



# Executive stock options and IPO underpricing<sup>☆</sup>

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## Abstract

In about one-third of US IPOs between 1996 and 2000, executives received stock options with an exercise price equal to the IPO offer price rather than a market-determined price. Among firms with such “IPO options”, 58% of top executives realize a net benefit from underpricing: the gain from the options exceeds the loss from the dilution of their pre-IPO shareholdings. If executives can influence either the IPO offer price or the timing and terms of their stock option grants, there should be a positive relation between IPO option grants and underpricing. We find no evidence of such a relation. Our results contrast sharply with the emerging literature on managerial self-dealing at shareholder expense.

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## 1. Introduction

More than two thousand US firms went public through initial public offerings (IPOs) between 1996 and 2000, generating average first-day returns of 42%. Many explorations of IPO underpricing have focused on who gains and who loses from pricing the IPO

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significantly below the closing market price on the first trading day.<sup>1</sup> Gainers include initial IPO investors (such as institutions and invited participants in “family and friends” programs), while losers include pre-IPO shareholders who either sell shares in the offering significantly below their market value or suffer substantial dilution on the shares they continue to hold. Indeed, between 1996 and 1998, the average IPO left \$15 million “on the table,” meaning the average company would have raised \$15 million more if it had been able to sell its shares at the first aftermarket closing price, rather than at the offer price. In 1999 and 2000, average money left on the table increased to almost \$80 million.

The purpose of this paper is to examine another set of winners from IPO underpricing: executives receiving stock options on the IPO date with an exercise price set equal to the offer price, rather than the closing market price on that date. As we document below, such options (henceforth referred to as “IPO options”) were granted to top executives in approximately one-third of US IPOs between 1996 and 2000. Executives granted IPO options are effectively receiving options granted “in-the-money” by the amount of the IPO underpricing. However, although in-the-money by the close of the first trading day, IPO options are treated as “at-the-money” for accounting, disclosure, and tax purposes.

Several recent studies have proposed that executives influence the terms of their compensation packages to their personal advantage. For example, [Yermack \(1997\)](#) provides evidence that executives influence the timing of their stock option awards, receiving at-the-money options just prior to releasing news that increases company stock prices.<sup>2</sup> [Bebchuk, Fried, and Walker \(2002\)](#) and [Bebchuk and Fried \(2003, 2004\)](#) argue that the practice of granting options at-the-money (rather than out-of-the-money or with exercise prices indexed to market movements) reflects the influence of rent-seeking managers trying to maximize their compensation in ways that are largely camouflaged to investors and the public. The benefit to executives of receiving options with an exercise price equal to the offer price (rather than the post-IPO market price) is substantial, and the fact that IPO options are treated as being granted at-the-money camouflages their cost. Therefore, to the extent that company executives can, indeed, influence the terms of their stock option arrangements, we expect IPO options to be granted more often and in larger quantities when the anticipated underpricing is high.

Recent studies have also indicated that executives influence IPO offer prices and that cross-sectional differences in IPO underpricing are explained in part by managerial incentives to set low prices. For example, [Ljungqvist and Wilhelm \(2003\)](#) find that underpricing is positively related to the proportion of IPO shares offered to families and friends of company employees, and they interpret this result as reflecting managerial influence over the offer price.<sup>3</sup> A problem with this test of the managerial-influence hypothesis is that many family and friends shares are allocated to lower-level employees or affiliates of the company who arguably have no input into the IPO offer price. In contrast,

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<sup>1</sup>See, for example, [Habib and Ljungqvist \(2001\)](#), [Loughran and Ritter \(2002, 2004\)](#), [Ljungqvist and Wilhelm \(2003\)](#), [Li and Masulis \(2006\)](#).

<sup>2</sup>In a similar vein, [Aboody and Kasznik \(2000\)](#) provide evidence that executives manipulate the timing of news announcements so that negative news is released before an option grant, while positive news is delayed until just after an option grant.

<sup>3</sup>[Ljungqvist and Wilhelm](#) also find that underpricing is negatively related to the CEO’s fraction of pre-IPO ownership. Because managers holding significant pre-IPO shares lose from IPO underpricing, this seems consistent with managerial influence over offer prices. However, this relation is only significant for Internet firms. We discuss this finding further in Section 5.

we focus on IPO options granted to top executives, who should have the most power (of anybody within the firm) to affect the offer price. Executives receiving IPO options will desire lower offer prices (holding pre-IPO ownership and the market price constant). Therefore, to the extent that company executives can influence price-setting in IPOs, we expect IPO underpricing to be higher in companies granting IPO options. Rocholl (2005) finds support for this hypothesis in a sample of companies listing on the Neuer Markt in Germany: companies with IPO options experience significantly higher underpricing than those without such options.<sup>4</sup>

In this paper, we analyze managerial influence over both compensation and IPO pricing decisions. Section 2 describes our data and summarizes the incidence of IPO options in a random sample of 874 IPOs between 1996 and 2000. Section 3 examines IPO options as a potential explanation for cross-sectional differences in IPO underpricing. We control for variables in the literature commonly linked to underpricing, and also for managerial characteristics (such as ownership of pre-IPO shares) that affect management incentives to underprice. In contrast to Rocholl's (2005) evidence from Germany, we find no evidence that US firms granting IPO options have higher first-day returns than firms not granting such options. Our results are robust to a variety of specifications and control variables, and are starkly inconsistent with the hypothesis that executives with IPO options take actions to increase the value of these options by setting especially low offer prices.

Section 4 tests for managerial influence over compensation by examining whether IPO options are granted more often and in larger quantities when the expected underpricing is higher. Contrary to our expectations, we find that firms in high-technology industries (with the highest underpricing and the largest overall option grants) grant IPO options with less frequency than do firms in other industries. We find some evidence that companies with stronger corporate governance are less likely to make IPO option grants, but we find no evidence that the prevalence or magnitude of IPO option grants is positively related to the anticipated underpricing. Finally, we allow for the joint endogeneity of IPO option grants and underpricing and again find no evidence that IPO options are related to IPO underpricing.

If managers can influence either the terms of their option grants or the IPO offer price, then we would expect a positive relation between IPO options and IPO underpricing. Our primary finding—that IPO underpricing is unrelated to the existence or magnitude of IPO options—is inconsistent with the emerging literature that executives influence compensation and IPO pricing decisions in ways that increase their personal wealth. Section 5 attempts to reconcile our results with those in the existing literature and discusses what is learned through our analysis. Section 6 concludes.

## 2. The prevalence of IPO options

### 2.1. Data

Our dataset consists of a random sample of 874 IPOs with prospectuses available on the Securities and Exchange Commission's (SEC's) Electronic Data Gathering, Analysis, and

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<sup>4</sup>Taranto (2003) also examines the relation between stock options and underpricing, but his analysis focuses on the tax benefits of options rather than the executive's benefits from setting the option exercise price at the IPO offer price.

