

Is Underpricing a Signal of Quality in 'Second' Initial Public Offerings?

John P. Cook
University of Kentucky

Dennis T. Officer
University of Kentucky

Allen and Faulhaber (1989), Welch (1989), and Grinblatt and Hwang (1989) model initial public offerings (IPO) underpricing as a signal from better informed firm owners to less informed investors. Papers by McGuiness (1992) and Garfinkel (1993) provide empirical results inconsistent with signaling theory. The purpose of this research is to provide additional evidence on the underpricing signaling models by examining the reissuance behavior of 'second' initial public offerings of reverse leveraged buyout (LBO) firms. First, the evidence indicates that reissuers tend to have superior long-run performance relative to nonreissuers. This evidence supports the signaling theory prediction that high quality reverse-LBOs should underprice their initial offerings to signal the quality of the firm and then recoup the cost of underpricing in a subsequent issuance. This evidence alone, however, cannot contradict the alternative explanation that issuers underprice to clear the market and then, after the price runs up, decide to have another offering. Our results also indicate that firms that reissue within one year of the initial offering tend to have greater levels of underpricing relative to nonreissuers. The alternative explanation does not predict a positive relationship between underpricing and probability of reissuance, as does signaling theory. Therefore, we interpret our finding that reissuers within one year tend to be associated with greater underpricing and exhibit superior performance as support for signaling theory.

INTRODUCTION

Allen and Faulhaber (1989), Welch (1989), and Grinblatt and Hwang (1989) model IPO underpricing as a signal of firm quality from better informed owners to less informed investors. If there were no information asymmetries between firm owners and investors, the offering price would match the market price. The offering price of an issuance would reflect the quality of the issuing firm. When information asymmetries exist, however, the market price of the offering may reflect the value of an average quality firm because investors may not be able to differentiate between a low quality and a high quality firm. Thus, a high quality firm will not receive proceeds that reflect its true worth. The signaling models propose that high quality firms signal their quality at a cost too high to be mimicked by low quality firms by discounting the offering price from the market price. The cost of underpricing is recouped in a seasoned offering where the additional shares reflect the value of a high quality firm. It is assumed that investors know that only the best firms can recoup the upfront cost of the underpricing signal from subsequent issues.

Papers by McGuiness (1992) and Garfinkel (1993) provide empirical results inconsistent with signaling theory. McGuiness finds no relationship between firm quality

and level of IPO underpricing, and Garfinkel finds underpricing has no significant impact on the probability of a seasoned offering.

The purpose of this research is to provide additional empirical evidence on the underpricing signaling models by examining the reissuance behavior of reverse-LBOs in the context of underpricing. Specifically, we examine the relationship, if any, between reverse-LBO underpricing and the probability of reissuance.

Although Muscarella and Vetsuypens (1989) show underpricing of reverse-LBO offerings to be significantly less than underpricing of IPOs, reverse-LBO offerings should provide a unique opportunity to further test signaling theory predictions. First, IPO signaling theories predict an initial partial stock offering and a subsequent seasoned offering. Consistent with this pattern, Muscarella and Vetsuypens (1990) show some reverse-LBOs issue common stock again as a publicly traded company a relatively short time period after the initial partial offering. Second, Muscarella and Vetsuypens (1990) contend that LBOs use the reconversion to public ownership mainly as a vehicle to lower leverage, not as a vehicle to expand their asset base. In addition, it is reported in the popular press that a major impetus behind reverse-LBOs is to allow the financiers of the LBO to start cashing out and to delever the firm's debt-laden balance sheet.¹ Therefore, reverse-LBOs appear to have an incentive to undertake a total (rather than partial) initial stock offering due to management's desire to lower the debt ratio. To the contrary, Muscarella and Vetsuypens (1990) find that reverse-LBOs tend to have greater financial leverage after the initial offering than is the norm for industrial firms. Under the assumption that a primary motive behind a reverse-LBO is to reduce leverage it appears that these firms may have undertaken a partial stock offering consistent with the IPO signaling theory models.

