



Changes in Management Ownership and the Valuation Effects of Equity Offerings *

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Abstract. Seasoned equity issues trigger share price declines, and this is usually interpreted as evidence of signalling. We find that seasoned equity issues also typically result in much lower managerial ownership in U.S. firms. Jensen and Meckling (1976) predict a stock price decline when managerial ownership falls. We conduct several tests to distinguish agency explanations from signalling explanations, and conclude that both effects are present.

1. Introduction

Stock prices fall when firms issue more equity to the public. See, for example, Asquith and Mullins (1986), Masulis and Korwar (1986), and Mikkelsen and Partch (1986). A widely accepted explanation of this is Myers and Majluf (1984) "lemons" argument. Shareholders know they do not always estimate stock prices correctly, and know managers have better information than they have. Rational managers should tend to issue more shares when the current price is too high, that way the firm (i.e. the existing shareholders) gets more money per share issued. Investors understand this, and consequently interpret an equity issue as a signal that a firm's stock price should be lower.

In this paper, we find that average management ownership declines substantially around seasoned equity offerings. Therefore, the issuing firms' managers do not subscribe proportionately to the new issues. In fact, we find that managers tend to actively sell their shares prior to and following equity offerings. We find that the decline in management ownership is inversely related to announcement period stock price revisions.

While this is consistent with the signalling hypothesis, it also can be explained by an agency argument. Jensen and Meckling (1976) point out that the less stock managers own, the less their interests correspond to shareholders' interests. Since

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equity offerings reduce managerial ownership, investors might infer a worsening agency problem, and bid down the issuing firm's stock price.

To distinguish the signalling hypothesis from the agency hypothesis, we exploit theoretical and empirical studies that suggest Jensen and Meckling's argument is part of a more complex non-linear relationship between managerial holdings and agency problems. See Stulz (1988), Morck et al. (1988), and McConnell and Servaes (1990). These studies argue that firm performance rises with managerial ownership in widely held firms for the reasons Jensen and Meckling cite. But they conclude that firm performance falls with higher managerial ownership in more closely held firms because it protects managers from takeovers, institutional shareholder pressure, and other corporate governance checks and balances that constrain managers in widely held firms.

In sub-samples of firms with similar changes in management ownership, we find a significant non-linear relationship between share price changes in reaction to seasoned equity issues and levels of managerial ownership. This finding is consistent with previous non-linear cross sectional results using firm performance levels. Since a signalling story does not predict such a relationship, we conclude that part of the stock price decline around seasoned equity offerings is due to investors' expectations of increased agency problems in the issuing firms.

The rest of the paper is organized as follows: Section 2 describes the sample and methodology. Section 3 presents descriptive statistics and our empirical results. Section 4 assesses the impact of changes in management ownership following seasoned equity offerings and Section 5 examines the relationship between firm value and management equity ownership. Section 6 concludes.

2. Sample and Methodology

2.1. THE SAMPLE

We use the *Wall Street Journal* (WSJ) CD-ROM database to find announcements of primary public seasoned equity offerings between September 1991 to December 1992.¹ The WSJ CD-ROM database lets us search for the headline NEW SECURITIES ISSUES from September 1991 on. The headline precedes a list of seasoned and initial public offerings. We consider only seasoned offerings. We cross-check the announcements with the *Wall Street Journal Index*, and if there is any significant confounding event within five days prior to and one day after an equity offering announcement, we drop the observation.²

Our final sample of 81 events satisfies the following criteria:

- a) Daily returns for the firms must be available on the Centre for Research in Security Prices tapes for a period starting 360 trading days prior to and including the announcement date. This results in our losing young firms that are issuing more shares shortly after their initial public offerings.

- b) The firm's proxy statements are in the microfiches produced by Q Data Corporation, and statements are available within 2 years both prior to and after the event. The availability of proxy data was a factor in limiting our sample size. However, as noted in footnote 1, our resultant sample provides results that are very similar to past studies, and hence not unusual.
- c) The firm is not in a regulated industry. We drop firms with SIC codes in the 4,000s from the sample.
- d) The firm is in COMPUSTAT.

