ANNOUNCEMENT EFFECTS OF NEW EQUITY ISSUES AND THE USE OF INTRADAY PRICE DATA

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ABSTRACT

This study develops procedures for testing announcement effects on intraday stock returns. Intraday stock returns surrounding announcements of new issues of equity and debt are examined. During the first fifteen minutes following new equity issue announcements, there is an abnormally large number of transactions, high volume, and a -1.5% average return. There is a small, but statistically significant negative average return during the hour preceding the announcements and the average return during the three hour period surrounding the announcements is between -2.3% and -3.0% depending on the measurement procedure. The size of the offering, the stated purpose of the issue and the estimated profitability of new investments do not have a significant impact on stock returns. New debt issue announcements also do not have a significant impact on stock returns. After the issuance of new shares, there is a significant price recovery of 1.5%. This evidence is inconsistent with many theoretical rationales for the negative price impact of new equity issue announcements.

1. Introduction

The market reaction to new issues of corporate securities has been the focus of a number of empirical investigations.[1] The results of these studies suggest that announcements of new issues of equity have a negative impact on common stock prices.[2] At a superficial level, this negative market reaction appears anomalous. New issues are voluntary actions at the discretion of firm managers. If managers act in the best interests of shareholders, they will issue new securities only when the net benefits to shareholders are positive. Several hypotheses have been suggested in the literature to explain this negative market reaction.

This study uses intraday transaction prices and exact announcement times to examine the within day pattern of common stock returns surrounding announcements of new issues of seasoned equity and debt by industrial firms. Earlier studies were based on daily data and did not directly identify the announcement day. Instead, they identified the date of publication of the announcement in the *Wall Street Journal.* Since the first public announcement could have occurred before, during, or after trading hours on the last day prior to the *Wall Street Journal* announcement, these studies equate the announcement effect with the cumulative return over a two day interval including the publication day and the preceding trading day. The use of intraday data and the exact time of the announcement has two primary advantages over the methodology used in these previous studies.

First, these data permit more efficient estimation of the effects of new information on common stock prices. The longer the measurement period, the greater

[1] See: Asquith and Mullins [1986], Dann and Mikkelson [1984], Eckbo [1986], Kolodny and Suhler [1985], Masulis and Korwar [1986], Mikkelson and Partch [1986] and Schipper and Smith [1986].

[2] The average common stock price decline reported by these authors is 3.14% following announcements of new issues of equity. See Smith[1986], Table 1.

are sources of variability attributable to extraneous factors unrelated to the event under study. Measuring returns over shorter intervals of time greatly reduces this component of the variance of the stock returns. The greater the component of the variance attributable to extraneous factors relative to the announcement, the less powerful are statistical tests of the significance of announcement effects over that interval. For example, in the present study, the total variance of the mean price change over a three hour period surrounding the announcement is more than 4.5 times the total variance of the mean price change during the first 15 minutes following the announcement. The relative inefficiency associated with the use of a two day announcement period return is a possible explanation for the finding of Mikkelson and Partch[1986] that announcements of common stock issues do not have a statistically significant impact (at the 10% level) on prices when the intended use of the funds is for capital expenditures. The present study finds that the impact on prices from such announcements is statistically significant at the 1% level.

Second, the use of intraday data permits examination of the within day pattern of common stock price adjustments to new information. For example, the present study finds that there is a statistically significant negative return during the one hour interval prior to the announcement and that the price adjustment is completed over two post announcement trading hours.

Intraday transaction data for firms listed on the New York and American Stock exchanges are currently available in computer readable form. The availability of intraday data makes possible a wide array of new empirical work on issues relating to the intraday pattern of stock price adjustments to new information. The use of intraday data also raises fundamental methodological questions regarding the appropriate measurement of within day returns and the corresponding significance tests. Several well known measurement problems that arise in conjunction with empirical work in finance based on daily data become more severe when intraday data are used. In particular, because the time intervals are measured in minutes and hours, most securities do not trade within every interval on every day. Careful consideration must be given to the treatment of missing observations. Since the length of time between transactions varies considerably, measurement problems associated with non-synchronous trading are also important.

In addition to standard parametric tests of statistical significance, several bootstrap algorithms extending the resampling procedures in Efron[1982] are developed. Even when parametric statistics (such as t statistics) can be calculated, the bootstrap algorithms provide more appropriate tests of statistical significance since the random sample sizes and missing observations are accounted for directly in the resampling procedures. Methodological issues concerning the measurement of within day returns and the development of significance tests are discussed in Section 2.

This paper also reexamines several hypotheses that have been advanced in the literature to explain the negative market reaction to announcements of new issues of equity. This reexamination leads to a number of empirical tests to distinguish between the hypotheses.

In contrast to earlier studies, the current study examines whether the market reaction differs according to the estimated profitability of the firm's investments. Unexpected announcements of impending security issues intended to finance new investment projects signal an increase in planned investment spending. If managers act to maximize the value of the firm and only positive net present value projects are undertaken, then investors would consider new investment spending to be "good news." On the other hand, if managers maximize some other objective function,[3]

[3] It has been suggested, for example, that large firms do not maximize profits, but instead maximize sales revenue subject to the constraint that profits meet or

then new investment spending would be "bad news." In either case, the market reaction should reflect investors' beliefs about the net present value of these incremental projects. This hypothesis is tested for a sample of common stock issues using Tobin's Q as a gross present value (profitability) index for all of the firm's investment opportunities. While previous studies have examined the effect of the intended use of the proceeds and the size of the offering on the stock price adjustment, they find conflicting evidence. The use of intraday data provides further evidence on these effects. The competing hypotheses are discussed in Section 3, the data are described in Section 4, and the empirical results are reported in Section 5. Section 6 concludes the work with a brief summary of the main results.

2. Methodological Issues Related To Measuring Intraday Returns

2.1. The Cumulative Return Technique

Event studies using daily data generally employ some version of the cumulative return method for estimating abnormal returns surrounding an event. By redefining the standard interval from one day to some shorter period (say 15 minutes), it is possible to apply the same technique to intraday data.

Consider dividing the trading day into intervals of fixed length with interval 0 beginning at the time of day that an event occurred. If a security trades in consecutive event time intervals $t-1$ and t, then the return during interval t can be measured as

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \tag{2.1.1}$$

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exceed some minimum acceptable level. See Baumol[1967, Chapter 6].

where

t = the interval measured relative to the event

$R_{i,t}$ = the return on security i during interval t

$P_{i,t}$ = the last transaction price for security i in interval t

$P_{i,t-1}$ = the last transaction price for security i in interval $t-1$.

In studies using daily data, it is customary to subtract the expected return for a security from its actual return in order to obtain an excess or abnormal return. Expected returns are estimated either unconditionally (i.e. the unconditional mean return for the security measured over some interval not containing the event day) or conditional on the market portfolio using some version of the Market Model or the Capital Asset Pricing Model. Since trades on the New York Stock Exchange settle only once per day, there is no difference, in terms of the opportunity cost of the invested capital, between transactions completed at 10:00 a.m. and transactions completed at 4:00 p.m. The expected intraday return over this period includes a risk premium component, but no component reflecting the time value of money since both transactions are settled at the same time of day, five days following the transaction. Because intraday returns are measured over intervals that are short, the risk premium component of the expected return is also small. Thus, not much is lost (from the event study perspective) if the unconditional expected return is assumed to be equal to zero. This is the approach taken throughout in the present study. The conditional expected return, however, is significantly different from zero during some intervals. As transaction data become more widely used, the calculation of a continuous time market index will facilitate the estimation of intraday conditional expected returns (See Wood, McInish and Ord[1985] for some preliminary work in this area). Alternatively, an actively traded index contract, such as the S&P 500 futures contract, could be used as the market index.

The average return during each interval t relative to an event can be estimated by

$$\overline{R}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} R_{i,t} \tag{2.1.2}$$

where $R_{i,t}$ is the return on security i during interval t measured relative to its event and N_t is the number of securities in the sample with transactions in the relative intervals $t-1$ and t.

Average cumulative returns from period $\tau - k$ to period τ can be estimated by

$$\overline{CR}_{k,\tau} = \sum_{t=\tau-k}^{\tau} \overline{R}_t. \tag{2.1.3}$$

Hypotheses can be tested using either the average return from equation (2.1.2) or the average cumulative return from equation (2.1.3). The t-statistic used to test the hypothesis that the event had no impact on the stock price during interval t can be calculated by

$$t(\overline{R}_t) = \overline{R}_t / S(\overline{R}_t) \tag{2.1.4}$$

where $S(\overline{R}_t)$ is the estimated cross sectional standard deviation of $\overline{R}_t$. The calculation of $S(\overline{R}_t)$ implicitly assumes that all of the observations are independent. If returns are calculated for securities with intervals overlapping in calendar time, this assumption is not justified. Because security prices are affected by general market trends as well as firm specific information, stock returns exhibit nonzero contemporaneous correlation. When a small number of returns are measured over intervals overlapping in calendar time, portfolio returns can be calculated by averaging the returns of these securities and each portfolio return can be treated as a single independent observation. This is the approach taken in the present study. While this approach is not the most efficient procedure when observations tend to cluster in the calendar periods, for most intraday studies the problem will not be severe since the probability of two events occurring in the same within day interval will generally be small. When testing hypotheses about $\overline{R}_t$, observations can be treated as independent as long as the events did not occur within the same 15 minute interval. When measuring cumulative returns, it is important that the events do not overlap in any part of the cumulative interval.

A t-statistic for $\overline{CR}_{k,\tau}$ can be calculated by

$$t(\overline{CR}_{k,\tau}) = \overline{CR}_{k,\tau}/S(\overline{CR}_{k,\tau}) \tag{2.1.5}$$

where

$$S(\overline{CR}_{k,\tau}) = \text{the estimated standard deviation of } \overline{CR}_{k,\tau}$$
$$= \left[\sum_{t=\tau-k}^{\tau} \text{var}(\overline{R}_t)\right]^{1/2}$$
$$\text{var}(\overline{R}_t) = \text{the estimated variance of } \overline{R}_t.$$

The calculation of $S(\overline{CR}_{k,\tau})$ in equation (2.1.5) assumes that the covariance between $\overline{R}_j$ and $\overline{R}_k$ is equal to zero for $j \neq k$. Patell and Wolfson[1985] find that intraday returns exhibit negative autocorrelation. It is possible for observed returns to exhibit nonzero serial correlation even if the true returns do not. For example, the fluctuation between bid and ask prices, can induce negative autocorrelation in the observed returns (Roll[1984]). Assuming non-positive serial correlation in the observed returns (i.e. zero or negative), $S(\overline{CR}_{k,\tau})$ represents an upper bound for the estimated standard deviation of $\overline{CR}_{k,\tau}$. The existence of negative serial correlation biases the t-tests towards accepting the null hypothesis of no effect.

If a security does not trade in both relative intervals $t-1$ and t, its return during interval t is undefined and that observation is excluded from the sample. Because the intervals are very short, most securities do not trade during every interval. This causes a large number of missing observations when using this technique. Several alternative techniques that result in a smaller number of missing observations are considered.

2.2. The Compound Return Technique

Consider dividing the trading day into intervals of fixed length as before. Then, the k-period compound return can be defined as

$$R_{i,k,t} = \frac{P_{i,t} - P_{i,t-k}}{P_{i,t-k}} \tag{2.2.1}$$

where

t = the interval measured relative to the event

$R_{i,k,t}$ = the k-period compound return for security i from interval $t-k$ to interval t

$P_{i,t}$ = the last transaction price for security i in interval t

$P_{i,t-k}$ = the last transaction price for security i k periods prior to period t.

Average compound returns can be calculated by $\overline{R}_{k,t} = \frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,k,t}$ where $R_{i,k,t}$ is the k-period return for security i from interval $t-k$ to interval t measured relative to its event and N_t is the number of securities in the sample with a transaction in period t and a transaction k periods prior to period t. Hypotheses can be tested using $\overline{R}_{k,t}$ by calculating the t-statistic $t(\overline{R}_{k,t}) = \overline{R}_{k,t}/S(\overline{R}_{k,t})$ where $S(\overline{R}_{k,t})$ is the estimated cross sectional standard deviation of $\overline{R}_{k,t}$. Again, if the k-period intervals overlap in calendar time, it is necessary to calculate independent portfolio returns by averaging the individual returns for those securities with return intervals overlapping in calendar time.

