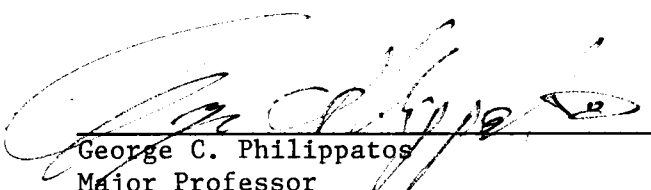
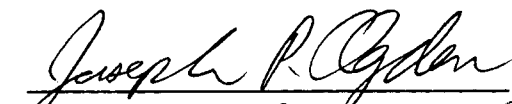
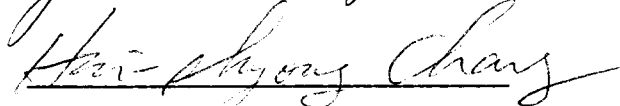
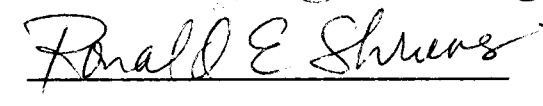


To the Graduate Council:

I am submitting herewith a dissertation written by Majed R. Muhtaseb entitled "Essays on Firm Valuation and Common Stock Offerings: The Empirical Evidence." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.


George C. Philippatos
Major Professor

We have read this dissertation
and recommend its acceptance:


Accepted for the Council:


Vice Provost
and Dean of The Graduate School

ESSAYS ON FIRM VALUATION AND COMMON STOCK
OFFERINGS: THE EMPIRICAL EVIDENCE

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Majed R. Muhtaseb

December 1987

To my parents,
Rajab and Nadwa Muhtaseb,
and my recently born son,
Abdullah

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Whatever accomplishment this dissertation may represent, it is indeed the product of enormous combined efforts. I would like to express my gratitude and appreciation to the individuals who helped and supported me in this endeavor.

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ABSTRACT

The purpose of this dissertation is to contribute to our understanding of the impact of a new common stock issue on the behavior of the stock price. Asquith and Mullins (1986), Masulis and Korwar (1986) and several others document that share prices of industrial firms and public utilities decline by about 3.0% and less than 1.0%, respectively, in response to the announcement of a new common stock issue. Four hypotheses are tested to identify the factors that affect the change in stock price at the announcement (offering) date of a new common stock issue. Managerial ownership hypothesis states that the two-day common stock issue announcement period cumulative abnormal return (CAR) increases as managerial ownership of the firm's common stock increases. Slack abundance hypothesis holds that the decline in stock price, in response to the announcement of a new common stock issue, moderates as the proportional amount of financial slack, included in the financing of the project, increases. Rights versus publicly underwritten offerings hypothesis avers that issuing new shares of common stock through a rights offering results in a smaller drop in stock price than issuing through a publicly underwritten offering. Finally, hypothesis of determining the subscription price in a rights offering maintains that firms while setting the subscription price comply with the theoretical predictions of either the Myers and Majluf (1984) model, which implies that firms resort to low subscription prices to secure the financing of a project, or the Heinkel and Schwartz (1986)

model which claims that high quality firms set high subscription prices to distinguish themselves from low quality firms.

The data consist of 352 industrial firms and 625 public utilities; of which 196 were offered through rights offerings over the 1962-1984 period and 781 were offered through publicly underwritten offerings over the 1971-1984 period. The market model is employed to estimate the abnormal returns around the announcement date of a new common stock issue; as in Dann-Mikkelsen (1984). The four hypotheses are tested by estimating a cross-sectional regression model where the two-day announcement (offering) period CAR is the dependent variable.

It is found that moderate levels of managerial ownership affect the stock price performance, at the announcement of a new common stock issue in a favorable manner. Extremely high levels of managerial ownership do not bring about the expected desirable outcomes associated with managerial ownership. A negative relationship is obtained between the two-day announcement period CAR and financial slack, at odds with slack abundance hypothesis. We document that stock prices of industrial firms drop by 2.1% in response to the announcement of a new common stock issue through a rights offering versus 3.5% through a publicly underwritten offering; consistent with our hypothesis. In addition, the drop in stock prices of public utilities does not vary significantly across rights offerings (0.73%) and publicly underwritten offerings (0.81%). And, all industrial firms and some public utilities are found to comply with the predictions of the Heinkel and Schwartz (1986) model. However, the remaining public utilities are found to be concerned with the funding of a project as suggested by the Myers and Majluf (1984) model.

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INTRODUCTION

The objective of this study is to contribute to our understanding of stock price behavior around the announcement date of a common stock issue. To accomplish this objective, the following four issues are addressed:

1. The impact of ownership of a fraction of the common stock of the firm by its insiders on the change in stock price.
2. The impact of the presence of financial slack on the change in stock price.
3. The variation in the change in stock price, at the announcement date, across the different methods of raising external equity capital.
4. The determination of the subscription price in a rights offering.

Recent empirical research documents the decline in stock price associated with the announcement of new a equity issue. Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986) and others (see Table 1) have found an empirical regularity of stock price decline at the announcement of a new common stock issue. During the announcement period of a public underwritten common stock offering, the stock price drops by about 3% for industrial firms and less than 1% for public utilities. In addition White and Lusztig (1980) find that the announcement of a common stock rights offering has a negative effect on the stock price.

TABLE 1
SUMMARY OF TWO-DAY ANNOUNCEMENT PERIOD CUMULATIVE ABNORMAL RETURNS
ASSOCIATED WITH COMMON STOCK CAPITAL STRUCTURE CHANGES

Study	Type of Capital Structure	Industrials	Public Utilities
Asquith-Mullins (1986)	Issuance of Common Stock	-3.0	-0.90
Hess-Bhagat (1986)	"	-4.28	-1.00
Masulis-Korwar (1986)	"	-3.25	-0.68
Mikkelson-Partch (1986)	"	-3.56	N.A.
Skipper-Smith (1986)	"	-2.79	N.A.
Kolodny-Suhler (1985)	"	-2.98	N.A.
Pettway-Radcliffe (1985)	"	---	-0.33
Moore-Peterson Peterson (1986)	Issuance of Common Stock through a traditional offering Issuance through a shelf registration	-2.36 -1.54	-0.75 -0.95
White-Lusztig (1980)	Issuance of Common Stock through a rights offering	Neg. Abnormal Return	
Marsh (1979)	Issuance of Common Stock through a rights offering	Neg. Abnormal Return	
Dann-Mikkelson (1984)	Issuance of convertible debt Issuance of convertible debt through a rights offering	-2.31 -1.23	N.A. N.A.
Mikkelson (1981)	Conversion of debt to common Stock	-2.13	N.A.

Several hypotheses have been advanced to explain this empirical regularity. In a market of less than fully informed investors, whose information is inferior to that of the firm's management, the equity issue will signal to the market that the firm's future earnings prospects (which determine the firm's real value) fall short of investors' expectations. Rational investors in the market will hedge by discounting the stock price [see Myers and Majluf (1984) and Miller and Rock (1985)]. Moral hazard problems associated with partial ownership have also been advanced as an explanation. A new equity issue will reduce the entrepreneur's ownership fraction and thus signal a poorer quality firm [Leland and Pyle (1977)], which will provide an incentive for him to engage in suboptimal investment policies and/or perquisite consumption [Jensen and Meckling (1976)]. In addition, the new equity issue will change the firm's asset structure and reduce the firm's leverage ratio. An unexpected drop in leverage ratio will render the firm's outstanding debt and equity less risky causing wealth transfer from shareholders to bondholders and reduce the effective interest tax shield per share [Miller and Modigliani (1963), Masulis (1983), and Galai and Masulis (1976)]. Lastly, a nominal explanation for the drop in stock price is a downward sloping demand curve for the firm's securities. This explanation assumes absence of perfect substitutes for the firm's securities. However, Scholes (1972) tests this proposition using secondary distributions and finds a perfectly elastic demand curve for the firm's securities.

Despite the comprehensive nature of the extant body of research, there are a number of gaps that although recognized, remain empirically unaddressed. For instance, the effect of insider ownership on the announcement period abnormal returns is still unexamined. Also, if informational asymmetry and agency problems are partially resolved for firms whose insiders (managers) own a significant proportion of outstanding stock the drop in stock price is expected to be smaller. Our results indicate that moderate levels of insider ownership tend to reduce the drop in stock price.

Financial slack is shown to have serious implications for firm valuation at the announcement of a new common stock issue, in the Myers and Majluf (1984) model, but no empirical work has been done to assess the consequences of financial slack.

Another neglected issue is the distinction between the effects of underwriting methods. More specifically, we will attempt to answer the following question. How does the drop in stock price vary across publicly underwritten offerings and preemptive rights offerings? Our study is the first to address this issue. The results suggest that issuing common stock through a rights offering inflicts a smaller damage on current stockholders' wealth than does issuing common stock through a public underwritten offering, for industrial firms but not for public utilities.

Finally, we subject to empirical testing the competing predictions of the Myers and Majluf (1984) and Heinkel and Schwartz (1986) models. According to the former, firms set a low subscription price in a rights

offering to insure against the failure of the offering. The latter researchers suggest that better quality firms set a high subscription price so as to distinguish themselves from lower quality firms. It is found that industrial firms conform to the predictions of the Heinkel and Schwartz model whereas some public utilities conform to the predictions of the Heinkel and Schwartz model while others conform to the predictions of the Myers and Majluf model.

This project is divided into two parts. Part I, examines the effects of sources of stock price dilution, insider ownership and financial slack, on the behavior of the stock price at the announcement date of a common stock issue. Part II looks at the differences in valuation consequences of employing different modes of raising equity capital. Here efforts are also made to determine what considerations do firms attend to when setting the subscription price in rights offering. Parts I and II, respectively will have their own review of the literature, hypotheses, methodology and results sections.

PART I

THE EFFECTS OF INSIDER OWNERSHIP AND FINANCIAL SLACK
ON THE COMMON STOCK RETURNS AT THE ANNOUNCEMENT
OF A NEW COMMON STOCK ISSUE

1.1. REVIEW OF THE LITERATURE

The market frowns upon announcements of primary common stock issues. Table 1 lists all the studies to date that document the reaction of the market to the announcement of a common stock issue. During the two day announcement period the stock prices of industrial firms and public utilities decrease by about 3%-4% and less than 1%, respectively.

Some authors have characterized the drop in the stock price at the announcement of new equity issue as an anomaly. The intriguing nature of the stock price around the announcement date has generated a significant amount of theoretical research, as well as empirical, especially in the last few years. This voluminous research has advanced several theoretical explanations such as (1) information signalling; (2) managerial incentives; (3) implied cash flow changes; (4) optimal capital structure; and (5) perfect substitutes. Each empirical research has supported some or all of the explanations simultaneously. Yet few attempts have been successful in relating the price change with various theoretical explanations unambiguously, see Masulis and Korwar (1986) and Asquith and Mullins (1986).

1.1.1. Information Signalling

Many information signalling models rely heavily on the concept of informational asymmetry developed by Akerloff (1970) and Spence (1973). Most notably is the model of Myers and Majluf (1984). In this model announcement of new equity issue signals to the market that

assets-in-place are overvalued and thus the market, recognizing its informational disadvantage relative to the managers of the firm, responds by shrinking the stock price. Therefore the firm is better off financing new projects with internal funds, that is, employing financial slack, rather than issuing new equity. In addition, the drop in stock price is greater with an equity issue than with a debt issue.

The findings of recent research attempts, listed in Table 1 support the predictions of the Myers and Majluf model. The smaller drop in stock price for utilities is consistent with the fact that equity issues of public utilities are more frequent and thus more predictable, suggesting a smaller degree of informational asymmetry between the management of the public utility and the market. Dann and Mikkelson (1984) and Eckbo (1986) examine the valuation effects of the announcement of straight and convertible debt issues on common stock. Their findings support the Myers and Majluf predictions, the drop in stock price is smaller (and less statistically significant) for straight debt issues than it is for convertible debt issues. Still, the unanswered question is, whether the firm is better off issuing straight debt instead of issuing convertibles. Mikkelson and Partch also attempt to test the predictions of the Myers and Majluf model with respect to the effect of the riskiness of the security being issued on the stock price. They classify their sample of straight debt issues according to Standard and Poor's ratings. Results are consistent with the predictions but are not statistically significant. Finally, Dann and Mikkelson present evidence that contradicts the predictions of the

Miller and Rock model, in that issues which constituted replacement financing cause a similar drop in the stock price as did issues that constituted new financing.

Similarly, Leland and Pyle (1977) address the moral hazard problem due to informational asymmetry between management and investors. In the model investors take managerial ownership as a valid signal of the quality of the firm. Firm value varies directly with managerial ownership. Downes and Heinkel (1982) show empirically that a higher level of entrepreneurial equity ownership implies greater firm value.

1.1.2. Managerial Incentives

Jensen and Meckling (1976) show that an owner-manager will increase his consumption of perquisites and engage in suboptimal investment policies when his ownership fraction in the firm's equity is reduced. New issues of common stock effectively reduce managerial ownership of the firm's common stock. Therefore, the findings of Table 1 support this hypothesis. In addition, Vermaelen (1981) finds a significant positive association between the two day announcement period return associated with a common stock repurchase and the fraction of insider holdings.

1.1.3. Implied Cash Flow Change

In the presence of informational asymmetry between managers and stockholders with respect to the firm's earnings and with the use of the firm's budget constraint, Miller and Rock (1985) show that the announcement of any new financing signals to the market that the

expected future earnings are less than originally anticipated by the market and as a result stock price will drop. Also, based on the budget constraint, the greater is the amount of external financing needed the larger is the decline in stock price.

Again the findings in Table 1 support this hypothesis because issues of common stock represent new external financing. However, Dann and Mikkelsen (1984) provide evidence which contradicts the implications of the Miller and Rock model. They find that issues which constitute replacement financing cause a similar drop in the stock price as do issues which constitute new financing. Miller and Rock model may theoretically explain the different responses of stock price to varying amounts of external financing, but it does not explain the responses of the stock price to different security offerings.

1.1.4. Optimal Capital Structure

According to the contributions of Modigliani and Miller (1963), DeAngelo and Masulis (1980) and others, the value of a levered firm is, *ceteris paribus*, greater than that of another otherwise identical unlevered firm, due to the favorable treatment of interest expense by the tax law. Consequently a new equity issue will reduce share value because it causes a reduction in the firm's leverage ratio and consistently the per share interest tax shield. Building on the capital structure argument, Galai and Masulis (1976) study the impact of unanticipated change in capital structure on the firm's shareholders' wealth. An unanticipated drop in leverage, due to a new equity issue, will reduce the riskiness of debt outstanding and thus transfer wealth

from current shareholders to bondholders. For complete expositions of capital structure arguments see Masulis (1980a) and (1983).

The negative two day announcement period cumulative abnormal return supports the explanations offered by the capital structure argument. However, an unanswered question is, if managers act in the best interest of the current stockholders and the firm actually pursues an optimal capital structure policy, why does the firm engage in financing strategies (issuing common stock) that are detrimental to its value?