Retrieval (EDGAR) system between 1996 and 2000. To form this sample, we first collect data on all IPOs during this period from the Securities Data Company (SDC) database. We eliminate REITs, ADRs, closed-end funds, foreign issuers, unit offerings, and IPOs with an offer price less than five dollars. We also require the firm to be listed on the Center for Research in Security Prices (CRSP) within 14 days of the offer, to enable us to calculate the initial return. This leaves a total of 2,250 IPOs. We collect data on a random sample consisting of one-half of these firms. To obtain the necessary information on executive ownership and options, each firm must have an IPO prospectus and a proxy statement for the fiscal year that includes the IPO. Because EDGAR does not have such filings for all firms, we lose some additional firms, resulting in our final sample of 874 IPOs.

To investigate the relation between underpricing and options issued at the offer price, we hand-collect data on options issued around the IPO. We obtain this information from the proxy statement that covers the fiscal year of the IPO. The typical company discloses information on the five highest-paid executive officers, though the number of executives covered varies across firms.<sup>5</sup> We obtain information on options issued to each of these top officers in the year of the IPO. An IPO option is defined as an option whose exercise price is directly linked to the IPO offer price. In most cases, an IPO option is an option with an exercise price equal to the offer price, and it is issued on (or within a few days of) the offering date. In a small number of cases, however, options are issued with an exercise price equal to some percent of the offer price (e.g., 80% or 110%), and these also qualify as IPO options. In addition, IPO options can be issued several months before or after the IPO. In these slightly ambiguous cases, we refer to the text of the prospectus to determine whether it was in fact an IPO option, i.e., whether the exercise price was explicitly linked to the offer price. Finally, we also collect data on options issued after the IPO and options outstanding at the end of the first post-IPO fiscal year.

Executive ownership data are extracted from the IPO prospectus. We collect information on the number of shares owned by each of the top executives identified above, as well as the number of shares each executive sold in the offering. Our objective is to characterize how much the executive personally has at stake, which includes not just direct ownership but ownership by the executive's family members, shares in trusts associated with the executive, and other related holdings. We read the footnotes of the ownership tables to characterize these data as accurately as possible. Executive ownership is defined as shares owned by the top executives as a fraction of shares outstanding prior to the IPO.

We obtain the offer price, offer date, proceeds, and number of primary and secondary shares issued from the prospectus, supplementing these data with SDC data when necessary. We also obtain the filing range, the number of shares filed, whether the issue was backed by a venture capitalist, whether the issue is in a technology industry, and the names of the lead underwriters from SDC.

We use our data to calculate various IPO-specific statistics. The initial return (our measure of underpricing) equals the percent difference between the first aftermarket closing price and the offer price. Volatility is defined as the standard deviation of daily returns over the first three months after the IPO, minus the standard deviation of the

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<sup>5</sup>The SEC requires disclosure on the top five highest-paid executive officers with total cash compensation exceeding \$100,000; many of the smaller IPOs in our sample have fewer than five executive officers meeting these criteria.

equally weighted market index over that same period. To rank each underwriter, we use Loughran and Ritter's (2004) updated measures of Carter and Manaster's (1990) underwriter quality.<sup>6</sup> Ranks range from zero to nine, with higher ranks representing higher-quality underwriters. Overhang is defined as pre-IPO shares retained divided by shares issued in the IPO. Firms with greater overhang suffer less dilution, meaning the costs of underpricing are lower and the level of underpricing is likely to be greater (Bradley and Jordan, 2002).

Finally, we classify firms into several industry groupings. Firms that Loughran and Ritter identify as Internet firms are labeled as such. Firms that SDC defines as belonging to a high-tech industry, but that are not included in the Internet category, are classified as technology firms. Among firms that do not fall into either of these categories, those with an SIC code between 6000 and 6999 are classified as finance firms. All remaining firms fall into an "other firms" category.

## 2.2. Descriptive statistics on IPO options

Table 1 provides descriptive statistics on firms with and without options issued at the offer price to a top executive. Looking first at Panel A, we see that approximately one-third of our sample firms have IPO options (288 out of a total of 874 firms). The second row provides some preliminary evidence against our main hypothesis that firms with IPO options tend to have higher underpricing: firms with IPO options have average initial returns of 29%, compared to 49% for firms without such options, and the difference is significant at the 1% level.

Additional statistics in Panel A suggest that at least some of this difference in underpricing is related to significant differences in the types of firms that have IPO options. For example, firms with IPO options tend to have higher offer prices, larger offerings, and lower post-IPO volatility, and are less likely to be venture backed or to be Internet or technology firms. All of these relations suggest that firms with IPO options tend to be less risky, and less risky firms tend to have lower initial returns. At a minimum, the evidence in this table emphasizes the importance of controlling for firm-specific characteristics in subsequent tests.

Panel A of Table 1 also shows that firms with IPO options have significantly lower overhang. This is consistent with these firms' lower initial returns, as overhang and initial returns are positively correlated. In addition, top executives in firms with IPO options own an average 30% of shares outstanding prior to the IPO, compared to 26% for firms without IPO options; the difference is significant at the 10% level.

Finally, Panel A of Table 1 shows that about 62% of companies granting IPO options had also granted options to its top executives before the IPO, while 87% of companies *not* granting IPO options had granted options previously. These results indicate that most companies issue stock options to their top executives before going public. Moreover, companies not granting options before the IPO date are more likely to grant IPO options than are companies with previously granted options. Specifically, of the 686 companies with pre-IPO options, 26% granted IPO options to at least one of their top executives. In comparison, 58% of the companies without any pre-IPO options granted IPO options to

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<sup>6</sup>We thank Jay Ritter for making data on underwriter ranks available: <http://bear.cba.ufl.edu/ritter/ipodata.htm>.