Abnormal Returns and Managerial Ownership Data

We use a standard event study methodology. A company's announcement period abnormal return is

$$CAR_i \equiv \sum_{t=-1}^0 (r_{it} - r_{mt}) \quad (1)$$

where the seasoned offering announcement in the *Wall Street Journal* is on day $t = 0$, r_{it} is company i 's return on day t , and r_{mt} is the market return on the same day. We use the CRSP equally weighted index for r_{mt} because our sample contains relatively small firms. Using the value weighted index gives qualitatively similar results. Adjusting for β risk also has no significant effect.

We examine the proxy statement most immediately prior to and most immediately following each announcement to obtain management share ownership. Management is defined as officers and directors. We use both because we want to gauge insider participation in the share issue, and officers and directors are both clearly insiders for this purpose.

The change in management ownership around a seasoned equity offering is defined as:

$$\Delta\alpha = \alpha_1 - \alpha_0 \quad (2)$$

where α_0 is managers' fractional ownership before the issue and α_1 is their fractional ownership afterwards.

Other Variables

We calculate a "stock price run up variable", RUNUP, the fractional abnormal increase in a firm's stock price from day -360 to day -10 , where the offering announcement is on day zero. Firm size (SIZE) is another control variable, since management ownership is typically negatively correlated with firm size. We measure firm size by the natural log of total assets at the end of the fiscal year preceding the event.³

Table I. Descriptive statistics for the sample of 81 seasoned equity offerings from September 1991 through December 1992

Variables	Mean	Median	Min	Max	Percent negative
CAR	-0.018***	-0.022***	-0.152	0.153	70
α_0	0.229	0.187	0.007	0.837	
α_1	0.161	0.121	0.006	0.664	
$\Delta\alpha$	-0.068***	-0.045***	0.047	-0.353	95
$\Delta\alpha_d$	-0.039***	-0.029***	-0.001	-0.211	100
$\Delta\alpha_t$	-0.028***	-0.016***	0.085	-0.297	76
δ	0.233	0.185	0.049	2.825	
RUN-UP	0.159***	0.026**	-0.625	2.354	47
Firm size	5.090	4.928	1.110	9.101	

*** The value is statistically significant at 1%; ** The value is statistically significant at 5%.

CAR is the two-day announcement period excess return over the CRISP equally-weighted index return. α_0 is the level of pre-announcement management ownership. α_1 is the level of post-announcement management ownership, so $\Delta\alpha = \alpha_1 - \alpha_0$ is the change in management ownership induced by the equity issue. With α_d the level of management ownership had managers remained totally passive during the equity offering, $\Delta\alpha_d = \alpha_d - \alpha_0$ measures the dilution effect and $\Delta\alpha_t = \alpha_1 - \alpha_d$ measures the management participation effect. δ is the relative size of the equity issue to the number of outstanding shares before the issue. RUNUP is a firm's cumulated excess return over the period of 360 to 10 trading days before the announcement date. SIZE is the natural logarithm of a firm's total assets (in \$million) at the end of previous fiscal year before the equity offering.

Univariate Statistics

Table I reports descriptive statistics of our sample. The mean two-day announcement period cumulative abnormal return is -1.8% , and this is significantly different from zero ($p = 0.001$). The median is -2.2% , also significantly different from zero ($p = 0.00001$ in a rank sign-test). Seventy percent of the firms in our sample have negative abnormal returns. This result is comparable to earlier studies such as Asquith and Mullins (1986).

The mean and median pre-announcement management ownership levels are 22.9% and 18.7% . Compared to Morck, Shleifer and Vishny (1988), who document a mean management ownership of 10.6% for Fortune 500 companies, our numbers are higher. Since our sample includes NASDAQ firms, which are generally smaller than Fortune 500 firms, this is reasonable.

The mean and median ratio of shares issued to pre-announcement number of shares outstanding, δ , are 23.3% and 18.5% . This is comparable to the primary equity offering sample in Masulis and Korwar (1986), where the analogous numbers are a 14.8% mean and 12.5% median.

Post-announcement management ownership is significantly lower than pre-announcement ownership. The mean decreases from 22.9% to 16.1%, a statistically significant drop of 6.8% ($p = 0.0001$). Of our 81 firms, 77 or 95% of the sample show a decline in management ownership. The decline in management ownership is not solely due to dilution. Had management neither bought nor sold during the equity offerings, the mean post-announcement management ownership level, α_1 would have been 19%. The actual value of 16.1% is significantly different from this ($p = 0.0001$). In 62 firms of the 81 firms, managers sell shares around the offering date.