The compound return technique has the advantage that a security need not trade in consecutive intervals in order to be included in the sample. Every security with a transaction in period t and a transaction k periods prior to period t is included in the estimation of $\overline{R}_{k,t}$. Using this technique, however, there is still a question of how to estimate the return for securities that did not trade in a given interval. Two solutions are proposed. First, the interval t stock price can be estimated by the last transaction price prior to the end of interval t regardless of when that transaction occurred. Given this assumption, the k-period compound return can be estimated by

$$R'_{i,k,t} = \frac{P_{i,t^*} - P_{i,t-k}}{P_{i,t-k}} \tag{2.2.2}$$

where

$R'_{i,k,t}$ = the estimated k-period compound return for security i from event interval $t-k$ to event interval t.

P_{i,t^*} = the last transaction price prior to the end of event interval t regardless of whether the transaction occurred in interval t or before.

$P_{i,t-k}$ = the last transaction price k periods prior to interval t.

The problem with this approach is that the information contained in the price movements of other securities within the same event time interval is ignored. If the average return during this event time interval is different from zero, this measurement technique will bias the estimated mean towards zero.

Rather than assume that the stock price does not change during an interval in which there are no trades, the price change during these event time intervals can be estimated by the average return on the securities that did trade in the same interval relative to the event. Given this assumption, the k-period compound return can be estimated by

$$R''_{i,k,t} = \begin{cases} R_{i,k,t} & \text{if the security traded in interval } t \\ R'_{i,k,t} + \sum_{s=j+1}^{t} \overline{R}_s & \text{if the security last traded in interval } j < t. \end{cases} \tag{2.2.3}$$

While this approach is economically intuitive, the lack of independence between observations makes standard parametric statistical tests infeasible. Statistical tests can be performed on this measure by employing the bootstrap methodology developed by Efron[1982]. This and other bootstrap applications are discussed in Section 2.5.

2.3. The Continuous Time Approach

Rather than simply modifying the standard event study methodology originally developed for tests using daily data, it may be more appropriate to model the specific characteristics of within day transaction data. We assume here that "true" stock prices vary continuously. However, prices are observed only at discrete intervals when a transaction occurs. Thus, while we wish to estimate $E(P_{i,t_1}/P_{i,t_0})$, we only observe $P_{i,s_{i,1}}$ and $P_{i,s_{i,0}}$ where $s_{i,0} < t_0$ and $s_{i,1} < t_1$.

Assume that, under the null hypothesis, stock prices follow the stochastic differential equation

$$\frac{dP_i}{P_i} = (\alpha' X_i)dt + \sigma dz_i \tag{2.3.1}$$

where z_i is a standard Brownian process and X_i is a vector of exogenous variables. Let $m_i = s_{i,1} - s_{i,0}$ be the number of minutes between the last transaction for security i prior to event time t_0 and the last transaction for security i prior to event time t_1. Then, under the null hypothesis, $\log(P_{i,s_{i,1}}/P_{i,s_{i,0}})$ is normally distributed with mean $(\alpha' X_i - \frac{1}{2}\sigma^2)m_i$ and variance $\sigma^2 m_i$, and

$$E(P_{i,t_1}/P_{i,t_0}) = e^{\left(\alpha' X_i(t_1 - t_0)\right)}. \tag{2.3.2}$$

We can use observations on $\log(P_{i,s_{i,1}}/P_{i,s_{i,0}})$ to estimate α and σ^2. Assuming the stochastic process above and assuming that the observations are independent, the log of the likelihood function has the following form:

$$\log(L) = -\sum_{i=1}^{N}\left[\frac{1}{2}\log(2\pi\sigma^2 m_i) + \frac{1}{2\sigma^2 m_i}(R_i - (\alpha' X - \tfrac{1}{2}\sigma^2)m_i)^2\right] \tag{2.3.3}$$

where $R_i = \log(P_{i,s_{i,1}}/P_{i,s_{i,0}})$. If X is equal to one so that we are only estimating the mean return, then the maximum likelihood estimates have the following closed form:

$$\begin{aligned}\hat{\sigma}^2 &= \frac{1}{N}\sum_{i=1}^{N}\frac{1}{m_i}\left(R_i - \left(\sum_{j=1}^{N} R_j \Big/ \sum_{j=1}^{N} m_j\right)m_i\right)^2 \\ \hat{\alpha} &= \left(\sum_{i=1}^{N} R_i \Big/ \sum_{i=1}^{N} m_i\right) + \hat{\sigma}^2/2.\end{aligned} \tag{2.3.4}$$

Closed form solutions do not exist when α is not a scaler. However, in these cases, the maximum likelihood estimates can be calculated using numerical methods. Hypotheses can be tested by calculating t statistics using the Wald test or by calculating a chi-square statistic using the likelihood ratio test.

This approach assumes that the return per minute is constant during the interval and extrapolates the estimated return over periods in which there are no trades. If the rate of return is not constant, (for example, if a price effect occurs most rapidly during the first 15 minutes following an announcement and slower thereafter) then this approach may overstate the true effect.

2.4. Transaction Return Technique

The methods discussed in Section 2.1 through Section 2.3 measure security returns over intervals of fixed length in minutes. An alternative metric of intervals relative to an event is the number of transactions. A transaction interval is defined as the interval between consecutive transactions regardless of when the transactions occurred in event time. Denote the interval ending with the first transaction following the event as interval 0. Then, k-period transaction returns can be calculated by

$$TR_{i,k,t} = \frac{P_{i,t} - P_{i,t-k}}{P_{i,t-k}}$$

where

$TR_{i,k,t}$ = the k-period transaction return for security i from transaction interval $t-k$ to transaction interval t.

$P_{i,t}$ = the price of security i, t transactions following (or preceding) the event.

Average k-period transaction returns are estimated by $\overline{TR}_{k,t} = \frac{1}{N}\sum_{i=1}^{N} TR_{i,k,t}$ and the t-statistic can be calculated as $t(\overline{TR}_{k,t}) = \overline{TR}_{k,t}/S(\overline{TR}_{k,t})$ where $S(\overline{TR}_{k,t})$ denotes the estimated cross sectional standard deviation of $\overline{TR}_{k,t}$. The cross sectional standard deviation of the transaction interval returns is calculated using returns measured over intervals of varying lengths in minutes. This approach implicitly assumes that the speed of adjustment to new information is properly measured in terms of the number of transactions that have occurred rather than the elapsed time in minutes from the announcement. This is consistent with the price of actively traded stocks adjusting more quickly to new information than infrequently traded stocks.

An alternative approach is to assume that the variance per minute is constant across securities and that the variance over a transaction interval is equal to a scaler times the length of that interval in minutes. Let $m_{i,k,t}$ denote the number of minutes over which $TR_{i,k,t}$ is measured. Then the BLUE (best linear unbiased) estimate of the mean return over k transactions is obtained by weighting each observation, $TR_{i,k,t}$, by $1/m_{i,k,t}$ which is proportional to the reciprocal of the variance of that observation.

2.5. Applications of Bootstrap Estimates of Statistical Significance

The bootstrap, developed by Efron[1982] and others, is one of several resampling plans that can be applied to complicated situations where standard techniques for statistical inference are infeasible. To illustrate the basic bootstrap technique, consider a sample $(x_1, x_2, \ldots, x_n)$ drawn independently from an unknown distribution F and a statistic $\hat{\theta}(x_1, x_2, \ldots, x_n)$ defined on $(x_1, x_2, \ldots, x_n)$. A common problem of statistical inference is to estimate $p \equiv \text{Prob}_F\{\theta(x_1, x_2, \ldots, x_n) < K\}$ for some constant K.

For a general function $\theta(x_1, x_2, \ldots, x_n)$ and a fixed sample size n, the bootstrap probability p can be calculated from the information contained in the sample using the following algorithm:

(1) Estimate the distribution function F with the nonparametric empirical distribution $\hat{F}$ putting probability mass $1/n$ on each x_i.
(2) Draw a "bootstrap" sample from $\hat{F}$, $(x_1^*, x_2^*, \ldots, x_n^*)$, where each x_i^* is drawn randomly, with replacement from the observed values $(x_1, x_2, \ldots, x_n)$, and calculate $\hat{\theta}^* = \hat{\theta}(x_1^*, x_2^*, \ldots, x_n^*)$.
(3) Independently repeat step (2) a large number B of times obtaining $\hat{\theta}^{*1}$, $\hat{\theta}^{*2}$, ..., $\hat{\theta}^{*B}$, and calculate

$$p \equiv \text{Prob}_{\hat{F}}\{\theta(x_1, x_2, \ldots, x_n) < K\} = \frac{\text{number of times } \hat{\theta}^* < K}{B}$$

This algorithm, as well as standard parametric statistical procedures, assumes a fixed sample size. However, when there are missing observations, the sample size is random and reflects the number of securities that traded in a given interval. The basic bootstrap algorithm can be extended to account directly for these missing observations.

For example, consider the problem of estimating the statistical significance of an announcement effect with a sample of N events when only $n < N$ securities associated with these events traded in the relevant event time interval. The bootstrap probability can be estimated from the existing observation using the following algorithm:

(1) Sample with replacement from the set of all events. If the security associated with the chosen event traded in the relevant event time interval, include it in the sample; otherwise, discard it. If the security is included in the sample, calculate its return over the relevant event time interval.
(2) Repeat step (1) N times and calculate the average event time return. Note that the size of the sample over which you are averaging is random and the expected sample size is n.
(3) Repeat steps (1) and (2) B times. The fraction of the average returns from step (2) that are less than (greater than) zero is the bootstrap estimate of the probability that the population mean is less than (greater than) zero.

Bootstrap theory is based on asymptotic results as $B \to \infty$. In practice, however, the bootstrap process must be terminated at some point. Since the estimated probabilities only reflect the information contained in the sample, it is reasonable to conclude that the optimal number of bootstrap samples is related to the number of possible permutations of the data. For example, for a fixed sample size of N, there are N^N different bootstrap samples that can possibly be drawn. In Monte Carlo simulations, Efron[1982] found the bootstrap estimates to perform well after several hundred iterations. However, when missing observations cause the sample size to become random, the number of possible permutations of the data increases dramatically. The bootstrap probabilities presented in Section 5 are estimated from 1000 bootstrap samples (i.e. $B = 1000$). A discussion of the sensitivity of the results to this assumption is also provided.

As noted above, the algorithm can be used to estimate probability values when standard parametric tests are impossible. For example, consider the return measure R'' that is calculated assuming the return on a stock that does not trade in a given interval is equal to the average return on the securities that did trade in the same interval relative to the event (equation 2.2.3). This return measure is intuitively appealing since it makes efficient use of all of the information contained in the sample. However, standard parametric statistical tests are infeasible with this measure due to the lack of independence between observations. Probability values can be calculated for this return measure with a dynamic resampling plan that extends the adjusted bootstrap procedure described above.

Suppose we wish to test the null hypothesis that R'' is equal to zero during the event time period from interval t to interval $t+k$. We can calculate a bootstrap probability value using the following dynamic resampling algorithm:

(1) Sample with replacement from the set of all announcements for which the exchange was open during the event time period from interval t to $t+k$. If the security associated with the chosen announcement traded at least once prior to interval t and at least once between t and $t+k$, include it in the sample; otherwise, discard it and skip to step (3). If the security is included in the sample, calculate its return between the last transaction prior to interval t and the last transaction prior to $t+k$.

(2) If the security traded in interval $t+k$, no adjustment is necessary; proceed to step (3). If the last trade for this security between t and $t+k$ occurred in interval $j < t+k$, do the following for each interval $s = j+1, \ldots, t+k$:

   (a) Sample with replacement from the set of all announcements for which the exchange was open during the event time interval s.

   (b) If the security associated with the chosen announcement traded in both event time intervals $s-1$ and s, keep the observation; otherwise, discard it.

   (c) Repeat this procedure n_s times, where n_s is the number of announcements for which the exchange was open during the event time interval s, and calculate the mean interval s return for this sample. Add this mean return to the return found in step (1).

(3) Repeat steps (1) and (2) n times, where n is the number of securities in the sample for which the exchange was open during the event time intervals from t to $t+k$. Calculate the average k-period return.

(4) Finally, repeat the entire procedure B times. The fraction of the estimated mean k-period returns that are less than zero is an estimate of the probability that the mean of the population is less than zero. This probability estimate is used as a test of the statistical significance of the k-period return.

3. Announcement Effect Hypotheses

Several rationales for the negative market reaction to announcements of impending common stock issues have been suggested. Many of these rationales overlap to some degree. This section presents stylized versions of each of these rationales that result in distinct testable hypotheses concerning the price response of the common stock. The hypotheses are categorized as information hypotheses, price pressure hypotheses and leverage hypotheses.