UNDERPRICING MODELS, FIRM QUALITY, AND HYPOTHESIS

In addition to signaling models, other models have been offered to explain underpricing in the presence of information asymmetry. In Baron's (1982) model it is assumed that investment bankers have more information about investors' demand for securities than do the issuers. The issuer's inability to perfectly monitor the underwriter's level of distribution effort results in offer prices set below the level that would prevail in the absence of information asymmetries. Ritter (1984) proposes that underwriters intentionally underprice IPOs and earn profits by allocating issues only to favored customers who regularly buy a variety of investment services from them at higher-than-market fees. In Rock's (1986) model and its extensions by Beatty and Ritter (1986), underpricing is compensation for the risk of trading against superior information. Uninformed investors are assumed to subscribe to every IPO indiscriminately while informed investors invest in information production and subscribe to IPOs only when they expect the after market price to exceed the offer price. Consequently, uninformed investors subscribe to a disproportionate share of the IPOs that trade at a discount from the offer price in the after market. Firms intentionally underprice their offerings to maintain a positive expected return so that uninformed investors will remain in the IPO market. Tinic (1988) suggests that

¹ For examples see Angela DeRosa, "Reversing the LBOs of the '80s," *Global Finance* (April 1991), pp. 32-36 and Stuart Weiss, "Cashing Out of LBOs," *CFO: The Magazine for Chief Financial Officers* (November 1990), pp. 52, 54.

underpricing may provide the issuer and the underwriter with protection against legal liabilities. Large initial returns to investors through underpriced offerings may reduce both the probability of a lawsuit and the conditional probability of an adverse judgment.

The signaling models suggest high quality firms wish to signal their quality to investors by underpricing the IPO. The signal reveals the mean and variance of the firm's future cash flows and hence the firm's quality. Firm quality can be described as the likelihood of the generation of positive information. If the after market is efficient (and given the arrival of no new information), there should be no differential risk-adjusted expected return between a low and high quality firm. Given the arrival of new information, good news would be expected to generate positive abnormal returns and bad news would be expected to generate negative abnormal returns. It is plausible that a high quality firm is more likely to enjoy good news and less likely to suffer bad news than a low quality firm. Therefore, given a set of low and high quality firms with identical risk and arrival of new information, we would expect the high quality firms to outperform the low quality firms. If we assume that the market is efficient and there is arrival of new information subsequent to initial offerings, then we can expect a differential risk-adjusted return between low and high quality firms.

HYPOTHESIS

One test of the signaling models is to examine the relationship between the quality of those firms who make a secondary issue and those who fail to do so. The underpricing signaling models would be supported if those firms that make a second offering tend to be high quality firms and those that do not tend to be low quality firms. A positive relationship between underpricing and subsequent offerings would provide support for signaling theory. We formally test the following:

Hypothesis:

- H_0 : There is no relationship between firm quality and the probability of issuing stock in a second offering.
- H_A : There is a positive relationship between firm quality and the probability of issuing stock in a second offering.

The next section describes the sample of reverse-LBOs and the methodology used to estimate the relationship(s) between firm quality and subsequent performance.

DATA AND METHODOLOGY

DATA

The sample consists of 111 reverse-LBOs of common stock during the January 1, 1983–December 31, 1991 period. To be included in the initial sample, the following criteria must be satisfied:

- The issue must be a non-Regulation A offering due to an inability to secure such issues through data sources.²

² Regulation A offerings do not exceed \$1.5 million in aggregate in any one year and are permitted to use streamlined registration requirements.

