

Reputation and Financial Intermediation: An Empirical Investigation of the Impact of IPO Mispricing on Underwriter Market Value*

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This paper investigates the empirical significance of underwriter reputation capital by analyzing the impact of initial returns of IPOs on lead-underwriter market value. Consistent with reputation costs, overpriced offerings are associated with a decrease in lead-underwriter market value significantly in excess of estimated direct costs. For moderately underpriced offerings, however, underwriter wealth effects are positive. Consistent with higher reputation costs, these wealth effects are insignificant when the IPO underpricing is more extreme. In jointly managed offerings, it is lead-underwriters that are primarily affected by IPO initial performance. *Journal of Economic Literature* Classification Numbers: G24, G32. © 1997 Academic Press

1. INTRODUCTION

In firm commitment initial public offerings (IPOs), underwriters certify the offering price on the basis of a due diligence investigation of the

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issuer.¹ They also market the offering by conducting “road shows,” organizing a selling syndicate, and obtaining indications of interest from potential investors. It has been suggested that, for the price certification provided by underwriters to be effective, they must be perceived to have valuable reputation capital at stake.² The argument is that it is the risk to which the underwriter’s reputation is exposed that determines the credibility of the certification.

How empirically significant is the role of the underwriter reputation capital in IPO pricing? The aim of the paper is to answer this question. Our approach is based on analyzing the impact of IPO initial returns on the market value of lead underwriters. The basic notion is that if mispriced offerings cause significant damage to underwriter reputation, it should be possible to detect such reductions in reputation capital in the form of losses in underwriter market value.

Beatty and Ritter (1986) is one of the few studies to empirically examine the repercussions of IPO initial returns for underwriters. Their results indicate that underwriters that systematically misprice offerings tend to lose market share.³ A source of concern (see Tinic (1988), James (1992)), however, is that the market share results in Beatty and Ritter (1986) may be partly attributable to shifts in the nature of the underwriting industry over their 1977–1982 sample period, rather than losses in reputation capital. Evidence that mispricing carries a penalty for underwriters is also provided in James (1992) which documents that an underwriter’s pricing performance in the IPO has a significant effect on whether it is employed by the firm in subsequent offerings.

Our approach, by relying on the impact of IPO initial returns on lead-underwriter market value, offers certain advantages over analyses based on changes in underwriter market share. One benefit is that the wealth consequences of each IPO can be separately observed. This allows us to distinguish the wealth consequences of overpriced offerings from those of underpriced offerings and to analyze factors that may account for cross-

¹ See Ibbotson and Ritter (1995) for an overview of the initial public offering process and the role of underwriters. Booth and Smith (1986) discuss the certification and information gathering role of underwriters. It has been suggested in the literature that other ways in which the information asymmetry problems between issuers and potential subscribers may be reduced include: signaling through IPO underpricing (Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989)) and the involvement of venture capitalists (Megginson and Weiss (1991)) and auditors (DeAngelo (1981)).

² See Booth and Smith (1986), Megginson and Weiss (1991), Beatty and Ritter (1986), Carter and Manaster (1990), James (1992), Chemmanur and Fulghieri (1994) and DeAngelo (1981).

³ Some very recent research investigates the relation between long run IPO performance and changes in underwriter market share. The evidence suggests that underwriter market share is affected adversely by the poor long-run performance of IPOs managed. See Beatty and Vetsuypens (1995), Nanda *et al.* (1995), and Carter *et al.* (1995).

sectional variation in underwriter wealth effects. Further, by controlling for underwriters not involved in an offering, we can distinguish firm-specific reputation costs from effects that may be common across the underwriting industry. A drawback of our approach, however, is that for large diversified investment banking firms (e.g., Merrill Lynch) with a large market capitalization, the impact of any IPO mispricing may be hard to detect. For a boutique underwriter like Alex Brown, however, IPO mispricing effects could be very important. In the empirical analysis we scale the dollar amount of IPO mispricing by underwriter equity value to control for the relative importance of the offering to the underwriter's overall activities and to facilitate comparison with underwriter stock returns.

We argue that lead-underwriter wealth is expected to be affected by reputation as well as the direct (nonreputation) costs of IPO mispricing. The findings in Beatty and Ritter (1986) and James (1992) suggest that, when there is substantial mispricing, reputation costs should cause a decrease in the stock market value of the lead underwriter. In addition to such reputation effects, mispriced offerings are expected to impose additional direct costs on managing underwriters due to price stabilization and potential legal liability.⁴

The net impact of these reputation and direct costs leads to the following testable predictions: (1) Substantially overpriced IPOs will result in a significant loss in the stock market value of the lead underwriter. In the presence of significant reputation costs, this wealth loss is expected to be greater than the estimated direct losses—such as the cost of price stabilization. (2) In the case of underpriced IPOs, however, the wealth effects will be nonmonotonic. For moderately underpriced IPOs, lead-underwriter wealth effects are expected to be positive since it implies a successful placement of the offering and is consistent with the notion of an optimal level of IPO underpricing in equilibrium.⁵ Underwriters may also derive *quid pro quo* benefits by appropriately allocating underpriced shares among regular investors and benefit from the exercise of overallotment options that are typically included in underwriting contracts. For more severely underpriced IPOs, however, increasing reputation costs may result in the

⁴ In a related context, Muscarella and Vetsuypens (1989) analyze changes in market values of U.S. underwriters of the October 30, 1987 British Petroleum seasoned equity offering. In this offering, the biggest underwriting disaster of all time, underwriters stood to lose hundreds of millions of dollars due to their agreement to set the offer price prior to the market crash. The study shows that changes in market values of the U.S. underwriters on October 30, 1987 can be largely accounted for by the Bank of England's offer, on the same day, to repurchase shares at a floor price.

⁵ Ibbotson and Ritter (1995) provides a survey of the extensive literature on the underpricing of initial public offerings, including the equilibrium models that have been proposed to account for the existence of such underpricing.

underwriter wealth effect being negative or at least less positive than that for moderately underpriced IPOs.

Our empirical findings are consistent with these predictions. For sample IPOs with strongly negative *initial-day* excess returns (worse than -5%), lead-underwriter stocks on average experience a significantly negative excess return of -0.92% . The evidence is similar for sample IPOs with *initial-week* excess returns of less than -5% . The loss in lead-underwriter market value is significantly greater than can be attributed to direct costs of overpricing, such as the costs of after-market price stabilization.

In striking contrast, we find that for IPOs with moderately positive initial-week excess returns (between 10 and 20%), lead-underwriter stocks on average experience a significantly *positive* excess return of 1.07%. For higher levels of IPO underpricing (greater than 20%), however, underwriter wealth effects are found to be insignificant. It is shown that these wealth effects tend to be firm specific and cannot be accounted for by changes common to the IPO underwriting industry.

The evidence also indicates that, in jointly managed offerings when co-managing underwriters are present, it is lead underwriters that are primarily affected by the initial performance of IPOs. This suggests that the market may hold the lead underwriter largely responsible for setting the offering price of the IPO. In analyzing lead-underwriter stock returns in the week prior to the offering date, we find these returns to be significantly related to initial returns of the IPOs, after controlling for characteristics of the IPO and the lead underwriter. A reason for the predictability in IPO initial returns may be that, as documented in Hanley (1993), lead underwriters do not fully adjust IPO prices in response to new information in the days preceding an offering.