3.1. Information Hypotheses

The information hypotheses are the "Existing Asset Value Signaling Hypothesis" loosely based on the work of Myers and Majluf[1984], the "Cash Flow Signaling Hypothesis" based on the work of Miller and Rock[1985], and the "Wasteful Investment Hypothesis" related to the work of Berle and Means[1932] on the separation of ownership and control and more recent extensions by Jensen[1986] and others.

The Existing Asset Value Signaling Hypothesis is based on the premise that investors and management have asymmetric information about the intrinsic value of the firm's existing assets. Management is assumed to have access to more information than investors and they issue stock when there is need for external financing and they feel that the market value of the firm's assets is above its intrinsic value. Although an overvaluation of the firm's assets results in both risky debt and equity being overvalued, the overvaluation of the debt is less. Thus, if there is a need for external financing and management believes that the market value of the firm's assets is below its intrinsic value, the firm would issue debt. The decision to use external financing of any type and the magnitude of that external financing is determined by the level of the firm's planned investment and the magnitude of the firm's internally generated cash flow. Thus, assuming symmetric information about the magnitude of current investments and current internal cash flow, an announcement of the intent to issue equity will have a negative impact on the stock price and an announcement of the intent to issue bonds will have a positive impact on the stock price. Under this hypothesis, the intended use of the funds, the profitability of the investment, and/or the size of the issue will not have any impact on the size of the price drop because symmetric information about investment plans and internal cash flow is assumed.

The Cash Flow Signaling Hypothesis is based on the premise of asymmetric information about the magnitude of the firm's current internal cash flow, but symmetric information about the magnitude of the firm's current planned investments and symmetric information about the value of the firm's assets conditional on current internal cash flow. Under this hypothesis, investors' expectations about the magnitude of the firm's current internal cash flow will be inversely related to the level of external financing. Announcements of unexpected external equity or debt issues will signal that the firm has inadequate internally generated funds to finance its planned investments. Thus, announcements of either equity or debt issues that are used to finance new investment will result in a decline in stock prices and the absolute value of the percentage price decline will be directly related to the size of the issue. However, announcements of equity issues that are intended to retire existing debt are zero net external financings and do not signal information about the magnitude of the firm's current internal cash flow. Thus, they have no impact on stock prices. Since announcements of new external financing are assumed to contain no information about the magnitude of the firm's planned investments, the impact on prices is unrelated to the expected profitability of the new investments.

The Wasteful Investment Hypothesis is based on the premise that one of the agency costs associated with the separation of ownership from control of the corporation is a tendency for management to overinvest and accept projects having negative net present values. Given asymmetric information about the magnitude of the firm's investment plans but symmetric information about both the intrinsic value of the firm's existing assets and the firm's current internal cash flow, unexpected announcements of external security issues of any type signal a higher level of investment. If the gross present value profitability index of these incremental investments is less than unity, the stock price will be adversely affected. Announcements of bond issues as well as stock issues have a negative impact on the stock price.[4] The level of the planned investment and the absolute magnitude of the percentage stock price decline is directly related to the size of the issue and inversely related to the gross present value profitability index of the incremental investment. Announcements of stock issues to retire debt have no impact on the stock price since they convey no information about the level of planned investment expenditures.

3.2. Price Pressure Hypotheses

Financial practitioners have long argued that increasing the supply of equity causes a firm's stock price to decline. This view was labelled the "Price Pressure Hypothesis" by Scholes[1972]. Price Pressure Hypotheses can be categorized as the "Downward Sloping Demand Curve Hypothesis" and the "Transaction Cost Hypothesis."

The Downward Sloping Demand Curve Hypothesis is based on the assumption of an incomplete capital market with restricted short sales. Under these conditions, perfect substitutes for a firm's securities do not exist in the market. In the absence of

[4] Jensen[1986] argues that debt issues should not have a significant affect on stock prices since by issuing debt, the manager contractually bonds himself to pay out future cash flows in a way that cannot be accomplished with dividend payments on common stock.

perfect substitutes, firms face downward sloping demand curves for their securities. This hypothesis predicts that an increase in quantity caused by a new issue of common stock will result in a permanent decrease in the stock price and the absolute value of the percentage price decline will be positively correlated with the size of the issue. Because the downward sloping demand curve hypothesis assumes symmetric information about the firm's investment opportunities, there will be no correlation between the magnitude of the percentage price decline and the intended use of the funds or the estimated profitability of the firm's incremental investments. The hypothesis also predicts that announcements of new issues of other securities (e.g., debt issues) will have no impact on the stock price.

The Transaction Cost Hypothesis predicts a temporary price pressure effect associated with new issues of common stock even if near-perfect substitutes for a firm's securities exist in the market. Under this hypothesis, the stock price decline following announcements of common stock issues reflects a discount that must be offered to compensate investors for the transaction costs they bear in adjusting their portfolios to absorb the new stock. Unlike the downward sloping demand curve hypothesis, since the value of the discount and the transaction costs are both proportional to the size of the issue, the transaction cost hypothesis predicts no correlation between the size of the issue and the magnitude of the price decline. Also, the transaction cost hypothesis predicts a subsequent price recovery after the underwriting syndicate has completely marketed the issue. Like the downward sloping demand curve hypothesis, the transaction cost hypothesis predicts no correlation between the size of the percentage price decline and the intended use of the funds or the expected profitability of the incremental investments. This hypothesis also predicts no stock price reaction to announcements of new issues of debt.

3.3. Leverage Hypotheses

The final set of hypothesis advanced to explain the negative market reaction to new issues of equity are the leverage hypotheses. These hypotheses are the "Tax Advantage of Debt Hypothesis" based on the Modigliani and Miller[1963] analysis of the tax advantage of debt financing and the "Redistribution Hypothesis" based on the analysis of risky debt in Merton[1974] and Galai and Masulis[1976].

The Tax Advantage of Debt Hypothesis assumes that an unexpected announcement of a new issue of equity will cause an anticipated decrease in financial leverage. Because of the tax advantages of debt financing, a decrease in financial leverage, ceteris paribus, will cause a negative stock price reaction. The absolute magnitude of the percentage price decline will be directly related to the size of the offering. This hypothesis also predicts that stock issues intended to retire existing debt will have a greater negative effect than issues intended to finance new investment spending due to the greater leverage reducing effect of the former type of issue. Finally, this hypothesis predicts that new issues of debt will have a positive effect on stock prices.

In contrast to the Tax Advantage of Debt Hypothesis, if an optimal capital structure exists, as argued by Kraus and Litzenberger[1973] and DeAngelo and Masulis[1980], then, assuming symmetric information about the firm's current and future cash flows, movement along the optimal leverage/value curve should increase the value of the firm regardless of whether the movement was caused by a new issue of equity or a new issue of debt.

The Redistribution Hypothesis is based on the observation that with a fixed investment policy, an unexpected decrease in leverage makes a firm's debt less risky. If the total market value of the firm remains unchanged, bondholders will experience

TABLE 1
PREDICTIONS OF COMPETING HYPOTHESES THAT EXPLAIN THE NEGATIVE COMMON STOCK PRICE REACTION TO NEW ISSUES OF EQUITY BY INDUSTRIAL FIRMS

	STOCK ISSUES				
	INTENDED USE OF PROCEEDS	ESTIMATED PROFITABILITY OF NEW INVESTMENTS	SIZE OF ISSUE	PRICE RECOVERY FOLLOWING ISSUE DAY	DEBT ISSUES
1. Information Hypotheses					
a. Existing Asset Value Signaling Hypothesis	No correlation with stock return	No correlation with stock return	No correlation with stock return	No Recovery	Positive effect on stock return
b. Cash Flow Signaling Hypothesis	No effect for pure capital structure changes Negative effect for new investment spending	No correlation with stock return	Negative on stock return	No Recovery	Negative effect on stock return
c. Wasteful Investment Hypothesis	No effect for pure capital structure changes Negative effect for new investment spending	Positive correlation with stock return	Negative correlation with stock return	No Recovery	Negative effect on stock return
2. Price Pressure Hypotheses					
a. Downward Sloping Demand Curve	No correlation with stock return	No correlation with stock return	Negative correlation with stock	No Recovery	No effect on stock return
b. Transaction Cost Hypothesis	No correlation with stock return	No correlation with stock return	No correlation with stock return	Full Recovery	No correlation with stock return
3. Leverage Hypotheses					
a. Tax Advantage of Debt Hypothesis	Smaller effect for new investment spending than for pure capital structure changes	No correlation with stock return	Negative correlation with stock return	No Recovery	Positive effect on stock return
b. Redistribution Hypothesis	Smaller effect for new investment spending than for pure capital structure change	No correlation with stock return	Negative correlation with stock return	No Recovery	Positive effect on stock return

an increase in value at the expense of the shareholders. This effect is most easily understood if the firm's common stock is viewed as a call option on the assets of the firm as in Merton[1974]. The redistribution hypothesis predicts that announcements of new equity issues will have a negative effect on stock prices and announcements of new debt issues will have a positive effect on stock prices. The magnitude of the effect will be directly related to the size of the issue and will, ceteris paribus, be larger for issues intended for pure capital structure changes than for issues intended for new investment spending.

The predictions of these competing hypotheses are summarized in the Table 1.

4. Sample Data

Our sample consists of 219 new issues of common equity and 85 new issues of straight, long-term debt offered between January 1981 and December 1983 by industrial firms listed on the New York or American Stock Exchange. Firms issuing new debt or equity during this period were identified in an annual publication by Drexel Burnham Lambert entitled *Public Offerings of Corporate Securities.* Common stock offerings were included in the sample if the value of the offering was at least \$15 million or at least 5% of the shares previously outstanding. Primary issues combined with large secondary distributions were excluded from the sample. Scholes[1972] has argued that large sales by insiders or other "informed" traders signals their assessment that the shares are overvalued. The exclusion of combined primary and secondary distributions helps to insulate the sample from the information revealed by a large sale of stock by insiders. For example, Asquith and Mullins[1986] find that the cumulative price decline from 10 days prior to the announcement until the announcement day is 2 percentage points greater for combined primary and secondary issues than for primary issues alone.

The first public announcement of each new issue was obtained from the Dow Jones News Service (sometimes referred to as the Broad Tape). The announcements were located using the Dow Jones News Retrieval Service and each announcement was read in its entirety in order to obtain information about the new issue that will be described later in the paper. Each news release that appears on the Dow Jones News Service is stamped with the date and time (to the nearest minute) that the release was transmitted over the wire service.[5]

As indicated in Figure 1, announcements of new issues of equity and debt occur throughout the day with a greater number occurring in the morning than in the afternoon. Since the Dow Jones News Service operates from 8:00 am until approximately 6:30 pm Eastern time, a number of announcements occurred either before the opening of trade on the exchanges at 10:00 am or after the close of trade at 4:00 pm Eastern time. Approximately 64% of the equity issue announcements and 51% of the debt issue announcements occurred while the exchanges were open. Note that for 14% of the announcements the full first day of the two day announcement period return used in earlier studies occurred prior to the announcement while the entire two day return occurred after the announcement for only 20% of the events. This highlights the problems associated with using the date of publication in the *Wall Street Journal* as the announcement day and indicates why a two day announcement period return is necessary with this approach. Figure 2 summarizes the distribution of announcements across the days of the week. Again, the announcements were spread throughout the week with Friday being the most frequent announcement day.

Intraday stock price data used in the following sections were obtained from a

[5] Studies using daily stock price data would also benefit from the use of the Dow Jones News Service as it allows a more accurate determination of the announcement day.