Table 1  
Average characteristics of firms with options granted at the offer price

	<i>Panel A</i> <i>Grants to any executive</i>		<i>Panel B</i> <i>Grants to CEO</i>	
	IPO Options	No IPO Options	IPO Options	No IPO Options
Number of Firms	288	586	176	698
Percent Initial Return	29.1	48.7***	27.3	46.1***
Offer Price (\$)	14.1	13.0***	14.4	13.2**
IPO proceeds (2000 \$mil)	131.2	71.0***	150.7	75.8**
Assets prior to IPO (2000 \$mil)	359.5	681.5	507.0	595.1
Volatility after IPO (%)	4.2	5.3***	4.1	5.2***
Underwriter Rank	7.7	7.5	7.6	7.5
Overhang	3.3	4.0***	3.3	3.9**
% Venture Capital Backed	28.1	49.8***	26.1	46.8***
% Internet Firms	14.6	24.7***	13.6	23.4***
% Technology (non-Internet) Firms	28.1	41.3***	24.4	40.1***
% Finance Firms	8.0	5.5	8.5	5.7
% Equity carve-outs	6.6	2.9**	9.1	2.9***
Executive (CEO) Stock Ownership (%)	30.5	26.2*	16.1	19.8*
% Firms granting pre-IPO options to executives (CEOs)	61.8	86.7***	50.0	58.3**

*Note:* The sample consists of 874 firms that went public between 1996 and 2000. IPO options are defined as options granted on or near the IPO date with an exercise price explicitly tied to the offer price. Percent initial return equals the percent change between the first aftermarket price and the offer price. The offer price is the price at which the company goes public. IPO proceeds equal the amount of money raised in the IPO, in millions of 2000 dollars. Assets equal firm assets prior to the IPO, in millions of 2000 dollars. Volatility after the IPO equals the standard deviation of daily firm stock returns over the first three months after the IPO, minus the standard deviation of the equally weighted index over that same period. Underwriter rank is a measure of the quality of the underwriter, with the minimum rank being zero and the maximum being nine, according to Loughran and Ritter's updated measures of the Carter and Manaster rankings. Overhang is defined as pre-IPO shares retained divided by shares issued in the IPO, where pre-IPO shares retained represent shares owned by pre-IPO shareholders that are not sold in the offering. Percent venture capital backed equals the percent of IPOs that are backed by venture capitalists before the IPO. Firms that Loughran and Ritter classify as belonging to the Internet industry are labeled Internet firms. Firms that SDC defines as belonging to a high-tech industry (but that do not belong to the Internet industry) are classified as technology firms. Firms that are in neither the Internet nor the high-tech industry and that have an SIC code between 6000 and 6999 are classified as finance firms. We rely on SDC to determine whether each offering is an equity carve-out. Pre-IPO options are defined as options granted prior to the IPO; Columns 1 and 2 (3 and 4) show the percent of firms that grant such options to their top executives (CEOs). Executive stock ownership (Columns 1 and 2) equals shares owned by the top executives as a fraction of shares outstanding prior to the IPO, and CEO stock ownership (Columns 3 and 4) is the analogous measure for the CEO only.

Asterisks denote significance differences between the two samples, based on *t*-statistics.

\*\*\*, \*\*, \* Denote significance at the 1%, 5%, and 10% level.

one of their top executives (not reported in the tables). For some of our newly public companies (such as companies created through equity carve-outs or family-owned businesses in which top executives have substantial stock ownership), the IPO date is the first occasion on which options are granted.

Panel B of Table 1 focuses on IPO options granted to CEOs. If CEOs have more control over the offer price than other executives, then the relation between IPO options and

underpricing should be more pronounced when the CEO receives such options. Of the 288 firms with IPO options, Panel B shows that 176 (61%) grant such options to the CEO. Contrary to our expectations, we find that firms whose CEO has IPO options actually have lower underpricing than firms in which any executive holds such options (27% for firms in which the CEO has IPO options, as reported in Panel B, compared to 29% across all firms in which any executive has IPO options, as reported in Panel A). At a minimum, Panel B provides no support for the idea that the relation between underpricing and the presence of IPO options is stronger when CEOs hold the options. A comparison of other firm characteristics across firms in which the CEO does or does not have IPO options results in inferences similar to those from Panel A.

### 3. Managerial influence over offer prices

#### 3.1. Managerial incentives to underprice

Executives receiving options with an exercise price equal to the IPO offering price benefit from higher underpricing (that is, lower offer prices relative to the aftermarket price). In contrast, executives holding shares of stock or options prior to the IPO lose from underpricing, because their shares are diluted when new shares are sold below the market price (see, e.g., Barry, 1989). To investigate the extent to which the net gain from underpricing is positive, we compute the hypothetical gains and losses from each \$1 decrease in the offer price (holding the aftermarket price constant) as follows:<sup>7</sup>

$$\text{Gain} = \left( \begin{array}{c} \text{Number of} \\ \text{IPO Options} \end{array} \right), \quad (1)$$

$$\text{Loss} = \left( \begin{array}{c} \text{Number of Shares} \\ \text{Exec Sold in IPO} \end{array} \right) + \left( \begin{array}{c} \text{Number of New Shares} \\ \text{Offered in IPO} \end{array} \right) \times \left( \begin{array}{c} \text{Executive's portion of} \\ \text{total shares retained} \\ \text{by company} \end{array} \right) \quad (2)$$

Table 2 provides summary statistics on the amounts gained and lost from IPO underpricing, for executives grouped by the ratio of gain to loss as defined in (1) and (2). The first column (gain/loss = 0) consists of the 3,043 executives who do not receive IPO options; their gain from underpricing is zero (by construction), while their average loss from underpricing is nearly \$2.3 million. The second column (0 < gain/loss ≤ 1) includes 373 executives receiving IPO options whose gains from underpricing are exceeded by their losses from pre-IPO shareholdings: these executives realize an average net loss of \$1.7 million from underpricing. The third column (1 < gain/loss ≤ 3) includes 133 executives who gain between \$1 and \$3 for each dollar lost from pre-IPO shareholdings; the average

<sup>7</sup>In computing the gain from underpricing, we ignore shares purchased by the executive at the offer price (an occurrence that is extremely rare in our data). Also, computing the gain from an IPO option as the dollar amount of the underpricing technically overstates the economic gain, because the value of options increases less than a dollar when the exercise price is lowered by a dollar. However, option deltas for IPO options are typically close to one, given the average term of these options (ten years), the inherent volatility in post-IPO stock prices, and the amount of the underpricing. This suggests that the gain from IPO options is reasonably measured by the dollar amount of the underpricing.

Table 2  
Do executives gain or lose money from underpricing the IPO?

Sample averages:	Executives ranked according to ratio of gains from ipo options to losses from pre-IPO shareholdings for each \$1 of underpricing			
	$\frac{\text{Gain}}{\text{Loss}} = 0$	$0 < \frac{\text{Gain}}{\text{Loss}} \leq 1$	$1 < \frac{\text{Gain}}{\text{Loss}} \leq 3$	$\frac{\text{Gain}}{\text{Loss}} > 3$
Number of executives	3,043	373	133	381
Company-level information				
Initial return	52%	29%	25%	25%
Underpricing per share	\$9.24	\$4.80	\$4.10	\$4.37
Total shares offered	17,130,600	13,546,976	6,236,081	7,562,709
Money left on table	\$115,286,301	\$137,198,048	\$25,382,929	\$49,290,012
Executive-level information				
# IPO options granted	0	83,096	140,143	149,002
Gain from underpricing due to IPO options	\$0	\$460,507	\$608,526	\$1,092,177
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Executive portion of total shares retained by company	7%	11%	2%	0%
Secondary shares sold	14,619	22,870	1,167	53
Loss from underpricing, due to pre-IPO ownership	\$2,273,433	\$2,209,734	\$373,068	\$44,668
<hr/>				
<b>Net gain from IPO underpricing</b>	−\$2,273,433	−\$1,749,227	\$235,458	\$1,059,097