The rest of the paper is organized as follows. The empirical hypotheses are developed in Section 2. Section 3 provides data sources and a brief description of the sample. The empirical analysis is in Sections 4 and 5. Section 6 concludes.

2. HYPOTHESES AND EMPIRICAL PREDICTIONS

In this section we discuss the impact mispriced offerings would be expected to have on the market value of underwriters. Damage to underwriter reputation capital, along with other direct (nonreputation) wealth consequences of mispricing, are considered in developing our empirical predictions.

Reputation Capital and IPO Mispricing

In our discussion of underwriter reputation capital and its importance to the pricing equilibrium in the IPO market, we follow Beatty and Ritter

(1986) and James (1992).⁶ In brief, the argument advanced in these papers is as follows. Investment banks, in the process of underwriting many offerings over time, can develop a reputation for having the ability to price issues and assess market conditions. Acquiring a good reputation is valuable, since it allows underwriters to earn a stream of quasi-rents, say in the form of higher underwriting fees. Underwriter reputation capital can play a critical role in alleviating information problems in the IPO market—if both investors and issuers rationally believe that underwriters would not risk damage to their reputation by underpricing offerings too much or too little. In other words, the price certification provided by underwriters will be credible when the present value of future quasi-rents on their reputation exceeds the potential short-run gain from opportunistic behavior. It follows from this argument that deviations from optimal IPO pricing should carry a penalty for underwriters: damage to their reputation and a loss of clients—otherwise, underwriters would have no incentive not to “cheat” in the pricing of offerings.

From these arguments we derive our predictions regarding the impact of IPO mispricing, both under- and overpricing, on underwriter market value from changes to its reputation capital. To avoid any confusion, it should be noted that in our discussion the term “mispricing” is used in the sense of deviation of the after-market price from the IPO offer price and refers to both under- and overpricing.

The predictions are: (i) When the IPO is moderately underpriced, consistent with the notion of an optimal level of IPO underpricing in equilibrium,⁷ we expect a small gain in underwriter stock market value—reflecting modest enhancement in reputation capital from the appropriate pricing and successful placement of the offering. (ii) When the offering is severely mispriced—in the sense that it is either substantially overpriced or extremely underpriced—we expect a significant loss in underwriter market value, consistent with significant damage to its reputation capital.

The anticipated relation between IPO initial returns, both positive and negative, and underwriter reputation wealth effects is depicted in Fig. 1.

Direct Wealth Effects of IPO Mispricing

Unlike the effect on underwriter reputation capital, the direct wealth effects of IPO mispricing are expected to be asymmetric, depending on whether the offering is under- or overpriced.

Substantially overpriced offerings are expected to be associated with a decrease in underwriter stock market value on account of the following

⁶ For related papers on reputation capital, see footnote 2.

⁷ See footnote 5.

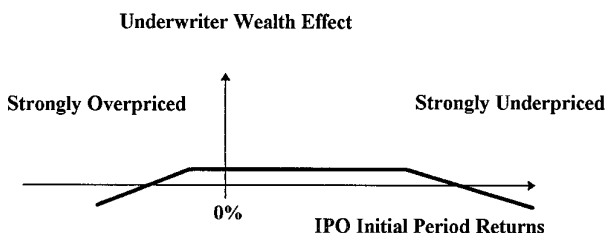


FIG. 1. IPO initial period returns and reputation wealth effects of mispriced IPOs.

factors: (a) the costs associated with price stabilization⁸ as underwriters expend resources in an effort to sustain the IPO after market price and (b) anticipated costs of potential legal action by investors when the IPO is overpriced. Though expected to be increasing in the magnitude of overpricing, the wealth losses will be determined by the extent to which underwriters engage in price stabilization and legal liability costs.

Strongly underpriced IPOs are, however, expected to have direct effects that increase underwriter wealth. Not only are the potential costs of overpricing avoided but, by appropriately allocating a strongly underpriced offering among its regular clients, the underwriter may be able to extract quid pro quo benefits from clients, say in the form of additional business. Underwriters may also gain by the exercise of overallotment options that are typically included in underwriting contracts.⁹ The expected relation between IPO initial return and underwriter direct wealth effects is depicted in Fig. 2.

The Combined Impact of Reputation and Direct Wealth Effects

Based on the above discussion of reputation and direct wealth effects of IPO mispricing, we state below our empirical predictions regarding the impact of mispriced offerings on underwriter wealth. The net impact of the predicted reputation and direct wealth effects is depicted in Fig. 3. Evidence in support for these predictions is analyzed in the empirical sections of the paper.

(1) *Underwriter wealth effects for overpriced IPOs.* (a) For strongly overpriced IPOs, the damage to reputation capital in conjunction with

⁸ For evidence of such price stabilization and its effect on IPO prices in the after market, see Miller and Reilly (1987), Ruud (1993), Hanley *et al.* (1996), Hanley *et al.* (1993) and Schultz and Zaman (1994).

⁹ Such options allow for an increase in the number of shares to be issued (usually up to 15%) and, hence, an increase in the commissions earned by the underwriter.

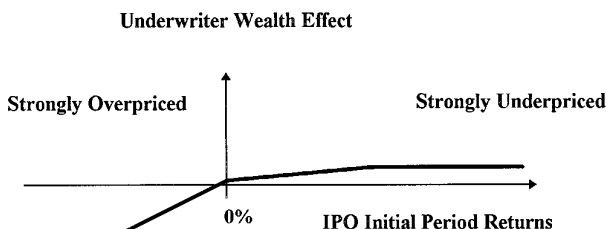


FIG. 2. Direct wealth effects of IPO mispricing.

direct wealth effects is predicted to result in a significant decrease in underwriter stock market value.

(b) Reputation costs should result in the loss in underwriter market value being significantly greater than can be accounted for in terms of direct wealth losses.

(2) *Underwriter wealth effects for underpriced IPOs.* The wealth effects for underpriced offerings are predicted to be nonmonotonic:

(a) Over some region of underpricing, an increase in underpricing is expected to be associated with an increase in underwriter stock market value.

(b) Beyond some level of underpricing, however, increasing reputation costs will cause underwriter wealth effect to be less positive or even negative.

3. DATA SOURCES AND SAMPLE DESCRIPTION

3.1. Data Sources

To derive the sample used for our empirical analysis, we began with the complete set of 1331 firm commitment initial public offerings reported in the “Corporate Market Data” section of the *Investment Dealer’s Digest*

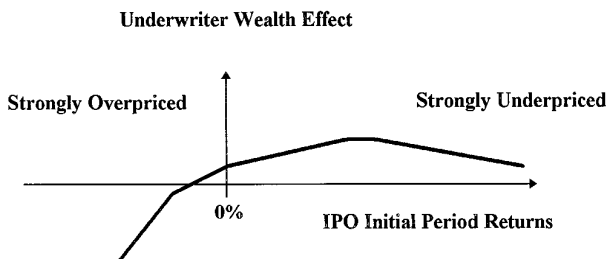


FIG. 3. Combined impact of reputation and direct effects of IPO mispricing.

over the period January 1987–December 1991. These offerings represent all the IPOs reported in the *Investment Dealer's Digest* over the sample period, after the exclusion of best efforts offerings, real estate investment trusts (REITs), unit offerings, and IPOs with offering prices below one dollar.¹⁰ Of these 1331 firm commitment IPOs, we selected the 554 issues that were managed by lead underwriters listed on the New York Stock Exchange, American Stock Exchange, or the Nasdaq at the time of the offering and for which lead-underwriter daily stock price data was available from *CRSP*. The sample was further reduced by the exclusion of 131 IPOs of closed-end funds¹¹ and one offering for which the offering price could not be identified. This resulted in a final sample of 412 IPOs. Of these, 279 IPOs were “nonoverlapping,” in the sense that there was a minimum separation of a week between the offering dates of IPOs by the same lead underwriter. For much of the empirical analysis below, we will utilize this nonoverlapping sample.