FIGURE 1

DISTRIBUTION OF ANNOUNCEMENT TIMES
INDUSTRIAL STOCK ISSUES
JANUARY 1981 THROUGH DECEMBER 1983

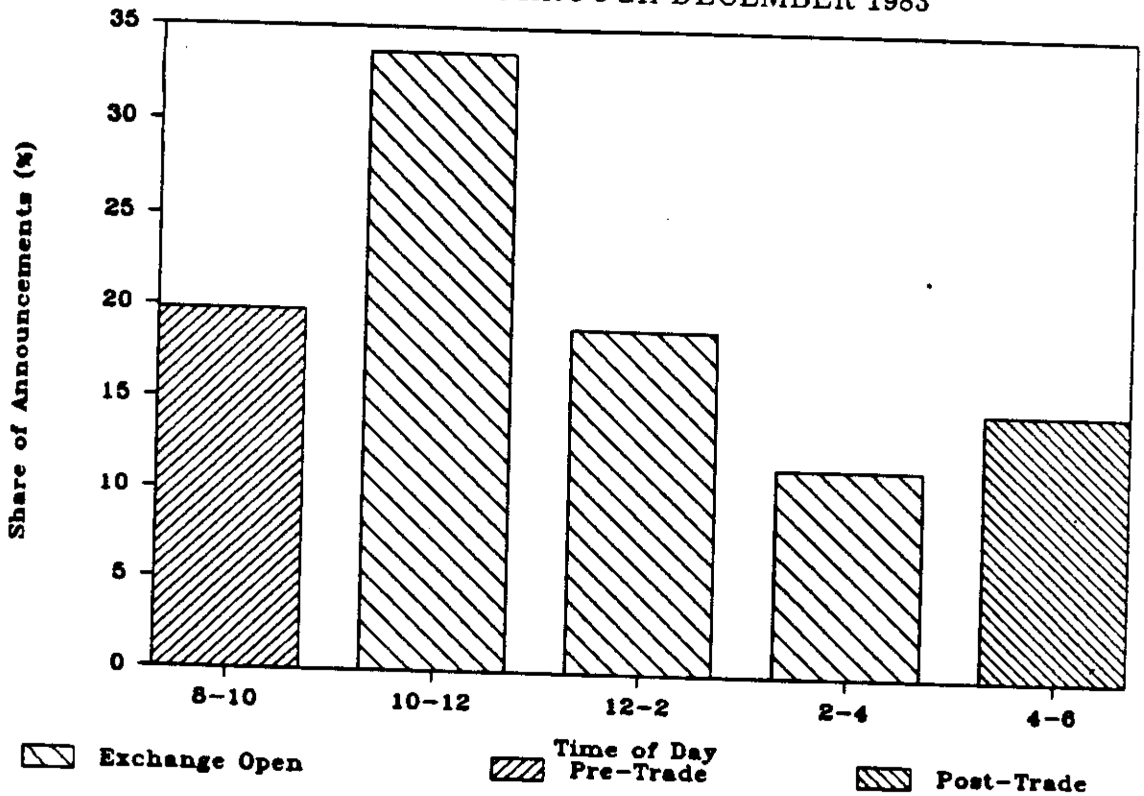
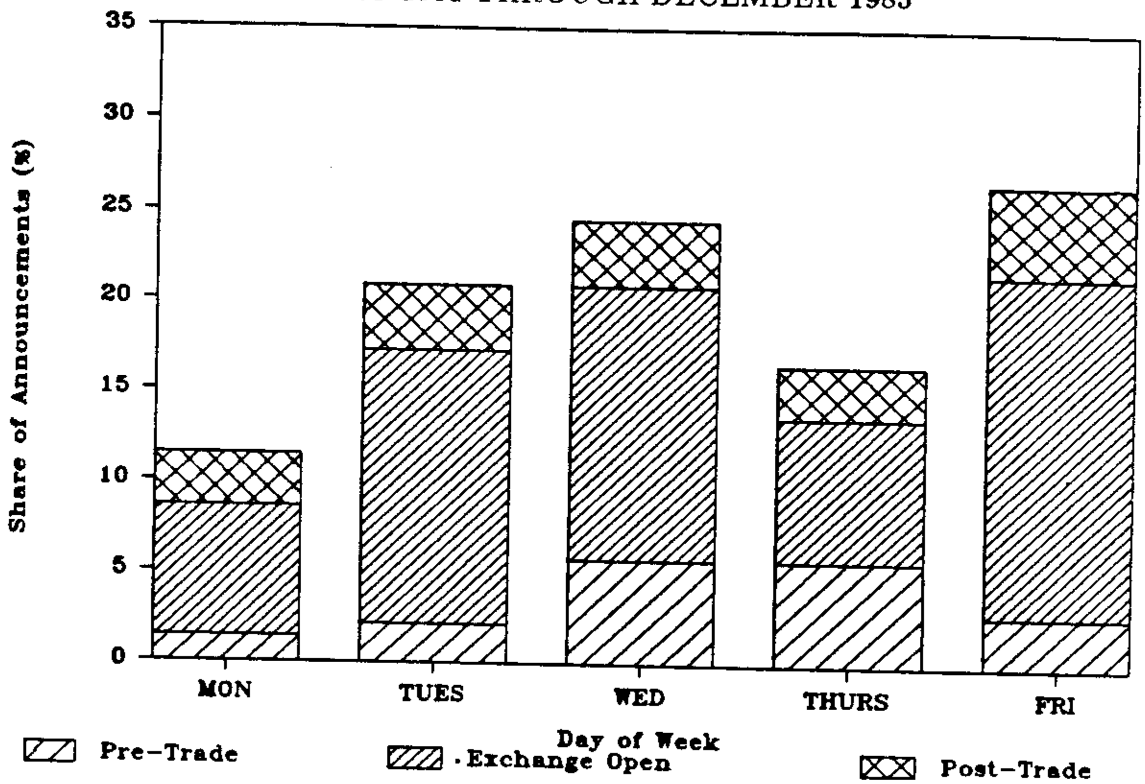


FIGURE 2

DISTRIBUTION OF ANNOUNCEMENTS
BY DAY OF WEEK AND TIME OF DAY
INDUSTRIAL STOCK ISSUES
JANUARY 1981 THROUGH DECEMBER 1983



data file provided by Francis Emory Fitch, Inc. The data consist of a time ordered record of each stock transaction made at the New York or American Stock Exchange. The date and time (to the nearest minute) of each transaction is recorded along with the price and number of shares transacted. These data were used to measure the intraday pattern of common stock returns surrounding announcements of new issues of equity and debt.

5. Empirical Results

5.1. Common Stock Issues

Table 2 reports the average intraday stock returns surrounding announcements of new issues of common equity by industrial firms. The estimates in Table 2 indicate that the stock market reacts rapidly to this new information. During the first 15 minutes following an announcement, stock prices fall, on average, by approximately 1.5%. This negative return is significant at the 1% level. During the three hour period surrounding the announcement, the average stock return is between -2.3% and -3.0% depending on the method used to measure the intraday returns.

Table 2 also reports the probability values for statistical inference calcualted using the parametric t test, the basic bootstrap procedure, and the bootstrap algorithm adjusted for missing observations. The p values calcualted using all three techniques are similar indicating that the t test and the basic bootstrap are robust to the problem of missing observations.

Table 2 indicates that stock returns are negative (and significant at the 1% level) during the one hour period preceding the time that announcements appear on the Broad Tape. The exchanges have taken great care to restrict transactions based on information that is unavailable to the general public. Explicit guidelines have been established by the exchanges with the intent to provide all traders with equal

TABLE 2
AVERAGE INTRADAY STOCK RETURNS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983

Hours From Announcement	$\overline{CR}_{k,t}$	$\bar{R}_{k,t}$	$\bar{R}'_{k,t}$	$\bar{R}''_{k,t}$	$\overline{CTR}_{k,t}$
-1.00 – 0.00	-0.6715	-0.4640	-0.3691	-0.5376	-0.3751
t test	.004	.001	.002	na	.027
adjusted bootstrap	.004	.000	.004	.000	.003
standard bootstrap	.003	.000	.000	.000	.001
0.00 – 0.25	-1.5051	-1.5051	-1.2450	-1.5051	-1.4446
t test	.000	.000	.000	na	.000
adjusted bootstrap	.000	.000	.000	.000	.000
standard bootstrap	.000	.000	.000	.000	.000
0.25 – 0.50	-0.4706	-0.4706	-0.3754	-0.4706	-0.5194
t test	.000	.000	.000	na	.000
adjusted bootstrap	.000	.000	.000	.000	.000
standard bootstrap	.000	.000	.000	.000	.000
0.50 – 2.00	-0.3511	-0.1560	-0.1634	-0.1903	-0.4124
t test	.099	.323	.225	na	.085
adjusted bootstrap	.089	.341	.300	.182	.048
standard bootstrap	.097	.316	.252	.181	.054
-1.00 – 2.00	-2.9983	-2.7457	-2.2709	-2.3499	-2.7450
t test	.000	.000	.000	na	.000
adjusted bootstrap	.000	.000	.000	.000	.000
standard bootstrap	.000	.000	.000	.000	.000

$\overline{CR}_{k,t}$ is calculated by summing the average return during each 15 minute period in the cumulative interval.

$\bar{R}_{k,t}$ is the average k-period compound return averaging over only those securities with a transaction in period t.

$\bar{R}'_{k,t}$ is the average k-period compound return assuming that the period t stock price is equal to the last transaction price regardless of then that transaction occured.

$\bar{R}''_{k,t}$ is the average k-period compound return estimating the change in price for securities that do not trade by the average price change for securities that did trade in the same relative interval. No standard errors are reported for these returns because of a lack of independence between the observations.

$\overline{CTR}_{k,t}$ is the maximum likelihood estimate of the continuous time return

TABLE 3

Bootstrap p-values to test the significance of the mean common stock return during the interval from one half hour following announcements of new equity issues until two hours following the announcements for various bootstrap sample sizes.

	$\overline{CR}$		$\bar{R}$		$\bar{R}'$		$\bar{R}''$		$\overline{CTR}$	
Mean Return	−.3511		−.1560		−.1634		−.1903		−.4125	
Bootstrap Sample Size	P-value Not Adjusted For Missing Observations	P-value Adjusted For Missing Observations	P-value Not Adjusted For Missing Observations	P-value Adjusted For Missing Observations	P-value Not Adjusted For Missing Observations	P-value Adjusted For Missing Observations	P-value Not Adjusted For Missing Observations	P-value Adjusted For Missing Observations	P-value Not Adjusted For Missing Observations	P-value Adjusted For Missing Observations
500	.092	.098	.318	.342	.244	.320	.180	.158	.056	.046
1000	.097	.089	.316	.341	.252	.300	.181	.182	.054	.048
1500	.105	.092	.318	.331	.257	.302	.187	.188	.053	.054
2000	.112	.096	.307	.334	.252	.294	.190	.196	.053	.052
2500	.108	.098	.304	.329	.258	.288	.190	.194	.055	.050
3000	.106	.100	.309	.331	.265	.286	.188	.198	.053	.051
3500	.107	.100	.310	.328	.267	.292	.191	.197	.051	.051
4000	.107	.101	.309	.325	.270	.295	.193	.197	.052	.049
4500	.110	.104	.307	.317	.270	.290	.197	.196	.055	.048
5000	.108	.101	.309	.319	.275	.289	.199	.197	.054	.049

access to information from public disclosures. The exchange guidelines governing public disclosure of material information are described in the Appendix. In keeping with the spirit of these guidelines, when new information is to be disclosed through several channels (a press conference and the wire services, for example), it is general corporate practice to release the information through all channels simultaneously. Thus, a negative average return preceding the appearance of the announcements on the Broad Tape is consistent with the hypothesis that the exchanges are not successful in their efforts to have information released simultaneously to all market participants. However, unintentional delays between the public announcements and their release over the wire service cannot be ruled out.

Table 3 contains the bootstrap p-values to test the significance of the mean common stock return during the interval from one half hour following announcements of new equity issues until two hours following the announcements for bootstrap sample sizes ranging from 500 to 5000 replications. This particular interval was chosen for further study because it is the only interval in which the statistical inferences are sensitive to the choice of measurement technique. Table 3 indicates that while the p-values are measured with error (as are significance levels calculated with standard parametric statistics), there is little to be gained by increasing the bootstrap sample sizes beyond 500 or 1,000 replications. Table 3 also confirms that the standard bootstrap algorithms are robust to the problem of missing observations. There is no indication of a consistent bias between the standard bootstrap results and the results after adjusting the bootstrap algorithm for missing observations even when the bootstrap sample sizes are increased to 5,000 replications. Since the major limitation of the bootstrap procedure has been its computational cost, these results should encourage further use of the bootstrap procedures since even in very complicated resampling situations, the standard bootstrap algorithm provides accurate results with as few as 500 replications.

Table 4 contains the number of negative, zero and positive returns during each fifteen minute interval relative to the event and for several longer intervals. The chi-square statistic used to test the hypothesis that positive returns and negative returns are equally likely during each interval is also reported. Even though the negative average return preceding the announcements is statistically significant, it is of interest to know whether the effect is pervasive, including a large fraction of the securities, or whether the average is dominated by a small number of large negative returns. For example, a few post-announcement transactions that were incorrectly time stamped as pre-announcement could affect this result. The number of negative returns is larger than the number of positive returns during each of the four 15-minute intervals preceding the announcement. During the one hour period preceding the announcement, the number of negative returns is twice as large as the number of positive returns. The hypothesis that positive and negative returns are equally likely during this one hour interval can be rejected at the 5% level of significance. Thus, the negative average return preceding the time that announcements appear on the Broad Tape is a wide spread occurrence.