*Note:* The gain from each \$1 of underpricing (“Gain”) is defined as the number of IPO options granted to each executive. The loss from each \$1 of underpricing (“Loss”) is defined as the number of secondary shares sold by the executive, plus the number of primary shares offered multiplied by the executive’s portion of total shares retained by the company (including options granted prior to the IPO and excluding all secondary shares). The gain from underpricing due to IPO options equals Gain multiplied by the dollar amount of the underpricing, and the loss from pre-IPO ownership (through both shares sold and dilution of retained shares) equals Loss multiplied by the dollar amount of the underpricing. Firms are put into one of four categories (as shown in Columns 1–4), based on the ratio of gain to loss. The first row shows the number of executives in each table. Company-level information represents information on the offering, averaged across the  $N$  executives in each category. Executive-level information represents information on each executive, similarly averaged across the  $N$  executives in each category.

“net gain” for these executives is about \$0.24 million. Finally, the fourth column (gain/loss > 3) includes 381 executives whose gain from IPO options is more than \$3 for each dollar lost from pre-IPO shareholdings. Executives in this group (which includes 254 executives who receive IPO options but own no shares prior to the IPO) realize an average net gain of over \$1 million.

The results in Table 2 show that the gains from underpricing exceed the loss from underpricing for 58% of the 887 executives receiving IPO options. However, Table 2 provides no evidence for our primary hypothesis that IPO options are positively related to underpricing but negatively related to pre-IPO ownership. Indeed, IPOs in which executives receive no IPO options have significantly higher underpricing as measured both in percentage (52%) and dollar (\$9.24) terms than do IPOs in which the executives receive IPO options (underpricing of 25% to 29%, \$4.10 to \$4.80). Within those IPOs where executives receive IPO options, there is no evidence that the underpricing is positively

related to the gain to loss ratio (which is an ex ante measure of executives' incentives to push for underpricing). Table 2 is not definitive, of course, because there could be other factors affecting underpricing that are also correlated with IPO option grants. We now turn to a regression analysis to control for such factors.

### 3.2. *IPO options and IPO underpricing*

Table 3 reports regressions explaining the first-day return in initial public offerings. The dependent variable is the percent difference between the first-day aftermarket price and the offer price. Independent variables include measures of IPO options (which we predict to be positively related to initial returns) and pre-IPO ownership by executives (which we predict to be negatively related to initial returns). In addition, we include a variety of controls that have been found in the prior literature to be related to IPO underpricing:

*Pre-IPO assets* (the logarithm of the book value of assets, adjusted for inflation using the 2000 Consumer Price Index). More information tends to be available about larger firms, suggesting that firms with greater assets will have lower information asymmetry and therefore lower underpricing.

*Overhang* (shares retained by pre-issue shareholders divided by shares issued in the IPO; see Bradley and Jordan, 2002). Ignoring secondary share sales, underpricing costs are reflected by dilution and are shared in relative proportion by all pre-IPO shareholders. A high number of shares offered relative to the number of existing shares (i.e., low overhang) causes dilution costs to be high, suggesting that underpricing will be low. We thus expect underpricing to be positively related to overhang.

*Underwriter rank* (a measure of underwriter quality as defined by Carter and Manaster (1990) and updated by Loughran and Ritter (2004)). Carter and Manaster argue that there is less uncertainty surrounding issues whose values are certified by higher-quality underwriters, and they therefore predict that underwriter rank should be negatively related to underpricing. However, Loughran and Ritter argue that underwriter rank could be positively related to underpricing because (1) companies going public want to attract the best analysts, who are often associated with the best underwriters, and (2) these underwriters tend to have more leverage to underprice the IPO shares, creating valuable currency to allocate to current or potential future investment banking clients.

*Venture-capital backing*. Similar to Carter and Manaster's arguments regarding underwriter rank, Megginson and Weiss (1991) predict that venture capitalists certify the value of an offering, thereby decreasing information asymmetry and resulting in lower underpricing. In addition, as active investors in the pre-IPO company that rarely sell shares in the IPO, venture capitalists will predictably seek to reduce "money left on the table" in IPOs, also resulting in lower underpricing.

*Nasdaq index and the Internet "bubble"*. Many authors show that both the number of firms going public and the magnitude of IPO underpricing tend to increase during bull markets. We include the Nasdaq composite index to control for such effects. To account for the especially high initial returns during the Internet bubble in 1999 and 2000, we also include a dummy variable for these years.

*Market returns* (the compounded daily return on an equally weighted index over the 15 trading days, ending on the day prior to the offer). Overall stock-market returns during the period before the offer price is set are positively related to underpricing (see, e.g., Logue, 1973; Hanley, 1993; Loughran and Ritter, 2002, 2004; Lowry and Schwert, 2004).

Table 3  
Do IPO options to top executives contribute to higher underpricing?

	Exp. sign	<i>Dependent variable: percent initial return</i>			
		96–00	96–00	96–98	99–00
Intercept		–46.6 (–3.4)	–30.04 (–1.4)	–7.65 (–0.5)	–58.88 (–1.6)
IPO options granted? (dummy)	+	–2.11 (–0.4)		4.09 (1.2)	–17.58 (–1.8)
Pre-IPO executive shares as % of pre-IPO shares outstanding	–	–0.03 (–0.4)		0.07 (1.3)	–0.21 (–1.1)
Ex ante Gain from underpricing (= # of IPO Options granted)	+		–81.48 (–0.8)		
Ex ante Loss from underpricing from Pre-IPO Ownership	–		–0.28 (–0.0)		
Ln (Real assets)	–	–3.46 (–2.3)	–3.62 (–1.6)	–0.17 (–0.1)	–6.38 (–2.1)
Overhang	+	4.64 (5.5)	3.68 (2.5)	1.08 (1.9)	9.32 (5.2)
Underwriter Rank		3.72 (2.8)	3.27 (1.6)	1.82 (2.2)	7.89 (2.3)
VC-backed (dummy)	–	10.37 (2.0)	8.20 (1.0)	–6.4 (–1.7)	27.82 (2.8)
Technology firm	+	1.77 (0.3)	2.72 (0.3)	6.09 (1.7)	11.64 (0.8)
Internet firm	+	52.03 (6.6)	54.47 (4.3)	71.55 (8.6)	43.13 (2.8)
Finance firm		–11.06 (–1.0)	–6.10 (–0.4)	–9.70 (–1.4)	2.10 (0.1)
Nasdaq Index		7.83 (2.4)	6.96 (1.3)	–0.32 (–0.1)	2.97 (0.6)
Market Return	+	3.20 (5.8)	2.91 (3.2)	2.09 (5.0)	4.86 (4.6)
1999 or 2000 year dummy	+	14.85 (2.1)	–3.96 (–0.4)		
Number of observations		836	269	468	368
R-squared		0.33	0.24	0.2	0.28