The mean and median cumulative excess stock price run-ups from day -360 to day -10 are 15.9% ($p = 0.006$) and 2.6% ($p = 0.05$). Offering firms tend to outperform the market before equity offering announcements, consistent with Masulis and Korwar (1986).

2.2. METHODOLOGY

Signals vs. Scoundrels

We propose two ways of distinguishing a signalling reaction to the securities issue, as in Myers and Majluf (1984), from an agency costs reaction, as in Jensen and Meckling (1976). Both involve relating the change in managerial stock ownership around the issue to the contemporaneous stock price movement.

Louder and Softer Signals

First, we hypothesize that any negative signalling effect of the offering should be heightened if managers simultaneously dump their companies' shares. It is useful to decompose $\Delta\alpha$ into two components. We define α_d as what managerial ownership would have been after the issue if managers had neither bought nor sold any stock, that is

$$\alpha_d = \frac{1}{1 + \delta} \cdot \alpha_0 \quad (3)$$

The d subscript indicates that this is what α would be if the only effect were the dilution due to the equity offering, which increases outstanding equity by the fraction δ .

$$\delta \equiv \frac{\text{number of additional shares issued}}{\text{number of shares outstanding before offering}} \quad (4)$$

The first component of $\Delta\alpha$ that interests us is the change that would have occurred had managers neither bought nor sold any shares,

$$\Delta\alpha_d = \alpha_d - \alpha_0 \quad (5)$$

The second is the change in management ownership due to active buying or selling of stocks around the offering,

$$\Delta\alpha_t = \alpha_1 - \alpha_d \quad (6)$$

If $\Delta\alpha_t$ is positive, managers have bought shares in their own company around the offering, if $\Delta\alpha_t$ is negative, they have sold.

If signalling is the important determinant of stock price changes around seasoned equity issues, we expect the decomposition into $\Delta\alpha = \Delta\alpha_t + \Delta\alpha_d$ to explain abnormal returns better than $\Delta\alpha$ does. A negative $\Delta\alpha_t$, indicating that managers are dumping stock around the issue date, reinforces the interpretation that managers view the stock as overvalued. A signalling story predicts a monotonic relationship between $\Delta\alpha_t$ and abnormal return, and no relationship between abnormal return and $\Delta\alpha_d$.

The lemons and signalling theory of Myers and Majluf (1984) argues that firms issue stock when equity is overvalued. One possible test of this is to relate $\Delta\alpha_t$ to prior stock price run-up.

Larger and Smaller Scoundrels

Jensen and Meckling (1976) suggest that agency conflicts increase as managerial stock ownership decreases. However, Stulz (1988) modifies their model in plausible ways to derive a non-linear relationship. The modification is to recognize that takeovers are an important constraint on agency conflicts, and that freedom from any threat of a takeover might lead to increased opportunistic behaviour by managers. When managerial ownership is high, a hostile takeover is impossible. Stulz therefore suggests that low and high levels of managerial ownership should be associated with severe agency conflicts, while median levels should be associated with fewer such conflicts. Morck et al. (1988), McConnell and Servaes (1990) and others have found empirical evidence of such a non-linear relationship, although the exact functional form of the relationship appears to depend on the definition of managerial ownership and on factors related to firm size. Figure 1 illustrates.

Since the changes in managerial ownership around seasoned equity offerings are large, if such an agency conflict interpretation is important, we should detect different changes in share value for falls in managerial ownership from above a certain initial level. If initial ownership is high enough to block a takeover and post-offering ownership is not, value should rise. If initial managerial ownership is insufficient to block a takeover, a further decrease due to the offering should reduce firm value. This difference should not exist if signalling is driving our results.

In this study, we are examining events that decrease α . Figure 2 illustrates what Figure 1 implies about the relationship between unit decreases in α and CARs.