Firm commitment offerings are managed by a lead underwriter in conjunction with comanagers, if any.¹² For each offering, the identities of the lead underwriters and comanagers, if any, were obtained from *Investment Dealer's Digest* and cross checked, where possible, with *Moody's Manual*. IPO prices, the number of shares being offered and the offering dates were gathered from *Investment Dealer's Digest*, *Moody's Manual*, and LEXIS/NEXIS by Mead Corp. Stock price return data, market value of equity, and data on number of shares outstanding were derived from *CRSP*.

3.2. Sample Description

Table I provides summary statistics of the sample IPOs on a yearly basis for 1987–1991 and by whether the IPO was listed on NYSE/AMEX or the Nasdaq. As indicated in the table, the average IPO initial-week excess return is 7.49%, with over 64% of the IPOs experiencing positive excess

¹⁰ A total of 1675 IPOs are reported in *Investment Dealer's Digest* over the period January 1987–December 1991.

¹¹ Closed-end fund assets consist of securities that are already publicly traded. Hence, the extent of underpricing and the risks involved in underwriting closed-end fund IPOs are very different from those of other IPOs.

¹² Comanagers are sometimes also referred to as coleads. As discussed on p. 1054 in Carter and Manaster (1990), in the public announcement of an offering (a tombstone) the investment banks in the underwriting syndicate are listed, with the managers listed first. The lead underwriter's name is on the top and left; comanagers, if any, are listed to the right of the lead underwriter's name.

TABLE I

MEAN DESCRIPTIVE STATISTICS ON IPOs MANAGED BY LEAD UNDERWRITERS LISTED ON THE NYSE/AMEX OR NASDAQ FOR THE PERIOD 1987–1991 (MEDIAN VALUES ARE IN PARENTHESES)

	Number of offerings	Offering amount in millions (\$)	Offering as a fraction of shares to be outstanding (%)	IPO initial-week excess returns (%)	Std. dev. of IPO initial-week excess returns (%)	Fraction of IPOs with positive initial-week excess returns (%)
<i>Panel A: By year of offering</i>						
1987	138	32.78 (17.75)	45.11 (29.01)	5.96 (0.59)	18.35	56.5
1988	64	28.45 (16.16)	32.81 (26.49)	5.54 (2.36)	8.82	71.9
1989	51	38.25 (23.03)	38.44 (30.45)	6.51 (2.27)	15.21	58.8
1990	59	32.79 (26.00)	33.54 (30.00)	8.27 (4.75)	15.12	76.3
1991	100	63.32 (31.00)	37.67 (28.89)	10.88 (4.31)	18.13	66.0
1987–1991	412	40.20 (23.00)	38.89 (29.08)	7.49 (2.30)	16.38	64.3
<i>Panel B: By the exchange listing of IPOs</i>						
NYSE or AMEX	99	90.70 (61.50)	40.73 (30.79)	2.87 (0.47)	10.35	53.5
Nasdaq	313	24.18 (19.44)	38.28 (28.98)	8.95 (2.82)	17.63	67.7

Note. The initial-week excess return for IPO j is measured as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{j5}) - 1$, where e_{jt} is the daily excess return on day t . The IPO daily excess return is measured by subtracting the equally weighted market index return from the IPO daily raw return (see footnote 11). The market index returns are derived from either the CRSP NYSE/AMEX or Nasdaq tape, depending on the exchange listing of the IPO. The offering amount does not include shares sold under the overallotment option.

returns.¹³ Initial-week excess returns are larger on average for offerings on the Nasdaq (mean 8.95%), than for offerings on the NYSE/AMEX (mean 2.87%). The average size of offerings in dollars is larger for firms listed on the NYSE/AMEX than those listed on the Nasdaq, though the average fraction of issuer shares being sold is similar (an average of about 40% of the shares to be outstanding post-IPO).

Table II provides the names of the 27 investment banking firms (or their holding companies) that served as lead underwriters for one or more of

¹³ The initial-week excess return was derived as follows: for any IPO j the initial-week excess return was defined as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{j5}) - 1$, where e_{jt} was the daily excess return on day t . The IPO daily excess return was measured by subtracting the equally weighted stock market index return (CRSP NYSE/AMEX or Nasdaq depending on IPO exchange listing) from the IPO daily raw return.

TABLE II
FREQUENCY AND SIZE OF FIRM COMMITMENT IPOs MANAGED BY LEAD UNDERWRITERS
LISTED ON THE NYSE, AMEX, OR NASDAQ FOR THE PERIOD 1987-1991

Name of lead underwriter	Number of IPOs	Mean IPO size in millions (\$)	Median IPO size in millions (\$)	Aggregate proceeds/mean equity value ^a
1. Corporate Management Group, Inc.	1	3.00	3.00	4.034
2. Sherwood Group, Inc.	1	5.25	5.25	0.070
3. Legg Mason Inc.	1	9.10	9.10	0.060
4. Kemper Corp.	1	32.50	32.5	0.023
5. First Albany Cos., Inc.	2	7.23	7.23	0.928
6. Kinnard Investments, Inc.	4	4.81	5.02	2.615
7. Moseley Holding Corp.	4	6.10	5.13	0.401
8. McDonald & Co. Investments, Inc.	4	8.89	6.73	0.623
9. Morgan Keegan Inc.	4	9.67	8.58	0.525
10. Raymond James Financial, Inc.	4	10.81	10.30	0.253
11. A. G. Edwards, Inc.	4	13.04	10.02	0.072
12. E. F. Hutton Group, Inc.	5	22.69	20.80	0.090
13. L. F. Rothschild Holdings, Inc.	5	25.84	14.45	0.549
14. Interstate Johnson Lane, Inc.	7	5.95	5.88	0.841
15. Wolf Financial Group, Inc.	7	5.24	5.00	1.070
16. Advest Group, Inc.	7	10.05	6.75	0.613
17. Piper Jaffray, Inc.	7	19.94	18.28	1.444
18. First Boston, Inc.	9	77.45	37.40	0.501
19. Ryan Beck & Co., Inc.	11	3.92	3.05	0.646
20. Bear Stearns Cos., Inc.	12	36.00	21.15	0.339
21. Shearson Lehman Brothers Holding	26	54.25	31.35	0.706
22. Salomon, Inc.	29	74.86	41.00	0.573
23. Primerica Corp. (Smith Barney, Harris Upham)	32	29.97	26.14	0.348
24. Morgan Stanley Group, Inc.	35	61.00	34.00	0.857
25. Paine Webber Group, Inc.	39	28.52	23.75	1.743
26. Merrill Lynch & Co., Inc.	70	66.99	40.00	1.311
27. Alex Brown, Inc.	81	26.40	22.00	9.181

