interpretation is also consistent with the earlier evidence in table 6, where average announcement period stock returns are more negative for relatively large stock price run-ups occurring over the prior three months. An alternative interpretation of this evidence is that relatively high price run-up stocks involve a higher proportion of cases where related capital expenditure announcements (with their positive price effects) occur *prior to* rather than simultaneous with stock offering announcements.

Turning to the variables indicated by the various theoretical models previously discussed, the results are mixed. The parameter estimate of  $\Delta SHR$  is negative and significant in the industrial sample when  $\Delta LEV$  is excluded from the regression. It is also significant in the public utility sample, but the sign is positive, which is inconsistent with the theoretical prediction. In part, this may reflect the special nature of this regulated industry where close government monitoring of firm performance and rate setting makes management shareholdings relatively unimportant in controlling the management-outside shareholder conflict of interest. As predicted, the parameter estimate for  $\Delta LEV$  is positive for both industrial and public utility samples. It is statistically significant in the public utility sample and when  $\Delta SHR$  is excluded from the regressions, it is also significant in the industrial sample. The parameter estimate for  $VAR$  is negative, as predicted by Myers and Majluf, but it is only significant in the public utility sample. Last, the negative and statistically significant parameter estimate for  $DI$  is consistent with the earlier predictions that decreases in management's fractional shareholdings have negative impacts on firm value.

Overall, the explanatory power of these cross-sectional regressions is modest. This could be a reflection of insufficient cross-sectional dispersion in the data. However, a number of explanatory variables are statistically significant and consistent with the predictions of some of the theories reviewed. Further, regulated public utility announcement returns appear to have very different relationships to the explanatory variables from those of industrial firms.

## 5. Summary and conclusions

This research documents a statistically significant fall in the value of common stock on the announcements of primary and combination stock offerings and dual debt-common stock offerings. The evidence indicates that the information conveyed by stock offering announcements is generally much greater for industrial firms than for public utilities, in part, because of the high frequency of public utility stock offerings.

Support is found in both the event study analysis and the cross-sectional regressions for stock price changes proportional with the changes in manage-

ment's fractional shareholdings in the firm. This is consistent with both the Jensen and Meckling agency model and the Leland and Pyle signalling model. The announcement period stock returns appear to be positively related to leverage change as is found in most studies of other capital structure changes. The evidence of relatively small negative announcement returns also appears consistent with a partially offsetting positive price reaction to contemporaneous announcements of capital expenditure increases.

When combination primary-secondary stock offerings not involving management sales of shares are announced, the average announcement effect is found to be less negative than an otherwise similar primary stock offering. This may reflect the somewhat smaller size of the combination offerings. Dual offerings of stock and non-convertible bonds have an average announcement effect similar to that of primary stock offerings even though the outside funds raised are larger. This evidence is not supportive of the Miller and Rock (1984) predictions but does appear consistent with the predictions of Myers and Majluf (1984) and with the earlier empirical evidence on the announcement effects of non-convertible debt offerings by Dann and Mikkelsen (1984).

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