1.1.5. Perfect Substitutes

The announcement of a new common stock offering by a firm increases the supply of the firm's shares and, because the demand curve is negatively sloped, stock price will drop. This argument assumes that there are no perfect substitutes for the firm's shares of common stock. It is important to emphasize that if size effects are present, they would take place on the offering date, when the supply of shares is actually increased and not on the announcement date. Therefore, the announcement of a common stock issue conveys important information to investors in the market, as documented by Scholes (1972).

1.2. HYPOTHESES

1.2.1. Managerial Ownership Hypothesis

We argue that the drop in stock price at the time of announcement of a new equity issue depends on the firm's ownership structure. To put the two categories of firms in perspective, owner-controlled firms are those firms whose insiders own a significant proportion of outstanding stock. Insiders play the dual role of residual claimants on the firm's earnings, and managers, who influence the firm's decision making process. On the other hand, management-controlled firms subscribe to the separation of ownership and control. Under this regime, the decision making process and ownership are separated from each other. Insiders of management-controlled firms claim title to a small, if any, fraction of firm's outstanding equity.

The hypotheses derives its relevance from the consequences of the separation of ownership from control of the corporation. The consequences of the separation are informational asymmetry and agency relationships. The problems associated with informational asymmetry and agency relationship are adverse selection and moral hazard, respectively.

Informational asymmetry, as developed in Akerloff (1970), exists whenever two transacting economic agents do not share the same information set. The product of the uneven distribution of information is two sets of information. A superior information set which is usually enjoyed by the agent rendering a service or selling a product and an inferior information set usually forced upon the agent receiving a

service or buying a product. In a perfect capital market [Modigliani and Miller (1958)], the financing decision is irrelevant to firm valuation, whereas, in a capital market of unevenly distributed information, investors (who possess inferior information sets) will question the managers' (who possess superior information sets) intentions concerning the financing decision.

The market recognizes the informational asymmetry regarding the true value of the firm between it and the firm's managers, and adjusts for the associated adverse selection costs in pricing the firm's securities. It recognizes that the firm's managers will issue new equity, if the market price per share is in excess of their assessment of the true value of the share, in compliance with current shareholder wealth maximization. Consequently, the market discounts the share price by an amount commensurate with the cost of informational asymmetry (on an ex ante basis).

The significance of the distinction between owner-controlled and management-controlled firms emerges now. For owner-controlled firms, stock owning insiders assume the roles of both managers (representing the firm) and investors (representing the market). Therefore, the consequences of informational asymmetry are less severe i.e., it is partially resolved. Consequently the market does not expect the manager of an owner-controlled firm to signal falsely by issuing shares of common stock when they are overpriced in the market, because of the partial ownership, assuming that the manager is aware of the subsequent costs of false signalling. Theoretical and empirical research support

our hypothesis. Leland and Pyle (1977) built a model in which outside investors take entrepreneurial ownership as a valid signal of the quality of the firm's future earnings. Forgone diversification benefits, due to high managerial fractional ownership, provide an incentive for managers to signal correctly to the market, a result consistent with our hypothesis. Downes and Heinkel (1982) found for a sample of initial public offerings, that outside investors are willing to pay a higher price for firms whose entrepreneurs maintained a greater equity ownership fraction.

In an agency relationship the principal can not fully monitor the actions of the agent. Consequently, the principal is forced to draw up contracts that enable him to define carefully the actions of the agent so as to insure that the agent acts in the best interest of the principal. In the absence of perfect and efficient markets for human and financial capital, agency relationships could prove costly.

Generally, the interests of the agent and the principal do not coincide fully. Therefore, in an attempt to resolve the informational asymmetry, they draw up costly contracts. Structuring, monitoring and bonding costs of these contracts and suboptimal investment policies make up the agency costs of an agency relationship. Jensen and Meckling (1976) show that agency costs are smaller under full ownership of the firm than under fractional ownership, because under the latter the liability of the manager to costs of perquisite consumption is limited to a proportion equivalent to his ownership fraction in the firm. However, the rational behavior of the outside stockholders will force

the agency costs (perquisite consumption) on the owner-manager. As a result, the model predicts a reduction in firm value when outside equity is used to finance the firm's projects. The manager of a management-controlled firm has little or no incentive to minimize agency costs, as opposed to the manager of an owner-controlled firm who has a vested interest in minimizing these costs, due to the expected decrease to his wealth.

A new equity issue means a real reduction in the managerial ownership fraction, if managers do not adjust their portfolio holdings to maintain their ownership fraction in their firm. The implications of this reduction are serious. The role of stock-owning insiders of owner-controlled firms as representatives of the firm has grown. Although they still maintain their positions as managers, their roles as representatives of the market has diminished because their fractional stock ownership has been effectively reduced. This outcome renders the informational asymmetry between the firm and the market more acute. In addition, the reduction in managerial ownership will provide a greater incentive for managers to take actions that will maximize the managers' utility functions rather than the stockholders'.

To summarize, a portion of the decline in stock price at the announcement of new equity issue is accounted for by the informational asymmetry conceived by the agency relationship between the owner-manager and outside stockholders and by the informational asymmetry between the firm's management and the market at large. For an owner-controlled firm, informational asymmetry is partially resolved and conflict of

interest prevalent in an agency relationship is reduced. Therefore, in a sample of common stock-issuing firms classified according to insider ownership, drop in stock price will decrease as insider ownership increases. That is, the higher is insider ownership the less likely that insiders will issue over-valued shares since the issue will cause earnings dilution. Consequently additional shares and reduced insiders' ownership are less likely to cause an increase in agency costs (monitoring, bonding and residual losses).

1.2.2. Slack Abundance Hypothesis

It is theoretically established that the value of the firm is determined by the discounted cash flows of real assets and not by the nominal financing consideration, [Modigliani and Miller (1958)]. That is, the value of the firm is completely independent of its capital structure in a world of perfect and frictionless capital markets. In these markets, capital is rationed to projects according to their risks; that is, firms need not worry about funding sources. On the other hand, empirical observation does not coincide with the predictions of the above proposition. Firms are concerned about funding sources. We see firms relying heavily on internally generated funds in financing investment projects. Kuh and Meyer (1963) documented that 75% of investment in manufacturing is internally financed. Given this corporate aversion to tapping the capital markets, internally generated funds should play a major role in the firm's investment and financing decisions. Yet the significance of the role is not empirically documented at the announcement of new equity issue.

In today's technical jargon, the existence of internally generated funds is called financial slack [Myers and Majluf (1984)], and it is more comprehensive. Financial slack is composed of cash, marketable securities and ability to issue default-risk-free debt. Managers usually attempt to build up financial slack to avoid the disclosure of strategic information regarding the firm's growth opportunities. If the firm were to resort to the capital markets, it would have to make public detailed financial reports. The availability of financial slack spares the firm the scrutiny from the market and exposure of its investment plans to its competitors during the period of investment. In addition, public financial reporting does not fully resolve the informational asymmetry problem. Recognizing this informational disadvantage, the market will offer an average price of the new securities. This leads to the conclusion that ex ante, the firm with above average value is better off with a higher level of financial slack. Slack will reduce the severity of the dilution at the time of the announcement of new (equity) financing.

Majluf (1978) proves that when the size of equity issue required to finance a project increases, the drop in stock price increases. That is, the drop in stock price is directly proportional to the size of the new equity issue. It is important to note that this effect is not due to the price pressure hypothesis; rather an increase in the size of required equity issue is synonymous with a drop in the amount of financial slack that a firm maintains.

It is important to emphasize that financing a project with default-risk-free debt is as harmless to firm valuation as cash in the firm's balance sheet. The harmful impact on the price of the firm's outstanding common stock varies proportionately with the riskiness of the securities issued. Because risky debt and preferred stock are senior securities and are of contractual nature more so than common stock, they are less responsive to changes in the variability of the firm's earnings. Consequently, issuance of risky debt or preferred stock creates a less acute informational asymmetry problem. Myers and Majluf (1984) show that the drop in stock price is smaller for a risky debt issue than for an equity issue. Thus, ex ante, the value of the firm is greater with a debt issue than with an equity issue.

If we extend the meaning of risk-free debt to include secured debt as defined by Stulz and Johnson (1985), their analysis would provide an indirect support for our postulated hypothesis. Stulz and Johnson define secured debt as debt backed up by real asset. Since the collateral renders the debt issue riskless, secured debt can be perceived as a form of financial slack. The authors show that the firm undertakes some investment projects if secured debt financing option is available, that it would not if issuing equity is the only available financing alternative. They assert that the security provision wards off some of the payoffs of the asset (collateral) from the unsecured bondholders to the stockholders. Then stockholders are better off with secured debt (financial slack) than otherwise.

In sum, if the firm has sufficient slack to finance an entire (a part of a) project, which includes debt, the problem is (partially) resolved. The firm will not have to face the discipline of the capital market, and the current stockholders will not have to surrender part of their current business (wealth) to new stockholders. As a result, the drop in stock price, in response to the announcement of a new equity issue, moderates as the proportional amount of financial slack, included in the financing of the project, increases.

1.2.3. Other Relevant Issues

Miller and Rock (1985) suggest that the announcement of new external financing signals lower than expected earnings. In addition, the Price Pressure Hypothesis claims that share prices must drop to induce investors to buy the new issue. Therefore, the larger the issue size, the greater the drop in stock price.

The new common stock issue brings about a change in the firm's leverage ratio. The reduction in leverage ratio has a potential to act on the stock price through three different channels. It shrinks the per share interest tax shield as advocated by Modigliani and Miller (1958). Galai and Masulis (1976) aver that a reduction in leverage ratio transfers wealth from the firm's current stockholders to its bondholders. Finally, Ross (1977) shows that a lower leverage ratio may signal a lower quality firm.

When estimating the impact of a new common stock issue on the stock price it is important to consider the liquidity of the market for the securities of the firm and reputation of the issuing firm. Generally,

the more liquid is the market of the firm's securities, the easier it is to distribute a new issue of common stock.

Myers-Majluf (1984) assert that in the presence of asymmetric information, managers of the firm decide to issue new share of common stock when their valuation of the firm falls short that of the market. That is, stock price performance prior to the announcement should be accounted for. Finally, the last factor to account for is the uncertainty surrounding the firm's assets. As the market's perceived uncertainty rises, so does the extent of the market's negative response to a new common stock offering announcement.

1.3. METHODOLOGY AND SAMPLE DATA

1.3.1. Sample Data

Firms that issued new shares of common stock through publicly underwritten offerings during the 1971-1984 period are initially identified from Barron's weekly table, "Coming Financing." For an observation to be allowed into the sample data it had to meet the following criteria:

1. The firm was either listed on the New York Stock Exchange or the American Exchange. The firm must have been listed on the exchange for at least 200 days prior to the announcement date. No initial public offerings were included in the sample.
2. The offering was filed with the SEC.
3. The offering was for common stock only. Dual and combination offerings of common stock and other securities are excluded.
4. Announcement of the issuance of new shares of common stock appeared in the Wall Street Journal.
5. No other simultaneous announcement should have accompanied the announcement of the new equity issue. The final sample consists of 273 industrial firms. The number of industrial firms with data available from CRSP and Compustat files is 273 and 225, respectively.

For industrial firms, insider ownership data are collected from Valueline from the most recent issue prior to the announcement. Data are available for 257 observations. However, we managed to obtain the offering size for 211 firms for which Compustat data are available.

In testing the hypotheses, the maximum number of observations possible is used because in some instances the values of some variables are missing.

Table 2 shows the annual distribution of the observations in the sample. The descriptive statistics of the observations used in testing the Insider Ownership Hypothesis and the Slack Abundance Hypothesis are on display in Tables 3 and 4, respectively.

1.3.2. Methodology

Event studies that investigate the impact of capital structure changes through security issuance on the prices of outstanding securities have made use of either the comparison period return approach developed by Masulis (1980a) or estimating the abnormal return of the security over that of a control portfolio (Asquith and Mullins) or finally estimating the abnormal return of the security over that justified by the market model for that security (Dann and Mikkelsen). In this project we employ the methodology used by Dann and Mikkelsen (1984).

Estimation of abnormal returns for common stock: The effects on the stock price of the common stock issue announcement are measured relative to a standard estimated from the market model. The abnormal return for security i is:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}); \quad (1)$$

where

t = the day measured relative to the event date;

TABLE 2
DISTRIBUTION OF OBSERVATIONS OVER 1971-1984 PERIOD

YEAR	Industrial	Public Utilities
1971	17	19
1972	12	23
1973	2	27
1974	2	32
1975	11	41
1976	15	37
1977	1	37
1978	9	48
1979	12	46
1980	37	41
1981	34	50
1982	29	52
1983	77	44
1984	15	11
	—	—
TOTAL	273	508

TABLE 3
DESCRIPTIVE STATISTICS FOR OBSERVATIONS WITH INSIDER OWNERSHIP
GREATER THAN OR EQUAL TO ZERO

	INSIDER OWNERSHIP RANGE				
	0.0 - 30.0		30.01 - 65.0		0.0 - 65.0
	Mean	Median	Mean	Median	Mean
Average Insider Ownership	9.0	6.0	42.7	41.8	12.4
Average $CAR_{i,-1,0}$	-3.71	-3.36	-4.80	-5.0	-3.80
Average market value of common stock (\$ millions)	679.32	273.4	194.8	114.8	654.85
Proceeds of the issue (\$ millions)	50.93	32.5	27.22	23.25	48.5
Size of the issue (Proceeds/market value of common stock)	0.097	0.123	0.227	0.213	0.159
Relative size of the firm	1.22	0.558	0.434	0.235	1.14
Number of observations	231		26		257

TABLE 4
DESCRIPTIVE STATISTICS FOR THE SAMPLE OF PUBLICLY UNDERWRITTEN
OFFERINGS OF COMMON STOCK BY INDUSTRIAL FIRMS
(SAMPLE USED TO ESTIMATE THE REGRESSION MODELS)

	Mean	Median
Cumulative Abnormal Return	-3.42	-3.28
Standardized Cumulative Abnormal Return	-1.58	-1.53
Insider Ownership	12.54	8.0
(No. of shares issued)/ (No. of shares outstanding)	0.158	0.125
Proceeds from the issue (\$ million)	49.50	29.70
Market value of the firm's common stock on the day prior to the announcement (\$ million)	496.60	237.14
Relative size of the firm	1.190	0.534
Slack	0.298	0.2264
L-T Debt Ratio Before Announcement	0.270	0.240
L-T Debt Ratio After Announcement	0.250	0.225
Change in L-T Debt Ratio	+0.024	+0.018
Raw Rate of Return Runup	14.44	13.29
Current Ratio	2.05	1.88
(CA-CL)/((CA-CL) + Proceeds)	0.61	0.64
Number of Observations	211	

$AR_{i,t}$ = abnormal return of security i for day t ;

$R_{i,t}$ = observed return on security i during day t ;

$E(R_{i,t})$ = expected rate of return on security i
for day t ;

$$= \alpha_i + \beta_i E(R_{m,t}) \quad (2)$$

$E(R_{m,t})$ = expected rate of return on CRSP equally weighted market portfolio for day t .