- Any issue for which a closing price can not be found during the first week of trading is eliminated from the sample.
- The issue must be underwritten in a firm-commitment agreement by an investment banker. Following prior studies, this filter is included because Ritter (1987) finds significant differences in the initial performance of underwritten issues and those handled on a best efforts basis.
- The issuance must be traded subsequently on either the NASDAQ, AMEX, or NYSE stock exchanges which ensures that both after market bid prices and rates of return are available.
- Reissuance behavior information must be available from IDD Information Services, Inc.
- Unit offerings and closed-end mutual funds are excluded from the sample.

Issuing firms and related data are collected from *Going Public: IPO Reporter* and data provided by IDD Information Services, Inc. Daily after market price data are obtained from *Standard & Poor's Daily Stock Price Records* and the 1991 CRSP-NASDAQ tapes.

METHODOLOGY

To determine the extent of initial underpricing and to test the signaling hypothesis, the return for the j th stock as of time t is defined as follows:

$$(1) R_{jt} = (P_{jt} / P_{j,t-1}) - 1$$

where:

- P_{jt} = The closing bid price or closing price (dependent upon where the stock trades in the after market) at the end of trading day t ; and
- $P_{j,t-1}$ = The closing price or closing bid price for the j th reverse-LBO for trading day $t - 1$.

Initial returns are not adjusted for market movements because prior research indicates that such an adjustment results in only slight changes in initial returns.³ Day $t = 1$ is defined as the offering day. The return on day $t = 1$ is defined as the relative price change from the offer price to the closing price or closing bid price at the end of the first trading day. For subsequent trading days, security returns are computed from closing bid price to closing bid price or from closing price to closing price.

Garfinkel (1993) points out that a difficulty associated with testing for a relationship between underpricing and firm quality and the likelihood of a subsequent equity issuance is that underpricing may be correlated with other variables that affect the probability of a subsequent equity issuance. First, there is some evidence of a negative relationship between underpricing and underwriter prestige. James (1992) finds firms using prestigious

³ Beatty and Ritter (1986) find market adjustments to returns have little impact on reported return levels. Beatty and Ritter note average initial IPO returns unadjusted for the market of 14.1 percent, whereas the average daily market return is less than 0.1 percent. The probability of market movements, however, is positive.

underwriters tend to reissue more often. Therefore, underwriter prestige is controlled for in examining the relationship between underpricing and probability of reissuance.

Second, James and Weir (1990) argue that *ex-ante* uncertainty is decreasing with the existence of debt in a firm's pre-IPO capital structure. This implies that, *ceteris paribus*, firms with greater pre-IPO debt levels will be associated with less *ex-ante* uncertainty. In conjunction with the Rock and Beatty and Ritter asymmetric information models, this would imply that firms with greater debt levels will underprice less. Therefore, firms with greater pre-IPO debt levels would be less likely to underprice and subsequently reissue at a later date. In addition, Myers (1977) argues that the existence of debt in a firm's capital structure induces an underinvestment problem which implies a negative relationship between endogenous existence of debt in a firm's pre-IPO capital structure and the probability of reissuance. In the case of reverse-LBOs, there may be a positive relationship between pre-IPO debt level and probability of equity reissuance assuming that these firms desire to further reduce leverage.

Third, larger firms, usually associated with less uncertainty and dispersion of firm value, are more likely to employ prestigious underwriters which suggests an inverse relationship between firm size and level of underpricing. At the same time, larger firms are more likely to have longer operating histories and more likely to survive to be able to reissue securities in the future. Thus, there is a positive relationship between firm size and the likelihood of a seasoned equity issuance.