^a Aggregate proceeds of offerings underwritten over the sample period divided by the mean market value of underwriter equity. The mean equity value is the average of equity values calculated one day prior to each offering by the underwriter.

the IPOs in our sample. The median number of sample IPOs for which an investment bank served as lead underwriter is 6, with the more active underwriters managing the bulk of the offerings. The 13 less-active underwriters managed a combined total of 40 IPOs, while the other 14 underwriters managed 372 IPOs over the sample period. The more active underwriters also tend to be involved in the larger IPOs, as indicated by the mean and median sizes of IPOs underwritten. The table also reports the relative importance of the IPO business to the underwriter, as measured by the ratio of aggregate proceeds to underwriter market value. This variable will be used in some of the subsequent analysis. It is apparent from the values of this variable that for several of the smaller underwriters (e.g., Alex Brown), the IPO business accounts for a far greater portion of their overall activity than it does for many of the larger, more reputable underwriters.

TABLE III
IPO INITIAL-WEEK EXCESS RETURNS CATEGORIZED BY
LEAD-UNDERWRITER CHARACTERISTICS

	Number of underwriters	Number of offerings	Mean IPO initial- week excess return (%)	Median IPO initial- week excess return (%)	Std. dev. of IPO initial- week excess returns (%)	Fraction of IPOs with positive initial- week excess returns (%)
<i>Panel A: By the frequency of underwriting</i>						
High frequency ^a	14	372	7.63	2.34	16.36	65.3
Low frequency	13	40	6.11	0.85	16.69	55.0
p-value of two-sample test			0.576 ^c	0.319 ^f		
<i>Panel B: By the aggregate dollar amount of underwriting</i>						
Above median ^b	14	361	7.00	1.92	15.56	62.3
Below median	13	51	10.92	6.12	21.13	78.4
p-value of two-sample test			0.207 ^c	0.052 ^f		
<i>Panel C: By the mean dollar amount per offering</i>						
Above median ^c	14	355	7.01	1.83	15.65	62.3
Below median	13	57	10.43	6.12	20.22	77.2
p value of two-sample test			0.144 ^c	0.033 ^f		
<i>Panel D: By the aggregate offering amount relative to underwriter equity value</i>						
Above median ^d	14	301	8.64	3.72	17.28	67.11
Below median	13	111	4.35	0.39	13.19	56.76
p value of two-sample test			0.008 ^c	0.001 ^f		

Note. The initial-week excess return for IPO j is measured as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{j5}) - 1$, where e_{jt} is the daily excess return on day t . The IPO daily excess return is measured by subtracting the equally weighted market index return from the IPO daily raw return.

^a High frequency underwriters are those that served as lead-underwriters for more than the median number (6) of sample IPOs for the period 1987–1991.

^b Above median underwriters are those that served as lead-underwriters for above median aggregate amount (\$52.16 million) of sample IPOs for the period 1987–1991.

^c Above median underwriters are those that had a mean IPO size in dollars per offering greater than the median (\$13.04 million) for the period 1987–1991.

^d Above median underwriters are those that had an aggregate IPO size relative to the mean equity value greater than the median (0.6) for the period 1987–1991. The mean equity value is an average of the equity value that was calculated based on the stock price one day prior to each offering.

^e Two-sample t -test.

^f Two-sample median test.

Though our focus is primarily on the wealth effects on lead underwriters, we also investigate the impact of IPO mispricing on comanagers, if any, involved in the offering. Of the 412 sample IPOs, 96 offerings were managed by a single lead underwriter. The rest of the IPOs in the sample were joint offerings in which the IPO was managed by the lead underwriter in conjunction with one or more comanagers: 214 of the IPOs had 1 comanager, 55 IPOs had 2 comanagers, 14 IPOs had 3 comanagers, while 2

IPOs had 4 comanagers. For 1 IPO the number of comanagers could not be identified.

Table III reports IPO initial-week excess returns categorized by various characteristics of the lead underwriter. As indicated in Panel A, the frequency with which investment banks served as lead underwriters was not significantly related to IPO underpricing. Earlier studies have shown that IPOs by more reputable underwriters tend to be less underpriced (see Tinic (1988) and Carter and Manaster (1990)).¹⁴ To proxy for underwriter reputation, we used average offering size and the aggregate dollar amount of offerings over the sample period.¹⁵ Consistent with earlier findings, the results in Panels B and C indicate that lead underwriters with larger than median values for these variables were associated with less IPO underpricing, though the evidence is weak. We also examined whether initial underpricing was related to the relative importance of the IPO business to the underwriter, as measured by the ratio of aggregate proceeds to underwriter market value. As reported in Panel D, underwriters for which the IPO business was relatively more important exhibited significantly higher initial underpricing on average. The reason for this, as evidenced by the information in Table II, is that several of the smaller, less reputable underwriters tend to be specialized to the underwriting of IPOs. For many of the larger, more reputable underwriters, however, it appears that the IPO business represents a relatively smaller portion of their overall activity.

4. EMPIRICAL ANALYSIS OF THE IMPACT OF IPO INITIAL PERIOD RETURNS ON UNDERWRITER MARKET VALUE

In this section we investigate the contemporaneous relation between IPO initial period performance and lead-underwriter common stock returns. Cross-sectional regression results are presented and discussed. The possibility that our findings may be the result of factors common to the underwriting industry rather than firm-specific reputation costs is investigated. Finally,

¹⁴ This finding has been explained on the basis that lower risk, higher quality issuers signal their quality by the choice of more prestigious underwriters.

¹⁵ It is shown in Megginson and Weiss (1991) that underwriter market share tends to be highly correlated with measures of underwriter reputation ranks as measured by Carter and Manaster (1990). For the empirical analysis, including regression analysis, we prefer to rely on measures of underwriting activity rather than use the underwriter rankings reported in Carter and Manaster (1990) since these are likely to have changed for our sample period. The variables we use are dummy variables to indicate whether an underwriter's market activity over the entire sample period exceeded the sample median. It should be noted that using the full sample period can introduce a potential bias if, for example, low IPO returns early in the sample lead to a lower market share for the underwriter later in the sample period.

the impact of mispriced offerings on publicly traded comanaging underwriters is examined.

4.1. *Impact of IPO Initial Returns on Lead-Underwriter Market Value*

Lead-underwriter excess returns are provided in Table IV, categorized on the basis of initial period IPO excess returns. For each IPO, lead-underwriter excess returns are derived using a market model estimated over trading days -190 to -10 prior to the offering date.¹⁶ The lead-underwriter excess returns reported in the table correspond to the period over which IPO excess returns are calculated. Panel A is based on 1-day IPO excess returns, while Panels B and C are based on 1-week IPO excess returns. While Panels A and B utilize the full sample of 412 IPOs, Panel C uses the nonoverlapping sample of 279 IPOs discussed earlier. The impact of IPO mispricing on the wealth of publicly traded comanaging underwriters is analyzed later in the paper.