β_i = $\text{Cov}(R_{it}, R_{mt}) / \text{Var}(R_{m,t})$, a measure of systematic risk;

α_i = $E(R_{i,t}) - \beta_i E(R_{m,t})$,

e_{it} = disturbance term of security i over day t ,

$E(e_{i,t}) = 0$.

For each firm in the sample, daily returns for the 160 trading days preceding the 41 trading days prior to the announcement date and the 160 trading days subsequent to the 40 days following the announcement date are used to estimate the market model.

According to this method abnormal returns are defined as:

$$AR_{i,t} = R_{i,t} - \hat{\alpha} + \hat{\beta} R_{m,t}, \quad (3)$$

$\hat{\alpha}$ and $\hat{\beta}$ are parameter estimates of α and β , respectively.

Once the abnormal returns are obtained for each security, they are averaged across securities to obtain the return for an equally weighted portfolio. Therefore, average abnormal returns for each relative day are computed by:

$$AR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t}; \quad (4)$$

where N is the number of securities with abnormal returns during day t . The daily abnormal returns for period surrounding announcement date are reported in Table 5.

The cumulative abnormal return for a portfolio of N securities, CAR_p , are calculated by summing average abnormal returns over event time,

$$CAR_{p,K,L} = \sum_{t=K}^L AR_{p,t}; \quad (5)$$

where $CAR_{p,K,L}$ is the cumulative abnormal return of portfolio p for the period from $t=\text{day } K$ until $t=\text{day } L$.

Of special interest will be the two-day announcement period. A two-day announcement period is usually required because the announcement of an equity issue by firm i is published in the Wall Street Journal on $t=0$; however, the firm may have made a public announcement about the issue on day $t = -1$. Trading affected by the announcement takes place over the two days. Therefore a two-day average abnormal return is investigated for each announcement. The two-day cumulative abnormal return portfolio p is $CAR_{-1,0}$, where

$$CAR_{p,-1,0} = AR_{p,-1} + AR_{p,0}; \quad (6)$$

$AR_{p,-1}$ = abnormal return of portfolio p on the day preceding the announcement in the Wall Street Journal; and

TABLE 5

COMMON STOCK PORTFOLIO ABNORMAL RETURNS AND CUMULATIVE ABNORMAL
RETURNS SURROUNDING THE ANNOUNCEMENT DATE OF A PUBLICLY
UNDERWRITTEN OFFERING BY 273 INDUSTRIAL FIRMS

DAY	AR	CAR	DAY	AR	CAR
-40	0.2303	0.2457	1	0.0438	-0.5098
-30	-0.0933	0.8320	2	0.0468	-0.4630
-20	0.0646	1.7472	3	0.2790	-0.1840
-19	0.0030	1.7501	4	0.0660	-0.1180
-18	-0.0896	1.6606	5	-0.1125	-0.2305
-17	0.2454	1.9060	6	0.0186	-0.2119
-16	0.0277	1.9337	7	-0.1512	-0.3631
-15	0.1493	2.0830	8	-0.1187	-0.4818
-14	0.2778	2.3608	9	-0.1068	-0.5887
-13	0.3342	2.6950	10	0.0730	-0.5156
-12	0.3280	3.0230	11	-0.0769	-0.5925
-11	-0.1456	2.8774	12	0.0866	-0.5059
-10	0.1010	2.9784	13	-0.0654	-0.5714
-9	-0.1245	2.8539	14	-0.0338	-0.6053
-8	0.0784	2.9323	15	0.1162	-0.4890
-7	-0.0008	2.9315	16	-0.0540	-0.5431
-6	0.1288	3.0603	17	0.2542	-0.2889
-5	-0.2076	2.8527	18	-0.1346	-0.4236
-4	0.1703	3.0229	19	-0.0879	-0.5115
-3	0.1268	3.1497	20	0.0363	-0.4751
-2	-0.1913	2.9584	30	0.0849	-1.2054
			40	-0.0607	-1.4728
-1	-2.7792	0.1792			
0	-0.7328	-0.5536			

$AR_{p,0}$ = abnormal return of portfolio p on the day in which an announcement appeared in the Wall Street Journal.

To test whether the average cumulative abnormal return, CAR , is statistically significant, we compute the t -test,

$$t = \frac{CAR}{\hat{\sigma}} \quad (7)$$

where $\hat{\sigma}$ is the sample standard deviation of two-day cumulative abnormal returns estimated from forty non-overlapping two-day average cumulative abnormal returns over the trading days -41 to -2 and $+1$ to $+40$. These two day CAR s are assumed to be independent drawings from a stationary normal distribution. The test in (7) is student t -distributed with 39 degrees of freedom.

Brown and Warner (1985) identify a problem of t -test misspecification caused by the autocorrelation of average residuals of the market model. The above t -statistic takes care of this problem because its standard deviation is derived from CAR s covering an equal length of time (two days) as the event period in question.

1.3.3. Cross-Sectional Regression Models

The hypotheses are tested by estimating the following linear multiple regression model:

$$CAR_{i,-1,0} = f(\overset{+}{\text{INSIDER}}, \overset{+}{\text{SLACK}}, \overset{-}{\text{LOGSIZE}}, \overset{-}{\text{ADEBT}}, \overset{+}{\text{RELSIZE}}, \text{RUNUP}, \text{VAR})$$

where the sign above each variable represents the expected direction of the partial relationship and

$CAR_{i,-1,0}$ = Two day announcement period cumulative abnormal return of firm i .

INSIDER = Level of Insider Ownership of the firm's common stock

FINANCIAL SLACK =
$$\frac{\text{Cash} + \text{Marketable Sec's}}{\text{Cash} + \text{Marketable Sec's} + \text{Proceeds of the Issue}}$$

LOGSIZE = Log of the size of the issue measured as a fraction of the number of shares outstanding prior to the announcement

Δ DEBT	=	$\frac{\text{L-T Debt}}{\text{L-T Debt} + \text{Preferred Stock} + \text{Market Value of the Firm's Common Stock prior to the Issue.}}$	$\frac{\text{L-T Debt}}{\text{L-T Debt} + \text{Preferred Stock} + \text{Market Value of the Firm's Common Stock after the Issue.}}$
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RELsize =
$$\frac{\text{Market value of the firm's common stock on the day preceding the two-day announcement period.}}{\text{Average Market Value of the common stock of firms which trade on the exchange, on the same day.}}$$

RUNUP = Stock price run-up prior to the announcement measured by adding the daily rate of return for the 40 trading days preceding the two day announcement period.

VAR = Variance of the residuals of the estimated market model.

The dependent variable is the two-day announcement period CAR since the objective of the paper is to show that part of the change in stockholders wealth, in response to the announcement of a common stock

issue, is determined by factors such as managerial ownership of the stock of the firm and financial slack.

Insider is a variable measured as a fraction which represents management's fractional ownership of the outstanding shares. Insider can be thought of as the entrepreneurial claim on the firm's assets, advanced by Jensen and Meckling (1976) and Leland and Pyle (1977).

Financial slack is constructed to conform with the ideal world of the Myers and Majluf model. It is assumed that the total financing required for a project consists of financial slack (cash and marketable securities) and proceeds of the new equity issue. In other words financial slack is measured as the ratio of internally generated funds to the total financing requirements of a project.

Logsize represents the relative size of the issue. It is included in the model to account for the effect of the size of the offering on the CAR. Logsize measures relative amount of new financing. As amount of new financing increases, as advanced by Miller and Rock (1985), CAR decreases. Also, as size of the issue increases, the risk of failure of distributing the issue increases. We use the logarithm of relative issue size since other studies, such as Bhagat and Frost (1986) and Hansen and Pinkerton (1982) employed this functional form.

Δ Debt is a measure of offering provoked change in the firm's debt ratio. Δ Debt controls for the effects of capital structure changes. Debt ratio changes generally imply similar directional changes in the firm's expected future earnings. Therefore the smaller is the drop in the firm's debt ratio the higher is the CAR.

Size of the firm is measured by its relative size prior to the announcement. According to Relsize, the relative size of the average firm is one. The firm size proxy may stand for the reputation of the issuing firm and possibly the liquidity of the market for the firm's securities. The larger is the firm the larger is the market for its securities and consequently the higher is the CAR.

Run-up controls for stock price performance prior to the announcement. It is generally hypothesized that firms issue new shares of common stock when they believe that the market is overpricing the firm's shares.

Var is measure of the perceived market uncertainty regarding the existing assets of the firm. This variable is used by Masulis and Korwar (1986). The greater is the uncertainty the lower is the CAR.

1.4 RESULTS

1.4.1. Results of Managerial Ownership Hypothesis

The findings of this hypothesis provide some new insights about the determinants of stock price behavior around the announcement date of a new common stock issue. Table 6 reports the regression results of the two-day announcement period CAR against the relevant explanatory variables including equity ownership by the firm's insiders. The results of the entire sample, model 1, are by no means conclusive; the coefficient of the variable insider ownership appears with the predicted positive sign but it is not statistically significant. The absence of statistical significance for the coefficient of insider ownership may be attributed to the fact that the financial behavior of small firms is different from that of large firms. It is generally believed that it is more feasible for insiders or even outside investors to own a substantial equity position in a small firm than it is in a large firm.

By analyzing the sample of observations further, it is found that firms whose insider ownership exceeds 30% of the outstanding common stock are indeed small firms. Table 3, p. 24, contains descriptive statistics of the sample observations. Mean relative size of these firms is 0.44. If we assume that the relative size of the average firm is 1.0, then the size of firms whose insider ownership exceeds 30.0% is about two fifths the size of the average firm. Table 3 also shows that the mean relative size for firms whose insider ownership does not exceed 30% is 1.25, but the median relative size is 0.560. In other words, a fairly large number of firms in the subsample have below average sizes.¹

TABLE 6

CUMULATIVE ABNORMAL RETURN REGRESSION RESULTS OF 211 INDUSTRIAL FIRMS

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
INSIDER OWNERSHIP	0.0-65.0	0.0-30.0	30.01-65.0	0.0-65.0	0.0-30.0	30.01-65.0
INTERCEPT	-2.46 (-1.26)	-1.24 (-0.58)	-15.60 (-2.34)**	-2.02 (-1.00)	-0.51 (-0.24)	-17.40 (-2.57)**
INSIDER	0.019 (1.17)	0.056 (2.12)**	0.105 (1.30)	0.028 (1.60)	0.068 (2.54)**	0.10 (1.15)
SLACK ¹	-4.13 (-3.3)***	-3.91 (-2.90)***	-2.23 -0.61	-0.50 (-0.80)	-0.56 (-0.88)	3.31 (0.77)
ΔDEBT	-9.13 (-0.50)	-24.86 (-1.14)	68.53 (2.02)**	-23.77 (-1.28)	-42.80 (-2.00)**	59.1 (1.61)
LOGSIZE	-0.32 (-0.46)	0.09 (0.12)	-1.88 (-1.02)	-0.21 (-0.30)	0.68 (0.90)	-1.35 (-0.68)
REL-SIZE	0.10 (0.81)	0.081 (0.66)	1.51 (1.34)	0.087 (0.72)	0.074 (0.60)	1.52 (1.07)
RUNUP	-3.04 (-2.14)**	-3.51 (-2.33)**	0.72 (0.17)	-3.13 (-2.13)**	-3.60 (-2.33)**	2.80 (0.50)
VAR	-646.6 (-0.78)	-1036.3 (-1.00)	2312.3 (1.56)	-697.0 (-0.80)	-1131.7 (-1.05)	2671.6 (1.72)*
Adjusted R ²	0.05	0.08	0.012	0.02	0.06	0.0
F-Ratio	2.64**	3.15	1.04	1.60	2.55	1.00
No. OF Obs	211	187	24	203	181	22

Values in parenthesis are t-values.

* denotes statistical significance at the 0.10 level.

** denotes statistical significance at the 0.05 level.

*** denotes statistical significance at the 0.01 level.

¹ Slack2 was limited to positive values only.

Having established, with the help of Appendix A, that size of the firm does not affect the drop in stock price at the announcement date of a new common stock issue and having found that firms whose insider ownership extends beyond 30.0% are primarily small firms, we proceed in our investigation of the relationship between the two day announcement period CAR and insider ownership of the firm's common stock.

The distinction between very small firms and other firms is desirable because it is important to account for the fact that managerial teams who control more than 30% of their firm's outstanding shares of common stock, are likely to be entrenched within their firm. They are immune from the disciplines of all outside markets. Their substantial common stock position guarantees them future employment and protects against raids from the market for corporate control. Consequently, insider ownership may not bring about the expected desirable outcomes. Table 3, p. 24, indicates that firms whose insiders own more than 30% of the common stock generally suffer from a greater drop in stock price at the announcement of a new common stock issue.

To control for this effect, separate models are estimated for firms whose managerial ownership is less than or equal to 30.0%, and for firms whose managerial ownership exceeds 30%; models 2 and 3, respectively.

The results of model 2 show that the coefficient of insider ownership is positive and significant, at the 0.05 level, indicating that moderate levels of insider ownership affect the stock price

¹See Appendix A for a thorough analysis of the impact of the size of the firm on the two-day announcement period CAR.

performance at the announcement of a new equity issue in a favorable manner. The results are consistent with the hypothesis. The results suggest that insider ownership, for all firms whose insiders control no more than 30% of the outstanding common stock, reduces the drop in stock price at the announcement of a new common stock issue. Model 2 in Table 6 suggests that for every percentage increase in insider ownership, the two-day announcement period CAR increases by 0.056%. This model predicts that the CAR for an average firm with a 20% insider ownership is 0.85% greater than the CAR for a similar firm, but with an insider ownership of 5%.

It is also found that the relationship between the CARs and insider ownership for firms whose managerial ownership exceeds 30%, model 3, is positive and statistically insignificant. The lack of significance indicates that substantial insider ownership does not bring about the expected desirable effects to the firm at the announcement of a new equity issue, in contrast with our hypothesis. This result does not affect the earlier results for firms with insider ownership below 30.0% because these firms are very small firms and do not represent the more typical industrial firm. In addition, this subsample accounts for 10% of the entire sample.

Unlike some other studies that examine the variation in profit performance across manager-controlled and owner-controlled firms, we examine the consequences of insider ownership to the stock price at the announcement of a specific event.

According to our findings, ownership of no more than 30% of the common stock of the firm by insiders warrants the attention of the market as evidenced in the results in Table 6. The market apparently observes insider ownership and prices the benefits derived from it; reduced agency costs and partial resolution of informational asymmetry. The results provide the first empirical support for the Jensen and Meckling (1976) model. Jensen and Meckling show that in an agency relationship, where the utility function of the owner-manager (agent) is different from that of the outside stockholder (principal), greater insider ownership minimizes the divergence in interests between the owner-manager and the outside stockholders, and ultimately reduces the agency costs prevalent under a principal-agent relationship.