*Note:* In Column 1, the sample consists of IPOs between 1996 and 2000. In Column 2, the sample consists of IPOs between 1996 and 2000 in which at least one of the top executives was granted IPO options. The samples in Columns 3 and 4 consist of IPOs between 1996 and 1998 and between 1999 and 2000, respectively. The ex ante gain from underpricing (“Gain”) equals the number of IPO options granted to each executive, in millions, divided by the offer price. The ex ante loss from underpricing (“Loss”) equals the number of secondary shares sold by the executive, plus the number of primary shares offered multiplied by the executive’s portion of total shares retained by the company (including options granted prior to the IPO and excluding all secondary shares), in millions, divided by the offer price. The “Nasdaq Index” is the level of the Nasdaq Composite Index at the end of the month preceding the IPO. The “Market return” is the compounded daily percentage return on an equally weighted index over 15 trading days, ending on the day prior to the offering date. All other variables are defined in Table 1. *T*-statistics are shown in parentheses.

*Industry controls.* Information asymmetry theories predict that initial returns will be higher for riskier firms, suggesting that firms in technology industries will be more underpriced. We thus include an Internet dummy and a technology dummy (defined as

non-Internet technology firms, using the SDC high-tech classification). Analogously, we include a finance firm dummy to capture the potentially different risk characteristics of these firms.

Columns 1 and 2 of Table 3 report coefficients of regressions explaining IPO underpricing over the 1996–2000 period, including measures of IPO options and executive pre-IPO ownership as well as the control variables discussed above. In Column 1, the measure of IPO options is a dummy variable equal to one if any of the top executives in the firm receive IPO options. The coefficient on this dummy variable is negative (rather than positive as predicted) but not significant. Pre-IPO executive shareholdings are negatively related to underpricing as predicted, but the relation is similarly insignificant.

While Column 1 of Table 3 addresses whether the *prevalence* of IPO options affects initial returns, Column 2 focuses on the *magnitude* of IPO options for the subsample of firms granting IPO options. The primary variables of interest are the ex ante gain from underpricing (defined in Eq. (1) as the number of IPO options) deflated by the offer price and the ex ante loss from underpricing (defined in Eq. (2) as a function of pre-IPO ownership), also deflated by the offer price.<sup>8</sup> The gain and loss coefficients are both statistically insignificant, and the gain coefficient has the wrong sign. In sum, neither Column 1 nor Column 2 provides any support for our main hypothesis that firms whose top executives have IPO options tend to have higher underpricing.

In both Columns 1 and 2, the inferences on the control variables are generally similar to prior results in the literature. Consistent with Ljungqvist and Wilhelm (2003) and Loughran and Ritter (2004), we find that Internet firms and firms that went public during the bubble period tended to have higher initial returns. Consistent with the idea that larger offerings are subject to less information asymmetry, we find that firms with greater pre-IPO assets tend to experience lower initial returns. Similar to Bradley and Jordan (2002), we obtain a significantly positive coefficient on overhang: dilution costs are greater in issues with lower overhang, suggesting that underpricing will be lower. Consistent with existing findings, prior market returns are also positively related to initial returns. However, in contrast to the predictions of Carter and Manaster (1990) and Megginson and Weiss (1991), but similar to the findings of Beatty and Welch (1996), Cooney, Singh, Carter, and Dark (2001), and Loughran and Ritter (2004), we find that underwriter rank and venture capital backing are positively (rather than negatively) related to underpricing. The coefficient on the Nasdaq composite index is positive and marginally significant in Column 1, providing some evidence that initial returns are higher when the level of the Nasdaq index is higher.

Loughran and Ritter (2004) and Lowry and Schwert (2004) show that many factors influenced underpricing differently during the bubble period, suggesting that our coefficient estimates in the Table 3 regressions might not be stable throughout our sample period. To address this concern, Columns 3 and 4 of Table 3 re-estimate the Column 1 regression over the 1996–1998 and 1999–2000 subperiods, respectively. Consistent with Loughran and Ritter (2004) and Lowry and Schwert (2004), many of the coefficients on the control variables are

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<sup>8</sup>As discussed earlier, the gain from each IPO option is a direct function of the dollar underpricing, i.e., the difference between the first secondary market closing price and the offer price. For regressions, we deflate both the number of IPO options and the dollar underpricing by the offer price. This results in percent underpricing as the dependent variable and the number of IPO options over the offer price as our measure of the magnitude of IPO options. Missing data on certain explanatory variables limit the sample size in some regressions.

significantly different between the two regressions. However, the coefficients on our main variables of interest—the measures of IPO options and pre-IPO ownership—still provide no support for our main hypothesis: none are significant in the predicted direction. Inferences are similar if we re-estimate the Column 2 regressions over the same subperiods.

We specify the above regressions in a variety of other ways (not reported in our tables) to check the robustness of our results. For example, we divide the loss into losses from secondary share sales and losses due to dilution, and we estimate regressions including both these explanatory variables. We also define the initial return as the percent difference between the offer price and the aftermarket price 21 trading days after the IPO (instead of the first day), to ensure that the effects of underwriter price support do not bias our results.<sup>9</sup> In addition, we redefine our measure of IPO options in a variety of ways, including IPO options as a fraction of shares issued in the offering (following Taranto, 2003) and as a fraction of pre-IPO shares. In all cases, our inferences are unchanged: we detect no positive relation between IPO options and IPO underpricing.

We also examine the possibility that IPO options are used to compensate executives for unexpectedly low share values in cases where it becomes apparent that the offering will be less successful than originally anticipated. Assuming the initial return is still expected to be positive, this would suggest that executives in firms with lower *unexpected* initial returns would have more IPO options. We have tested this in a two-stage framework: we regress initial returns on factors related to underpricing, and then put the residual from this regression into a second-stage regression where IPO options is the dependent variable. However, results provide no support for the idea that IPO options represent an eleventh-hour payment to executives.

### 3.3. CEO influence over the offer price

Habib and Ljungqvist (2001) hypothesize that underpricing will be related to managers' incentives: IPOs in which managers have greater incentives to bargain for higher offer prices, for example because they are selling their own shares in the IPO, will be less underpriced. However, Table 3 provides no evidence that the top-executive team can influence offer prices to their personal advantage.<sup>10</sup>

Table 4 provides a potentially stronger test of this managerial influence hypothesis. Among the top-executive team, the CEO arguably has the most influence over the offer price. Table 4 replicates the regressions in Table 3 based only on IPO options and pre-IPO ownership for the CEO. As before, regressions in Columns 1 and 2 of Table 4 include IPOs over the entire sample period, with Column 1 focusing on the prevalence and Column 2 on the magnitude of IPO options. Columns 3 and 4 focus on the 1996–1998 and 1999–2000 subperiods, respectively.