To investigate such an effect, we relate α_0 squared to our abnormal returns. We also run piecewise linear regressions of abnormal returns on the following variables,

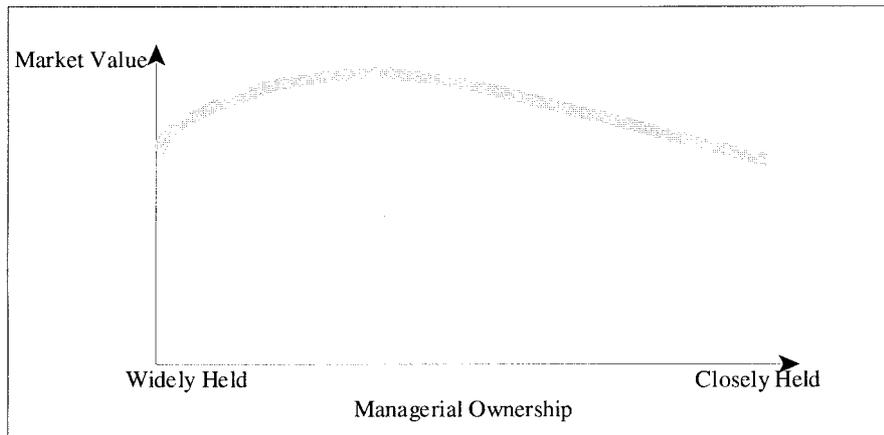


Figure 1. Firm value vs. managerial ownership.

$$\begin{aligned}
 \pi_1 &\equiv \alpha_0 && \text{if } \alpha_0 < \alpha_{low} \\
 & && \alpha_{low} \text{ if } \alpha_0 \geq \alpha_{low} \\
 \pi_2 &\equiv 0 && \text{if } \alpha_0 < \alpha_{low} \\
 & && \alpha_0 - \alpha_{low} \text{ if } \alpha_{low} \leq \alpha_0 < \alpha_{hi} \\
 & && \alpha_{hi} \text{ if } \alpha_0 \geq \alpha_{hi} \\
 \pi_3 &\equiv 0 && \text{if } \alpha_0 < \alpha_{hi} \\
 & && \alpha_0 - \alpha_{hi} \text{ if } \alpha_0 \geq \alpha_{hi}
 \end{aligned} \tag{7}$$

We allow the data to choose α_{low} and α_{hi} . A non-linear effect should exist only if expected changes in agency conflicts are an important determinant of share price changes around seasoned offerings. If signalling is only important, this non-linear relationship should be absent.

3. Statistical Analysis

3.1. MARKET REACTIONS TO CHANGES IN MANAGEMENT OWNERSHIP

Table II reports means and median two-day cumulative abnormal returns for various sub-samples, stratified according to the extent of the decline in management ownership and the extent of management participation in the equity offering.

Panel A in Table II compares abnormal returns for sub-samples with above vs. below median management ownership declines. The mean and median abnormal returns are -3.2% and -2.8% and significantly different from zero only for the sub-sample where management ownership declines by more than the median decline. Test for equal means and the Wilcoxon signed-ranks test for equal medians both indicate that the returns in the two sub-samples are significantly different from each other.

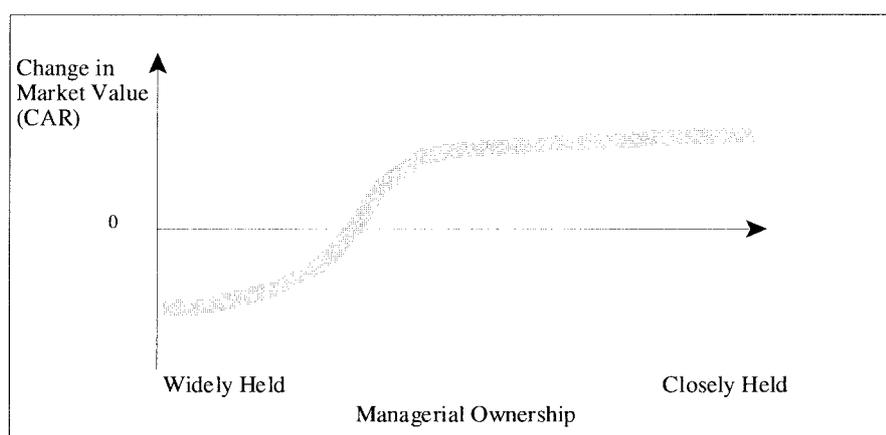


Figure 2. Cumulative Abnormal Returns (CAR) due to a unit decrease in managerial ownership as a function of initial managerial ownership.