As indicated in Panel A, there were only 10 IPOs with 1-day excess returns less than -5% . This number rises to 50 when 1-week IPO excess returns are considered in Panel B. Such an increase is not unexpected, however, since investment banks typically engage in market stabilization to keep IPO after-market prices from falling below the offer price in the days immediately following an offering.¹⁷ This suggests that using 1-week IPO excess returns following the offering date may provide a more reliable measure of IPO price performance. To ensure that our results were not sensitive to the choice of measurement period, we replicated much of the analysis using excess returns estimated over 2-week and 1-month horizons, for the nonoverlapping sample of 279 IPOs. The results, not reported in the paper, were essentially similar, though less significant, possibly due to the increase in variance of excess returns over longer periods.¹⁸ This is

¹⁶ Excess returns are derived using a market model as follows. Underwriter j 's daily excess return on day t measured by a market model is defined as

$$e_{jt} = r_{jt} - (a_j + b_j r_{mt}),$$

where r_{jt} is underwriter's daily raw return on day t and r_{mt} is the return on the CRSP equally weighted index on day t . Both a_j and b_j are OLS estimates of the regression equation

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \varepsilon_{jt}$$

over the estimation period, -190 to -10 trading days prior to the offering date. Obtaining lead-underwriter excess returns by subtracting the equally weighted market index returns from underwriter stock price returns does not significantly affect any of the results in the paper.

¹⁷ See references in footnote 8.

¹⁸ An additional reason for preferring 1-week excess returns, rather than excess returns over longer periods, is that fewer observations are lost in constructing a nonoverlapping sample, in which lead underwriters are engaged in no more than one offering over the measurement period.

TABLE IV
LEAD-UNDERWRITER COMMON STOCK EXCESS RETURNS FROM ONE-DAY FULL SAMPLE,
ONE-WEEK FULL SAMPLE, AND ONE-WEEK NONOVERLAPPING SAMPLE CATEGORIZED
BY LEVEL OF IPO EXCESS RETURN

IPO excess return	Number of offerings	Mean underwriter excess return (%)	Median underwriter excess return (%)	<i>t</i> statistics	Fraction of positive underwriter excess returns (%)
<i>Panel A: One-day full sample</i>					
Greater than 20%	57	-0.07	-0.19	-0.26	47.4
10 to 20%	52	0.15	-0.04	0.39	48.1
0 to 10%	187	0.01	0.03	0.03	50.8
-5 to 0%	106	-0.05	0.02	-0.21	50.9
Less than -5%	10	-0.92	-0.86	-2.43	30.0
Total	412	-0.02	-0.01	-0.20	49.5
<i>Panel B: One-week full sample</i>					
Greater than 20%	66	0.68	0.34	1.11	53.0
10 to 20%	51	1.58	0.93	2.06	58.8
0 to 10%	148	0.03	0.03	0.07	50.0
-5 to 0%	97	0.26	0.68	0.60	57.7
Less than -5%	50	-1.11	-1.48	-2.14	34.0
Total	412	0.24	0.09	1.03	51.5
<i>Panel C: One-week non-overlapping sample</i>					
Greater than 20%	45	0.57	0.17	0.78	51.1
10 to 20%	34	1.95	1.43	1.88	61.8
0 to 10%	104	0.26	-0.12	0.58	49.0
-5 to 0%	66	-0.07	0.45	-0.12	54.5
Less than -5%	30	-0.94	-1.10	-1.45	43.3
Total	279	0.31	0.09	1.10	51.6

Note. The initial-week excess return for IPO *j* or underwriter *j* is measured as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{j5}) - 1$, where e_{jt} is the daily excess return on day *t*. The IPO daily excess return is measured by subtracting the equally weighted market index return from the IPO daily raw return, while the underwriter daily excess return is measured by using a market model estimated over trading days -190 to -10 prior to the offering date. In Panels A and B a week is defined to be 5 trading days starting on the day of the offering.

consistent with the findings in Ruud (1993) and Hanley *et al.* (1993) that stabilization activities occur over relatively short periods of one to two weeks after the offering date.

Lead-underwriter excess returns are significantly negative with a mean return of -0.92% for IPOs with 1-day excess returns less than -5%. In other categories of 1-day IPO excess returns, however, lead-underwriter excess returns are not significant. This may be due to considerable residual IPO-valuation uncertainty in the market by close of trading on the initial day, since selling and stabilization may still be in progress. For the small number of IPOs with substantial first-day negative excess returns, the early withdrawal of price support presumably indicates that underwriters acknowledge the offering to be significantly overpriced.

For the full sample of one-week IPO excess returns in Panel B, the 50 IPOs with strongly negative excess returns (less than -5%) are found to be associated with significantly negative lead-underwriter excess returns (mean -1.11%). Further, consistent with our empirical predictions, underwriter excess returns are nonmonotonic in the magnitude of IPO underpricing. For IPOs with excess returns between -5 and 10% , the effect on lead-underwriter stock price is insignificant, while the 51 IPOs with excess returns between 10 and 20% are associated with significantly positive underwriter excess returns (mean 1.58%). For the 66 IPOs with positive excess returns greater than 20% , mean underwriter excess returns, though positive, are found to be statistically insignificant.¹⁹ The results for the nonoverlapping sample in Panel C are similar, though weaker, possibly on account of the reduction in sample size.

Overall, the results in Table IV are supportive of our empirical predictions. Note, however, that these results do not control for characteristics of the offering or the lead underwriter which might be expected to affect lead-underwriter stock return. We do this in the next section.

4.2. Cross-Sectional Regression Analysis

In this section we report the results of a cross-sectional regression analysis of the initial-week lead-underwriter excess returns for the nonoverlapping sample of IPOs. The explanatory variables used in the regressions are discussed below.

Mispricing is the dollar amount of IPO mispricing divided by the lead-underwriter's equity value.²⁰ This is defined to be $(\text{IPO amount in dollars} \times \text{IPO initial-week excess return}) / (\text{Lead-underwriter equity value})$. Scaling by underwriter equity value facilitates comparison with underwriter stock returns as well as controls for the relative importance of the offering to the underwriter's overall operations. In the absence of information on the quantity of shares purchased during price stabilization, scaled overpricing also provides a reasonable way to estimate the largest potential loss to lead underwriters from price stabilization.

Based on earlier discussion, we expect the marginal impact of a dollar of IPO mispricing on lead-underwriter market value to depend on the nature of the mispricing. To take account of this, we interact *Mispricing* with dummy variables indicating whether the IPO initial-week excess return was less than -5% , between 10 and 20% , or greater than 20% .

¹⁹ Overall the 117 IPOs with excess returns greater than 10% are associated with significantly positive lead-underwriter excess returns (mean 1.07%).

²⁰ Lead-underwriter equity value was calculated based on stock price data one day prior to the offering date.

These three interaction variables are denoted $I(\text{DumNegRet} * \text{Mispricing})$, $I(\text{DumP1Ret} * \text{Mispricing})$, and $I(\text{DumP2Ret} * \text{Mispricing})$, respectively.

The sum of the coefficients on *Mispricing* and $I(\text{DumNegRet} * \text{Mispricing})$ provides an estimate of the marginal impact of a dollar of IPO overpricing on underwriter market value. Potential direct costs of overpricing, such as the costs of price stabilization, are expected to be less than the total dollar amount of the overpricing. Hence, a finding that the sum of these coefficients was significantly greater than one would be consistent with the presence of reputation costs, since this would indicate that a dollar of overpricing resulted in greater than a dollar loss in lead-underwriter market value.