Similar to the inferences from Table 3, Columns 1 and 2 provide no support for the managerial influence hypothesis: none of the coefficients on either IPO options or pre-IPO CEO ownership are significant. However, Column 3 provides some evidence in support of

<sup>9</sup>Aggarwal (2000) shows that underwriters are generally not actively involved in price support activities a month after the offering.

<sup>10</sup>Our results that top executives cannot influence the offer price are consistent with those of Loughran and Ritter (2004), who find no evidence that IPOs in which managers or other pre-IPO shareholders sell shares (meaning they would benefit from a higher offer price) are less underpriced.

Table 4  
Do IPO options to the CEO contribute to higher underpricing?

	Exp. sign	<i>Dependent variable: percent initial return</i>			
		96–00	96–00	96–98	99–00
Intercept		–44.4 (–3.3)	–38.36 (–1.4)	–6.18 (–0.4)	–58.8 (–1.7)
IPO options granted? (dummy)	+	–1.72 (–0.3)		6.72 (1.8)	–22.39 (–1.8)
Pre-IPO CEO shares as % of pre-IPO shares outstanding	–	–0.10 (–1.0)		0.04 (0.6)	–0.35 (–1.5)
Ex ante Gain from underpricing (= # of IPO Options granted)	+		–167.65 (–1.1)		
Ex ante Loss from underpricing from Pre-IPO Ownership	–		–19.23 (–0.5)		
Ln (Real assets)	–	–3.55 (–2.3)	–5.36 (–1.8)	–0.34 (–0.3)	–6.11 (–2.0)
Overhang	+	4.68 (5.6)	2.02 (1.1)	1.11 (1.9)	9.49 (5.3)
Underwriter Rank		3.58 (2.7)	4.80 (1.8)	1.87 (2.3)	7.55 (2.2)
VC-backed (dummy)		9.91 (2.0)	–1.94 (–0.2)	–7.28 (–2.0)	26.84 (2.7)
Technology firm	+	1.70 (0.3)	8.90 (0.7)	6.39 (1.8)	11.21 (0.7)
Internet firm	+	52.04 (6.7)	54.92 (3.4)	71.04 (8.5)	43.81 (2.8)
Finance firm		–10.74 (–1.0)	–3.50 (–0.2)	–9.79 (–1.4)	2.19 (0.1)
Nasdaq Index		7.76 (2.4)	11.51 (1.5)	–0.21 (0.0)	2.98 (0.6)
Market Return	+	3.23 (5.8)	2.78 (2.4)	2.10 (5.1)	4.93 (4.7)
1999 or 2000 year dummy	+	14.8 (2.1)	–14.02 (–0.9)		
Number of observations		836	163	468	368
R-squared		0.33	0.21	0.2	0.29

*Note:* In Column 1, the sample consists of IPOs between 1996 and 2000. In Column 2, the sample consists of IPOs between 1996 and 2000 in which at least one of the top executives was granted IPO options. The samples in Columns 3 and 4 consist of IPOs between 1996 and 1998 and between 1999 and 2000, respectively. The ex ante gain from underpricing (“Gain”) equals the number of IPO options granted to the CEO, in millions, divided by the offer price. The ex ante loss from underpricing (“Loss”) equals the number of secondary shares sold by the CEO, plus the number of primary shares offered multiplied by the CEO’s portion of total shares retained by the company (including options granted prior to the IPO and excluding all secondary shares), in millions, divided by the offer price. The “Nasdaq Index” is the level of the Nasdaq Composite Index at the end of the month preceding the IPO. The “Market return” is the compounded daily percentage return on an equally weighted index over 15 trading days, ending on the day prior to the offering date. All other variables are defined in Table 1. *T*-statistics are shown in parentheses.

the prediction that CEOs with IPO options underprice their offerings by a greater amount: the coefficient on the IPO options dummy for the 1996–1998 period is positive and marginally significant. Nonetheless, we hesitate to interpret this single finding too strongly.

This is the only relevant coefficient in Tables 3 or 4 that is significant in the expected direction, and several are significant in the opposite direction. In addition, the result is not robust to alternative specifications not reported in the table: when we use the ex ante gain and loss (as in Column 2) as our measure of IPO options instead of the dummy variable over this same subperiod, the coefficient is significantly negative. Similarly, the IPO dummy variable is significantly negative in the 1999–2000 regression (shown in Column 4). In sum, the results in Table 4 suggest that the predicted relations are no more pronounced for the CEO than for the top management team taken as a whole.

### 3.4. *Managerial influence over the price within the filing range*

Our objective is to examine whether executives with IPO options increase their personal wealth by underpricing their IPOs by a greater amount. Up to this point, we have investigated executives' ability to influence the offer price by examining whether initial returns are significantly related to IPO options and pre-IPO ownership. As an alternative test of this same idea, we examine the relation between IPO options and the price update, defined as the percentage change between the offer price and the midpoint of the filing range (as stated in a preliminary prospectus). An advantage of this approach is that it does not rely on the assumption that the first aftermarket price is an unbiased estimate of firm value, an assumption that Loughran and Ritter (2004) suggest might not hold during the bubble period. However, this approach also assumes that all bargaining over the offer price occurs at the pricing meeting (when the offer price is set) rather than when the underwriter is chosen (prior to the setting of the initial filing range).

To examine the relation between the price update and both IPO options and pre-IPO ownership, we estimate regressions similar to those in Tables 3 and 4. IPO options and pre-IPO options are defined as above, and most of the same control variables are included. The only difference is that the dependent variable is the price update instead of the initial return. Results (not reported in the tables) yield inferences similar to those from the previous section. None of the coefficients on either IPO options or pre-IPO ownership are significant, regardless of whether we define IPO options as a dummy variable or a dollar gain, and regardless of whether regressions are specified over the entire 1996–2000 sample period or over the 1996–1998 and 1999–2000 subperiods. In summary, regressions using the price update as the dependent variable again provide little support for the conjecture that executives are able to influence the offer price to their advantage.

