

**INFORMATIVENESS OF THE EQUITY  
FINANCING DECISION: DIVIDEND REINVESTMENT  
VERSUS THE PUBLIC OFFER**

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**Abstract**

Stock price reactions to announcements of new equity issues via dividend reinvestment plans (DRPs) have been shown to be statistically insignificant. The insignificant reaction documented in studies using conventional event study methods may be because (1) equity issuance through DRPs arises from economic motives that are different from those underlying general cash offers, (2) new-issue DRPs are generally much smaller than general cash offers, hence their effects are more difficult to detect, or (3) identification of the precise event date for new-issue DRPs is problematic. We compare stock price reactions to DRPs and general cash offers taking care to control for relative issue size and employing stringent sampling techniques to assure reliable identification of the event date. Our results show that stock price reactions to DRPs and general cash offers are statistically indistinguishable once the appropriate controls are employed.

**INTRODUCTION**

Private firms in the US raise equity capital publicly by (1) general cash offers, (2) rights offers to current shareholders, (3) new-issue dividend reinvestment plans offered to shareholders, and on a delayed basis, by (4) issuing warrants exercisable for stock, and (5) issuing convertible securities. Stock price reactions to announcements of financing using all of these methods have been investigated in varying degrees of detail, and average reactions to all but one of the methods have been found to be negative. Peterson, Peterson and Moore [16] identify the exception, announcement of initiation of dividend reinvestment plans (DRPs), where they find no statistically reliable average price reaction.

Several prominent theoretical explanations for negative stock price reactions to public equity issuance announcements exist and have been tested. The explanations may be grouped loosely into three broad categories: (1) information effects, (2) leverage effects, and (3) downward sloping demand for shares. A non-negative stock price reaction to announcement of a DRP can be useful in identifying a subset of non-supported explanations.

Two peculiarities about DRPs exist, however, that make detection of price reactions difficult. First, announcement of DRP initiations rarely occur in a widely read medium such as *The Wall Street Journal*. Thereby, the information may not be impounded quickly enough to be detected with reliable statistical precision. To adjust for this shortcoming, we compare new-issue DRP announcement effects with effects of general cash offer announcements that also do not appear in *The Wall Street Journal*. Second, DRP issues are very small compared to any of the other issue methods. Because most of the theoretical predictions imply that price effects should depend on issue size, we control for size in examining abnormal stock price changes.

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The authors express gratitude to Ellen Roueche for expert technical assistance.

## EQUITY ISSUANCE - WHY THE METHOD MATTERS

General cash offers of common stock result in an average equity devaluation of over 3 percent for industrial firms and nearly 1 percent for utilities (Smith [20], Table 1). Equity rights offer announcements exhibit an average reduction in equity value of almost 3 percent for industrials and over 1 percent for utilities (Hansen [4]). Barclay and Litzenberger [3] find that a component of the GCO announcement effect is apparently the result of downward sloping short-term demand (price pressure). Hansen [4] finds evidence of short-term price pressure around rights offerings. But in both types of offerings, some of the announcement effect is permanent, thus giving support to leverage effects, information effects, or downward sloping long-term demand due to imperfect substitutes for the new shares.<sup>1</sup>

New issues sold through DRPs reach the markets gradually causing little concerted short-term pressure on prices. And demand for DRP issues is self-selected, hence subscribers are likely to be the ultimate holders of the new shares. This means that price concessions are not necessary to attract ultimate buyers. Thus, a null reaction to new-issue DRPs and negative reactions to other issuance methods is consistent with short-term price pressure.<sup>2</sup>

New-issue DRPs could elicit negative stock price reactions due to information effects, leverage effects, or downward sloping long-run demand for shares due. Following Barclay and Litzenberger [3], we categorize information effects as (1) signaling that the firm's assets are overvalued (Myers and Majluf [15]), and (2) signaling management's expectation that the firm's cash flow distribution will deteriorate in terms of the level of cash flow (Miller and Rock [13]), or the riskiness of cash flow (Healy and Palepu [6]).<sup>3</sup> The two categories can be distinguished empirically by recognizing that a DRP issue should convey information according to the second category, but not the first. In the Myers and Majluf [15] setting the firm's management seeks to sell overvalued shares in order to benefit current shareholders at the expense of new investors. This "lemons" problem in the sense of Akerlof [1] requires outside investors to serve as a source of wealth to be expropriated. A DRP cannot serve as a vehicle for such expropriative behavior because new shares go directly to current shareholders.<sup>4</sup> Thus, the absence of a stock price reaction to a DRP announcement is consistent with the Myers and Majluf signaling hypothesis and is inconsistent with cash flow signaling explanations such as that of Miller and Rock.