It should also be noted from Table 4 that 84% of the securities experience a decline in price during the first 15 minutes following the announcement and 96% of the securities suffer a price decline during the period from one hour prior to the announcement until two hours following the announcement. However, only 53% of the securities experience a negative return during the 90 minute period beginning one-half hour after the announcement.

TABLE 4

NUMBER OF NEGATIVE, ZERO AND POSITIVE RETURNS
DURING EACH 15-MINUTE INTERVAL RELATIVE TO
ANNOUNCEMENTS OF NEW ISSUES OF COMMON EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983

Hours From Announcement	Negative Returns	Zero Returns	Positive Returns	χ^2
-1.00 – -0.75	16	12	12	0.57
-0.75 – -0.50	15	21	4	6.37*
-0.50 – -0.25	19	13	11	2.13
-0.25 – 0.00	22	19	13	2.31
0.00 – 0.25	56	6	5	42.64**
0.25 – 0.50	42	15	18	9.60**
0.50 – 0.75	28	14	23	0.49
0.75 – 1.00	25	16	20	0.56
1.00 – 1.25	17	24	18	0.03
1.25 – 1.50	23	16	15	1.68
1.50 – 1.75	20	22	16	0.44
1.75 – 2.00	16	16	19	0.26
-1.00 – 0.00	27	14	14	4.12*
-1.00 – 0.25	50	7	3	41.68**
-1.00 – 2.00	32	2	1	29.12**
0.50 – 2.00	20	8	15	0.71

* Significant at the 5% level.

** Significant at the 1% level.

χ^2 Chi-square statistic with one degree of freedom used to test the hypothesis that positive returns and negative returns are equally likely during the event time interval.

The nonparametric statistics reported in Table 4 are consistent with the parametric statistics reported in Table 2. Each shows a small, but statistically significant, negative average return during the one hour period preceding the announcement, a large, statistically significant negative return during the first 30 minutes following the announcement, and a small and statistically insignificant negative return for the next 90 minutes.

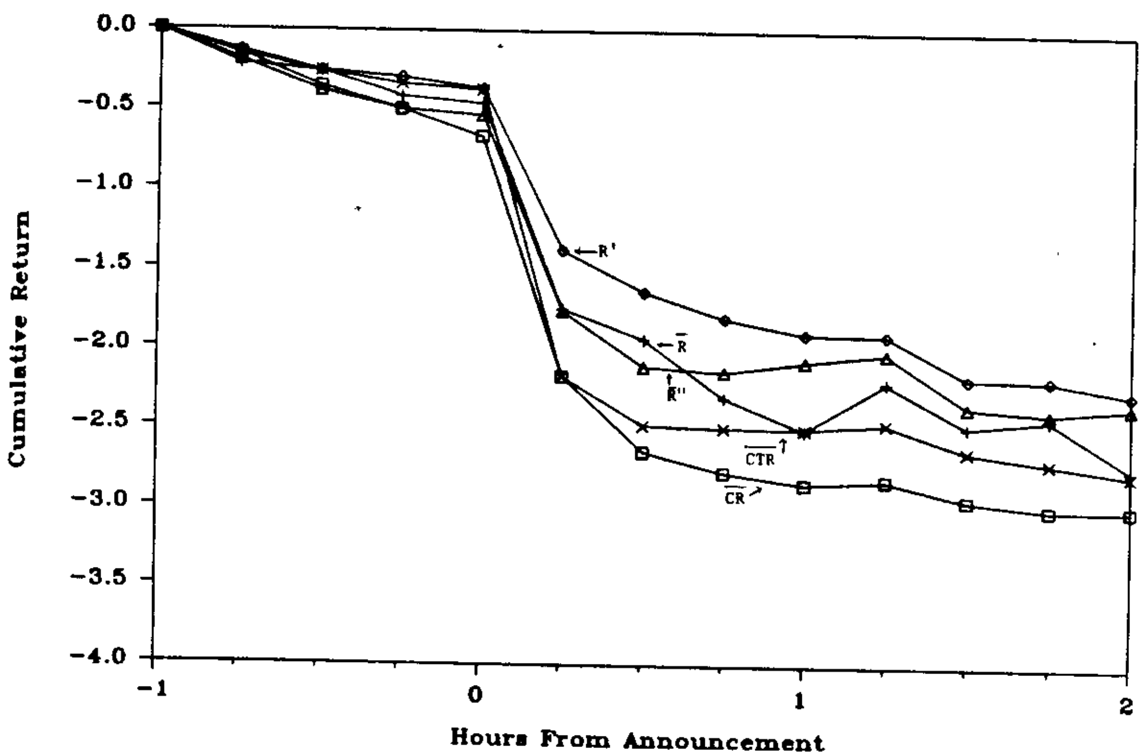
Figure 3 contains plots of the cumulative and compound average returns during the period from one hour prior to the announcement until two hours following the announcement. This figure was included to facilitate the comparison between the measurement techniques discussed in Section 2. Each method used to measure the returns produces a similar scenario. However, the magnitude of the measured effect is sensitive to the choice of technique. The data suggest the following observations.

Among the measurement techniques, the cumulative return technique, $\overline{CR}_{k,t}$ is the most heavily influenced by very actively traded stocks. Remember that a security needs to trade in the consecutive relative intervals, $t-1$ and t, in order to be included in the average return for interval t. In Figure 3, $\overline{CR}_{k,t}$ also exhibits the most rapid speed of adjustment to the new information. This is consistent with the rationale used to justify the measurement of returns in transaction intervals. The speed of adjustment to new information seems to be related to the number of transactions since the announcement. The compound return technique, $\overline{R}'_{k,t}$ is influenced less by the most frequently traded stocks. This return clearly understates the true speed of adjustment since securities are assumed to have zero returns over intervals in which they do not trade. While neither of these techniques are perfect, they provide upper and lower bounds on the estimated speed of adjustment.

The most erratic return measure in this sample is the simple compound return

FIGURE 3

A COMPARISON OF RESULTS
USING DIFFERENT MEASUREMENT TECHNIQUES TO ESTIMATE
AVERAGE INTRADAY STOCK RETURNS SURROUNDING ANNOUNCEMENTS
OF NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983



$\overline{CR}_{k,t}$ is calculated by summing the average returns for each 15 minute period during the cumulative interval.

$\overline{R}_{k,t}$ is the average k-period compound return averaging over only those securities with a transaction in period t.

$\overline{R}'_{k,t}$ is the average k-period compound return assuming that the period t stock price is equal to the last transaction price regardless of when that transaction occurred.

$\overline{R}''_{k,t}$ is the average k-period compound return estimating the change in price for securities that do not trade by the average price change for securities that did trade in the same relative interval.

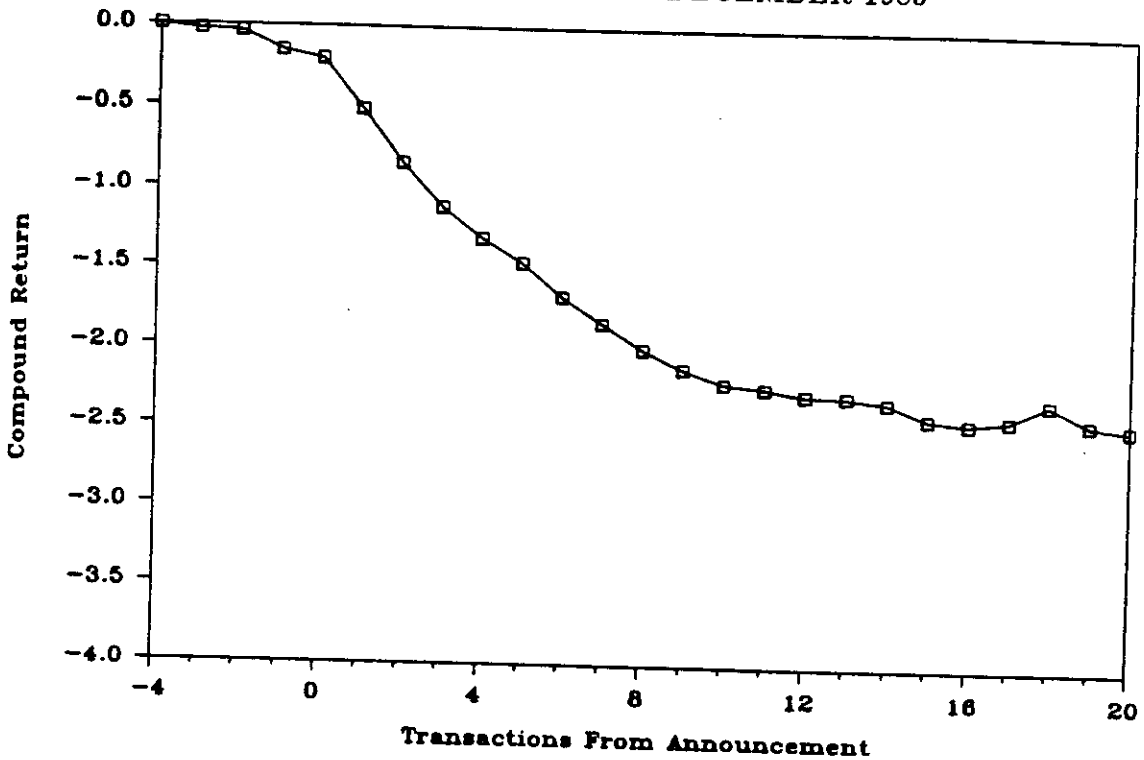
$\overline{CTR}_{k,t}$ is the maximum likelihood estimate of the continuous time return.

$\overline{R}_{k,t}$. This measure has a volatile time series path since a given security affects the average return for a cumulative interval only if it traded in the last 15 minutes of that interval. Thus, for example, the return from interval -1.0 to interval $+1.5$ could be calculated with a very different set of securities than the return from interval -1.0 to interval $+1.75$. $\overline{R}''_{k,t}$, an estimate using information from both $\overline{R}_{k,t}$ and $\overline{CR}_{k,t}$, seems to provide a reasonable point estimate. However, as indicated above, lack of independence between observations makes standard parametric statistical tests infeasible. More complicated bootstrap techniques are required to make statistical inferences with this method. The continuous time return, $\overline{CTR}_{k,t}$, produces a point estimate similar to $\overline{R}_{k,t}$ in this sample. Since this measurement technique does not discard any information from the sample and permits within sample based statistical tests, it has several advantages over the other measurement techniques. Further exploration of the properties of these measurement techniques seems warranted from this preliminary examination.

Figure 4 contains a plot of the average compound return measured in transaction intervals. Each interval in Figure 4 represents one transaction for each security regardless of how long (or short) that interval was in minutes. The price decline in Figure 4 appears more gradual than the decline in Figure 3. Specifically, the negative price adjustment during the first fifteen minute interval following the announcement (interval 0) is much larger in Figure 3 than in Figure 4. Multiple transactions occurred during the first 15 minutes following the announcement and, as indicated in Figure 4, the average price declined steadily through each transaction. Under the efficient market hypothesis, all information available to market participants should be reflected in the current stock price. Figure 4, however, suggests the possibility of a systematic pattern in the returns following the announcement of a new issue

FIGURE 4

AVERAGE COMPOUND RETURN
MEASURED IN THE NUMBER OF TRANSACTIONS
RELATIVE TO ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983



of equity. Table 5 provides additional details about the results displayed in Figure 4. The negative average return is statistically significant for each of the first nine transactions following the announcement. This pattern suggests the existence of profit opportunities for floor traders who have very low transaction costs and are able to act within the first 15 minutes following this public announcement. Profit opportunities of this type may simply reflect the normal rate of return on the time, expertise, and invested capital of these professional traders.

An explanation for this gradual price adjustment that is consistent with the semi-strong form of the efficient market hypothesis is the "orderly market" hypothesis discussed in Dann, Mayers and Raab[1977]. One of the recognized responsibilities of a specialist on the NYSE is to maintain an orderly market for the shares he trades. The concept of an orderly market has not been well defined. However, if an orderly market is defined as one in which price changes between consecutive transactions are small, then specialists have an incentive to avoid large price changes in order to maintain the appearance of an orderly market. Since the bid and ask quotes on a specialist's book are only binding for 100 shares, a low cost way to avoid large price changes is to complete multiple low volume transactions with a continuously changing price. This behavior would result in the price pattern depicted in Figure 4 while the quantity constraint imposed by the specialist would not allow profit opportunities that are inconsistent with the efficient market hypothesis.