Leland and Pyle (1977) show that investors, in the presence of informational asymmetry between them and the management of the firm, take managerial ownership as a valid signal of the quality of the firm. Our results suggest that the market indeed takes notice of and rewards managerial ownership. Taking insider ownership as a measure of informational asymmetry between the owner-manager and outside stockholders, informational asymmetry diminishes as insider ownership increases. The partial resolution of informational asymmetry diminishes the incentive for the manager to signal falsely. In other words, the market, at the time of the announcement of a new equity issue assumes that the firm's manager (owner-manager) is cognizant of the costs that accompany false signalling, takes the decision by the manager to issue new shares of common stock as a true signal of the firm's genuine need

to finance a project and not an attempt to exploit outside stockholders by selling them overpriced shares of common stock to the benefit of the firm's current stockholders.

Finally, our results contribute to the findings of Downes and Heinkel (1982) who empirically document that the value of the firm changes directly with entrepreneurial ownership for a sample of initial public offerings of common stock. The results that we obtain build upon the findings of Downes and Heinkel and suggest that the market does not only observe managerial ownership when the firm goes public but also monitors and reacts to it during the life of the firm subsequent to the initial public offering.²

1.4.2. Results of Slack Abundance Hypothesis

The results in Table 6 indicate that the coefficient of financial slack is negative and statistically significant at the 0.01 level in models 1 and 2. That is, the higher is the level of financial slack, the lower is the two-day announcement period CAR, contrary to the predictions of slack abundance hypothesis. This finding is rather difficult to accept if the Myers and Majluf (1984) model is correct. Therefore, further analysis of the matter is called for. In attempting to explain why a positive sign is not found it is important to go back and reexamine the route taken in deriving the results of the Myers and

²Other models were estimated by including Insider and (Insider)² as independent variables.² Insider was positive and statistically significant. (Insider)² was negative and marginally statistically significant. Results of other variables did not materially change.

Majluf model, upon which our hypothesis is based. The following statement from Myers and Majluf (1984) delineates the significance of one crucial assumption:

We have shown that ample financial slack allows the firm to avoid external financing and to disentangle investment decision from conflicts of interest between old stockholders and new investors. However, this result depends on management's acting in the best interest of passive stockholders.

Implied in this assumption is that current stockholders do not rebalance their portfolios. That is, if new shares of common stock are issued, current stockholders do not participate and the entire issue is sold to new investors. This assumption remains controversial until future research investigates stockholder behavior, in regard to portfolio rebalancing, around the announcement date of a major event such as a common stock offering.

Myers and Majluf do not stop at acknowledging the controversy of the assumption of passive current stockholders. They examine the implications of the alternative assumption of management who acts in the best interest of active current stockholders. Under this assumption current stockholders do rebalance their portfolios in response to the announcement of a new common stock issue. Myers and Majluf consider two alternative scenarios for the status of financial slack. First, the firm does not have any financial slack but stockholders have sufficient cash to finance the entire project; however, they only purchase part of the issue due to optimal portfolio considerations. Second, the firm has sufficient cash to cover the entire project. If the firm invests in the project, stockholders of the firm will have a claim on the project

through their ownership of the firm's common stock. The same portfolio considerations that prompted them not purchase the entire issue in the previous scenario will prompt them to sell a fraction of their shares. Therefore, stock price drops regardless of who holds the financial slack and whether or not the firm maintains financial slack. Consequently, MM's proposition of financial irrelevance is obtained.

It is noteworthy to mention that the above discussion is based upon the assumption of active stockholders. Again we do not know what portfolio reallocation strategies stockholders pursue at announcements of new common stock issues. It is the task of future research to contribute to our understanding of stockholder behavior at announcements of important events.

So far we have provided a theoretical explanation for not obtaining a positive sign for financial slack within the Myers and Majluf (1984) world. The next step is to interpret why the CAR drops proportionately with financial slack. In the province of the invariance proposition of Modigliani and Miller (1958) and our empirical findings greater amounts of financial slack may signal the presence of large amounts of suboptimally allocated funds. It is possible that the market perceives that these funds are invested in low yielding financial assets when they can be maximally exploited within the operations of the firm.³

³Use of the proceeds were included as independent variables in the regression models. Dummy variables representing use of proceeds were not significant and the sign of slack did not change. In addition CAR

However, the results can also be explained outside the realm of the Myers and Majluf model. The concept of financial slack is not new to the finance literature. Some of the earlier works theorize that the firm does not only maximize profits but also maximizes other objectives such as liquidity and control. The most notable works are those of Cooper (1949) and Reder (1947).

Cooper asserts that there are two important arguments in the firm's utility function, liquidity and profits. Actual level of output at time $t+1$ is determined by liquidity and profit positions at time t . The objective of the firm is to determine the optimal combination of liquidity and profit positions. In this model liquidity and profits are competing forces. In other words there are conditions under which the firm foregoes profits (by contracting output) in order to attain a desirable liquidity position. Cooper suggests that firms maximize liquidity, in addition to control, to sustain dominant ownership.

In the same vein, Reder investigates the trade-off associated with maximizing profits and financial control of the firm. He argues that, if the firm were to realize its full growth potential so as to maximize the present value of its net worth, the entrepreneur will have to suffer from a control loss as a result of raising external capital, which takes the form of either a loan or common equity. Consequently, the entrepreneur does not maximize profits but attempts to maintain a

was regressed against high slack values only because we thought that firms with high slack may issue common stock for different reasons, but slack was still negative.

minimum percentage ownership which provides him with substantial control over the firm and effectively limits the financing of the growth of the firm's assets to his own funds. The price of maximizing the entrepreneur's control over the firm at the expense of maximizing profits is a skimpy growth in the firm's assets.

Cooper and Reder, in essence, present the same argument. The firm's entrepreneur compromises the growth of the firm to enhance his control over it. At the announcement of a new common stock issue the market infers from the issue that the entrepreneur has been misallocating the firm's resources. Funds are invested in liquid assets when they should be invested in productive assets. Therefore, the greater is the amount of liquid assets the more serious is the discipline of the capital market, as revealed by our findings.

Another possible explanation as to why we do not obtain a positive sign for the coefficient of financial slack is that there may be other variables which are better measures of financial slack. Consider the following alternative variable:

$$\text{Slack2} = \frac{\text{Current assets} - \text{Current Liabilities}}{(\text{Current Assets} - \text{Current Liabilities}) + \text{Proceeds}}$$

Financial slack according to Slack2 is the proportion of current assets financed with long-term (permanent) capital. It also takes care of short-term liquidity considerations by accounting for current liabilities. Slack2, in essence, suggests that the financing requirements of a project are the sum of current assets not financed with short-term capital and proceeds of the issue. The results of

models 4-6 report that the coefficient of Slack2 is negative in models 4 and 5, but not significant.⁴

This finding does not support slack abundance hypothesis. However this finding enjoys theoretical foundations for it supports the slack invariance proposition derived by Myers and Majluf (1984), under the assumption that management of the firm acts in the best interest of active current stockholders. Not only Slack2 is insignificant, but its coefficient (close to zero in models 4 and 5) is very small compared to that of slack measure used in models 1-3.

Considering the additional findings of Slack2 and Slack3 of Appendix B, how and whether or not financial slack affects the stock price at the announcement of a new common stock issue depends on the financial slack variable used. Unfortunately, there are no existing empirical works that have addressed the issue of the impact of financial slack at the announcement of new external financing.

1.4.3. Discussion of Relevant Issues

The results of the control variables are displayed in Table 6, p. 34. The size of the issue, measured in logarithms, provides a simultaneous test of the price pressure hypothesis, which assumes a

⁴One may argue that there are two shortcomings associated with our measure of financial slack. These shortcomings are (1) its dependence on the size of the issue and (2) the fact that firms maintain positive balances of cash and marketable securities for many reasons, besides financing projects, such as satisfying transactions and liquidity needs. For investigation of another possible measure of financial slack see Appendix B. However, we believe that our measure of financial slack should comply with the theoretical model on which the hypothesis is based, namely the Myers and Majluf (1984) model.

downward sloping demand curve, and the Miller and Rock (1985) hypothesis whereby a larger amount of new financing is associated with poorer than expected earnings. Coefficient of size of the issue does not have a consistent sign and is statistically insignificant. Asquith and Mullins and Masulis and Korwar find similar results. This finding suggests that size of the issue does not have an impact on the stock price at the announcement date of a new common stock issue. However, it is not empirically feasible to distinguish between the price pressure hypothesis and the Miller and Rock hypothesis. Coefficient of relative size of the firm is positive but also insignificant.⁵

Capital structure effects are accounted for by using the variable, ΔDebt , which measures the offering induced change in financial leverage. Capital structure effects include transfer of wealth from stockholders to bondholders [Galai and Masulis (1976)], loss of tax shield [Modigliani and Miller (1963)] and information signalling through a leverage change [Ross (1977)]. According to the above three capital structure hypotheses, a decrease in the firm's financial leverage has a negative impact on stockholders' wealth. The coefficient of the variable ΔDebt is negative and statistically significant at the 0.05 level in model 5 only. This finding reinforces the findings of Masulis

⁵ There was a fairly high degree of multicollinearity between the variables, Relsize , Logsize and ΔDebt . This multicollinearity problem is difficult to avoid especially between Logsize and ΔDebt . The models in Table 6, p. 34, were estimated without Relsize and Logsize . The coefficients of other variables were generally not affected by excluding Relsize and Logsize from the model.

and Korwar (1986). In addition, it is significant in model 3 but it has the wrong sign.

The coefficient of Runup, stock price run-up, is negative and statistically significant in models 1, 2, 4 and 5, indicating that the market observes stock price behavior in predicting common stock offerings. The fact that the coefficient of Runup is negative implies that the greater is the stock price run-up, prior to the announcement, the lower is the two-day announcement period CAR. This finding provides support for the Myers and Majluf (1984) argument whereby managers decide to issue new shares of common stock when they perceive those shares to be overpriced by the market. This finding reconfirms the findings of Masulis and Korwar and contradicts the findings of Asquith and Mullins.

The coefficient of Var is negative, in all models except 3 and 6, but insignificant. Variance of the residuals of the market model can be thought of as a measure of uncertainty surrounding the assets of the firm. However, Var does not seem to affect the two-day announcement period CAR. Bhagat, Marr and Thompson (1985) and Masulis and Korwar (1986) find similar results.

The results in Table 6, p. 34, suggest that the financial behavior of firms with managerial ownership that does not exceed 30% is conspicuously distinct from that of firms with managerial ownership that stretches beyond 30%. This proposition becomes obvious once we compare the significance of the coefficients of Insider, Slack, Δ Debt and Runup across the two types of firms.

PART II

RIGHTS OFFERING VS. PUBLICLY UNDERWRITTEN OFFERING

AND

DETERMINATION OF SUBSCRIPTION PRICE IN A COMMON STOCK

RIGHTS OFFERING

2.1. INTRODUCTION AND REVIEW OF THE LITERATURE

Rights offerings and publicly underwritten offerings are the best known equity financing methods. However they are different in substance. More importantly rights offerings provide an opportunity for the firm's current stockholders to preserve their ownership fractions in the firm. The fact that both methods have survived as viable means of obtaining external capital suggests that under certain conditions a rights offering is more economical while a publicly underwritten offering is favored under different conditions. Provided that the costs/benefits of the two methods are different and that the financing methods affect risk-return trade-offs for stockholders, it is plausible that the valuation consequences of the two methods are different. Despite the intriguing nature of the expected differences in the price behavior of the stock around the announcement dates of common stock issues, a systematic comparison of the price behavior around the announcement dates has not been performed to date. This is the task that we aspire to accomplish in this section. Table 1, p. 2, contains a list of studies that examine the impact of relevant capital structure changes on stock price.

Smith (1977) provides the only study that attempts to examine the difference in stock price behavior between publicly underwritten offerings and subscription rights offerings, in a comparative manner, but around the offering date. He finds no evidence of abnormal returns for either method. Smith investigates the issuing costs of the two methods in order to show that publicly underwritten offerings are not

less costly and thus does not pay attention to the signalling implications of the announcement of a rights offering versus a publicly underwritten offering.

Hansen and Pinkerton (1982) identify the conditions under which firms resort to either mode of equity financing. They hypothesize that it is economical for the firm to issue new shares of common stock through a publicly underwritten offering if ownership of the firm is relatively diverse; it is more economical to issue through a rights offering if the firm has a large block of stock controlled by few outside stockholders or by the board of directors or officers. The evidence they find supports their hypothesis. The average level of control for firms issuing nonunderwritten common stock is 61% of the outstanding common stock, in a sample of nonunderwritten offerings occurring between January 1971 and December 1979.

Empirical evidence indicates that the presence of the preemptive right option in the corporate charter has a favorable impact on the firm's value. Bhagat (1983) investigates the effect of deleting the preemptive right amendment on stock price. He tests two hypotheses; Shareholder Wealth Maximization, which claims that the firm's management has an additional less expensive means of issuing new common stock, and Management Welfare Maximization, which asserts that passage of the amendment will serve the management's interests at the expense of stockholders. At the proxy mailing date, the stock price suffered a drop of 0.68% which is statistically significant. It is clear from this finding that the market perceives the preemptive right option favorably.

The only study that examines the behavior of stock prices around the announcement date of a rights offering is that of White and Lusztig (1980). Interestingly, this study is an exception on another count; they do not construct a time-series of abnormal returns prior to and subsequent to announcement date. Instead, they estimate a pooled cross-sectional time-series model. The daily return on security j , for the days -90 until +45, is the dependent variable. The dummy variables representing the announcement date and day prior to announcement date (equivalent to two-day announcement period in standard event studies) have negative signs and are statistically significant. This finding reinforces the findings of studies of publicly underwritten offerings; issuing equity securities whether through subscription rights offerings or publicly underwritten offerings signals negative information to the market. But we still do not know whether the intensity of negative information varies between the two methods.

Marsh (1979) examines the efficiency of the U.K. stock market with respect to equity rights issues. He tests the Price Pressure Hypothesis and the Efficient Market Hypothesis using various methodological techniques, such as CAPM and the market model. The abnormal returns are sensitive to the portfolio weighting scheme. When an equally weighted market index is used to estimate the abnormal returns, they were much smaller. Marsh attributes the high post-announcement returns to size and concludes that there are no significant inefficiencies. Marsh uses monthly and quarterly returns for British equity rights issues over the period 1962-1975.

The findings of White and Lustzig and Marsh do not document conclusively the comparative advantage of one method of raising capital through issuance of common stock over another. We find that the stock price of an industrial firm drops by 2.1% at the announcement of a common stock issue through a rights offering versus 3.5% through a publicly underwritten offering. The drop in stock price of public utilities does not vary significantly across rights offerings and publicly underwritten offerings.

Myers and Majluf (1984) and Heinkel and Schwartz (1985) have introduced models to explain the use of rights offerings by firms. According to the Myers and Majluf model, the firm is faced with a positive NPV project for which it must secure financing. To do so the firm resorts to a rights offering and sets a low subscription price to insure the success of the offering. On the contrary, Heinkel and Schwartz rely on Viscusi's (1978) costly certification argument to establish that high quality firms, at the time of a financing need, raise capital through a rights offering with a high subscription price so as to distinguish themselves from low quality firms that raise capital through publicly underwritten offerings. All industrial firms and some public utilities are found to comply with the predictions of the Heinkel and Schwartz model. However the remaining public utilities are found to be concerned with securing the financing of a project, as suggested by the Myers and Majluf model.