LOGIT ANALYSIS

To isolate the signaling content of underpricing, it is necessary to control for underwriter prestige, financial leverage, and *ex-ante* uncertainty. The relationship between firm quality and underpricing and the probability of reissuance is tested employing a logit model that controls for underwriter prestige, post-issuance debt level, and firm size. The logit model has the following form:

$$(2) Y_i = F(X_i'B) + U_i$$

where:

$$F(X_i'B) = L(X_i'B) = \frac{e^{X_i'B}}{1 + e^{X_i'B}}$$

The regression model is run three times where the dependent variable, SO, is a binary variable assigned a value of zero or one depending upon whether the firm has a subsequent stock offering within three arbitrarily chosen time periods; 12 months, 24 months, or within seven years of the initial public offering. Four independent variables are employed in the model. The first, R_{j1} , is the initial return on the first day of trading which is a proxy for underpricing. The signaling hypothesis would be supported by a positive coefficient of R_{j1} which would indicate that greater underpricing at the IPO is associated with a greater probability of a subsequent offering.

Second, a proxy is needed for firm quality in order to test the relationship between firm quality and the probability of issuing stock in a seasoned offering. Firm quality is measured using a matching firm wealth relative based on 252 trading day holding period returns. Holding period returns are defined as:

$$(3) R_j = \prod_{t=2}^{252} (1 + r_{jt})$$

where:

r_{jt} = The unadjusted raw return on firm j on day t .

This measures the total return from a buy and hold strategy where a stock is purchased at the first closing market price or bid price after going public and held to the close of the 252nd trading day. The matching firm wealth relative is determined by dividing the buy and hold return defined above by the same holding period return covering the same time period of a matching firm. A wealth relative greater than 1.00 can be interpreted as superior performance relative to the benchmark. It is assumed that, on average, high quality firms will tend to have superior long-term performance relative to a matching firm. A positive coefficient of the wealth relative would provide support for the signaling hypothesis.

The long-term performance measure is determined without explicitly adjusting for beta. The extant literature documents that IPOs tend to have a mean beta greater than 1.00 and that it tends to decline with the length of time since the IPO. The wealth relative computed using matching firms assumes the beta of the matching firm is similar to that of the reverse-LBO. To the extent that the beta of a reverse-LBO is greater than that of the matching firm, the matching firm wealth relative will overstate reverse-LBO performance or firm quality. Any overstatement of firm quality will tend to bias the results against finding support for the signaling hypothesis.

The procedure for selecting matching firms is similar to that employed by Ritter (1991). Among firms listed on Compustat CD-ROM, market capitalization values are obtained for the years ending 1985 and 1988. Each reverse-LBO is matched within each two or three digit SIC code with a firm that is relatively equal in market value. The market values employed for matching purposes are the 1985 year-end market values of possible matching firms for reverse-LBOs that occurred in the period January 1, 1983 through December 31, 1988, and the 1988 year-end market values of possible matching firms for reverse-LBOs that occurred in the period January 1, 1989 through December 31, 1991. If a match is cannot be made within a three digit SIC code, one is made within a two digit code. To be a considered a candidate for a matching firm, a prospective firm must have daily return data available on either the 1991 NASDAQ or NYSE CRSP tape.

The third independent variable employed is the gross proceeds of the initial stock offering that is used to proxy for firm size. Larger initial offerings, as measured by gross proceeds, should be associated with firms of larger size. The fourth independent variable used is a dummy variable that proxies for underwriter prestige. Consistent with Garfinkel

(1993), the dummy is assigned a value of one if the underwriter is a national firm, and zero otherwise. A firm is considered national if it is assigned a value of one to four in Carter and Manaster (1990).

EMPIRICAL RESULTS

The characteristics of the sample of 111 reverse-LBOs are described in Table 1. Panel A contains descriptive statistics for those firms that reissued within one year of the initial offering. Twelve, or nearly 11 percent, of the sample of 111 reverse-LBOs reissued within one year of the initial offering.