However, the data are not consistent with the orderly market hypothesis. Figure 5 shows the average trading volume and number of transactions (measured relative to the daily totals) for each 15-minute interval relative to the event. During the first 15 minutes following an announcement there is an abnormally large number of transactions *and* correspondingly high volume. The first 5 transactions following the announcement have a median volume of 300 shares and a mean of

TABLE 5

AVERAGE TRANSACTION INTERVAL RETURNS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983

Transaction Interval	Average Return	*t* Statistic	Weighted Average Return	*t* Statistic
-4 – -1	-0.201*	-2.119	-0.263**	-2.606
0	-0.343**	-4.601	-0.180*	-2.275
1	-0.327**	-6.989	-0.296**	-5.873
2	-0.274**	-5.220	-0.239**	-4.026
3	-0.207**	-4.002	-0.118**	-2.356
4	-0.129*	-2.210	-0.152**	-2.499
5	-0.167**	-3.328	-0.198**	-3.569
6	-0.117**	-2.498	-0.100	-1.557
7	-0.160**	-2.571	-0.187**	-3.469
8	-0.170**	-3.564	-0.147**	-3.282
9 – 12	-0.201*	-2.133	-0.417**	-4.000
13 – 16	-0.071	-0.700	-0.435*	-2.247
17 – 20	0.069	0.604	0.033	0.259

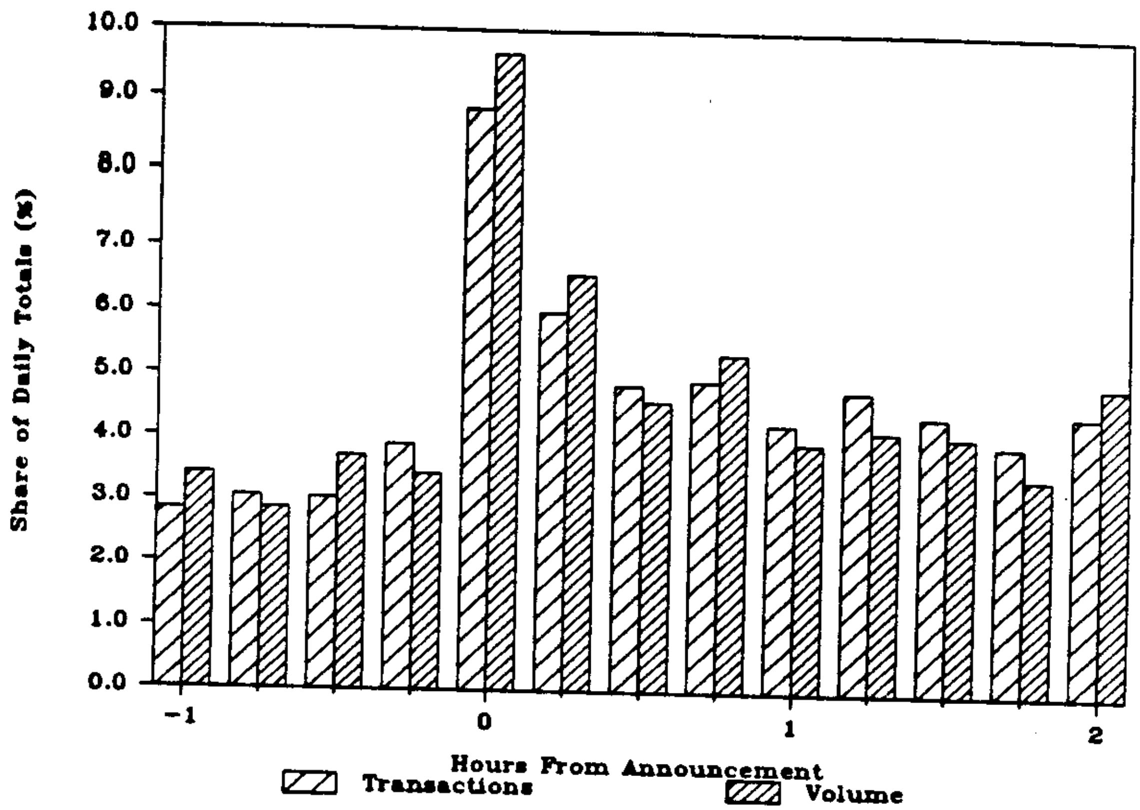
* Significant at the 5% level.

** Significant at the 1% level.

The weighted average return is the best linear unbiased estimator assuming that the the variance per minute is constant across all securities and that the variance over a transaction interval is proportional to the length of the interval in minutes.

FIGURE 5

AVERAGE TRADING VOLUME AND NUMBER OF TRANSACTIONS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983



1,108 shares while the last 5 transactions preceding the announcement have a median volume of 300 shares and a mean of 968 shares. The first transaction following the announcement has a median volume of 400 shares and a mean of 2,258 shares. Thus, there is no evidence of quantity rationing by the specialists following these announcements.

Asymmetric assessment of the information contained in these announcements would result in an increase in trading volume and number of transactions as depicted in Figure 5. Alternatively, the large number of transactions illustrated in Figure 5 and the price path in Figure 4 could result from specialists clearing their books by exercising a large number of stop loss orders immediately following the announcement.

5.2. New Issues and Tobin's Q Ratio

When it is announced that a firm is issuing additional common stock in order to finance new investment projects, the market reaction should reflect investors' beliefs about the marginal rate of return on the firm's incremental investments. Unfortunately, it is difficult to obtain objective information about investors' beliefs concerning the gross present value generated per dollar of new investment. It is not unreasonable to assume, however, that a proxy for this present value profitability index is the ratio of a firm's market value to the replacement cost of its assets. This ratio, referred to as Tobin's Q ratio, is a measure of the present value of the future cash flows of the firm divided by the cost associated with starting the enterprise anew. The Q ratio has commonly been used to estimate the monopoly rents that accrue to a particular firm or industry. Ratios greater than unity identify firms earning economic rents (caused by brand loyalty, barriers to entry, or other deviations from perfect competition) and ratios less than unity identify firms with less advantaged economic positions.

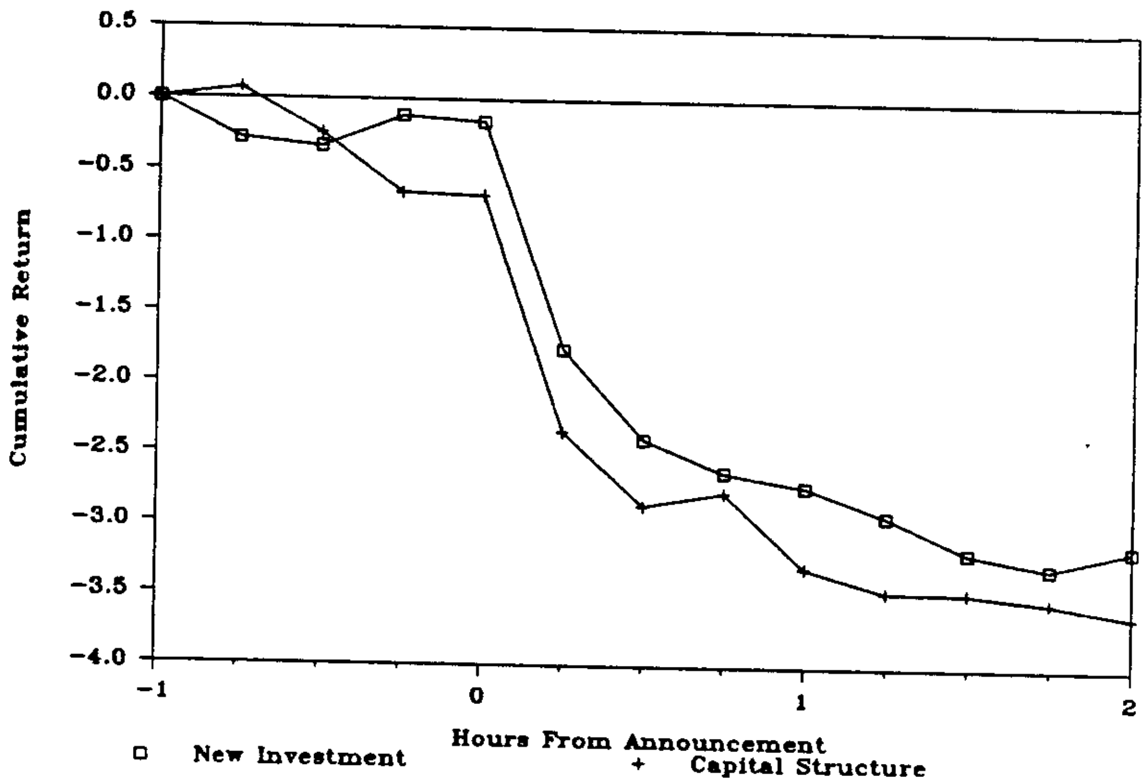
There is no necessary connection between Tobin's Q and the gross present value/cost ratio for a firm's incremental investments. Firms with large economic rents may have already fully exploited their profitable investment opportunities. On the other hand, firms with outdated or inefficient plant and equipment may have profitable opportunities for modernization or new product development. It will be hypothesized here, however, that marginal and average Q are positively correlated so that, on average, knowledge of average Q provides some information about marginal Q.

To test the hypothesis that investor beliefs about the profitability of new investment projects have a significant impact on the market reaction to announcements of a new issues of equity, each new issue is classified according to the intended use of the funds. The announcements are placed in one of the following four categories: (1) change in capital structure only; (2) new investment spending only; (3) mixed (capital structure change and new investment); or (4) unannounced.

Figure 6 shows the market reaction to announcements of new issues of equity for pure capital structure changes and for new investments. It is somewhat surprising that there is little difference between the negative average returns associated with these two very different uses of funds. Capital structure changes have no impact on the physical assets of the firm. Thus, any share price adjustment to this information must reflect anticipations of future tax benefits (or penalties), redistribution effects between the stockholders and the bondholders, information about management's expectations concerning future earnings, and/or price pressure effects. New investments, on the other hand, affect real activity. Yet, on average, the market provides a similar negative response to each type of announcement.

FIGURE 6

AVERAGE INTRADAY STOCK RETURNS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
WITH OBSERVATIONS PARTITIONED BY
THE STATED PURPOSE FOR RAISING NEW FUNDS



The two hour common stock return following the announcement is regressed on a dummy variable (USE) set equal to one for announcements indicating pure capital structure changes and zero for new investment spending. The result is presented in Table 6. Consistent with the finding in Figure 6, the use variable is not statistically significant.

For each firm announcing that some portion of the proceeds of the new issue will be used for new investment spending, Tobin's Q ratio is calculated. These firms are then partitioned into two groups separating firms with Q ratios above and below 1.0. Figure 7 contains plots of the average common stock returns surrounding announcements of new issues of equity with the observations partitioned by the Q ratio of the issuing firm.[6]

The point estimate of the mean return for large Q firms is less negative than the return for small Q firms. This pattern is consistent with the hypothesis that investors perceive new investments by small Q firms as worse news than new investments by large Q firms. However, this difference is not statistically significant. The fact that even firms with Q ratios larger than 1.0 experience negative average returns following announcements of a new issue of equity is also inconsistent with the wasteful investment hypothesis and arguments based on the agency costs of free cash flow.

To further test this hypothesis, the two-hour common stock return following the announcement (R_i) is regressed on the Q ratio (Q) and a dummy variable set equal to one for firms with Q ratios larger than 1.0 and zero otherwise (DQ) again using the maximum likelihood procedure developed in Section 2.3. The results are reported in Table 6. The point estimate for both of the Q variables is greater than

[6] Comparing the top and bottom quartile of firms ranked by the Q ratio of the issuing firm produces results similar to those reported here.

TABLE 6

MAXIMUM LIKELIHOOD REGRESSIONS OF TOBIN'S Q RATIO AND VARIOUS SIZE VARIABLES ON TWO HOUR STOCK RETURN FOLLOWING ANNOUNCEMENTS OF NEW ISSUES OF COMMON EQUITY

1. $$E(R_i) = \exp(\underset{(-1.52)}{-.0187} - \underset{(-0.55)}{.0078}(USE))$$

2. $$E(R_i) = \exp(\underset{(-1.75)}{-.0241} + \underset{(0.36)}{.0029}(Q_i))$$

3. $$E(R_i) = \exp(\underset{(-1.21)}{-.0220} + \underset{(0.19)}{.0038}(DQ_i))$$

4. $$E(R_i) = \exp(\underset{(-2.51)}{-.0208} + \underset{(0.23)}{.0259}(Q_i - 1)RS_i)$$

5. $$E(R_i) = \exp(\underset{(-5.19)}{-.0262} + \underset{(1.83)}{.0476}(RS_i) - \underset{(-0.65)}{.0297}(Q_i - 1)(RS))$$

6. $$E(R_i) = \exp(\underset{(0.54)}{.0416} + \underset{(0.20)}{.0015}(Q_i) - \underset{(-0.86)}{.0061}(LAS_i))$$

7. $$E(R_i) = \exp(\underset{(-1.01)}{-.0325} + \underset{(0.39)}{.0034}(Q_i) + \underset{(0.34)}{.0034}(LRS_i))$$

USE Dummy variable set equal to 1 if the announced use of the proceeds reflects a pure capital structure change and 0 for new investment spending.