In this essay, we empirically investigate stock price behavior around the announcement date of a new common stock issue, and compare the responses of stock prices for publicly underwritten offerings to those for rights offerings. The objective of this hypothesis is to determine the comparative advantage of one method over the other. In the second hypothesis we attempt to determine whether observed price behavior conforms to either the Myers and Majluf or the Heinkel and Schwartz models.

2.2. HYPOTHESES

2.2.1. Rights vs. Publicly Underwritten Offerings: Differential Valuation Consequences

The major distinction between a subscription rights offering and a publicly underwritten offering is that with a rights offering, whether or not an investment banker is involved, the firm's current stockholders have priority over all other investors in purchasing the new issue of common stock. For each share, the stockholder is issued an option (the right) to purchase a number of shares at a specified price, usually slightly below the market price to insure the success of the issue, within a specified period, required by New York Stock Exchange to be at least fourteen days. Rights are traded in the exchange in which the issuing firm is listed.

In an information signalling framework, the decision to raise capital through a subscription rights offering conveys a different signal than if a public offering is chosen. Heinkel and Schwartz (1985) theorize that high quality firms issue shares of common stock through a rights offering whereas lower quality firms issue shares of common stock through a public offering. A rights offering is more apt to signal favorable information than would be the case with publicly underwritten offerings. According to Myers and Majluf (1984), the informational asymmetry between the firm's management and existing stockholders and the market is the major reason for the drop in stock price at the announcement of a new equity issue. If the firm's management can costlessly communicate its information to the existing stockholders or

the market, the stock price will no longer drop. As a result of the informational asymmetry, the market will consider management's action as consistent with current stockholder wealth maximization. Therefore, the firm's management will decide to issue equity securities only when the market's assessment of the stock price exceeds that of the firm's managers. Consequently, rational investors in the market will discount the stock price by an amount equal to their best estimate of the difference between the market's price and management's assessment of the price. A by-product of this scenario is a wealth transfer from the current to the new stockholders, who buy the stock at the discounted price. Authors who documented the drop in stock price in response to the announcement of a new equity issue include Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkleson and Partch (1986) and others. Share prices of industrial firms and public utilities drop by 3% and less than 1% respectively (see Table 1, p. 2).

Once we differentiate between the methods of issuing common stock, the scenario changes. The decision to issue equity through a subscription rights offering is a signal to current stockholders that the investment outlook for the firm is good, so that the firm's management is giving seniority for them to capitalize on the firm's expected windfall profits. Theoretically, if the issue is fully subscribed, i.e., every stockholder exercises his right to acquire the specified number of shares, there will not be a drop in stock price. Shares will not be sold at the discounted price and no wealth transfer will take place (i.e., new (potential) stockholders will not gain at the

expense of current stockholders). A fully subscribed rights offering is equivalent to costless communication between the firm's management and current stockholders where informational asymmetry is completely resolved. Therefore, under a rights offering, even if the issue is not fully subscribed within the Myers and Majluf model, informational asymmetry is implicitly partially resolved. Under a public offering, in contrast with a rights offering, the problem of informational asymmetry is not resolved and, as a result, the market will assume the worst and act on the stock price accordingly.

Heinkel and Schwartz (1985) show that high quality firms differentiate themselves (from low quality firms which resort to publicly underwritten offerings) when issuing new shares of common stock by making use of rights offerings; whereby it is economical for high quality firms to compensate the investment banker for the investigation costs. By virtue of the investigation, a greater amount of information is divulged and ultimately the firm's securities are more accurately priced. On the contrary, low quality firms resort to an unformed investment banker (who is not compensated for the investigation costs), when issuing new shares of common stock, and as a result these firms' securities are offered at an average price.

Generally, rights offerings are not fully subscribed. According to Smith (1977), 50% of stockholders exercise their rights, 40% sell out for cash and 10% do not respond. Because 40% of the new shares will be bought by outside stockholders, effectively causing dilution of earnings, we do not expect a zero drop in stock price at the

announcement of a new common stock issue through a rights offering, for two reasons. First, as White and Lustzig show, stock price drops in response to the announcement of a new equity issue through a rights offering. Second, the suboptimal portfolio allocation problem of subscribing for the new shares may force investors away from their optimal portfolios.

Dann and Mikkleson (1984) also document that the drop in stock price associated with the announcement of a convertible debt rights offering is 1.23%, compared to a 2.31% drop associated with the announcement of a convertible debt public offering. The hypothesis of equal price response for public offerings and rights offerings is rejected at the 0.10 level.

There are two hypotheses about the stock price response to the announcement of a new common stock issue brought to market through either a public offering or a rights offering.

H1₀: Share prices are not influenced by either a public offering or a rights offering. Issuing shares of common stock through either method is merely a financing activity that does not signify anything about the firm.

H1_a: Share prices are influenced by announcements of new common stock issues.

H2₀: The change in stock price at the announcement of a new common stock issue is independent of the method of sale. Compared to a public offering, a rights offering does not convey differential information.

H2_a: The change in stock price at the announcement of a common stock issue varies between a public offering and a rights offering because each one conveys different information.

2.2.2. Determination of Subscription Price in a Common Stock Rights Offering

Heinkel and Schwartz (1986) develop a signalling model in which the mode of financing conveys information about the quality of the firm. Their model builds heavily on Viscusi's (1978) costly quality certification argument under which it is cost-effective for some firms to incur investigation costs so as to distinguish themselves from the average firm. Firms issuing shares of common stock know more about their quality than do investors. Signalling the quality of the firm is done through the subscription price. However for high quality firms, which employ a rights offering with a standby agreement, it is less costly to incur the investigation costs rather than to signal through the subscription price. The standby agreement of the investment banker provides an insurance against failure of the rights offering, which makes high quality firms indifferent to signalling through the subscription price. Intermediate quality firms signal through the subscription price. The higher the price, the greater is the quality of the firm. Since this quality of firms uses uninsured rights offerings, there is a positive probability that the offering may fail, and the firm will bear the costs associated with failure. Therefore a high subscription price does serve as a credible signal of the quality of the firm. Lower quality firms will resort to the uninformed

underwriter to market the issue. The dissipative signalling equilibrium that Heinkel and Shwartz establish is a partially revealing equilibrium because lower quality firms are priced on average and are not distinguished from each other.

The major distinction between the Heinkel and Schwartz (1986) and Myers and Majluf (1984) models lies in the signalling implications of setting the subscription price. According to HS, the subscription price is a monotonically increasing function of the quality of the firm (i.e., a higher subscription price simply signals higher quality). In the MM model, the motivations are different. Asymmetric information is prevalent between the firm's management and its stockholders. The firm is also faced with a positive NPV project that will be financed by the new equity issue. The firm cannot realize the positive NPV of the project unless it insures its financing from the existing common stockholders. The firm's management will resort to a rights offering with a subscription price low enough to warrant a successful subscription. Therefore, the lower the subscription price in a rights offering, the more likely that dilution will transfer wealth from old stockholders to new stockholders, indicating that the value of assets-in-place relative to growth opportunities is high. In other words, the management of the firm makes it very costly for current stockholders not to exercise their rights in a common stock rights offering by setting a low subscription price.

Clearly, the signalling implications of the subscription price in the two models are in sharp contrast. According to HS, a high

subscription price implies a higher quality firm, thus a high relative price at the offering of a new common stock issue will reduce the drop in the stock price. In contrast, in the MM model a high subscription price will signal that the firm's management is not keen about the possible wealth transfer when the rights offering fails and the firm floats new shares of common stock via underwriters. Therefore, the firm is signalled to have lower-value assets-in-place, consequently a high subscription price leads to a greater drop in stock price.

2.2.3. Size of the Firm

Firm size related effects are known to exist. Size of the firm stands for the reputation of the issuing firm and the liquidity of the market for its securities. Consequently, there are generally deeper and broader markets for securities of larger firms than there are for the securities of smaller firms.

2.3. SAMPLE DATA AND METHODOLOGY

2.3.1. Sample Data

Firms that issued new shares of common stock through public offerings during the 1971-1984 period are initially identified from Barron's weekly table entitled "Coming Financing". Firms that issued new shares of common stock through a rights offering during the 1962-1984 period were obtained from the CRSP Daily Master File. For an observation to be included, it must meet the following criteria:

1. The firm was either listed on the New York stock Exchange or the American Exchange. The firm must have been listed on the exchange for at least 200 days prior to the announcement date. No initial public offerings were included in the sample.
2. The offering was filed with the SEC.
3. The offering was for common stock only. Dual offerings of common stock and other securities are excluded.
4. Announcement of the issuance of new shares of common stock appeared in the Wall Street Journal.
5. No other simultaneous announcement should have accompanied the announcement of the new equity issue.
6. The final sample, for which data from CRSP Daily Rates of Return file is available, consists of 352 industrial firms and 625 public utilities; of which 196 and 781 were offered through rights offerings and publicly underwritten offerings, respectively. The distribution of the final sample is shown in

Table 7. In addition, Table 8 reports the descriptive statistics of the sample observations.

2.3.2. Methodology

Event studies investigating the impact of capital structure changes through security issuance on the prices of outstanding securities have made use of the comparison period return approach developed by Masulis (1980a); have estimated the abnormal return of the security over that of a control portfolio (Asquith and Mullins); or have estimated the abnormal return of the security over that justified by the market model for that security (Dann and Mikkleson). In this project we employ the methodology used by Dann and Mikkleson (1984).

Estimation of abnormal returns for common stock: The effects on the stock price of the new equity issue announcement are measured relative to a standard estimated from the market model. The abnormal return for a security is:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}), \quad (1)$$

where

t = the day measured relative to the event date;

$AR_{i,t}$ = abnormal return of security i for day t ;

$R_{i,t}$ = observed return on security i during day t ;

$E(R_{i,t})$ = expected rate of return on security i for day t ;

$$= \alpha_i + \beta_i E(R_{m,t}) \quad (2)$$

TABLE 7
DISTRIBUTION OF OBSERVATIONS OVER 1962-1984 PERIOD

YEAR	Rights Offerings		Publicly Underwritten Offerings	
	Industrial Firms	Public Utilities	Industrial Firms	Public Utilities
1962	0	2		
1963	4	5		
1964	5	6		
1965	5	8		
1966	10	6		
1967	10	5		
1968	4	4		
1969	9	11		
1970	5	10		
1971	7	15	17	19
1972	1	13	12	23
1973	1	5	2	27
1974	0	5	2	32
1975	4	5	11	41
1976	1	4	15	37
1977	1	3	1	37
1978	1	1	9	48
1979	2	3	12	46
1980	2	4	37	41
1981	2	2	34	50
1982	1	0	29	52
1983	2	0	77	44
1984	2	0	15	11
TOTAL	79	117	273	508

TABLE 8
DESCRIPTIVE STATISTICS OF FIRMS WHICH ISSUED COMMON STOCK

	I N D U S T R I A L F I R M S				P U B L I C U T I L I T I E S			
	Rights Offering		Pub. Underwritten Offering		Rights Offering		Pub. Underwritten Offering	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Two Day Announcement Period CAR	-2.07	-1.87	-3.51	-3.32	-0.73	-0.82	-0.81	-0.68
(Number of Shares Offered) (Number of shares outstanding)	27.45	17.06	16.0	12.80	8.94	7.60	10.78	10.0
Proceeds from the issue (\$ million)	67.40	21.10	48.31	31.12	76.09	39.43	61.60	42.70
Average of market value of the firm's common stock (\$ million)	821.60 ¹	150.0	477.4	237.14	1280.5 ¹	692.75	1029.60	476.25
Relative size of the firm	3.0	0.54	1.11	0.52	5.08	2.34	2.74	1.33
Number of Observations	79		273		117		508	

¹ Average of market value of the firm's common stock does not accurately represent the true mean of the sample because of few unusually large firms. When the largest five industrial firms are eliminated the mean drops to \$265.82 million and when the largest public utility (AT&T) is eliminated the mean drops to \$740 million.

$E(R_{m,t})$ = expected rate of return on CRSP equally weighted market portfolio for day t ;

$\beta_i = \text{Cov}(R_{i,t}, R_{m,t}) / \text{Var}(R_{m,t})$, a measure of systematic risk;

$\alpha_i = E(R_{i,t}) - \beta_i E(R_{m,t})$; and

e_{it} = disturbance term of security i over day t ,

$E(e_{it}) = 0$.

For each firm in the sample, daily returns for the 160 trading days preceding the 41 trading days prior to the announcement date and the 160 trading days subsequent to the 40 trading days following the announcement date are used to estimate the market model.

According to this method abnormal returns are defined as:

$$AR_{i,t} = R_{i,t} - \hat{\alpha} + \hat{\beta} R_{m,t} \quad (3)$$

where $\hat{\alpha}$ and $\hat{\beta}$ are the market model parameter estimates of α and β , respectively.

Once the abnormal returns are obtained for each security, they are averaged across securities to obtain the return for an equally weighted portfolio. Therefore, average abnormal returns for each relative day are computed by:

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t}, \quad (4)$$

where N is the number of securities. The cumulative abnormal return for a portfolio of N securities, CAR_p , is calculated by summing average abnormal returns over event time,

$$CAR_{p,K,L} = \sum_{t=K}^L AR_t, \quad (5)$$

where $CAR_{p,K,L}$ is the cumulative abnormal return of portfolio p for the period from $t = \text{day } K$ until $t = \text{day } L$.

Of special interest will be the two-day announcement period. A two-day announcement period is usually required because the announcement of an equity issue by firm i is published in the Wall Street Journal on $t = 0$. However, the firm makes a public announcement about the issue on day $t = -1$. Trading affected by the announcement takes place over the two days. Therefore a two-day average abnormal return is investigated for each announcement. The two-day cumulative abnormal return for portfolio p is $CAR_{-1,0}$, where

$$CAR_{p,-1,0} = AR_{p,-1} + AR_{p,0}; \quad (6)$$

$AR_{p,-1}$ = abnormal return of portfolio p on the day preceding the announcement in the Wall Street Journal; and

$AR_{p,0}$ = abnormal return of portfolio p on the day in which an announcement appeared in the Wall Street Journal.

To test whether the average cumulative abnormal return, CAR , is statistically significant, we compute the t -test,

$$t = \frac{\overline{CAR}}{\hat{\sigma}} \quad (7)$$

where $\hat{\sigma}$ is the sample standard deviation of two-day cumulative abnormal returns estimated from forty nonoverlapping two-day average cumulative abnormal returns over the trading days -41 to -2 and $+1$ to $+40$. These

two day CAR's are assumed to be independent drawings from a stationary normal distribution. The test in (7) is student t-distributed with 39 degrees of freedom.

Brown and Warner (1983) identify a problem of t-test misspecification caused by the autocorrelation of average residuals of the market model. The above t-statistic resolves this problem because its standard deviation is derived from CAR's covering an equal length of time (two days).