## 4. **Managerial influence over stock option arrangements**

One of the most striking facts about executive stock options in the US is that the exercise price is nearly always set equal to the current stock price at the grant date. For example, 94% of option grants to S&P 500 CEOs in 1998 were at-the-money grants, despite the fact that in-the-money options would be optimal in many situations (Hall and Murphy, 2000, 2002). Several explanations for this widespread practice have been offered in the literature. First, options that are in-the-money at grant are not deductible as a compensation expense if an executive's total non-performance-based compensation exceeds \$1 million.<sup>11</sup> Second,

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<sup>11</sup>Options granted in the money are not considered "performance-based compensation" under Section 162(m) of the Internal Revenue Code.

because the accounting charge for options (during our sample period) is equal to the “spread” between the market and exercise price on the date of grant, options granted in-the-money trigger an accounting charge, which makes them less desirable from the standpoint of accounting-fixated boards of directors (Murphy, 2003; Hall and Murphy, 2003).<sup>12</sup> Finally, as argued by Bebchuk, Fried, and Walker (2002), managers desire options with the “lowest possible exercise price” but avoid in-the-money options because of the outrage such options spark from critics.

Although accounting, institutional, and outrage considerations cause options to be granted at-the-money, Yermack (1997) and Aboody and Kasznik (2000) find that grants and information disclosures are strategically timed to make the options in-the-money soon after the grant. Yermack’s results suggest that managers time their grants to occur immediately before good news is publicly disclosed. Aboody and Kasznik take the timing of the grant as given and argue that managers delay disclosing good news until after the grant (while disclosing bad news before the grant). Both Yermack and Aboody and Kasznik suggest that such strategic timing enables executives to increase the value of their options by an average of approximately 2%.

Lie (2005) and Heron and Lie (2007) suggest that the stock price increase following stock option grants reflects *fraudulent* timing of option grants rather than simply *strategic* timing: the grant date of options is set retroactively to a day when the stock price was lower than on the actual grant date, thus increasing the option gains for executives. Such practices represent an extreme example of how executives can influence their stock option arrangements. The practices also run afoul of both accounting and tax laws, and by late-2006 the SEC was investigating more than 130 companies suspected of backdating their option grants.<sup>13</sup>

For a company going public, the potential gains from granting options on the IPO date, or backdating options (that were granted subsequent to the IPO) to the IPO date, are substantially greater—the difference in value is approximately equal to the amount of underpricing, which averages 42 percent during our sample period. For some types of firms, average underpricing is substantially higher, meaning the gains to these executives from obtaining IPO options (compared to post-IPO options) are even greater.

While IPO options are typically in-the-money by the close of trading on the date of grant (that is, the IPO date), they are treated as being granted at-the-money by the SEC, the Internal Revenue Service (IRS), and the Financial Accounting Standards Board (FASB). To the extent that companies want to grant in-the-money options, IPO options provide a way to provide valuable compensation to executives while avoiding tax, accounting, and outrage consequences. Similarly, to the extent that executives can influence the timing of their option grants, executives will prefer IPO options to a similar number of options issued at market prices subsequent to the offering. In either case (managerial influence or company preference) we predict the prevalence and magnitude of IPO option grants to be positively related to the anticipated underpricing.

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<sup>12</sup>Between 1996 and 2000, companies could choose to account for options either as the “fair market value” (using Black-Scholes or a similar valuation methodology) or as the difference between the market price of the stock and the exercise price on the grant date. Until late 2002, only a handful of companies adopted the fair-market-value approach. However, by early 2003, following several accounting scandals that focused attention on accounting problems, more than 100 companies had voluntarily begun to expense options. The fair-value approach became mandatory in 2006.

<sup>13</sup>See, for example, *Wall Street Journal*, Dec. 7, 2006, p. A3.

#### 4.1. Underpricing and options grants around the IPO

Tables 5 and 6 show that IPO underpricing is more pronounced among Internet firms and during the bubble years of 1999 and 2000. If IPO options are granted to take advantage of IPO underpricing, we would expect IPO options to be especially prevalent for Internet firms and during the bubble years. However, as shown in Tables 5 and 6, IPO options diminished rather than grew in 1999 and 2000, and such options are less prevalent in Internet firms than in other industries.

Looking at Panel A of Table 5, average underpricing in 1999 and 2000 was over 70%, compared to an average 16% in the 1996–1998 period. If managers have substantial influence over their compensation, one would expect the use of IPO options to be especially prevalent during the high underpricing years. However, during 1999 and 2000, only 27% of firms granted IPO options to a top executive, and only about 16% of firms granted IPO options to the CEO. In contrast, during the lower initial return years of

Table 5  
Options granted around the IPO, by year

Panel A: Prevalence of IPO options and pre-IPO options						
Firm grouping	IPOs in Sample	Average underpricing	IPO options		Pre-IPO options	
			To any top executive	To CEO	To any top executive	To CEO
1996	180	12.9%	35.0%	18.9%	68.3%	51.1%
1997	192	14.9	38.5	28.1	71.9	51.6
1998	126	23.1	38.1	22.2	71.4	47.6
1999	221	78.5	27.6	15.8	85.5	59.3
2000	155	74.5	27.1	16.1	94.2	72.9
1996–2000	874	42.3	33.0	20.1	78.5	56.6

  

Panel B: Prevalence of Post-IPO Options						
Firm grouping:	Number of IPOs	Post-IPO options: All sample firms		Post-IPO options: Firms in which aftermarket price never fell below offer price		
		To any top executive	To CEO	Number of IPOs	To any top executive	To CEO
1996	180	30.0%	13.9%	49	22.4%	8.2%
1997	192	22.4	12.5	57	19.3	12.3
1998	126	42.9	21.4	22	36.4	9.1
1999	221	40.3	18.6	108	37.0	20.4
2000	155	46.5	27.1	28	25.0	21.4
1996–2000	874	35.7	18.2	258	29.2	15.5

Note: The sample consists of IPOs between 1996 and 2000. Panel A shows the percent of top executives and the percent of CEOs that were granted options at or prior to the IPO. Pre-IPO options are defined as the maximum of (1) options exercisable within 60 days upon the IPO, and (2) options held at the end of the first fiscal year following the IPO, less options granted subsequent to the IPO. Panel B shows the percent of top executives and CEOs that were granted post-IPO options. Post-IPO options are defined as options granted between the IPO and the end of the first fiscal year.

Table 6  
Options granted around the IPO, by industry

<b>Panel A: Prevalence of IPO options and pre-IPO options</b>						
Firm grouping	IPOs in Sample	Average underpricing	<i>IPO options</i>		<i>Pre-IPO options</i>	
			To any top executive	To CEO	To any top executive	To CEO
Internet	187	108.8%	22.5%	12.8%	92.5%	62.0%
Technology (non-Internet)	323	37.6	25.1	13.3	91.0	68.7
Financial	55	8.2	41.8	27.3	41.8	34.5
Other	309	13.0	46.0	30.4	63.4	44.7

  

<b>Panel B: Prevalence of post-IPO options</b>						
Firm grouping	<i>Post-IPO Options:</i> All Sample Firms			<i>Post-IPO Options:</i> Firms in which aftermarket price never fell below offer price		
	Number of IPOs	To any top executive	To CEO	Number of IPOs	To any top executive	To CEO
Internet	187	49.2%	20.3%	72	43.1%	20.8%
Technology (Non-Internet)	323	35.3	20.7	95	24.2	14.7
Financial	55	23.6	14.5	16	12.5	12.5
Other	309	30.1	20.3	81	25.9	12.3

*Note:* The sample consists of IPOs between 1996 and 2000. Panel A shows the percent of top executives and the percent of CEOs that were granted options at or prior to the IPO. Pre-IPO options are defined as the maximum of (1) options exercisable within 60 days upon the IPO, and (2) options held at the end of the first fiscal year following the IPO, less options granted subsequent to the IPO. Panel B shows the percent of top executives and CEOs that were granted post-IPO options. Post-IPO options are defined as options granted between the IPO and the end of the first fiscal year.