Issuance of equity by initiating a DRP or by any other method may have an adverse stock price effect according to several hypotheses related to financial leverage. Ross [17] presents a signaling model in which leverage reductions reveal lack of confidence by managers in the firm's ability to meet obligations. Issuance of new equity reduces the proportion of the firm's cash flows that are shielded from corporate income taxes (Modigliani and Miller [14]). Such a decision may also reveal management's expectation that the firm's need for tax shields may diminish due either to declining profits (Mikkelson [10]) or increasing riskiness of cash flows (Healy and Palepu [6]).

A decline in leverage may result in a wealth transfer from bondholders to stockholders provided firm value remains constant. This is due to the reduction in default risk of the firm's debt and to a reduction in stock price variance. The latter results in a stock price decline due to the call option analogy for levered equity (see Merton [9]). Kalay and Shimrat [7] find that equity issuance does not provide wealth transfers to bondholders. A new issue DRP announcement will have a negative equity valuation effect to the extent that any of the leverage-related hypotheses is true.

Finally, a new equity issue via a DRP could have a negative effect due to a downward sloping long-run demand curve for the firm's shares (see Scholes [18] and Harris and Gurel [5]). A downward sloping curve would imply an incomplete market or the absence of spanning for the firm's stock.

Peterson, Peterson and Moore [16] investigate stock price reactions to new issue DRP announcements by industrial and utility firms. They report an average abnormal return for industrials that is not statistically significant at conventional levels. They find a significant negative average price reaction only for the subset of their utility sample that adopted DRPs prior to the 1981 tax law.<sup>5</sup> They conclude that their findings are consistent with the notion that the option of receiving stock or cash dividends is valuable.

## SAMPLE SELECTION AND TEST METHOD

Because announcements of DRPs rarely appear in *The Wall Street Journal*, the announcement period is defined by the filing date for registration of new shares with the Securities and Exchange Commission (SEC). Registration

statements are displayed in the Public Reference Room of the SEC headquarters building on the filing date or the following day. Once on display the statements are in the public domain in that access to the statements is unrestricted. In addition, over 12 private vendors of information maintain a daily presence in the Reference Room. They provide registration information to their respective subscribers. The filing date also identifies the information event for firms registering new issue GCOs. To insure comparability of price reactions for both methods, both samples exclude all observations having announcements regarding new equity offerings in *The Wall Street Journal* prior to or during the filing date ( $t = 0$ ) and the following two trading days ( $t = 1, 2$ ).

The DRP sample is identified from the Registered Offering Statistics (ROS) file published by the Securities and Exchange Commission (SEC), and includes the years 1974 (first full year in which new issue DRPs existed) through 1987. The GCO sample is identified from the *Investment Dealers Digest*. From both samples we exclude utility, transportation, communications and banking firms. The samples are restricted to have sufficient return data in the Center for Research in Securities Prices (CRSP) files for NYSE, AMEX and NASDAQ firms. Filing dates and numbers of shares registered are verified using the *SEC News Digest*. Offerings made with a stated specific purpose such as acquisitions are deleted. Sample points having other material firm-specific announcements such as dividends or earnings during  $t = 0, 1$ , and  $2$  in *The Wall Street Journal* are eliminated.

The selection criteria result in 55 DRP announcements and 43 GCO announcements. New issue DRPs are much smaller in size than GCOs. The average DRP filing is for 530,273 shares (median 300,000), and the average GCO filing is for 1,204,079 shares (median 1,000,000). New issue DRPs represent an average increase of 3.11 percent in shares outstanding (median 2.37 percent), compared to an average 16.94 percent increase for GCOs (median 12.97 percent). Thus, the average GCO filing average increases shares outstanding over 5 times more than the average DRP filing.