The sum of the coefficients of *Mispricing* and $I(\text{DumP1Ret} * \text{Mispricing})$, representing the marginal impact of a dollar of underpricing when IPO initial-week returns are between 10 and 20%, is predicted to be significantly positive. Further, based on the predicted nonmonotonicity in underwriter wealth effects and the evidence in Table IV, the coefficient of $I(\text{DumP1Ret} * \text{Mispricing})$ is expected to be larger than that of $I(\text{DumP2Ret} * \text{Mispricing})$.

We may expect the impact of mispriced IPOs on lead-underwriter market value to be related to the level of the investment bank's underwriting activity. Less-active underwriters may have a smaller reputation capital at stake and their market values may be affected less severely by overpriced offerings. To test this we interact *Mispricing* with dummy variables indicating whether the lead underwriter was less active than the median. Activity level of underwriters is measured in two ways: (a) by the total number of IPOs over the sample period and (b) by the aggregate dollar amount of offerings underwritten scaled by underwriter market value.²¹ In the latter measure, scaling the IPO activity by underwriter market value is done to provide a measure that is reflective of the relative importance of the IPO business to the underwriter. The above mentioned interaction variables, $I(\text{DumLowFreq} * \text{Mispricing})$ and $I(\text{DumLowSize} * \text{Mispricing})$, are expected to be estimated with negative coefficients.

The regression results are presented in Table V.²² In model 1, consistent with results in Table IV, the coefficient of *Mispricing*, representing the impact of offerings with IPO initial-week excess returns between -5

²¹ If activity is measured using the (unscaled) aggregate dollar amount of offerings underwritten, the results are similar to the ones reported. While the interaction variable has the expected sign, it is statistically insignificant.

²² For the cross-sectional regression analysis two observations are dropped. For one observation the number of shares offered and, thus, the value of the *Mispricing* variable is not available. We also disregard one outlier that had an extraordinarily high loss relative to underwriter equity value. This was the issue by Regenex Inc., underwritten by Corporate Management Group Inc. The loss relative to underwriter equity value was 21.5% for the initial day and 69.8% for the initial week. The underwriter excess return was -7.58% for 1-week and was an anomalous 1.11% for the initial day.

TABLE V

OLS ESTIMATES OF COEFFICIENTS IN CROSS-SECTIONAL REGRESSIONS OF LEAD-UNDERWRITER INITIAL WEEK EXCESS RETURN (%) FOR NONOVERLAPPING SAMPLE OF IPOs; HETEROSKEDASTICITY-CONSISTENT WHITE (1980) *t* STATISTICS ARE GIVEN IN PARENTHESES^a

Independent variables	Model		
	1 ^{b,c}	2	3
<i>Constant</i>	0.001 (0.211)	0.000 (0.094)	0.002 (0.592)
<i>Mispricing</i>	0.096 (0.288)	0.796 (1.160)	0.182 (0.515)
<i>I(DumP2Ret*Mispricing)</i>	0.305 (0.779)	-0.331 (-0.496)	0.224 (0.551)
<i>I(DumP1Ret*Mispricing)</i>	1.444 (2.249)	0.912 (1.212)	1.352 (2.068)
<i>I(DumNegRet*Mispricing)</i>	4.647 (3.497)	3.992 (2.741)	5.023 (3.799)
<i>I(DumLowFreq*Mispricing)</i>		-0.834 (-1.406)	
<i>I(DumLowSize*Mispricing)</i>			-1.056 (-1.043)
Adjusted <i>R</i> ²	0.053	0.057	0.053
Number of observations	277	277	277

Note. The initial-week excess return for underwriter *j* is measured as $(1 + e_{j1})(1 + e_{j2}) \dots (1 + e_{jt}) - 1$, where e_{jt} is the daily excess return on day *t*. The underwriter daily excess return is measured by using a market model estimated over trading days -190 to -10 prior to the offering date.

^a Variable definitions are as follows: *Mispricing* = (IPO dollar amount*IPO initial-week excess return) divided by lead-underwriter equity value; *I(DumP2Ret*Mispricing)* = interaction of *DumP2Ret* and *Mispricing*, where *DumP2Ret* is a dummy variable that equals one if IPO initial-week excess return is greater than 20% and zero otherwise; *I(DumP1Ret*Mispricing)* = interaction of *DumP1Ret* and *Mispricing* where *DumP1Ret* is a dummy variable that equals one if IPO initial-week excess return is 10 to 20% and zero otherwise; *I(DumNegRet*Mispricing)* = interaction of *DumNegRet* and *Mispricing*, where *DumNegRet* is a dummy variable that equals one if IPO initial-week excess return is less than -5% and zero otherwise; *I(DumLowFreq*Mispricing)* = interaction of *DumLowFreq* and *Mispricing*, where *DumLowFreq* is a dummy variable that equals one if the underwriter served as a lead underwriter for less than or equal to the median number (6) of sample IPOs for the period 1987-1991, and zero otherwise; *I(DumLowSize*Mispricing)* = interaction of *DumLowSize* and *Mispricing*, where *DumLowSize* is a dummy variable that equals one if the underwriter's aggregate offering amount relative to its equity value is less than the median (0.6) for the period 1987-1991, and zero otherwise.

^b The null hypothesis that the sum of two estimated coefficients, *Mispricing* and *I(DumNegRet*Mispricing)*, equals one is rejected on the basis of a Chi-square test with a *p*-value of 0.0029. The hypothesis that the coefficients *I(DumP1Ret*Mispricing)* and *I(DumP2Ret*Mispricing)* are equal is rejected with *p* value of 0.0598

^c *P* values that test the null hypothesis that the slope of *Mispricing* equals zero for IPOs with initial-week excess returns greater than 20%, 10 to 20% and less than -5% are 0.0815, 0.0062, and 0.0002, respectively.

and 10%, is positive but statistically insignificant. The coefficient on $I(\text{DumNegRet} * \text{Mispricing})$ is positive and statistically significant. Further, on the basis of a Chi-square test, we are able to conclude that the sum of the two coefficients, Mispricing and $I(\text{DumNegRet} * \text{Mispricing})$, is significantly greater than one (p value of 0.003).²³ This suggests the existence of reputation costs for overpriced IPOs, since the marginal impact on lead-underwriter market value significantly exceeds the potential wealth loss from stabilization efforts. The coefficients on $I(\text{DumP1Ret} * \text{Mispricing})$ and $I(\text{DumP2Ret} * \text{Mispricing})$ are estimated with positive signs. The sum of the coefficients of Mispricing and $I(\text{DumP1Ret} * \text{Mispricing})$ is significant with a p value of 0.007. Further, consistent with our hypothesis, the coefficient on $I(\text{DumP2Ret} * \text{Mispricing})$ is smaller than that on $I(\text{DumP1Ret} * \text{Mispricing})$. On the basis of a Chi-square test (p value of 0.06) we are able to reject the null hypothesis that the coefficients on $I(\text{DumP1Ret} * \text{Mispricing})$ and $I(\text{DumP2Ret} * \text{Mispricing})$ are equal.