Table 1—Characteristics of 111 Reverse-LBOs by Reissuance Activity

Panel A: Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within One Year of Reverse-LBO

	Reissuers N = 12	Nonreissuers N = 99
Mean Underpricing	0.059*	0.014*
252 Day Holding Period Return	1.403***	0.827***
252 Day Cumulative Abnormal Return	0.275***	-0.231***
Wealth Relative	1.199***	0.792***
Matching Firm Wealth Relative	1.997	0.956

Panel B: Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within Two Years of Reverse-LBO

	Reissuers N = 18	Nonreissuers N = 93
Mean Underpricing	0.036	0.015
252 Day Holding Period Return	1.417***	0.787***
252 Day Cumulative Abnormal Return	0.297***	-0.268***
Wealth Relative	1.261***	0.754***
Matching Firm Wealth Relative	1.913*	0.905*

Panel C: Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within Seven Years of Reverse-LBO

	Reissuers N = 25	Nonreissuers N = 86
Mean Underpricing	0.027	0.016
252 Day Holding Period Return	1.258***	0.782***
252 Day Cumulative Abnormal Return	0.133***	-0.266***
Wealth Relative	1.118***	0.754***
Matching Firm Wealth Relative	1.628*	0.906*

* Indicates difference between reissuer and nonreissuer is significant at the 10 percent level

** Indicates difference between reissuer and nonreissuer is significant at the 5 percent level

*** Indicates difference between reissuer and nonreissuer is significant at the 1 percent level

All three panels of Table 1 indicate that stock performance in the 252 trading days subsequent of the initial offering is significantly different for reissuers relative to nonreissuers. Firms that reissue have significantly superior performance relative to nonreissuers regardless of the reissuance behavior classification scheme employed or performance measure used. Panel A shows that the 12 reissuers have over a 40 percent 252 trading day holding period return and over a 17 percent loss for the 99 nonreissuers, which is significantly different at the 1 percent level. The same performance pattern holds true as measured by cumulative market-adjusted returns, performance relative to the value-weighted CRSP index, or holding period return of a matched firm. These results provide support for the signaling theory prediction that high quality firms signal their type by underpricing.

These results should be interpreted with caution because they also support the alternative explanation that reverse-LBOs may have been underpriced to clear the market and then, after the price ran up, decided to have another offering.⁴ This alternative explanation, however, does not predict a positive relationship between IPO underpricing and probability of reissuance as do the signaling theories. A positive relationship between underpricing and probability of reissuance would allow us to interpret the combined results as providing support for the signaling theories rather than the alternative price run-up explanation, given the superior performance of the reissuers in our sample.

Panel A of Table 1 shows that average underpricing of reissuers is 5.9 percent and 1.4 percent for nonreissuers. The difference in underpricing is significant at the 10 percent level. We interpret this evidence as support for underpricing signaling theory, given the superior performance of reissuers. Our results differ from the findings provided by Garfinkel (1993). In his study of 494 IPOs from 1980 to 1983, the data indicate no significant difference in underpricing between firms that do or do not reissue within seven years of the original issuance. The difference in results may be partially explained by two factors. First, Garfinkel's classification of reissuance behavior is based on whether a firm reissues within a seven year time span. Our data presented in Panel A are categorized by reissuance behavior within one year of the initial offering. IPO underpricing theories do not specify a time frame within which an IPO is expected to undertake a seasoned offering. We argue that it is implausible that a high quality firm would wait up to seven years to undertake a seasoned offering to recoup the cost of underpricing. It should not be surprising that initial underpricing has little explanatory power of reissuance behavior up to seven years after the initial offering. Second, there may be unknown differences in the reissuance behavior of IPOs versus reverse-LBOs and over different time periods. Garfinkel's sample contains IPOs, whereas our sample contains solely reverse-LBOs. Also, his sample of IPOs is from 1980-1983 whereas our sample is from 1983-1991.

Panel B provides statistics of reverse-LBOs according to reissuance behavior within two years of the initial offering, and Panel C provides the same statistics according to reissuance behavior within seven years of the initial offering. The results reveal that when reissuance behavior is classified over longer periods of time subsequent to the initial offering, there is no significant difference in initial offering underpricing between reissuers and nonreissuers. This result is consistent with the findings of Garfinkel (1993).