2.3.3. Cross-Sectional Regression Models Rights vs. Public Offerings Hypothesis

The form of the model to be estimated is:

$$CAR_{i,-1,0} = f(\overset{+}{PUB}, \overset{+}{INDRO}, \overset{+}{PUBRO}, \overset{+}{RO}, \overset{+}{RELSIZE})$$

where the sign above each variable shows the expected direction of the partial relationship and

$CAR_{i,-1,0}$ = Two day announcement period cumulative abnormal return of firm i.

PUB = Indicator variable representing public utilities.

INDRO = Indicator variable representing rights offerings by industrial firms.

PUBRO = Indicator variable representing rights offerings by public utilities.

RO = Indicator variable representing rights offerings by all firms.

$$\text{RELSIZE} = \frac{\text{Market value of the firm's common stock on the day preceding the two-day announcement period.}}{\text{Average market value of the common stock of firms which trade on the exchange, on the same day.}}$$

The dependent variable is the two-day announcement period CAR because the focus of the paper is the impact of the method of sale on stockholders' wealth. Weighted least squares models are estimated by dividing the variables by the variance of the residuals from the market model.

PUB, INDRO, PUBRO and RO are indicator variables included in the regression model as independent variables to represent the kind of firm (public utility vs. industrial firm) issuing new shares of common stock and the method of selling those shares. The excluded set is publicly underwritten offerings by industrial firms. The coefficients of these indicator variables measure the difference between the two-day announcement period CAR of industrial firms and the CAR of the respective nonexcluded sets. The results of these variables will determine whether or not the drop in stock price, CAR, at the announcement date of a new common stock issue varies across publicly underwritten offerings and rights offerings.

Size of the firm is proxied by its relative size. According to RELSIZE, the relative size of the average firm is one. This size measure stands for the liquidity of the market for the firm's securities.

Determination of Subscription Price in a Rights Offering Hypothesis

The form of the model to be estimated is:

$$CAR_{i,-1,0} = (RELP, DUM, INTER).$$

$CAR_{i,-1,0}$ = Two-day offering period cumulative abnormal return of firm i .

$RELP = \frac{\text{Offering Price in a Rights offering}}{\text{Average of the closing prices of the}} \\ \text{proceeding 10 or 5 days.}$

DUM = Indicator Variable representing relative prices greater than or equal to 0.70 for industrial firms and 0.90 for public utilities.

$INTER = \text{Relative Price} * DUM.$

The dependent variable is the two-day offering period CAR because the emphasis of the paper is on the determination of the subscription price in a rights offering, as inferred from the impact of the announcement of subscription price on the stock price. Again, weighted least squares models are estimated by dividing the variables by the variance of the residuals from the market model.

Relative subscription price is the ratio of the subscription price per share at the offering date to the average of the stock price of the "several" preceding trading days. Ten days are used for RELP1 and five days are used for RELP2. If the coefficient of this variable is positive, then it would be a clear support for the HS predictions and against those of MM, but if it is negative, the converse is true.

However, limiting representation of the relative offering price to RELP1 or RELP2 may lead to distorted results. The sample of firms issuing shares of common stock through a rights offering may include firms that are motivated by considerations addressed by Heinkel and Schwartz, and others motivated by considerations discussed by Myers and Majluf. To account for this possibility the sample must be divided into subsamples of low and high relative prices. DUM is added to the model to control for the possibility that firms which resort to high relative prices may have different intercepts. Finally, INTER tests whether or not the relationship between relative price and the CAR has a different slope at higher relative prices.

One must acknowledge that including RELP, DUM and INTER as independent variables in the same regression model brings about a high degree of multicollinearity. However, this multicollinearity problem is eliminated by estimating separate models for low and high relative prices.

2.4. RESULTS

2.4.1. Rights Offerings vs. Publicly Underwritten Offerings

Tables 9, 10, 11 and 12 report the stock price behavior around the announcement dates of new public offerings and rights offerings by industrial firms and public utilities. The absolute size of the drop in stock price is smaller for rights offerings than for publicly underwritten offerings. (See Table 13). For industrial firms, Tables 9 and 10, show that the change in stock price is -3.5% and -2.10% (both are statistically significant at the 0.01 level) for publicly underwritten offerings and rights offerings, respectively. The hypothesis of equal means is rejected at the 0.01 level. Similarly, Tables 11 and 12 show that the change in stock price of public utilities is -0.81% and -0.73% (both are statistically significant at the 0.01 level) for publicly underwritten offerings and rights offerings, respectively. Table 13 displays the summary statistics of the two-day announcement period CAR.

The two day announcement period cumulative abnormal return is regressed against different combinations of indicator variables representing public utilities, rights offerings by industrial firms, rights offerings by public utilities and rights offerings. The excluded group of new common stock issues are those of industrial firms. The first attempt to detect differences in valuation consequences resulting from the use of different methods of issuing shares of common stock is seen in model 1 in Tables 14 and 15. It is estimated for the entire sample of new common stock offerings. The only distinction in this

TABLE 9

**COMMON STOCK PORTFOLIO ABNORMAL RETURNS AND CUMULATIVE ABNORMAL
RETURNS SURROUNDING THE ANNOUNCEMENT DATE OF A PUBLICLY
UNDERWRITTEN OFFERING BY 273 INDUSTRIAL FIRMS**

DAY	AR	CAR	DAY	AR	CAR
-40	0.2303	0.2457	1	0.0438	-0.5098
-30	-0.0933	0.8320	2	0.0468	-0.4630
-20	0.0646	1.7472	3	0.2790	-0.1840
-19	0.0030	1.7501	4	0.0660	-0.1180
-18	-0.0896	1.6606	5	-0.1125	-0.2305
-17	0.2454	1.9060	6	0.0186	-0.2119
-16	0.0277	1.9337	7	-0.1512	-0.3631
-15	0.1493	2.0830	8	-0.1187	-0.4818
-14	0.2778	2.3608	9	-0.1068	-0.5887
-13	0.3342	2.6950	10	0.0730	-0.5156
-12	0.3280	3.0230	11	-0.0769	-0.5925
-11	-0.1456	2.8774	12	0.0866	-0.5059
-10	0.1010	2.9784	13	-0.0654	-0.5714
-9	-0.1245	2.8539	14	-0.0338	-0.6053
-8	0.0784	2.9323	15	0.1162	-0.4890
-7	-0.0008	2.9315	16	-0.0540	-0.5431
-6	0.1288	3.0603	17	0.2542	-0.2889
-5	-0.2076	2.8527	18	-0.1346	-0.4236
-4	0.1703	3.0229	19	-0.0879	-0.5115
-3	0.1268	3.1497	20	0.0363	-0.4751
-2	-0.1913	2.9584	30	0.0849	-1.2054
			40	-0.0607	-1.4728
-1	-2.7792	0.1792			
0	-0.7328	-0.5536			

TABLE 10

COMMON STOCK PORTFOLIO ABNORMAL RETURNS AND CUMULATIVE ABNORMAL
RETURNS SURROUNDING THE ANNOUNCEMENT DATE OF A COMMON STOCK
RIGHTS OFFERING BY 79 INDUSTRIAL FIRMS

DAY	AR	CAR	DAY	AR	CAR
-40	0.2400	0.9945	1	-0.5347	-3.5366
-30	-0.0488	0.4083	2	-0.1824	-3.7190
-20	0.1507	0.8413	3	0.2739	-3.4450
-19	0.2789	1.1203	4	-0.7509	-4.1959
-18	-0.1358	0.9845	5	-0.6494	-4.8453
-17	0.3203	1.3048	6	-0.1052	-4.9505
-16	-0.6232	0.6815	7	0.0307	-4.9198
-15	0.2544	0.9359	8	-0.2587	-5.1785
-14	0.6524	1.5883	9	-0.3331	-5.5116
-13	-0.0304	1.5579	10	-0.1413	-5.6529
-12	0.0870	1.6449	11	-0.0377	-5.6906
-11	-0.1855	1.4594	12	0.3435	-5.3471
-10	0.0327	1.4921	13	0.0347	-5.3124
-9	0.0118	1.5038	14	0.3575	-4.9549
-8	-0.3243	1.1795	15	0.5620	-4.3928
-7	-0.2660	0.9136	16	0.0515	-4.3413
-6	-0.8451	0.0684	17	-0.2824	-4.6237
-5	-0.1213	-0.0528	18	0.1413	-4.4824
-4	-0.2234	-0.2762	19	-0.0821	-4.5645
-3	-0.0196	-0.2958	20	-0.0464	-4.6110
-2	-0.6368	-0.9327	30	0.4340	-4.5312
			40	-0.2088	-4.8436
-1	-0.8458	-1.7785			
0	-1.2234	-3.0019			

TABLE 11

COMMON STOCK PORTFOLIO ABNORMAL RETURNS AND CUMULATIVE ABNORMAL
RETURNS SURROUNDING THE ANNOUNCEMENT DATE OF A PUBLICLY
UNDERWRITTEN OFFERING BY 508 PUBLIC UTILITIES

DAY	AR	CAR	DAY	AR	CAR
-40	0.0530	0.0754	1	-0.0765	0.1428
-30	-0.0800	0.5533	2	-0.1308	0.0119
-20	0.1366	1.0065	3	0.0470	0.0590
-19	0.0721	1.0787	4	-0.1317	-0.0726
-18	-0.0062	1.0724	5	-0.0490	-0.1217
-17	0.0713	1.1437	6	-0.0331	-0.1548
-16	0.0674	1.2112	7	-0.0041	-0.1590
-15	-0.0750	1.1362	8	-0.0060	-0.1650
-14	0.0235	1.1597	9	-0.0183	-0.1833
-13	0.0263	1.1860	10	0.0366	-0.1467
-12	0.1027	1.2888	11	0.0447	-0.1019
-11	-0.0408	1.2479	12	0.0152	-0.0867
-10	0.0875	1.3355	13	-0.0811	-0.1678
-9	-0.0332	1.3023	14	0.0381	-0.1296
-8	-0.0285	1.2737	15	-0.0413	-0.1710
-7	0.0285	1.3023	16	0.0069	-0.1640
-6	-0.0526	1.2497	17	-0.0128	-0.1769
-5	-0.0824	1.1672	18	0.0101	-0.1667
-4	-0.0346	1.1326	19	-0.0048	-0.1716
-3	-0.0411	1.0915	20	0.1840	0.0124
-2	-0.0588	1.0326	30	0.0144	-0.2330
			40	0.0355	-0.2022
-1	-0.5238	0.5087			
0	-0.2893	0.2193			

TABLE 12

COMMON STOCK PORTFOLIO ABNORMAL RETURNS AND CUMULATIVE ABNORMAL
RETURNS SURROUNDING THE ANNOUNCEMENT DATE OF A COMMON STOCK
RIGHTS OFFERING BY 117 PUBLIC UTILITIES

DAY	AR	CAR	DAY	AR	CAR
-40	-0.1003	-0.1071	1	0.0110	-2.5117
-30	-0.0613	-0.3809	2	-0.0434	-2.5551
-20	-0.0770	-1.3232	3	0.0165	-2.5386
-19	0.1571	-1.1661	4	-0.0355	-2.5742
-18	0.0494	-1.1167	5	-0.0702	-2.6444
-17	-0.0246	-1.1413	6	-0.0251	-2.6695
-16	-0.0780	-1.2193	7	-0.0513	-2.7209
-15	0.0586	-1.1607	8	-0.1421	-2.8630
-14	-0.1304	-1.2911	9	-0.0943	-2.9574
-13	0.2190	-1.0721	10	0.0811	-2.8762
-12	-0.0549	-1.1270	11	-0.1589	-3.0352
-11	-0.1409	-1.2679	12	-0.0791	-3.1143
-10	-0.1144	-1.3824	13	-0.0071	-3.1214
-9	-0.0835	-1.4659	14	0.1577	-2.9637
-8	-0.0074	-1.4734	15	-0.1893	-3.1531
-7	-0.1992	-1.6727	16	-0.0253	-3.1785
-6	-0.0147	-1.6874	17	-0.0884	-3.2669
-5	-0.1648	-1.8522	18	0.0064	-3.2605
-4	0.1046	-1.7475	19	-0.1418	-3.4023
-3	0.0337	-1.7138	20	-0.1283	-3.5307
-2	-0.0741	-1.7880	30	-0.1074	-4.3267
			40	-0.0091	-5.0856
-1	-0.4191	-2.2071			
0	-0.3156	-2.5227			

TABLE 13
DESCRIPTIVE STATISTICS OF TWO-DAY ANNOUNCEMENT PERIOD
CAR FOR INDUSTRIAL FIRMS AND PUBLIC UTILITIES

	Industrial Firms	Public Utilities
Publicly Underwritten Offerings		
CAR	-3.51	-0.81
t-value	-16.20	-8.35
Std. Dev. of CAR	3.61	1.93
Percent Negative	85.0	68.5
Range of CAR	-14.50 - +7.62	-8.91 - +8.58
Rights Offerings		
CAR	-2.07	-0.73
t-value	-4.50	-5.10
Std. Dev. of CAR	5.20	2.24
Percent Negative	68.3	71.8
Range of CAR	-14.83 - +25.12	-6.47 - +8.08

TABLE 14

OLS REGRESSION RESULTS OF THE TWO-DAY ANNOUNCEMENT PERIOD CUMULATIVE ABNORMAL RETURN AGAINST RELATIVE SIZE AND INDICATOR VARIABLES REPRESENTING COMMON STOCK RIGHTS AND PUBLICLY UNDERWRITTEN OFFERINGS BY INDUSTRIAL FIRMS AND PUBLIC UTILITIES

Dependent Variable	Intercept	PUB	INDRO	PUBRO	RO	Relative size	F-value	Adj R ²	No of obsv	Model
Entire Sample CAR	-1.77 (-15.50)***				0.468 (1.83)*	0.006 (0.55)	1.90	0.00	977	1
CAR	-3.50 (-20.01)***	2.70 (12.41)***	1.38 (3.67)***	0.117 (0.39)		-0.0048 (-0.50)	42.50	0.15	977	2
CAR	-3.50 (-20.00)***	2.70 (12.42)***		-1.27 (-2.67)***	1.38 (3.71)***	-0.0048 (-0.50)	42.50	0.15	977	3

Values in Parentheses are t-values

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

*** The cumulative abnormal return, over the two day announcement period, for the entire sample of 962 observations is 1.716%.

TABLE 15
WLS REGRESSION RESULTS OF THE TWO-DAY ANNOUNCEMENT PERIOD CUMULATIVE ABNORMAL
RETURN AGAINST INDICATOR VARIABLES REPRESENTING COMMON STOCK RIGHTS AND
PUBLICLY UNDERWRITTEN OFFERINGS BY INDUSTRIAL FIRMS AND PUBLIC UTILITIES

Dependent Variable	Intercept	PUB	INDRO	PUBRO	RO	Relative Size	F-Value	Adj R ²	No of obsv.	Model
Entire Sample CAR	-2.81 (-17.46)***				0.92 (2.89)***	0.021 (0.71)	4.50	0.01	977	1
CAR	-3.75 (-20.00)***	2.80 (8.85)***	1.57 (4.26)***	-0.0008 (-0.0)		-0.012 (-0.42)	23.06	0.08	977	2
CAR	-3.75 (-19.94)***	2.81 (8.56)***		-1.56 (-2.33)***	1.56 (4.26)***	-0.012 (-0.43)	23.05	0.08	977	3

Values in parentheses are t-values.