The announcement effects for DRP filings and GCO filings will be compared by estimating a model of the form given in equation (1).

Equation 1

$$CAR_{i,t} = \beta_0 + \beta_1 TYPE_i + \beta_2 (F(n_i/N_i)) + \varepsilon_i$$

In (1),  $TYPE_i = 1$  if the filing is for a DRP and 0 if a GCO. The relative size of the offering is measured as the percentage increase in shares outstanding that will result from the issue. This is denoted by  $n_i/N_i$ , where  $n_i$  = number of shares registered and  $N_i$  = number outstanding as of the month prior to that in which the filing is recorded. Information-based models that predict price reactions to equity issuance are not sufficiently rich to guide us in choosing the form of the relationship between the cumulative abnormal return ( $CAR_{i,t}$ ) and issue size ( $n_i/N_i$ ), thus we indicate a general functional form,  $F(n_i/N_i)$ , in (1), and report results from different specifications below.

We will also estimate and report the abnormal return on equity per dollar of capital raised. This measure is denoted by  $CARDOL$  and is defined:

Equation 2

$$CARDOL_{i,t} = \frac{CAR_{i,t} \times P_{i,t} \times N_i}{n_i \times P_{i,t}}$$

The numerator of (2) is the abnormal dollar change in equity value of firm  $i$  during period  $t$  and the denominator is the dollar value of new equity capital to be raised based on the current price per share, thus  $CARDOL$  is the abnormal return per dollar raised.

The abnormal returns ( $AR_{i,t}$ ) used in equations (1) and (2) are generated from the market model estimated by ordinary least squares over the period  $t = -170$  to  $t = -21$ . The announcement period is defined as the two-day period,  $t = 0$  and  $t = +1$ , in order to capture delayed effects.

Abnormal returns ( $AR_{i,t}$ ) are standardized as in Mikkelsen and Partch [12]. These are reported in order to facilitate comparison of our findings with those in other studies. Average abnormal returns (AAR) are calculated cross-sectionally and cumulative average abnormal returns (CAAR) are calculated by summing AAR over time for various time spans of interest. Test statistics for CAAR are denoted by  $Z$  and are calculated as in Mikkelsen and Partch [12]. These are assumed to be asymptotically unit normal with zero mean under the null hypothesis.

## RESULTS

Cumulative average abnormal returns ( $CAAR_{i,t}$ ) for three intervals are presented in Table 1. These include the pre-event period,  $t = -5$  to  $t = -1$ ; the event period,  $t = 0$  to  $t = +1$ ; and the post-event period,  $t = +2$  to  $t = +5$ . For the sample of 55 DRP filings the pre-event period exhibits insignificant abnormal returns (CAAR) of -.97 percent ( $Z = 1.269$ ). The event period is also characterized by insignificant abnormal performance (CAAR = -.30 percent;  $Z = -.989$ ). The post-event period exhibits insignificant performance as well (CAAR = .2 percent;  $Z = .344$ ).

**TABLE 1**  
**Cumulative Average Abnormal Returns (CAAR)**  
**And Test Statistics (Z) For Stocks Of Sample Firms**  
**Filing Dividend Reinvestment Plans And**  
**General Cash Offers During 1974-1987**

	Dividend Reinvestment Plans (n=55)		General Cash Offers (n=43)	
	CAAR(%)	Z	CAAR(%)	Z
Pre-Event Period ( $t = -5$ to $t = -1$ )	-0.966	-1.269	-0.695	0.071
Announcement Period ( $t = 0$ to $t = +1$ )	-0.303	-0.989	-1.929	-3.989
Post-Event Period ( $t = +2$ to $t = +5$ )	0.221	0.344	-1.091	-1.671

The insignificant event-period result is evidently not due to extreme observations. The median value of the event-period CAARs is -.34 percent, compared to the CAAR of -.30 percent.