Table 2 presents statistics of 69 reverse-LBOs categorized by the same reissue behavior classifications shown in Table 1 for which debt ratios were available at the end of the year of initial issuance. This allows us to examine debt levels of firms by reissuance behavior. Qualitatively, the results are similar to those described from Table 1. Surprisingly, although the debt levels of both classes of firms are high (62.88 percent and 60.19 percent) according to industry standards, there is no significant difference in debt level between reissuers and nonreissuers. This evidence contradicts our premise that reverse-LBOs with greater leverage will be more likely to reissue in order to further delever. It was expected that firms with greater post-IPO debt levels would be the ones with the greater incentive to delever through a subsequent seasoned equity offering regardless of any

⁴ We would like to thank an anonymous referee for pointing this out.

signal employed at the initial offering. This result implies that debt level may not be so important to control for in testing the signaling hypothesis.

Table 2—Characteristics of 69 Reverse-LBOs by Reissuance Activity
Debt Ratios (Debt ratios of 42 of 111 firms are not available)

Panel A: Debt Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within One Year of Reverse-LBO

	Reissuers N = 7	Nonreissuers N = 62
Debt Ratio Percentage	62.88	60.19
Mean Underpricing	0.038	0.032
252 Day Holding Period Return	1.424***	0.847***
252 Day Cumulative Abnormal Return	0.286***	-0.239***
Wealth Relative	1.204***	0.812***
Matching Firm Wealth Relative	2.565	1.019

Panel B: Debt Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within Two Years of Reverse-LBO

	Reissuers N = 12	Nonreissuers N = 57
Debt Ratio Percentage	61.44	60.28
Mean Underpricing	0.016	0.036
252 Day Holding Period Return	1.470***	0.786***
252 Day Cumulative Abnormal Return	0.344***	-0.297***
Wealth Relative	1.321***	0.753***
Matching Firm Wealth Relative	.289	0.942

Panel C: Debt Characteristics of Firms That Reissue Equity Versus Firms That Do Not Reissue Within Seven Years of Reverse-LBO

	Reissuers N = 17	Nonreissuers N = 52
Debt Ratio Percentage	63.51	59.40
Mean Underpricing	0.012*	0.039*
252 Day Holding Period Return	1.332***	0.766***
252 Day Cumulative Abnormal Return	0.197***	-0.311***
Wealth Relative	1.184***	0.744***
Matching Firm Wealth Relative	1.918	0.934

- * Indicates difference between reissuer and nonreissuer is significant at the 10 percent level
 ** Indicates difference between reissuer and nonreissuer is significant at the 5 percent level
 *** Indicates difference between reissuer and nonreissuer is significant at the 1 percent level

Tables 3 and 4 present the results of the logistic model (equation (3)) for the 111 reverse-LBOs using each of the three reissuance behavior classes and 69 reverse-LBOs using each of the three reissuance behavior classes, respectively. Table 3 reveals that when one year is used as the cutoff period for determination of reissuance behavior (model one), firms associated with greater underpricing and superior performance are more likely to reissue. The coefficient of the initial return on the first day of trading, R_{j1} , is positive and significant at the 5 percent level ($p = .0329$). The coefficient of the matching-firm wealth relative, our proxy for firm quality, is also positive and significant ($p = .0734$). These results are consistent with Panel A of Table 1 and provide support for IPO underpricing theory.