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

*** Denotes significance at the 0.01 level.

model is made between publicly underwritten offerings and rights offerings regardless of whether they are public utilities or industrial firms. Rights offerings are represented by the indicator variable RO. The coefficient of RO is positive and statistically significant (in Table 15). The average change in stock price in response to the announcement of a new common stock issue is -1.8%. However, if the common stock issue is offered through a rights offering, the change in stock price is about -1.3%.

The above findings provide sufficient evidence against $H1_0$ and $H2_0$ and provide support for $H1_a$ and $H2_a$. They show that stock prices do respond to announcement of common stock issues and the method of sale does affect the stock price at the announcement date. The coefficient of the intercept is negative and highly significant, indicating that publicly underwritten offerings of common stock influence the stock price. The coefficient of the indicator variable representing rights offerings clearly demonstrates that the stock price response to a rights offering is substantially different from that to a publicly underwritten offering (for industrial firms only).

Model 2 sheds additional light on the relationship between the two-day announcement period CAR and method of sale. The coefficient of the variable PUB, representing public utilities, is positive and statistically significant--its coefficient, 2.70%, being equal to the difference between the industrial firms announcement period CAR and public utilities announcement period CAR. This finding can be

attributed to the fact that public utilities are regulated and consequently are subject to greater information disclosure.

The fact that public utilities operate in a regulated environment may explain why there is no statistical difference between their CAR for publicly underwritten offerings and their CAR for rights offerings. The coefficient of the variable PUBRO, the indicator variable representing rights offerings by public utilities, is positive but insignificant. In other words, the effect of the announcement of a common stock issue offered through a rights offering on the stock price is not different from the effect of a common stock issue offered through a publicly underwritten offering.

The results for industrial firms are different from those of public utilities. In model 2, the coefficient of the variable INDRO, indicator variable representing common stock rights offerings by industrial firms is positive and statistically significant. Its coefficient is 1.38%, indicating that the drop in stock price at the announcement of a new common stock issue through a rights offering is smaller by a magnitude of 1.38%. This number is equal to the difference between the two day announcement period CAR of publicly underwritten offering and the two day announcement period CAR of a rights offering. Model 3 is essentially a summary of the above results. The results of the weighted least squares models, shown in Table 15, are similar to those of OLS models. However, their parameter estimates have greater statistical significance.

Our findings contribute to the so called "unresolved financing paradox" already established in the literature. The paradox stems from the fact that only 10% of all new common stock issues are sold through rights offerings to stockholders. Moreover, the use of rights offerings to raise capital has been gradually disappearing since the 1950s, despite the fact the issuing costs on these types of financing modes are much lower when compared to publicly underwritten offerings. According to Smith (1977), the issuing costs of pure rights offering are about 40% of the issuing costs of underwritten public offerings. Our evidence shows that one of the consequences of issuing shares of common stock through publicly underwritten offerings, as opposed to rights offerings, is greater loss in shareholder wealth.

To appreciate the greater loss in shareholder wealth consider the following scenario. If the market value of a typical industrial firm's common stock is \$250 million, the reduction in shareholder's wealth amounts to \$9.0 million and \$5.5 million if the firm issues shares of common stock through publicly underwritten offering and rights offering, respectively. That is, this firm could enhance its stockholders' wealth by \$3.5 million, if it chooses a rights offering over a publicly underwritten offering when it raises capital by issuing shares of common stock. In addition the offering dilution for a publicly underwritten offering is -25% versus -13% for a rights offering. In other words, if the firm were to raise \$50 million by issuing common stock through a publicly underwritten offering, the value of the firm's common stock increases by only \$37.5 million, subsequent to the offering. In the

case of a rights offering, the value of common stock increases by \$43.5 million.¹

This finding provides the first attempt to compare and document the consequences to shareholder wealth of issuing shares of common stock through a rights offering versus a publicly underwritten offering, at the announcement date of a common stock issue. Smith (1977) examines the effect of the method of sale on the stock price at the offering date and finds that neither method is superior to the other.

Hansen and Pinkerton (1982) offer a partial explanation for the "unresolved financing paradox." They find that about half of all nonunderwritten offerings are initiated by firms for which at least two-thirds of the outstanding stock is centrally located. This phenomenon is undoubtedly true for smaller firms. However, examples of firms that issued common stock through rights offerings in the 1960's include AT&T, Boeing Co., Burroughs Corp., Chrysler Corp., Continental Oil Co. (Conoco Inc.), IBM and Shell Oil Co. It is highly unlikely that two-thirds of the outstanding common stock is centrally located for any of these firms.

According to our sample, the market value of the common stocks of firms which issued new shares through a rights offering, on the day prior to the announcement is less than \$200 million for about 70% of the firms in the sample. Usually smaller firms have greater ownership

¹These calculations are based on median values. The offering dilution for rights offerings is equal to $(-0.0187 \times \$150 \text{ mil})/\$21.1 \text{ mil.} = 13\%$. Whereas for publicly underwritten offerings it is equal to $(-3.32 \times \$237 \text{ mil.})/\$31.12 = 25\%$.

concentration than large firms and markets for their securities are generally smaller. To control for these size effects a relative size measure, RELSIZE, is included in each of the regression models. The coefficient of RELSIZE is not significant and does not appear to have a consistent sign. These results provide evidence that size effects do not play any role at the announcements of a new common stock issue.

Hansen and Pinkerton explain the "unresolved financing paradox" in terms of issuing costs. They document that it is more cost-effective for firms that enjoy concentrated equity ownership to issue new shares of common stock to raise capital through a rights offering than it is through a publicly underwritten offering. Conversely, firms whose equity ownership is widely dispersed will find it cost-effective to issue new shares of common stock through a publicly underwritten offering. Therefore we are still left with an "equity financing paradox" in terms of valuation consequences. Our results indicate that rights offerings inflict smaller damages on stockholders' wealth. This finding is also independent of the size of the firm.

Our findings give support to the findings of Bhagat (1983). Bhagat finds that the market perceives the preemptive right amendment in the corporate charter favorably. Our findings also reconfirm the findings of White and Lustzig (1980), who merely document that the stock price drops in response to the announcement of a common stock rights offering.

2.4.2 Determination of Offer Price in a Rights Offering

In testing the competing predictions of the MM and HS models, two relative prices are used. To avoid distorting the results or biasing

them toward supporting the predictions of any model, the sample is broken down into three categories according to the values of the relative prices.²

<u>Category</u>	<u>Industrial Firms</u>	<u>Public Utilities</u> ³
Relative Prices		
1	Entire Sample	Entire Sample
2	Greater than 0.70	Greater than 0.90
3	Less than 0.70	Less than 0.90

Descriptive statistics for all categories are displayed in Tables 16 and 17 for industrial firms and public utilities, respectively. Relative prices of public utilities are generally substantially higher than those of industrial firms. Proceeds per issue for public utilities are greater but size of the issue as a fraction of the market value of the firm's common stock is smaller than that of industrial firms.

Industrial Firms

Tables 18 and 19 display the OLS and WLS results for industrial firms, respectively. Model 1 shows that the relative price alone does not seem to affect the two-day offering period CAR.

²Other categorizations were also considered, the ones we present produced the most meaningful and consistent results.

³For public utilities, hypothesis of equal variances for relative prices greater than 0.90 and relative prices less than 0.90 is rejected at the 0.01.

TABLE 16

DESCRIPTIVE STATISTICS OF OBSERVATIONS USED IN TESTING THE
DETERMINATION OF OFFER PRICE IN RIGHTS OFFERING HYPOTHESIS--
INDUSTRIAL FIRMS

	Entire Sample		Relative Price ≥ 0.70		Relative Price < 0.70	
	Mean	Median	Mean	Median	Mean	Median
CAR ¹	-1.50	-1.12	-1.61	-1.17	-0.57	-2.14
REL P1	0.819	0.828	0.858	0.837	0.627	0.648
Std. Dev. of Rel p1	0.113		0.084		0.052	
REL P2	0.825	0.839	0.858	0.846	0.632	0.659
Std. Dev. of Rel p2	0.115		0.085		0.065	
PROCEEDS (\$ millions)	65.69	20.25	73.80	21.59	9.96	6.54
Average of the market value of the firm's common stock ² (\$ millions)	722.71	135.18	834.78	160.80	133.01	42.9
Number of observations	69		59		10	

¹Two day offering period CAR

²These values are preoffering period values and not
preannouncement period values.

TABLE 17

DESCRIPTIVE STATISTICS OF OBSERVATIONS USED IN TESTING THE
DETERMINATION OF OFFER PRICE IN RIGHTS OFFERING HYPOTHESIS--
PUBLIC UTILITIES

	Entire Sample		Relative Price ≥ 0.90		Relative Price < 0.90	
	Mean	Median	Mean	Median	Mean	Median
CAR ¹	-0.94	-0.89	-0.77	-0.92	-1.12	-0.90
RELPl	0.894	0.909	0.926	0.922	0.845	0.873
Std. Dev. of Relpl	0.058		0.020		0.063	
RELp2	0.897	0.912	0.927	0.924	0.851	0.879
Std. Dev. of Relp2	0.059		0.020		0.068	
PROCEEDS (\$ millions)	77.61	39.43	78.06	42.30	85.13	36.75
Average of the market value of the firm's common stock ² (\$ millions)	1067.21	544.02	728.73	484.85	1551.87	719.5
Proceeds/market value of the firm's common stock	0.096	0.091	0.095	0.093	0.098	0.087
Number of observations	105		63		42	

¹Two day offering period CAR

²These values are preoffering period values and not
preannouncement period values.

TABLE 18

OLS REGRESSION RESULTS OF TWO-DAY OFFERING PERIOD CAR AGAINST RELP1--
INDUSTRIAL FIRMS

Relative Price Variable	0.0 - 1.0			≥ 0.70	< 0.70
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-6.51 (-1.62)	-15.90 (-2.88)***	-28.98 (-1.65)	-14.45 (-2.48)**	-28.98 (-1.67)
RELP1	6.17 (1.27)	24.57 (2.73)***	45.30 (1.62)	15.01 (2.21)**	45.3 (1.65)
INTER1		-7.80 (-2.39)**	-30.21 (-1.05)		
DUM1			14.53 (0.80)		
Adjusted R ²	0.01	0.07	0.07	0.063	0.160
F-Ratio	1.61	3.44	2.67	4.90	2.70
Number of Observations	69	69	69	59	10

Values in parentheses are t-values.

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

*** Denotes significance at the 0.01 level.

TABLE 19

**WLS REGRESSION RESULTS OF TWO-DAY OFFERING PERIOD CAR AGAINST RELP2--
INDUSTRIAL FIRMS**

Relative Price Variable	0.0 - 1.0			≥ 0.70	< 0.70
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-7.15 (-1.70)*	-20.62 (-3.13)***	-37.75 (-2.43)**	-16.90 (-2.34)**	-37.75 (-2.42)**
RELP2	6.63 (1.24)	30.94 (2.89)***	58.34 (2.34)**	17.57 (2.04)**	58.34 (2.33)**
INTER1		-8.97 (-2.60)***	-40.78 (-1.55)		
DUM1			20.85 (1.22)		
Adjusted R ²	0.010	0.09	0.09	0.052	0.33
F-Ratio	1.54	4.2	3.30	4.20	5.4
Number of Observations	69	69	69	59	10

Values in parentheses are t-values.

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

The relationship between CAR and relative price is clearer once model 2 is considered. In model 2 the interaction term (INTER1) between relative price and indicator variable (DUM1), representing high relative prices, is added to the model. The coefficient of relative price variable is positive and statistically significant. INTER1 appears negative and statistically significant indicating that the slope of the response function at higher relative prices is different. Model 3 depicts the results after an indicator variable representing high relative prices is added to model 2. While the coefficients of RELP and INTER1 retained their respective signs, neither is significant. The coefficient of indicator variable, DUM1, is positive but not significant, indicating that higher relative prices do not have a different intercept.

To reinforce our finding further and eliminate the multicollinearity problem, an additional model is estimated for each of categories 2 and 3. Models 4 and 5 show the results of categories 2 and 3, respectively. The strong positive association between the two-day offering period CAR and relative price is reestablished for firms that set high subscription prices. For firms at the lower end, the association is positive but not statistically significant according to OLS model in Table 18.⁴ However, model 5 in Table 19 indicates that RELP is positive and significant. The results of the WLS models are

⁴The results of RELP2 are similar to those of RELP1, but are not reported here for conservation of space.

similar to those of OLS models but generally have greater statistical significance.

The above findings indicate that industrial firms conform to the theoretical predictions of Heinkel and Schwartz. Higher quality firms use the subscription price in a rights offering as a signalling mechanism to distinguish themselves from lower quality firms. The firm that sets a high subscription price runs a greater risk of failure of the offering; therefore the subscription price is a valid and credible signal of the quality of the firm. Our results demonstrate that the market favorably perceives a high subscription price, as evidenced by the strong positive association between the two-day offering period CAR and the relative offering price. However this positive association is moderated at very high relative prices, according to model 2 in both tables. The coefficient of INTER1 is negative, but smaller than that of RELP, and therefore partially offsets the rate of growth of CAR as relative price increases.

Given that the subscription price in a rights offering is a valid signal of the quality of the firm, results of industrial firms indicate that the financing of the project is not the primary consideration as advocated by Myers and Majluf. Rather, it is the quality of the cash flows generated by the project that counts.

Public Utilities

The results of public utilities are provided in Tables 20 and 21. The coefficient of relative price in model 2, in Table 20 indicates that there is no significant association between the two-day offering period

TABLE 20

OLS REGRESSION RESULTS OF TWO-DAY OFFERING PERIOD CAR AGAINST RELP1--
PUBLIC UTILITIES

Relative Price Variable	0.0 - 1.0			≥ 0.90	< 0.90
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.197 (-0.07)	4.33 (1.19)	7.41 (1.96)*	-19.37 (-1.88)*	7.41 (1.91)*
RELP1	-0.83 (-0.26)	-6.60 (-1.53)	-10.18 (-2.28)**	20.10 (1.81)*	-10.17 (-2.23)**
INTER1		1.06 (1.93)*	30.27 (2.49)**		
DUM1			-26.79 (-2.41)**		
Adjusted R ²	0.0	0.015	0.061	0.035	0.09
F-Ratio	0.07	1.85	3.25	3.27	4.95
Number of Observations	105	105	105	63	42

Values in parentheses are t-values.

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

TABLE 21

**WLS REGRESSION RESULTS OF TWO-DAY OFFERING PERIOD CAR
AGAINST RELP1--PUBLIC UTILITIES**

Relative Price Variable	0.0 - 1.0			≥ 0.90	< 0.90
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	3.86 (1.22)	0.82 (0.20)*	3.55 (0.80)	-13.14 (-1.28)	3.55 (0.83)
RELP1	-3.33 (-0.94)	-2.61 (-0.54)	-5.84 (-1.11)	13.56 (1.23)	-5.84 (-1.15)
INTER1		1.14 (1.80)*	19.4 (1.61)		
DUM1			-16.7 (-1.52)		
Adjusted R ²	0.0	0.033	0.032	0.01	0.01
F-Ratio	0.9	2.76	2.14	1.51	1.33
Number of Observations	105	105	105	63	42

Values in parentheses are t-values.