Q Tobin's Q ratio for the issuing firm.

DQ Dummy variable set equal to 1 for issuing firms with Q ratios greater than 1 and 0 otherwise.

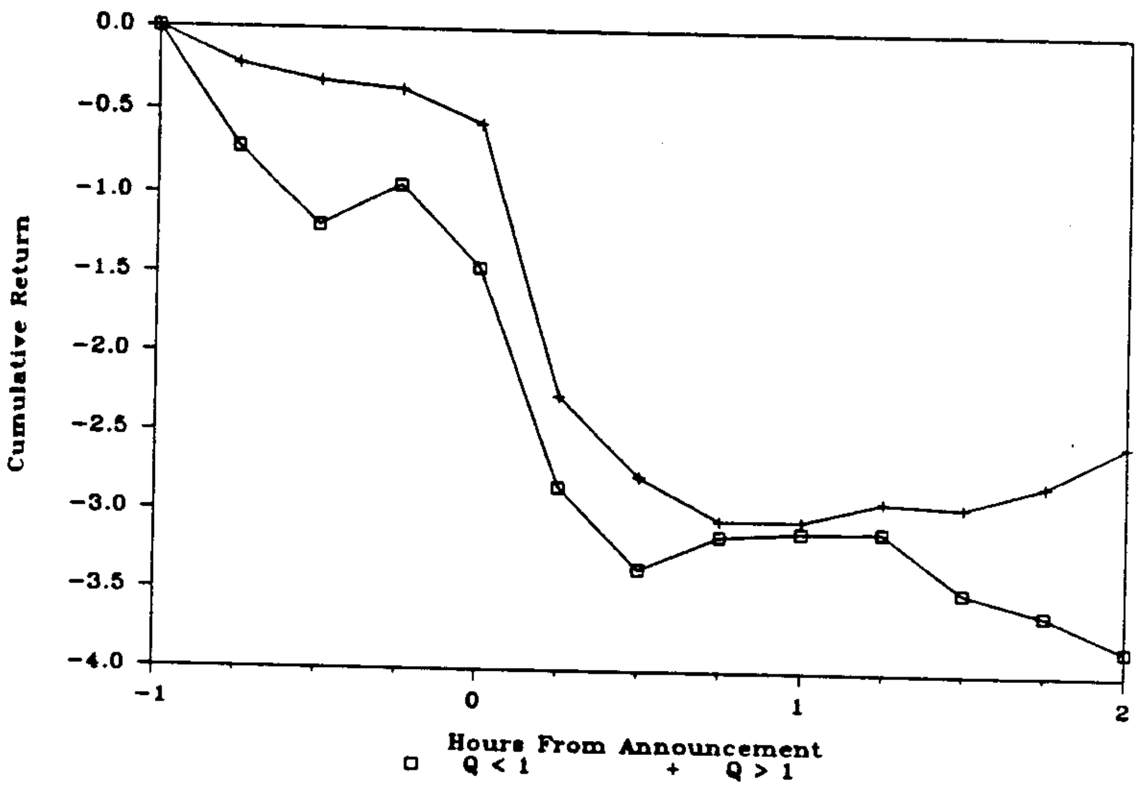
RS The dollar value of the new issue divided by the dollar value of the common shares previously outstanding.

LAS The log of the dollar value of the new issue.

LRS The log of the dollar value of the new issue divided by the dollar value of the common shares previously outstanding.

FIGURE 7

AVERAGE INTRADAY STOCK RETURNS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF EQUITY
WITH OBSERVATIONS PARTITIONED BY
THE Q RATIO OF THE ISSUING FIRM



zero as predicted by the wasteful investment hypothesis. However, the coefficients are not statistically significant.

The marginal Q ratio for an incremental project (MQ) measures the gross change in firm value per dollar invested in the project. The net change in firm value (ΔV) at the time of an announcement of a new issue of common stock whose proceeds are intended for new investment spending is given by

$$\Delta V = (MQ - 1)I \tag{5.3.1}$$

where I is the absolute dollar size of the issue. Dividing both sides of equation (5.3.1) by the value of the firm yields

$$R = (MQ - 1)RS \tag{5.3.2}$$

where $R = \Delta V/V$ is the common stocks return and $RS = I/V$ is the relative size of the issue. Assuming that the marginal Q ratio can be expressed as a linear increasing function of the average Q ratio (i.e. $(MQ - 1) = \alpha + \beta(Q - 1)$), equation (5.3.2) can be rewritten as

$$R = \alpha(RS) + \beta(Q - 1)(RS). \tag{5.3.3}$$

Relations (5.3.2) and (5.3.3) are tested in regression equations. The resulting coefficients (reported in Table 6) are not statistically significant. Finally, the log of the absolute dollar size of the issue and log of the relative size of the issue were included with the Q ratio of the issuing firm in a multiple regression on the common stock return. The results are reported in Table 6. Consistent with the results in this and the previous section, none of the coefficients are statistically significant. There is no evidence from this data that the estimated profitability of the firm's incremental investments has a significant impact on the magnitude of the price decline following announcements of new issues of equity by industrial firms. Thus, these data offer no support for the wasteful investment hypothesis or for hypotheses based on the agency costs of free cash flow.

5.3. Cross Sectional Analysis by Size of Offering

Several of the theories offered to explain the negative market reaction to new issues of common equity can be distinguished by the predictions they make about the effect of the size of the offering on the common stock return. Earlier studies using daily data find conflicting evidence on this effect. Mikkelson and Partch[1986] find that the relative size of the issue is not a significant explanatory variable while Asquith and Mullins[1986] find the same variable to be statistically significant in a multiple regression including the pre-announcement return as a second explanatory variable. Masulis and Korwar[1986] indicate that the relative size of the offering is statistically significant in two of the three multiple regressions that they report.

In order to investigate the effect of the size of the offering on the stock price adjustment, both the absolute dollar size and the relative size of the offering are tried in the regression equations. The appropriate choice of partition is not obvious. For example, the downward sloping demand curve hypothesis relates to the slope of the demand curve for an individual firm's shares and the best comparison across firms is not clear.

The two hour common stock return following the announcement (R_i) is regressed on the log of the absolute size of the issue (LAS) and the log of the relative size of the issue (LRS) using the maximum likelihood procedure developed in Section 2.3. R_i is also regressed on a dummy variable set equal to one for issues larger than the median and zero otherwise (DAS and DRS for absolute size and relative size, respectively). The results are presented in Table 7. None of the size variables in these regressions are statistically significant.

TABLE 7

MAXIMUM LIKELIHOOD REGRESSIONS
OF VARIOUS SIZE VARIABLES
ON THE TWO HOUR STOCK RETURN FOLLOWING ANNOUNCEMENTS
OF NEW ISSUES OF COMMON EQUITY

1. $$E(R_i) = \exp(\underset{(0.36)}{.0150} - \underset{(-0.80)}{.0033}(LAS_i))$$

2. $$E(R_i) = \exp(\underset{(-1.57)}{-.0264} + \underset{(0.12)}{.0006}(LRS_i))$$

3. $$E(R_i) = \exp(\underset{(-3.92)}{-.0182} - \underset{(-0.32)}{.0029}(DAS_i))$$

4. $$E(R_i) = \exp(\underset{(-3.80)}{-.0202} + \underset{(0.14)}{.0011}(DRS_i))$$

LAS The log of the dollar value of the new issue.

LRS The log of the dollar value of the new issue divided by the dollar value of the common shares previously outstanding.

DAS Dummy variable set equal to 1 for issues larger than the median in total dollar value and 0 otherwise.

DRS Dummy variable set equal to 1 for issues larger than the median in relative size (dollar value of the issue divided by the dollar value of the common shares previously outstanding) and 0 otherwise.

The lack of correlation between the magnitude of the price drop and the size of the issue is consistent with the existing asset value signaling hypothesis and the transaction cost hypothesis. However, it is inconsistent with the cash flow signaling hypothesis, the wasteful investment hypothesis, the downward sloping demand curve hypothesis and both of the leverage hypotheses.

5.4. Post Issue Day Returns

Thus far, the analysis has focused on the announcement effects of new issues of equity. However, several of the hypotheses also have implications for stock price behavior following the issuance of the securities. In particular, the transaction cost hypothesis predicts a price recovery following the issue, and some versions of the downward sloping demand curve hypothesis predict a fall in stock prices following the issue.

Table 8 presents the daily excess returns for five days prior to the issue day and the excess and cumulative excess returns for twenty days following the issue day. Daily excess returns were estimated using market model residuals with β estimated from two years of daily data ending one month prior to the announcement of the new issue. Intraday and over night returns are reported as gross (unadjusted) returns.

From the close of trade on day -2 until the opening of trade on day 0, there is a negative average return of 76 percent which is significant at the 1 percent level. Thus, not all of the negative stock price reaction is confined to the announcement period. However, starting at the opening of trade on the issue day, there is evidence of a significant price recovery. While the magnitude of the recovery (1.47% in 20 days) is smaller than the price drop at the announcement, this result is consistent with the hypothesis that transaction costs are at least partially responsible for the price drop at the announcement. Figure 8 displays the average intraday returns on

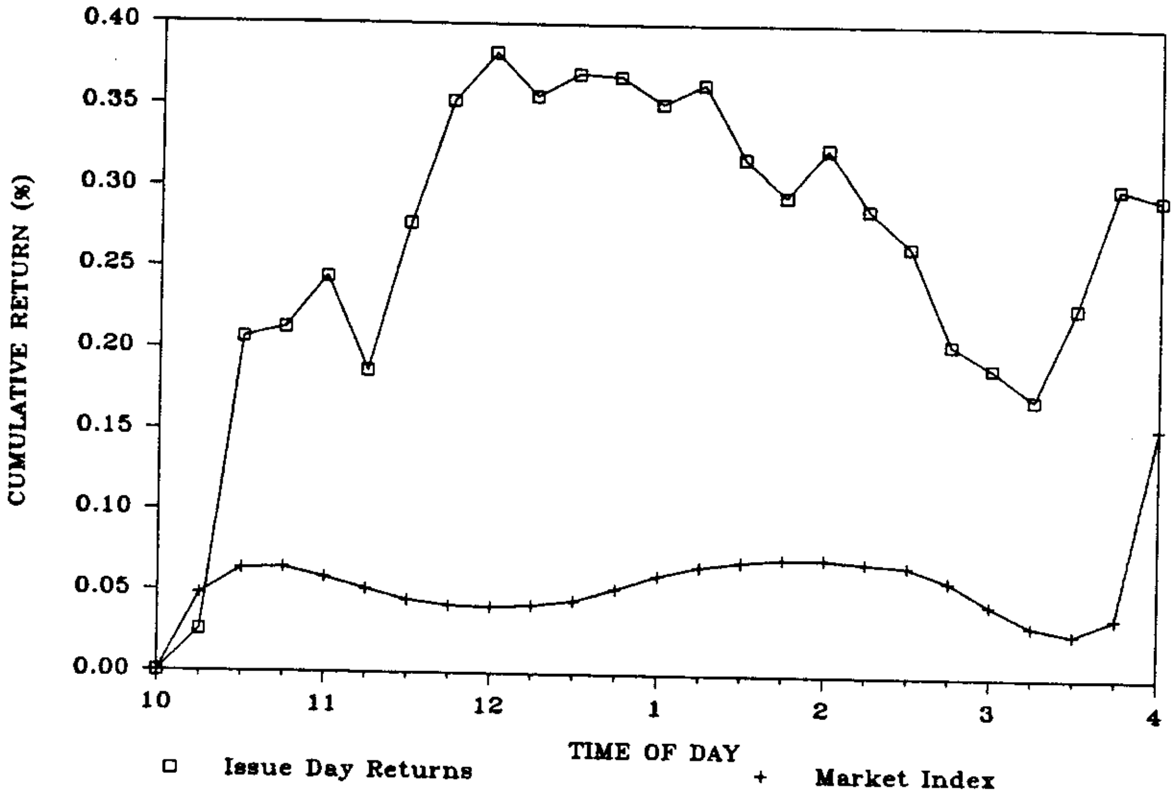
TABLE 8

CUMULATIVE EXCESS RETURNS
FOLLOWING NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983

Event Day	Excess Return	*t* Statistic	Cumulative Excess Return	*t* Statistic
-5	0.10	0.59		
-4	0.17	0.89		
-3	-0.06	-0.32		
-2	-0.12	-0.67		
-1	-0.43	-2.87		
close -1 to open 0	-0.33	-3.19		
open 0 to close 0	0.30	2.05	0.30	2.05
1	0.19	1.25	0.48	2.32
2	-0.15	-0.89	0.34	1.25
3	0.09	0.54	0.42	1.35
4	0.11	0.61	0.53	1.48
5	0.24	1.56	0.77	1.98
6	0.03	0.19	0.80	1.91
7	0.06	0.36	0.86	1.92
8	0.14	0.91	1.00	2.11
9	-0.13	-0.83	0.88	1.76
10	0.11	0.66	0.99	1.87
11	-0.19	-1.28	0.80	1.46
12	-0.09	-0.64	0.71	1.26
13	0.23	1.61	0.93	1.61
14	0.18	1.14	1.11	1.85
15	0.03	0.20	1.14	1.84
16	0.17	1.16	1.31	2.06
17	0.10	0.61	1.41	2.14
18	0.12	0.70	1.52	2.25
19	-0.02	-0.11	1.51	2.16
20	-0.04	-0.27	1.47	2.07

FIGURE 8

INTRADAY COMMON STOCK RETURNS
FOLLOWING NEW ISSUES OF EQUITY
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983



the issue day. There are significant positive returns especially during the morning of the issue day. For the purpose of comparison, an intraday market index calculated from Harris[1985] is also presented in Figure 8.