Table 3—Logistic Model Regression Results Relating Probability of Reissuance to Initial Return, 252 Day Return Performance, and Underwriter Prestige

	Model One (reissue within one year) N = 111			Model Two (reissue within two years) N = 111			Model Three (reissue Within seven years) N = 111		
	Coeff.	χ^2	p-value	Coeff.	χ^2	p-value	Coeff.	χ^2	p-value
Intercept	-3.043	11.49	.0007	-3.424	17.25	.0001	-2.562	15.16	.0001
R ₁	9.137	4.55	.0329	5.093	1.89	.1696	2.798	0.89	.3445
Matching Firm									
Wealth Relative	1.033	3.21	.0734	1.559	9.46	.0021	1.198	7.49	.0062
GP	0.003	0.07	.7903	0.005	0.38	.5371	0.009	2.31	.1283
REP _j	-1.051	1.65	.1993	-0.489	0.44	.5076	-0.599	0.91	.3395
	Model $\chi^2 = 15.13$ p-value .0044			Model $\chi^2 = 14.22$ p-value .0066			Model $\chi^2 = 10.55$ p-value .0322		

Once again, the results are less supportive of signaling theory when two and seven year reissuance behavior is examined. Models two and three show that although the coefficient of initial underpricing remains positive as predicted by signaling theory, the data indicate that such a relationship is not reliably present. The coefficient of our proxy for firm quality, the matching-firm wealth relative, remains positive and highly significant, however, as predicted by signaling theory.

Overall, our findings indicate that the classification method used for determination of reissuance behavior may affect the results. When the time period cutoff is extended beyond one year, underpricing appears to have no significant power to explain the reissuance behavior of firms. This result is consistent with the finding of Garfinkel (1993) where he uses only a seven year cutoff classification. One explanation discussed earlier is that underpricing cannot be expected to explain reissuance behavior beyond one year of the initial issuance. A second possible explanation for our finding may be that our results are biased against finding support for signaling theory because many firms do not have enough post-IPO time in which to become classified as reissuers. This may result in some firms being misclassified as nonreissuers when in fact they may decide to reissue within the allotted class time once enough time passes. In addition, our model does not take into account those firms that may have decided to reissue but withdrew the second offer because of market conditions.

Examination of Table 4 shows that the significance of the coefficient of underpricing is no longer significant in any of the three models. The coefficient of the matching-firm wealth relative remains significantly positive, however with the exception of model one. Consistent with the statistics presented in Table 2, firm post-issuance debt level appears to have no explanatory power in predicting reissuance behavior within one, two, or seven years of the reverse-LBO.

CONCLUSIONS

This paper tests the underpricing signaling model theories, which posit there should be a positive relationship between level of underpricing and firm quality and the likelihood of a subsequent equity issuance, by employing a logit model on a sample of reverse-

LBOs that controls for underwriter prestige and debt level. First, the data indicate that reissuers tend to have superior performance relative to nonreissuers. This finding alone cannot be interpreted as support for signaling theory, however, because one cannot rule out the alternative explanation that firms that have run-ups in stock prices are more likely to have a stock offering regardless of any signaling.

Table 4—Logistic Model Regression Results Relating Probability of Reissuance to Initial Return, 252 Day Return Performance, Underwriter Prestige, and Debt Level

	Model One (reissue within one year) N = 69			Model Two (reissue within two years) N = 69			Model Three (reissue Within seven years) N = 69		
	Coeff.	χ^2	p-value	Coeff.	χ^2	p-value	Coeff.	χ^2	p-value
Intercept	-4.043	4.12	.0423	-3.109	4.08	.0435	-2.528	3.60	.0578
Underpricing	5.963	0.77	.3796	-3.162	0.23	.6351	-6.385	1.06	.3030
Matching Firm Wealth Relative	0.631	1.87	.1710	1.439	6.23	.0125	1.119	4.75	.0293
Underwriter Prestige	-1.597	2.40	.1213	-0.633	0.41	.5228	-0.755	0.78	.3782
Debt Ratio %	0.031	1.27	.2602	0.006	0.08	.7818	.014	0.59	.4420
	Model χ^2 11.82 p-value .0188 R .069			Model χ^2 11.74 p-value .0240 R .250			Model χ^2 9.65 p-value .0467 R .217		

Second, we provide evidence that firms that reissue within one year of the initial offering tend to have greater levels of underpricing relative to nonreissuers. The results indicate that there is a positive relationship between underpricing and the probability of reissuance within one year of the initial offering. The alternative price run-up explanation does not predict a positive relationship between underpricing and probability of reissuance. Therefore, we interpret the combined evidence of superior performance and greater underpricing associated with reissuers as support of underpricing theory. Underpricing appears to have no significant explanatory power in predicting reissuance behavior beyond one year of the initial offering.