Table II. Mean and median two-day CARs and numbers of negative and positive CARs for Sub-samples partitioned by the extent of declines in management ownership and share sales by managers

	Mean	Median	CARs (#<0, #>0)
Panel A			
Decline in management ownership \leq sample median	-0.005	-0.019	(27, 14)
Decline in management ownership $>$ sample median	-0.032***	-0.028***	(30, 10)
Difference	0.027**	0.009**	
Panel B			
Management sells shares	-0.022***	-0.023***	(43, 19)
Management does not sell shares	-0.007	-0.022	(14, 5)
Difference	-0.015	-0.001	

*** Statistically significant at 1%; ** Statistically significant at 5%

Panel B in Table II, divides the sample into the 62 firms whose managers sell stock around the offering date, and the 19 firms whose managers buy or hold. The mean and median abnormal returns for the sub-sample where managers sell are -2.2% and -2.3%; both are statistically significant. For the sub-sample of firms where management does not sell, the mean and median abnormal returns are not statistically different from zero. However, neither the means test nor the Wilcoxon signed-rank test can reject the null hypothesis of equal mean or median abnormal returns across the two sub-samples. The tests lack power because the buy or hold sub-sample is small.

Table III. Mean and median declines in management ownership for sub-samples divided by the sample median cumulative excess stock price run-up from 360 to 10 trading days prior to the equity offering

	$\Delta\alpha$		$\Delta\alpha_d$		$\Delta\alpha_t$	
	Mean	Median	Mean	Median	Mean	Median
RUNUP \leq median	-4.9%***	-3.7%***	-3.5%***	-2.2%***	-1.4%***	-1.3%***
RUNUP $>$ median	-8.7%***	-5.3%***	-4.4%***	-3.1%***	-4.3%***	-2.6%***
Difference	3.8%**	1.6%**	0.9%	0.9%	2.9%**	1.3%**

*** Statistically significant at 1%; ** Statistically significant at 5%; * Statistically significant at 10%.

$\Delta\alpha = \alpha_1 - \alpha_0$ is the total change in management ownership; $\Delta\alpha_d = \alpha_d - \alpha_0$ measures the dilution effect and $\Delta\alpha_t = \alpha_1 - \alpha_d$ measures the management participation effect; α_0 and α_1 are the level of pre and post-announcement management ownership, respectively, and α_d is the level of management ownership had management remained totally passive during the equity offering. RUNUP is the cumulative excess stock price run-up from 360 to 10 trading days prior to the equity offering.

3.2. CHANGES IN MANAGEMENT OWNERSHIP AND STOCK PRICE RUN-UP

Table III divides the sample into two using the sample median cumulative excess stock price run-up from 360 to 10 trading days prior to the equity offering. The mean and median declines in management ownership are 8.7% and 5.3% for the steep run-up firms, but are only 4.9% and 3.7% for the flat run-up firms. The difference in the average decline in management ownership between the two sub-samples is mostly due to active selling by managers. The mean and median values of $\Delta\alpha_t$, the change in management ownership due to active trading are 4.3% and 2.6% for the steep run-up sub-sample, but only 1.4% and 1.3% for the flat run up sub-sample.

3.3. MANAGEMENT ENTRENCHMENT AND SEASONED EQUITY OFFERINGS

Table IV shows regressions of abnormal returns on the three piecewise linear measures of ownership defined above, π_1 , π_2 , π_3 .⁴ Since management ownership decreases around seasoned equity offerings in 77 (out of 81) firms, we delete the 4 cases in which management ownership increases. Therefore, in Table IV, we can unambiguously examine the effect of *decreases* in management ownership on market reaction. This will allow us to clearly interpret our regression results in Table IV in relation to the plot in Figure 2.

Recall that we decomposed the decline in management ownership into passive dilution (as defined in equation (5) by $\Delta\alpha_d$) and active management participation (as measured in equation (6) by $\Delta\alpha_t$). Regression 4.1 of Table IV shows that the R^2 of a regression of abnormal return on the decomposition of $\Delta\alpha$ into $\Delta\alpha_d$ and $\Delta\alpha_t$, 8.2%, is statistically significantly higher than the R^2 of a similar regression

Table IV. OLS estimates of two-day announcement period cumulative abnormal returns on pre-announcement management ownership, changes in management ownership and management participation