Thus, an analysis of the issue day returns provides support for the transaction cost hypothesis.

5.5. New Issues of Straight, Long-Term Debt

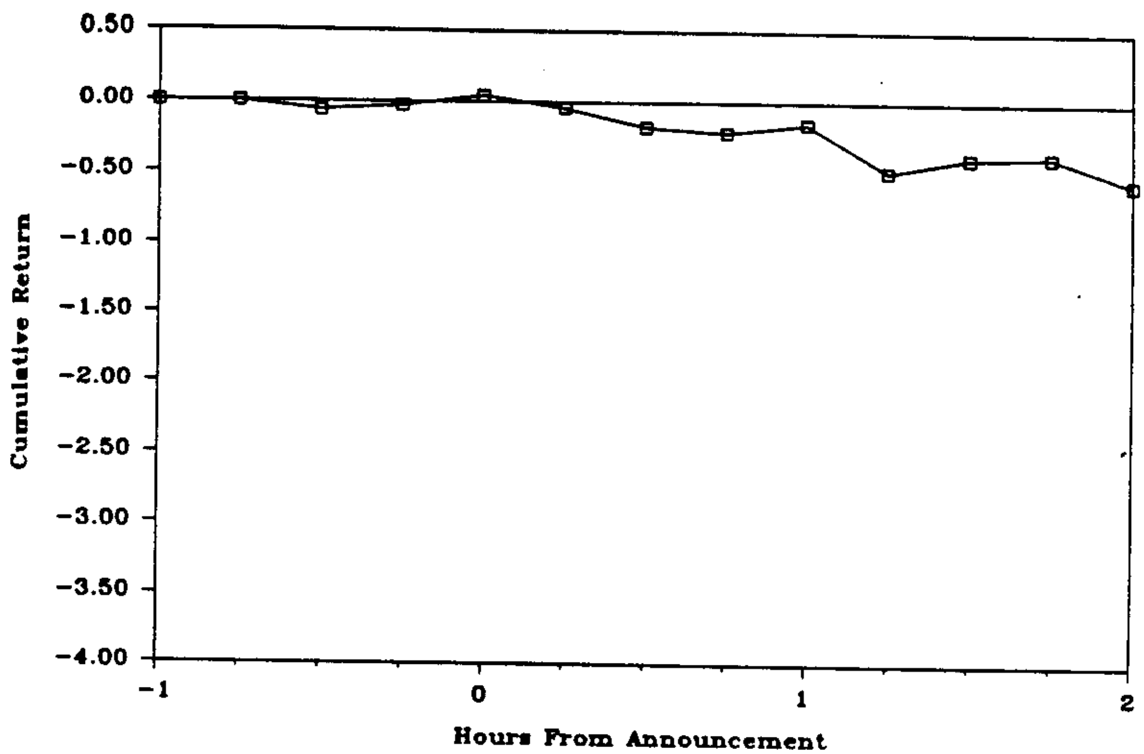
Figure 9 contains a plot of the average stock price reaction to announcements of new issues of straight, long-term debt by industrial firms. Consistent with several earlier studies, the common stocks in this sample experience small negative returns near the time that the debt issue is announced, but the returns are not significantly different from zero.

An insignificant stock price reaction to new issues of debt is consistent with the "price pressure" hypothesis (especially the version based on transaction costs) proposed to explain the negative stock price reaction to new issues of equity. A reduction in the share price would not induce investors to absorb the bond issue as it induces them to absorb the stock issue. The negative or zero return is not consistent with theories based on redistribution effects between bondholders and shareholders. Holding investment policy fixed, a new stock issue makes existing debt less risky and consequently causes a transfer of wealth from existing stockholders to bondholders. However, if the negative reaction to new issues of equity were caused by this redistribution, then a new debt issue should have a positive effect on share prices as the riskiness of existing bonds is increased.

Smith[1986] argues that debt issues are more predictable than common stock issues. Regular debt repayment in the form of maturing issues and sinking fund provisions require the firm to issue debt at regular intervals to maintain its capital

FIGURE 9

AVERAGE INTRADAY STOCK RETURNS
SURROUNDING ANNOUNCEMENTS OF NEW ISSUES OF
STRAIGHT, LONG-TERM DEBT
INDUSTRIAL FIRMS
JANUARY 1981 THROUGH DECEMBER 1983



structure. In addition, since the flotation costs for publicly placed debt have a large fixed component, firms tend to draw on bank lines of credit until an efficient public issue size is reached and then issue public debt to retire the bank debt. Because stock price changes reflect only the unanticipated component of the announcement, if these announcements are predictable to a large degree then no information can be inferred from the common stock return following the announcement.

6. Conclusions

This paper examines the within day patterns of common stock returns surrounding announcements of new issues of equity and debt by industrial firms. It is shown that the market reacts quickly to announcements of new issues of equity. During the first 15 minutes following an announcement, stock prices fall, on average, by 1.5%. The average price decline during the three hour period surrounding the announcement is between 2.7% and 3.0% depending on the method used to measure intraday returns. An abnormally large number of transactions and correspondingly high volume are observed during the first 15 minutes following the announcement. However, there is no evidence of significant abnormal trading activity (either positive or negative) during any other interval on the announcement day. Average stock prices fall by a small but statistically significant amount during the one hour period prior to the time that announcements appear on the Broad Tape. This evidence is consistent with the hypothesis that insider trades preceding the first public announcement of the issue affect the stock price. However, unintentional delays between the public announcement and their release over the wire service cannot be ruled out.

Neither the size of the issue nor the intended use of the proceeds (between pure capital structure changes and new investment spending) has a statistically significant impact on the observed returns. For stock issues used to finance new investment projects, market perceptions of the firm's investment opportunities (estimated using Tobin's Q ratio) also have no statistically significant explanatory power. Stock returns following announcements of new issues of debt are negative, but small and not significantly different from zero. An analysis of the returns surrounding the issue day indicate significant negative returns preceding the issue and a partial price recovery following the issue. The negative return is consistent with a price pressure effect and the recovery is consistent with the transaction cost hypothesis.

Table 9 summarizes the predictions of the competing hypotheses and the empirical results. The data do not support the cash flow signaling or wasteful investment hypotheses, the downward sloping demand curve hypothesis, or either of the leverage hypotheses. The data are consistent with the transaction cost hypothesis which implies that a discount must be offered to compensate investors for the transaction costs they bear in adjusting their portfolios to absorb the new issue. Also, if the insignificant common stock return following new issues of debt is caused by the fact that these announcements are largely predictable, then the data are also consistent with the existing asset value signaling hypothesis which implies that uninformed traders view a new issue of equity as a signal from more informed managers that the firm's assets are undervalued.

While these hypotheses were analyzed individually, the rejected hypotheses are also rejected in combination with others because they do not predict opposing effects (see Table 9). That is, when one hypothesis predicts a positive (negative) effect of a given variable, the other hypothesis either predicts a positive (negative) effect or no effect. The combination of a positive (negative) effect and no effect is a significant positive (negative) effect.

Several different techniques for measuring intraday returns are examined. The qualitative results of the paper are robust with respect to the different measurement

TABLE 9
SUMMARY OF EMPIRICAL RESULTS

YES: Implies the Data are Consistent with the Hypothesis
NO: Implies the Data are Inconsistent with the Hypothesis

	STOCK ISSUES				
	INTENDED USE OF PROCEEDS	ESTIMATED PROFITABILITY OF NEW INVESTMENTS	SIZE OF ISSUE	PRICE RECOVERY FOLLOWING ISSUE DAY	DEBT ISSUES
1. Information Hypotheses					
a. Existing Asset Value Signaling Hypothesis	(Yes) No correlation with stock return	(Yes) No correlation with stock return	(Yes) No correlation with stock return	(No) No Recovery	(No) Positive effect on stock return
b. Cash Flow Signaling Hypothesis	(No) No effect for pure capital structure changes (Yes) Negative effect for new investment spending	(Yes) No correlation with stock return	(No) Negative correlation with stock return	(No) No Recovery	(No) Negative effect on stock return
c. Wasteful Investment Hypothesis	(No) No effect for pure capital structure changes (Yes) Negative effect for new investment spending	(No) Positive correlation with stock return	(No) Negative correlation with stock return	(No) No Recovery	(No) Negative effect on stock return
2. Price Pressure Hypotheses					
a. Downward Sloping Demand Curve	(Yes) No correlation with stock return	(Yes) No correlation with stock return	(No) Negative correlation with stock return	(No) No Recovery	(Yes) No effect on stock return
b. Transaction Cost Hypothesis	(Yes) No correlation with stock return	(Yes) No correlation with stock return	(Yes) No correlation with stock return	(Yes) Full Recovery	(Yes) No effect on stock return
3. Leverage Hypotheses					
a. Tax Advantage of Debt Hypothesis	(No) Smaller effect for new investment spending than for pure capital structure changes	(Yes) No correlation with stock return	(No) Negative correlation with stock return	(No) No Recovery	(No) Positive effect on stock return
b. Redistribution Hypothesis	(No) Smaller effect for new investment spending than for pure capital structure change	(Yes) No correlation with stock return	(No) Negative correlation with stock return return	(No) No Recovery	(No) Positive effect on stock return

techniques. However, the magnitude of the measured effect is sensitive to the choice of technique.

APPENDIX

Exchange Guidelines On Public Disclosure Of Material Information

Both the New York and American Stock Exchanges publish detailed guidelines governing the public disclosure of material information by listed firms. The emphasis placed on these guidelines by the exchanges is exemplified by the following passage from the New York Stock Exchange Company Manual:

> A listed company is expected to release quickly to the public any news or information which might reasonably be expected to materially affect the market for its securities. This is one of the most important and fundamental purposes of the listing agreement which the company enters into with the exchange. (p. 2-4)

The normal medium for a public disclosure is via a press release. Under exchange guidelines, "Any release of information that could reasonably be expected to have an impact on the market for a company's securities should be given to the wire services and the press *for immediate release*." (NYSE Company Manual, p. 2-4, emphasis in original) The NYSE procedure for immediate disclosure requires that "News which ought to be the subject of immediate publicity must be released by the fastest available means. ... Ordinarily, this requires a release to the public press by telephone, telegraph, or hand delivery, or some combination of such methods. Transmittal of such a release to the press solely by mail is not considered satisfactory." (NYSE Company Manual, p. 2-6) The NYSE and Amex demand that new information requiring immediate disclosure be sent to both of the major financial wire services (Dow Jones & Co., Inc. and Reuters Economic Services).

The motivation for these explicit and stringent guidelines on disclosure and reporting are made clear in the following passage from the NYSE Company Manual:

> Unusual market activity or a substantial price change has on occasion occurred in a company's securities shortly before the announcement of an

important corporate action or development. Such incidents are extremely embarrassing and damaging to both the company and the Exchange since the public may quickly conclude that someone acted on the basis of inside information. (p. 2-1)

To further guard against insider trading, the Amex mandates that "insiders should refrain from trading, even after material information has been released to the press and other media, for a period sufficient to permit thorough public dissemination and evaluation of the information." (Amex Company Guide, p. 102) As a general policy, the Amex recommends that insiders refrain from trading for at least 24 to 48 hours after the release of material information.

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