REFERENCES

1. Allen, Franklin, and Gerald R. Faulhaber, "Signaling By Underpricing in the IPO Market," *Journal of Financial Economics*, 23 (1989), pp. 303-323.
2. Baron, D.P., "A Model of the Demand for Investment Bank Advising and Distribution Services for New Issues," *Journal of Finance*, 37 (September 1982), pp. 955-976.
3. Beatty, R.P., and J.R. Ritter, "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings," *Journal of Financial Economics*, 15 (1986), pp. 213-232.
4. Carter, Richard, and Steven Manaster, "Initial Public Offerings and Underwriter Reputation," *Journal of Finance*, 45 (September 1990), pp. 1045-1067.
5. DeRosa, Angela, "Reversing the LBOs of the '80s," *Global Finance*, 5 (April 1991), pp. 32-36.
6. Garfinkel, Jon A., "IPO Underpricing, Insider Selling and Subsequent Equity Offerings: Is Underpricing a Signal of Quality?" *Financial Management*, 22 (Spring 1993), pp. 74-83.

7. *Going Public: The IPO Reporter 1983-1992* (Philadelphia, Howard & Co.)
8. Grinblatt, Mark, and Chuan Yang Hwang, "Signaling and the Pricing of New Issues," *Journal of Finance*, 44 (June 1989), pp. 393-420.
9. Ibbotson, R.G., "Price Performance of Common Stock New Issues," *Journal of Financial Economics*, 2 (September 1975), pp. 235-272.
10. James, C., "Relationship-Specific Assets and the Pricing of Underwriter Services," *Journal of Finance* (December 1992), pp. 1865-1885.
11. James, C., and P. Weir, "Borrowing Relationships, Intermediation and the Cost of Issuing Public Securities," *Journal of Financial Economics* (November-December 1990), pp. 149-171.
12. McGuinness, Paul, "An Examination of the Underpricing of Initial Public Offerings in Hong Kong: 1980-90," *Journal of Business Finance & Accounting*, 19 (January 1992), pp. 165-186.
13. Muscarella, Chris J., and Michael R. Vetsuypens, "The Underpricing of "Second" Initial Public Offerings," *The Journal of Financial Research*, 12 (Fall 1989), pp. 183-192.
14. Muscarella, Chris J., and Michael R. Vetsuypens, "Efficiency and Organizational Structure: A Study of Reverse LBOs," *Journal of Finance*, 45 (December 1990), pp. 1389-1413.
15. Ritter, Jay R., "The 'Hot Issue' Market of 1980," *Journal of Business*, 57(1984), pp. 215-241.
16. Ritter, Jay R., "The Costs of Going Public," *Journal of Financial Economics*, 19 (1987), pp. 269-281.
17. Ritter, Jay R., "The Long-Run Performance of Initial Public Offerings," *Journal of Finance*, XLVI (March 1991), pp. 3-27.
18. Rock, K., "Why New Issues Are Underpriced," *Journal of Financial Economics*, 15 (January/February 1986), pp. 187-212.
19. Tinic, Seha M., "Anatomy of Initial Public Offerings of Common Stock," *Journal of Finance*, 43 (September 1988), pp. 789-822.
20. Weiss, Stuart, "Cashing Out of LBOs," *CFO: The Magazine for Chief Financial Officers*, 6 (November 1990), pp. 52, 54.
21. Welch, Ivo, "Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings," *Journal of Finance*, 44 (June 1989), pp. 421-449.