The insignificant price behavior could be because (1) the null hypothesis is true, (2) the DRPs are too small to cause a reliably detectable average abnormal return, or (3) the method of announcement (SEC registration) may be inadequate to convey a detectable signal. The latter possibility may be examined by focusing on the abnormal returns in Table 1 for GCO filings. The event period CAAR is -1.93 percent, significant at the .001 level ( $Z = -3.989$ ). This is consistent with findings on equity GCOs reported by other authors,<sup>6</sup> thus, it seems doubtful that the insignificant response to DRP filings is due only to the announcement method.

The second possibility, that DRPs are too small to allow for reliable detection using standard event study methodology, is first investigated by considering the abnormal return per dollar of capital raised (CARDOL). The analysis is presented in Table 2.

For the event period ( $t = 0, +1$ ), the sample mean value of CARDOL for DRP filings is 14.31 percent and the sample median is -23.80 percent; i.e., DRP filings lead to a median loss of about \$.24 per dollar of equity capital to be raised. For GCO filings, the sample mean value of CARDOL is 13.63 percent and the sample median is -17.47 percent. Thus GCO filings lead to a median loss of over \$.17 per dollar of capital raised, substantially less than the median loss of \$.43 reported by Asquith and Mullins [2] for their GCO sample.

The sample mean values have signs opposite the sample median values for the DRP filings and the GCO filings. The differences are due to extreme observations in each sample. For DRP filings, the standard deviation of CARDOL is 401.01 percent (standard error of sample mean = 54.07 percent), thus the estimated mean (14.31 percent) is highly unstable. The median average deviation (MAD), however, is 61.40 percent, compared to the standard deviation of 401.01 percent. The same characteristic applies to the GCO sample; the standard deviation of CARDOL is 173.38 percent (standard error of the mean = 27.20 percent). The MAD value for the GCO sample is 13.99 percent. Thus, the superior measure of central tendency in each case is the sample median.

**TABLE 2**  
**Cumulative Abnormal Returns Per Dollar Of Capital Raised (CARDOL)**  
**By Sample Firms Filing Dividend Reinvestment**  
**Plans And General Cash Offers During 1974 - 1987**

	Dividend Reinvestment Plans (n=55)	General Cash Offers (n=43)
ARDOL		
Mean (%)	14.31	13.63
Standard Deviation	401.01	173.38
Standard Error	54.07	27.20
Median (%)	-23.80	-17.47
Median Average Deviation	61.40	13.99

Statistical inference regarding CARDOL for both samples is guided by the marked non-normality of the data. The abnormal returns for the event period summarized in Table 1 are, in contrast, nearly normally distributed based on the Wilk-Shapiro criterion (.9889 for DRP filings and .9372 for GCOs).<sup>7</sup> The sample distributions of CARDOL deviate substantially from normality based on the Wilk-Shapiro criterion (.6264 for DRPs and .3456 for GCOs). The extreme observations and marked non-normality argue in favor of nonparametric analysis of ARDOL. The Mann-Whitney rank sum test for equality of medians produces a test statistic that is approximately normally distributed in finite samples. For the test of equal medians of CARDOL for the GCO and DRP samples, we calculate a test statistic of .299, not significantly different from zero at reasonable levels.<sup>8</sup>

Based on the analysis thus far, the abnormal price reaction per dollar raised is not significantly different for DRP and GCO filings, a result predicted by several information-based models (e.g., Miller and Rock [13] and leverage-related explanations, e.g., Ross [17]). But care must be taken in interpreting the result because the price effect may not be linear in relative issue size. We control for size in estimating equation (1) by specifying three functional forms, linear, quadratic, and logarithmic. The results are reported in Table 3.

**TABLE 3**  
**Estimation Results For The Model**

$$CAR_{i,t} = \beta_0 + \beta_1 TYPE_i + \beta_2(F(n_i/N_i)) + \epsilon_i$$

Where CAR = cumulative abnormal return for the  
two-day event period; TYPE = 1 if DRP, 0 if GCO; and  
 $n_i/N_i$  = percentage increase in shares.