The inclusion of additional variables in models 2 and 3 does not materially affect the results obtained in model 1. The coefficients of the interaction variables, $I(\text{DumLowFreq} * \text{Mispricing})$ and $I(\text{DumLowSize} * \text{Mispricing})$, are estimated with the predicted signs, though neither is statistically significant.²⁴

We now discuss further the economic significance of the anticipated reputation costs when IPOs are overpriced. From model 1, for an IPO with an initial-week excess return worse than -5% , the lead underwriter is subject to a wealth loss that is about 4.7 times the dollar amount of the IPO overpricing (from the sum of the coefficients on Mispricing and $I(\text{DumNegRet} * \text{Mispricing})$). Based on the two standard deviation range for the estimated coefficients we have that the wealth loss to the lead underwriter is expected to be between 2.2 to 7.3 times the dollar amount of the IPO overpricing. As we have argued above, if the direct costs of overpricing are unlikely to exceed the dollar amount of the overpricing, this suggests that the reputation costs of overpricing are in the range of 1.2 to 6.3 times the dollar amount of the overpricing. As an illustrative example, consider an IPO offering of \$23 million (the sample median) that experiences an initial-week stock return of -10% . From the discussion above, the corresponding loss of underwriter market value is expected to be in the range of \$5.1 to \$16.7 million. Of this total loss, reputation costs are expected to account for at least \$2.8 to \$14.4 million. The negative return experienced by the lead underwriter's stock will, of course, depend on its market capitalization. If, for instance, the underwriter's market value is \$500 million, we would expect to observe a negative return of between -1.03 and -3.34% .

²³ Similar results hold in models 2 and 3.

²⁴ Other explanatory variables, such as the exchange on which the IPO was listed, were tried but were not found to be significant and the results are not reported here.

In summary, the regression results are generally consistent with the hypothesized relation between IPO price performance and changes in lead-underwriter market value. Overpriced offerings are associated with a decrease in lead-underwriter market value that is significantly greater than the dollar amount of the overpricing. The impact of underpriced offerings is, however, nonmonotonic. IPO initial returns over a certain range are associated with an increase in lead-underwriter market value. There is a significantly smaller, if any, wealth impact for higher levels of IPO underpricing. The fact that strongly underpriced IPOs are not associated with a significantly negative wealth effect might reflect the difficulty faced by market participants in such cases in distinguishing between an unusually successful marketing effort by the underwriter and a poorly priced offering.

4.3. *Lead-Underwriter Wealth Effects Relative to Industry*

An alternative explanation for the association between IPO initial returns and lead-underwriter wealth may be that these wealth effects reflect systemic changes in the underwriting industry, rather than reputation costs specific to the lead underwriter. This could happen if, for instance, changes in the demand for underwriting services were correlated with the likelihood of IPO mispricing.²⁵ An overpriced IPO may, therefore, indicate a downturn in the anticipated volume of new offerings and reduced expected earnings for all underwriters, rather than a loss in reputation capital for the lead underwriter that managed the overpriced offering. Before proceeding further, we should note that there did not appear to be a concentration of severely overpriced offerings in any particular period, as might have been expected if the mispricing of offerings was strongly related to the periodic swings in the market for IPOs.²⁶

To investigate the issue more carefully, we compare the impact of mispriced offerings on lead-underwriter wealth relative to the contemporaneous impact on the wealth of publicly traded underwriters not associated with the offering. This approach allows us to distinguish between the effects of reputation costs, which should be specific to the lead-underwriter (and possibly comanagers), and industry-wide effects. For each IPO, initial-week industry average returns were constructed using returns of all publicly traded underwriters in the sample, excluding managers of the IPO and any other underwriter that served as a lead underwriter for another offering over this period. Industry-adjusted lead-underwriter excess returns are presented in Table VI.

²⁵ See Ritter (1984) for a discussion of the episodic nature of the IPO market.

²⁶ For instance, there was no systematic pattern to the occurrence of the 10 IPOs with initial-day return less than -5%. Three of these were in 1987, one in 1989, and three each in 1990 and 1991.

TABLE VI

THE IMPACT OF IPO INITIAL-WEEK EXCESS RETURNS ON LEAD-UNDERWRITER MARKET VALUE RELATIVE TO UNDERWRITING INDUSTRY FOR NONOVERLAPPING SAMPLE IPOs

IPO excess return	Number of offerings	Mean underwriter excess return (%)	Median underwriter excess return (%)	<i>t</i> statistics	Fraction of positive underwriter excess returns (%)
Greater than 20%	45	-0.04	-0.52	-0.06	46.7
10 to 20%	34	1.41	0.63	1.28	52.9
0 to 10%	104	-0.66	-0.59	-1.47	44.2
-5 to 0%	66	-0.46	-0.57	-0.91	42.4
Less than -5%	30	-1.46	-1.65	-2.10	33.3
Total	279	-0.35	-0.58	-1.23	44.1

Note. The initial-week excess return for IPO *j* or industry-adjusted initial-week excess return for underwriter *j* is measured as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{js}) - 1$, where e_{jt} is the daily excess return on day *t*. The IPO daily excess return is measured by subtracting the equally weighted market index return from the IPO daily raw return, while the underwriter daily excess return is measured by subtracting the equally weighted underwriting industry return from the underwriter daily raw return. For each IPO *j* the underwriting industry consists of investment banks of Table II, after excluding (i) the lead underwriter and comanagers, if any, of IPO *j* and (ii) investment banks that served as lead underwriters for other IPOs during the initial week of IPO *j*.

Table VI essentially replicates the analysis in Table IV Panel C, except that lead-underwriter excess returns are adjusted by industry average returns, rather than returns based on the market model. A comparison of the results in Table VI with those in Table IV Panel C indicates that industry-adjusted lead-underwriter returns are not qualitatively different from lead underwriter excess returns obtained using a market model. This indicates that the evidence on the impact of mispriced IPOs on lead-underwriter wealth cannot be attributed to industry-wide effects.²⁷

4.4. Impact of IPO Mispricing on Comanaging Underwriters

As described earlier, of the 412 sample IPOs, 316 IPOs were jointly managed by a lead underwriter and one or more comanagers. We have so far discussed the impact of mispriced IPOs on the wealth of the lead underwriter only. An issue of some interest is whether mispriced offerings also affect the wealth of comanagers. Since the lead underwriter is responsible for pricing the deal, we would expect mispricing to have a substantially greater effect on the lead underwriter than on the comanagers. To analyze the wealth effect of mispriced offerings on comanagers, offerings were categorized on the basis of IPO initial-week excess returns as in Table IV.

²⁷ Regression analysis similar to that in Table V yields similar results.