Variable	4.1	4.2	4.3	4.4	4.5	4.6	4.7
Intercept	-0.008	-0.011	0.0009	-0.012	-0.003	-0.011	-0.002
π_1		+0.057		+0.168		+0.076	
π_2		-0.147*		-0.039		-0.092	
π_3		+0.149*		+0.234**		+0.127*	
$\Delta\alpha_d$	0.023			0.414*	0.397		
$\Delta\alpha_t$	0.263**			0.235**	0.243**	0.232**	0.240**
α_0			-0.182**		-0.064		-0.106
α_0^2			+0.268**		+0.236*		+0.185
R-square	0.0820	0.0673	0.0546	0.1501	0.1385	0.1180	0.1089
p-value for F-stat.	0.0572	0.1634	0.1252	0.0379	0.0280	0.0690	0.0723

*** Statistically significant at 1%; ** Statistically significant at 5%; * Statistically significant at 10%.

α_0 and α_1 are the level of pre and post-announcement management ownership, respectively, and α_d is the level of management ownership had management remained totally passive during the equity offering. $\Delta\alpha = \alpha_1 - \alpha_0$ is the total change in management ownership; $\Delta\alpha_d = \alpha_d - \alpha_0$ measures the dilution effect and $\Delta\alpha_t = \alpha_1 - \alpha_d$ measures the management participation effect; the π_i 's are defined as follows:

$$\begin{aligned} \pi_1 &= \alpha_0 && \text{if } \alpha_0 < 0.10, \\ &= 0.10 && \text{otherwise;} \\ \pi_2 &= 0 && \text{if } \alpha_0 < 0.10, \\ &= \alpha_0 - 0.10 && \text{if } 0.10 = < \alpha_0 < 0.35, \\ &= 0.35 && \text{if } \alpha_0 \geq 0.35; \\ \pi_3 &= 0 && \text{if } \alpha_0 < 0.35, \\ &= \alpha_0 - 0.35 && \text{if } \alpha_0 \geq 0.35. \end{aligned}$$

These variables define a piecewise linear relationship between management ownership and CAR. The break points 0.10 and 0.35 were selected to maximize the R^2 . We exclude firms that experience increases in management ownership (i.e., 77 out of 81 firms are used).

with $\Delta\alpha$ alone, 6.2% (the latter is not reported in the Table). Including controls for the size of the run-up, firm size, and initial managerial ownership does not affect this finding.

The significant negative coefficient on π_2 in regression 4.2 implies that a fall in management ownership decreases shareholder value when initial ownership is low, consistent with Jensen and Meckling (1976). The significant positive coefficient on π_3 means decreases in management ownership increase shareholder value when it is initially high, consistent with Stulz (1988). Recall that $\Delta\alpha$ is always negative.

Regression 4.3 repeats this finding using initial managerial ownership and its square to capture the non-linearity. Initial managerial ownership, α_0 , has a negative significant coefficient, while α_0^2 has a positive and significant coefficient.

cient. Again, decreasing managerial ownership costs shareholders money when managerial ownership is initially low, but adds value when it is initially high.

The coefficients of regression 4.3 imply that at any level of initial managerial ownership above 68% the CAR should be positive. This corresponds to the level of managerial ownership that maximizes firm value in the context of McConnell and Servaes (1990) or Morck, Shleifer and Vishny (1988).

Regressions 4.4 and 4.5 repeat 4.2 and 4.3, but include $\Delta\alpha_t$ and $\Delta\alpha_d$. Active trading by managers, as measured by $\Delta\alpha_t$ is significant, consistent with signalling playing a role. Including $\Delta\alpha_t$ and $\Delta\alpha_d$ renders π_2 and α_0 insignificant. This may be due to collinearity between α_0 and $\Delta\alpha_d = \alpha_d - \alpha_0$. Regressions 4.6 and 4.7 repeat 4.4 and 4.5, but including $\Delta\alpha_t$ as the only additional variable. The coefficients on π_2 and α_0 are now insignificant. The R^2 s of regressions 4.7 and 4.5 are both significantly greater than that of 4.3. Those of 4.6 and 4.4 are significantly greater than the R^2 of regression 4.2. This is consistent with the signalling story matters.