* Denotes significance at the 0.10 level.

** Denotes significance at the 0.05 level.

*** Denotes significance at the 0.01 level.

CAR and relative price. The coefficient of the interaction term, INTER1, is positive and statistically significant (at the 0.10 level in Table 20). These results sharply contrast with those of model 2 for industrial firms. Unlike Model 3 for industrial firms, the coefficients of all variables are statistically significant including that of DUM1, the indicator variable representing high relative prices. Thus, high relative prices not only have different slopes but also have lower intercepts.

Model 3 clearly demonstrates that the relationship between the two-day offering period CAR and relative price at high relative prices is completely distinct from that at lower relative prices. This becomes more obvious once we consider the separate models of categories 2 and 3. Model 4, in Table 20, shows that for firms that resort to high relative prices, the intercept is negative and a positive relationship exists between the CAR and relative price. On the contrary, model 5, in Table 20, reveals that for firms that make use of low relative prices the intercept is positive and a negative relationship exists between CAR and relative price⁴. The results of the WLS models do not enjoy any statistical significance.

Apparently, among public utilities there are firms whose financial behavior complies with the predictions of the Heinkel and Schwartz model and others whose financial behavior conforms to the predictions of the Myers and Majluf model. Consequently, there are two kinds of public utilities that make use of rights offering to issue new shares of common stock. The first kind sends a credible signal about the quality of the

cash flows of the project through the subscription price, which is directly associated with the quality of cash flows of the project. The second kind of public utilities is more concerned with the financing of the project. Results of model 5, in Table 15, p. 76, unambiguously support the predictions of the Myers and Majluf model. Firms set a low subscription price to secure the financing of a positive NPV project. These utilities recognize the great pressure on a shareholder who is offered a substantially low subscription price to act on the rights. Assuming one right is required to purchase one new share in a common stock rights offering, the value of the right is equal to the difference between the market price per share and the set subscription price. Consequently, the lower is the subscription price, the greater is the value of the right. Therefore, for the shareholder to maximize wealth, he/she is forced to make a portfolio reallocation decision. The shareholder must either exercise the rights to buy the new shares or sell the rights to other investors. Whether the shareholder exercises the rights or sells them, the firm has rendered the funding of its project secure.

Interestingly, industrial firms that resort to low relative prices are much smaller than other industrial firms which resort to high relative prices. But public utilities that make use of low relative prices enjoy an average common stock market value which is double that of other utilities which make use of high relative prices. Not only that, but the drop in stock price during the two-day offering period for firms which set a high subscription price is 0.77% compared to 1.12% for firms which set a low subscription price (difference in means test

is significant at the 0.10 level). This evidence indicates that the market responds differently to different offering prices. The market responds more favorably to high offering prices because, at the time of issuing the new shares through a rights offering, the primary concern of a firm setting a high subscription price is to invest in a positive NPV project.

This corporate finance behavior on the part of some public utilities maybe the product of operating in a regulated "protected" environment. When they decide to invest in a project that may yield cash flows more risky than the firm's present cash flows, public utilities may go after the most secure source of financing so as to resolve some of the uncertainty associated with the project.

This study furnishes the first attempt at investigating the theoretical motivations that underly corporate financial decisions in regard to setting the subscription price in a common stock rights offering. The models developed by Heinkel and Schwartz (1985) and Myers and Majluf (1984) provide competing analytical justifications for setting the subscription price. However, so far no work has been done to subject the data to empirical testing. This is the task that we set out to accomplish and find that the Heinkel and Schwartz model explains the financial behavior of industrial firms and some public utilities. On the other hand, we also obtain evidence that shows that the Myers and Majluf model explains the financial behavior of the other public utilities.

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APPENDIXES

APPENDIX A

ANALYSIS OF THE IMPACT OF THE SIZE OF THE FIRM ON THE CAR

The objective of this appendix is to document empirically that our findings are not attributable to size related effects. Generally, small firms, because of their size, do not generate the investment interest of institutional investors. As a result, there is greater uncertainty surrounding firms with low-capitalizations because the market may not monitor them as closely as it does larger firms. Consequently, announcements of major events of low-capitalization firms represent greater surprises than those of large capitalization firms. In addition, because these firms are small, the market for their securities is usually small.

Analysis-of-variance (ANOVA) is used to test for size effects. However, ANOVA techniques are most useful when employed to test for differences among the means of samples by examining the amount of variation brought about by categorical variables. As such, we create relative size and insider ownership categorical variables based upon two criteria that we discuss along with the two designs that we investigate. We do recognize that creating categorical variables out of continuous variables compromises the objectivity of the tests but we also believe that some subjectivity is tolerable in the pursuit of thorough understanding of the relationships among the variables. Two designs are presented. Our objective is to determine whether or not different levels of insider ownership and relative size are responsible for the

differences among the means of the two day announcement period CARs. ANOVA is also repeated for standardized CARs. The following two hypotheses are tested:

H1: Treatment effects of Insider Ownership on the CARs and standardized CARs (CARs divided by the standard deviation of the residuals from the market model) are all zero.

H2: Treatment effects of Relative Size on the CARs and standardized CARs are all zero.

The first design is described in Table A1. While constructing this design, an attempt is made to include equal number of observations in each level. Results of this design indicate that H1 is not rejected at the 0.05 level for both CARs and standardized CARs. H2 is also not rejected at the 0.05 level, for both CARs and standardized CARs (but it is rejected at the 0.10 level for CARs only).

Table A2 displays comparisons of the main effects. Averaging across relative size, the hypothesis of equal means for insider ownership levels 1 & 3 is rejected at the 0.05 level. In addition, CARs and standardized CARs increase monotonically as insider ownership increases. Interestingly, the hypothesis of equal means for relative size levels 2 & 3 (CARs only) is rejected at the 0.05 level. But this hypothesis is not rejected for relative size levels 1 & 3. Keep in mind that level 1 represents the smallest relative sizes, level 2 represents the intermediate relative sizes and level 3 represents the greatest relative sizes. If size related effects are indeed present, they should be most profound between levels 1 & 3, and hypothesis of equal level

TABLE A1
ANALYSIS-OF-VARIANCE DESIGN OF THE TWO-DAY ANNOUNCEMENT
PERIOD CAR AND STANDARDIZED CAR--DESIGN 1

Relative	Insider Ownership	L E V E L			Entire Sample Averaging Across Insider Ownership
		1 <3.0	2 3 - <15.0	3 ≥15 - 65	
L 1	≤0.28	-3.57	-4.06	-3.22	-3.56
E		-1.56 11	-1.59 30	-1.26 44	-1.42 85
V 2	>0.28 - ≤0.941	-5.08	-4.32	-4.41	-4.63
E		-2.19 32	-1.81 32	-1.81 22	-1.95 86
L 3	>0.941	-3.35	-3.63	-2.71	-3.28
		-1.96 41	-1.93 25	-1.38 20	-1.82 86
Entire Sample Averaging Across Relative Size		-4.03 84	-4.03 87	-3.41 86	-3.82 257

Key: -3.57 Two day announcement period CAR

-1.56 Standardized CAR

11 Number of observations

TABLE A2
COMPARISONS OF MAIN EFFECTS--DESIGN 1

LEVEL	INSIDER OWNERSHIP		RELATIVE SIZE	
	CAR	STAND. CAR	CAR	STAND. CAR
1 - 2	-	-	*	*
1 - 3	-	*	-	-
2 - 3	-	-	*	

*Hypothesis of equal level means is rejected at the 0.05 level.

means for relative size levels 1 & 3 should have been rejected. In addition, the CARs and the standardized CARs do not follow a systematic pattern across the three levels of relative size.

The second ANOVA design is displayed in Table A3. A closer attention is paid to the construction of this design. Relative size measurements are identical to those in Table A1 to allow for meaningful comparisons. However, the number of observations in each level are generally not equal. Firms whose insider ownership exceeds 30% are excluded. These firms are primarily low capitalization firms which are possibly amateur participants in the public capital markets. In addition, officers of firms at this stage enjoy extensive control over the firm's decision making process. In this design, insider ownership levels are determined according to traditional guidelines. Level 1 represents immaterial concentration of insider ownership. Level 2 covers low-to-moderate levels of insider ownership. Level 3 accounts for substantial insider ownership.

Contrary to the results of the first design, H1 is rejected at the 0.05 level for both CARs and standardized CARs strongly suggested that insider ownership is responsible, at least partially, for the differences among the level means. In addition, standardized CARs monotonically increase as insider ownership increases. Hypothesis of equal level means is rejected at the 0.05 level for insider ownership levels 1 & 3 and 2 & 3 but not 1 & 2; Table A4. This finding indicates that for insider ownership to produce its favorable effects it would have to exceed 15.0%. Finally, H2 is not rejected at the 0.05 level for

TABLE A3
ANALYSIS-OF-VARIANCE DESIGN OF THE TWO-DAY ANNOUNCEMENT
PERIOD CAR AND STANDARDIZED CAR--DESIGN 2

Relative	Insider Ownership	L E V E L				Entire Sample Averaging Across Insider Ownership
		1 ≤5.0	2 5.01 - 15.0	3 15.01 - 30.0		
L 1	≤0.28	-3.40	-4.43	-2.65		-3.47
E		-1.42 18	-1.79 25	-0.95 28		-1.36 71
V 2	>0.28 - ≤0.941	-4.80	-4.26	-2.62		-4.32
E		-2.02 43	-1.88 23	-0.95 11		-1.83 77
L 3	>0.941	-3.38	-3.70	-2.63		-3.34
		-1.92 52	-1.86 19	-1.49 12		-1.84 83
Entire Sample Averaging Across Relative Size		-3.92 -1.88 113	-4.16 -1.84 67	-2.64 -1.08 51		-3.71 -1.69 231

Key: -3.40 Two day announcement period CAR

-1.42 Standardized CAR

18 Number of observations

TABLE A4
COMPARISONS OF MAIN EFFECTS--DESIGN 2

LEVEL	INSIDER OWNERSHIP		RELATIVE SIZE	
	CAR	STAND. CAR	CAR	STAND. CAR
1 - 2	-	-	-	-
1 - 3	*	*	-	-
2 - 3	*	*	-	-

*Hypothesis of equal level means is rejected at the 0.05 level.

both CARs and standardized CARs, indicating that size of the firm does not affect the CARs at the announcement of a new common stock issue.

An attempt is also made to detect the presence of interaction effects between insider ownership and relative size on the two day announcement period CAR. The results indicate that there is no interaction effect.

The results of analysis-of-variance clearly demonstrate that the variation in the CARs between the subsamples is solely attributable to insider ownership effects. That is, size effects are not responsible for the positive results obtained in this study.

The final step of the analyses of the size of firm involves regressing the two day announcement period CAR against relative size. The model is estimated for firms with insider ownership below 30%, and for firms with insider ownership greater than 30% and for the entire sample. The results in Table A5 indicate that the coefficient of relative size is positive but not statistically significant. The fact that relative size does not enjoy any statistical significance demonstrates that the results of insider ownership hypothesis are not brought about by firm size effects.

TABLE A5
REGRESSION RESULTS OF THE TWO-DAY ANNOUNCEMENT PERIOD
CAR AGAINST RELATIVE SIZE

	Cumulative Abnormal Return		
	0.0 - 30.0	30.01 - 65.0	0.0 - 65.0
Insider Ownership			
Intercept	-3.80 (-14.70)***	-4.95 (-6.35)***	-3.90 (16.12)**
Relative Size	0.121 (1.13)	1.00 (0.90)	0.14 (1.36)
Adjusted R ²	0.0	0.0	0.0
F-Ratio	1.3	0.8	1.84
Number of Observations	231	26	257

Values in parenthesis are t-values.

*** Denotes significance at the 0.01 level.

APPENDIX B

ANALYSIS OF AN ALTERNATIVE MEASURE OF FINANCIAL SLACK

The alternative measure of financial slack incorporates the overall liquidity considerations of the firm and avoids the dependence on the size of the issue. This measure is:

$$\text{Slack3} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The result of using the current ratio as a measure of financial slack are reported in Table B1.

Slack3 is the current ratio of the firm for the fiscal year preceding the announcement date. Slack3 has an advantage over Slack and Slack2; it is completely independent of the issue size and consequently eliminates the negative association between issue size and the announcement period CAR. It also controls for liquidity considerations. Unlike the coefficients of two previous slack variables, the coefficient of Slack3 is positive and significant at the 0.10 level in models 1 and 2. This finding implies that the market observes the level of financial slack, as measured by the firm's current ratio, and rewards it. The coefficient of Slack3 in model 1 suggests that if the firm had a current ratio of 2, prior to the announcement, the CAR would have increased by about 1.0%. In other words, financial slack does indeed reduce the discipline of the capital market at the announcement of a new common stock issue as originally suggested by Myers and Majluf.

TABLE B1
CUMULATIVE ABNORMAL RETURN REGRESSION
RESULTS OF INDUSTRIAL FIRMS

INSIDER OWNERSHIP	0.0-65.0	0.0-30.0	30.01-65.0
	Model 1	Model 2	Model 3
INTERCEPT	-3.07 (-1.50)	-1.43 (-0.64)	-17.5 (-2.54)**
INSIDER	0.0176 (1.02)	0.05 (1.82)*	0.11 (1.21)
SLACK ¹ Current Ratio	0.46 (1.91)*	0.41 (1.62)*	0.38 (0.36)
ΔDEBT	21.16 (1.16)	38.46 (1.80)*	-70.2 (-1.98)**
LOGSIZE	-0.28 (-0.42)	0.77 (1.02)	-2.0 (-1.0)
RELSIZE	0.081 (0.66)	0.07 (0.54)	1.52 1.09
RUNUP	-3.04 (-1.70)*	-3.51 (-1.84)*	0.10 (0.02)
VAR	-722.6 (-0.85)	-1238.7 (-1.18)	2648.5 (1.74)*
Adjusted R ²	0.02	0.05	0.0
F-Ratio	1.65	2.27	0.93
No. of Obs	210	187	23

Values in parenthesis are t-values.

* denotes statistical significance at the 0.10 level.

** denotes statistical significance at the 0.05 level.

*** denotes statistical significance at the 0.01 level.

¹ Data for current assets and current liabilities were obtained from Compustat tapes for the fiscal year preceding the announcement date.

The variable representing insider ownership appears positive but significant at the 0.10 level in model 2 only. ΔDebt , measures offering induced change in leverage, shows up significant at the 0.10 level in model 2 but with the wrong positive sign. However, it is significant at the 0.05 level and has the correct negative sign in model 3. Logsize and Relsize are both insignificant. Stock price runup is negative and significant at the 0.10 level in models 1 and 2. Finally, Var is marginally significant in model 3 but it has the wrong sign.

VITA

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