Intercept	TYPE	$n_i/N_i$	$(n_i/N_i)^2$	$\ln(n_i/N_i)$	R <sup>2</sup>
-.0093 (-1.30)	.0081 (1.07)	-.0590 (-1.84)			.0985
.0036 (0.36)	-.0007 (-0.08)	-.2042 (-2.38)	.2409 (1.82)		.1291
-0.354 (-4.67)	.0020 (0.24)			-.0077 (-2.65)	.1307

The results in Table 3 are based on ordinary least squares (OLS) estimation and, for all three functional forms, the coefficient estimate for TYPE (1 if DRP, 0 if GCO) is insignificantly different from zero. Thus, when issue size is controlled, stock price reactions to DRP filings are indistinguishable from reactions to GCO filings. Relative issue size is the dominant determinant of the price reactions in the linear and quadratic forms of the model. The coefficient estimate for  $n_i/N_i$  is negative and significant at least at the .07 level (for the linear version,  $t = -1.84$ , significant at the .07 level; for the quadratic version,  $t = -2.38$ , significant at the .02 level). For the quadratic and logarithmic forms, a nonlinear relationship between CAR and  $n_i/N_i$  is supported. The best model in terms of  $R^2$  ( $=.1307$ ) is the logarithmic version; coefficient estimate for  $\ln(n_i/N_i) = -.0077$ ;  $t = -2.65$ , significant at the .01 level.

The insignificant finding for TYPE is not due to multicollinearity or heteroskedastic error variance. The inverse of the correlation matrices for the explanatory variables was calculated for each version and variance inflation factors are no greater than 1.8. We estimated the three version with White's [21] heteroskedasticity adjustment and the results are similar to those reported in Table 3, i.e., TYPE is insignificant and issue size ( $n_i/N_i$ ) is significant.

## SUMMARY AND CONCLUSIONS

In this study we re-examine earlier findings that the initiation of new issue dividend reinvestment plans (DRPs) has an insignificant effect on issuing firms' equity values. Two plausible methodological issues might produce the null finding even if it is false. DRPs represent small increases in outstanding shares, and DRP filings are almost never announced in the financial press. The first issue is addressed by examining abnormal price performance with various controls for relative issue size. The second issue is examined by comparing the DRP results with general cash offer (GCO) filings that were not announced in *The Wall Street Journal*.

With the method of announcement held constant and with issue size controlled, we find the average price effects of DRP filings to be indistinguishable from the effects of GCO filings. Said differently, small GCO filings are found to produce only small price effects, the same as DRP filings. Thus, information conveyed by new-issue DRPs is the same as that conveyed by small GCOs; i.e., there is nothing special about the information transmission mechanism that characterizes DRPs.

## ENDNOTES

1. A compelling piece of evidence is presented by Kalay and Shimrat [7] who find that bonds of firms issuing new equity also exhibit a significant average negative price effect upon announcement, supporting the hypothesis that adverse information about firm value is conveyed.
2. Hansen [4] shows that downward pressure is exerted on stock prices while subscribers to rights offers seek ultimate buyers. Mazzeo and Moore [8] argue that a similar explanation holds for conversion-forcing calls of convertible securities. Prices are temporarily depressed while convertible security holders seek ultimate buyers for newly converted shares.
3. Common stock issuances based on increased riskiness of operating cash flows adjust financial leverage downward and may be revealing asymmetric information independently from an overvaluation phenomenon. Alternatively, if shares are being placed to outside investors, the stock issuance could also simultaneously be releasing information on overvaluation.
4. Rights offerings are offered initially to current shareholders. In practice, outside participation is still found to be substantial. Smith [18] provides information from a May 2, 1977 *Barron's* article that 50% exercise rights, 40% sell their rights, and 10% do nothing.
5. The 1981 tax law excludes reinvested (DRP) dividends of qualified utilities from personal income tax during the 1982-1985 period.

6. See Asquith and Mullins [2] and Mikkelson and Partch [11].
7. The Wilk-Shapiro criterion is such that a normal distribution yields a value of 1.0.
8. An often less powerful counterpart of the Mann-Whitney test is the median test, which produces a Chi-squared test statistic. In this case, we calculate a value of .04, which has a p-value of .8387.

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