Earlier research indicates that the issue size and the previous run-up are significantly related to abnormal returns.⁵ When we include the size of the issue as a fraction of initial stock outstanding, δ , the price run-up from day -360 to day -10 (RUNUP) and firm size in any of the regressions in Table IV, the parameter estimates do not greatly change although their significance decline somewhat. When δ and RUNUP are included, they are insignificant.

Asquith and Mullins (1986) and Masulis and Korwar (1986) both find large issues correlated with more negative price reactions, Hess and Bhagat (1986) find no significant relationship between issue size and CARs. Scholes (1972) argues that a more negative CAR from larger issues may indicate "price pressure." However, if managers are passive, a larger issue reduces their equity stake more, so an agency explanation is also possible.

4. Conclusions

Managers tend to sell stock in their own firms around the times seasoned equity is issued. Such issues also follow substantial pre-offering price run-ups. Active selling by managers, as opposed to reductions in their stakes due to dilution, is correlated with negative price reactions. We view this evidence as consistent with the lemons and signalling hypothesis of Myers and Majluf (1984), that these firms shares are overvalued.

However, we also find managerial ownership generally falls when seasoned equity is issued. In a sub-sample of firms where it does so, seasoned equity issues reduce share prices in firms with low initial managerial ownership, but increase share prices when initial managerial ownership is high. We view this as consistent with the corporate control literature (Jensen and Meckling, 1976; Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990) that relates firm value to managerial ownership, and therefore changes in firm value to changes in managerial ownership.

We conclude that share price changes around seasoned equity offerings are partly due to lemons and signalling, but also partly due to changes in managerial ownership that have corporate governance implications.

Notes

¹ We believe that our 16-month sampling period is not unusual in any way. Our sample size of 81 observations is comparable to those in Mikkelson and Partch (1986) with 63 such offerings, and in Asquith and Mullins (1986) with 128 such offerings. Secondly, the average market reaction of -3.2% for our sample is consistent with the findings in the literature (see, for example, Smith (1986) who summarizes the literature and finds an average market reaction of -3.14%), and our abnormal returns surrounding these events is consistent with earlier studies.

² Events such as “earnings announcements” and “dividend changes” are considered confounding. Twenty (20) observations are dropped from the sample due to confounding events.

³ We have also included other control variables such as the leverage ratio and “free” cash flow. However, adding these variables does not lead to any material change in our results reported here.

⁴ We do not adjust for heteroscedasticity since White tests fail to reject homoscedastic residuals at conventional significance levels for all regressions in Table IV.

⁵ Evidence on the effect of stock price run-ups prior to equity offering announcements is mixed. Asquith and Mullins (1986) find price reactions significantly and positively related to the 11-month prior run up. However, Masulis and Korwar (1986) find a abnormal returns significantly negatively related to the 60-day prior run up.

References

- Asquith, P. and D.W. Mullins: 1986, “Equity Issues and Offering Dilution”, *Journal of Financial Economics*: 61–89.
- Hess, A. and S. Bhagat: 1986, “Size Effects of Seasoned Stock Issues: Empirical Evidence”, *Journal of Business*: 567–584.
- Jensen, M. and W. Meckling: 1976, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, *Journal of Financial Economics*: 305–360.
- Masulis, R. and A. Korwar: 1986, “Seasoned Equity Offerings”, *Journal of Financial Economics*: 91–118.
- McConnell, J. and H. Servaes: 1990, “Additional Evidence on Equity Ownership and Corporate Value”, *Journal of Financial Economics*: 595–612.
- Mikkelson, W. and M. Partch: 1986, “Valuation Effects of Security Offerings and the Issuance Process”, *Journal of Financial Economics*: 31–60.
- Morck, R., A. Shleifer and R. Vishny: 1988, “Management Ownership and Market Valuation: An Empirical Analysis”, *Journal of Financial Economics*: 293–315.
- Myers, S. and N. Majluf: 1984, “Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have”, *Journal of Financial Economics*: 187–221.
- Scholes, M.: 1972, “The Market for Securities: Substitution vs. Price Pressure and the Effect of Information on Share Prices”, *Journal of Business* 45: 179–211.
- Smith, C.W.: 1986, “Investment Banking and the Capital Acquisition Process”, *Journal of Financial Economics* 15: 3–29.
- Stulz, R.: 1988, “Managerial Control of Voting Rights, Financing Policies and the Market for Corporate Control”, *Journal of Financial Economics*: 25–54.

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