TABLE VII
A COMPARISON OF LEAD AND COMANAGING UNDERWRITERS' ONE-WEEK MEAN EXCESS
RETURN (%); *t* STATISTICS ARE IN PARENTHESES

IPO excess return	Number of offerings	Lead underwriter market adjusted excess return	Comanaging underwriter market adjusted excess return	Lead-underwriter return-Comanaging underwriter return
Greater than 20%	18	1.16 (0.86)	0.53 (0.52)	0.45 (0.36)
10 to 20%	11	2.38 (1.40)	1.08 (0.87)	1.22 (0.59)
0 to 10%	19	-1.71 (-1.09)	-2.22 (-2.41)	0.53 (0.28)
-5 to 0%	15	-0.98 (-1.30)	0.53 (0.74)	-1.65 (-1.77)
Less than -5%	13	-1.93 (-2.79)	0.93 (0.50)	-2.69 (-1.31)
Total	76	-0.33 (-0.55)	-0.01 (-0.02)	-0.37 (-0.50)

Note. The initial-week excess return for IPO *j* or underwriter *j* is measured as $(1 + e_{j1})(1 + e_{j2}) \cdots (1 + e_{j5}) - 1$, where e_{jt} is the daily excess return on day *t*. The daily excess return is measured by subtracting the equally weighted market index return from the daily raw return.

Since we are interested in comparing the impact on comanagers and lead underwriters, the differences between the initial-week returns to comanagers and lead underwriters are also analyzed for the various categories of IPO initial returns.

There were 119 sample offerings for which one or more of the comanagers was publicly traded. The sample is further reduced to 76 offerings when instances in which comanagers associated with more than one IPO over the initial-week are excluded to obtain a nonoverlapping sample. To obtain comanager initial-week returns for each IPO, the returns of the publicly traded comanagers involved in the offering were averaged. Of the 76 sample IPOs, there were 73 IPOs with only one publicly traded comanager, while for 3 IPOs there were two publicly traded comanagers involved. The results are reported in Table VII.

As indicated in Table VII, comanager and lead-underwriter initial-week excess returns appear to be similar for underpriced offerings. Though average comanager initial-week returns are less positive than lead-underwriter returns, the difference is statistically insignificant. This indicates that coman-

aging underwriters may derive benefits similar to those received by lead underwriters from underpriced offerings. The anomalous negative average returns for both the lead underwriters and comanagers for the 19 IPOs with initial-week return between 0 and 10% may be simply the result of an unusual small sample—since for the 148 offerings in the full sample with IPO initial returns in this range, lead-underwriter excess returns were found to be insignificant. As in other cases, the difference between the returns to lead managers and comanagers for this subgroup is, however, statistically insignificant.

The more interesting finding is that overpriced offerings appear to have a very different impact on the wealth of comanagers, compared to their impact on lead-underwriter wealth. While lead-underwriter excess returns are negative and significant for strongly overpriced offerings (less than -5% initial-week return), comanager returns are positive and insignificant. The difference in initial-week returns, however, is not statistically significant for this subgroup. Considering all overpriced offerings, however, the difference between the initial-week returns of lead underwriters and comanagers is -2.1% , which is statistically significant with a t statistic of -2.02 . This evidence seems to suggest that reputation costs may fall primarily on lead underwriters even when comanagers are present.

5. PREDICTABILITY OF IPO INITIAL PRICE PERFORMANCE

The empirical evidence presented above indicates the significant impact of IPO initial period returns on lead-underwriter market value. This raises the possibility that if market participants expect a forthcoming IPO to be mispriced, this should be reflected in the lead underwriter's stock price prior to the offering. As a consequence, we would expect initial returns to be somewhat predictable on the basis of the lead-underwriter's stock returns prior to the offering. Such predictability can only exist if, as has been empirically documented (see Hanley (1993)), underwriters do not fully adjust offering prices in response to new information.

We test for the existence of such predictability using an OLS regression for the nonoverlapping sample of IPOs. The dependent variable is the IPO initial one-week excess return (*IpoRet*). To test for predictability, the lead-underwriter excess return in the week prior to the offering date (*UwReturn*) is used as an explanatory variable. To control for characteristics of the IPO and the lead underwriter, the regression includes dummy variables indicating whether the lead underwriter was listed on the NYSE/AMEX (*DumUwNYSE*), whether the lead underwriter managed less than the median number of sample IPOs (*DumLowFreq*) and whether the IPO was

listed on the NYSE/AMEX (*DumNYSE*).²⁸ In estimating the regression equation, we excluded one observation with an extreme value of *IpoRet*.²⁹ The results of the OLS regression are given below; *t* statistics of the estimated coefficients are in parentheses.

$$\begin{aligned} IpoRet = & 0.12 + 0.30 \text{ } UwReturn - 0.05 \text{ } DumUwNYSE \\ & (7.70) \quad (1.78) \quad \quad \quad (-2.65) \\ & - 0.04 \text{ } DumLowFreq - 0.05 \text{ } DumNYSE \\ & (-1.78) \quad \quad \quad (-2.40) \end{aligned}$$

Adjusted $R^2 = 0.056$.

Number of observations = 278.

The statistically significant coefficient (p value = 0.08) on *UwReturn* indicates that lead-underwriter common stock excess return in the week prior to the offering date is a significant predictor of IPO initial-week excess return. Consistent with earlier evidence, offerings are less likely to be underpriced if they are listed on the NYSE/AMEX and if the lead underwriter has a lower frequency of offerings in the sample.³⁰

6. CONCLUSION

We have investigated the impact of mispriced IPOs on lead-underwriter market value. For IPOs exhibiting substantially negative initial-day returns, we find that lead underwriters experience a significant loss in market value. The loss in market value is significantly greater than can be attributed to after-market price stabilization costs, suggesting damage to lead-underwriter reputation as a consequence of the overpricing.

²⁸ Variables indicating whether the lead underwriter was more or less active as measured by the aggregate dollar amount of offerings or average size of offerings were not found to have significant explanatory power in such regressions. These regression results are not reported.

²⁹ The value of *IpoRet* for the outlier observation was 120.8%, which is about twice as large as the next largest value of *IpoRet*. The regression estimates, without excluding the outlier, are quite similar to those in reported regression, except that the coefficient of *UwReturn* is no longer significant at conventional levels (p value = 0.17). To test for the robustness of our results, we also estimated logistic regressions in which a dummy variable was used to indicate whether there was under or overpricing. The results were qualitatively similar.

³⁰ The coefficient on *DumLowFreq* is based on the underwriter's volume over the entire sample period. It should be noted that this may bias the estimated coefficient if, for example, low IPO returns early in the sample lead to a lower market share for the underwriter later in the sample period. Our interest in including *DumLowFreq* as a regression variable is to control for characteristics of underwriter. Excluding this variable does not affect the statistical significance (at the 10% level) of *UwReturn*.

Over a certain range, substantially underpriced offerings are associated with significant increases in lead-underwriter market value. For higher levels of IPO underpricing, however, underwriter wealth effects are somewhat smaller. Our interpretation is that while there may be benefits to moderate underpricing, increasing reputation costs may make excessive IPO underpricing undesirable.

By examining the impact on lead-underwriter stock market value relative to other publicly traded firms in the underwriting industry, we have argued that the results in the paper cannot be attributed to industry effects, such as changes in the demand for underwriting services. A comparison of the stock returns of comanaging underwriters and lead underwriters indicates that while the impact of underpriced offerings tends to be similar, only lead underwriters appear to suffer wealth losses in overpriced offerings. These results suggest that reputation costs may be primarily borne by the lead underwriter, even when comanagers are present.

We find lead-underwriter stock returns in the week prior to the offering date to be significantly related to IPO initial-week returns, after controlling for characteristics of the offering and the lead underwriter. This suggests that investor beliefs about initial returns of a forthcoming IPO may tend to be incorporated into the stock price of the lead underwriter.

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