1996–1998, 37% of firms granted IPO options to a top executive, and 23% of firms granted IPO options to the CEO.

While fewer firms granted IPO options during the high underpricing years of 1999 and 2000, many more firms granted pre-IPO options. Irrespective of the level of underpricing, executives are likely to prefer pre-IPO options to IPO options. Options issued prior to an IPO often carry nominal exercise prices (such as 10¢ to \$1.00) that are rarely challenged by the SEC, IRS, or FASB as being below fair market value.<sup>14</sup> The value of pre-IPO options

<sup>14</sup>Indeed, in many cases, pre-IPO options are “unvested but immediately exercisable,” where executives exercise the options and hold the proceeds as forfeitable restricted stock until the vesting restrictions lapse. This seemingly odd decision (to exercise such options early when the acquired shares are forfeitable if the executive departs before vesting) is explained by tax considerations. In particular, if the executive waited until after the IPO to exercise the options, he or she would incur ordinary income tax on the difference between the market price on the exercise date and the nominal exercise price. However, if the executive exercises the option early and elects to treat the restricted stock acquired as taxable at the exercise date (where there is no taxes due, because he or she paid the nominal exercise price which the IRS accepts as the “market” price), the proceeds when the stock is eventually sold is taxed as capital gains and not as ordinary income.

is positively related to the spread between the exercise price and the true (but unobservable) market value, but unrelated to the level of underpricing.

As shown in Panel A of Table 5, 85% of firms granted pre-IPO options to a top executive in 1999, and 94% in 2000. In comparison, only 70% of firms granted pre-IPO options during the 1996–1998 period. Similar differences are found in pre-IPO options granted to CEOs. Therefore, the dramatic rise in IPO underpricing in 1999 and 2000 is associated with a significant decline in the granting of IPO options, but a significant increase in options granted prior to the IPO.

The finding that so many firms granted pre-IPO options in the bubble period suggests the possibility that these pre-IPO options “crowded out” IPO options, i.e., the issuance of pre-IPO options made IPO options unnecessary. If this was the case, then we would expect to see relatively few of these companies granting options in the months immediately following the IPO. Panel B of Table 5 addresses this issue. Specifically, the left-hand side of Table 5 examines the incidence of post-IPO options granted before the end of the first fiscal year following the IPO.<sup>15</sup> The crowding-out idea would predict that firms that went public during the bubble period would be less likely to grant post-IPO options. However, we find the exact opposite. Over 40% of firms that went public in 1999 and 2000 granted post-IPO options to a top executive, compared to 30% of firms that went public in the 1996 to 1998 period.

Finally, the right-hand side of Panel B of Table 5 examines whether the higher frequency of post-IPO options for firms that went public during the bubble period was driven by decreases in these firms’ stock prices. If a firm’s stock price decreases substantially, then executives’ outstanding options become less valuable and companies could be more likely to grant new options, especially if the previous options become out-of-the-money. The last two columns compare the frequency of companies granting post-IPO options, where the sample is restricted to those companies in which the aftermarket price never fell below the offer price prior to the end of the first fiscal year following the IPO. Results continue to show the same pattern, i.e., companies that went public during the bubble period were more likely to grant post-IPO options. The findings that managers of bubble-period IPO firms were less likely to have IPO options and more likely to have post-IPO options are particularly surprising because the difference in value between IPO options and post-IPO options is greatest for IPOs in this period. These results cast doubt on the ability of these managers to influence their compensation to their advantage.

Table 6 examines the same issue, categorizing companies by industry. The value of firms in the Internet and other technology industries is more uncertain, suggesting that they will be more underpriced on average. Consistent with this prediction, Table 6 shows that the average underpricing for Internet firms exceeds 100% during our sample period, and it is nearly 40% for non-Internet technology firms. In comparison, underpricing is only 8% for financial firms and 13% for firms in the “other” category. However, while Internet firms have the highest underpricing, they are the least likely to have IPO options. Only 22% of

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<sup>15</sup>Because firms have IPOs at different points during their fiscal year, the number of days between the IPO and the end of the first fiscal year following the IPO differs across firms. To ensure that differences in the incidence of post-IPO options are not driven by differences in the amount of time examined, we calculate the average number of days between the IPO and the end of the first fiscal year for companies going public in each year, 1996–2000. However, we find no significant differences.

Internet firms and 25% of other technology firms grant IPO options to their top executives, compared to over 40% of firms in the finance and other categories.

Similar to inferences from Table 5, we see that the types of firms with the highest average underpricing have the fewest IPO options, but the most pre-IPO options. Further, Panel B of Table 6 shows that the lower frequency of IPO options cannot be explained by these pre-IPO options crowding out IPO options. In fact, more firms in the Internet category grant post-IPO options than in any other industry group. Similar patterns exist if we restrict the sample to firms whose aftermarket price does not fall below the offer price. The paucity of IPO option grants in Internet firms is inconsistent with our prediction, and it is surprising given the heavy use of options in these types of firms (as reflected by the frequency of both pre-IPO and post-IPO options in these firms).<sup>16</sup>

#### 4.2. The determinants of IPO options and pre-IPO options

Results up to this point indicate that IPO options are not positively related to underpricing as predicted, and they are negatively related to pre-IPO options. Table 7 investigates in more detail the determinants of IPO option grants, as well as the determinants of pre-IPO options, in a multiple regression framework. The table shows Probit regressions explaining the prevalence of IPO and pre-IPO options. The dependent variables in Columns 1 and 2 are binary variables equal to one if the firm grants IPO options to any top executive or to the CEO only, respectively. The dependent variables in Columns 3 and 4 are similarly defined, but for pre-IPO options rather than IPO options.

Consistent with the descriptive evidence in Tables 5 and 6, Columns 1 and 2 of Table 7 provide little evidence that firms with higher expected underpricing are more likely to grant IPO options. For example, while Tables 5 and 6 show that underpricing is significantly higher in the bubble period and significantly higher for Internet firms, the coefficients on both of these variables are negative, and the coefficient on the Internet dummy is significant. At a minimum, this provides no evidence that IPO options are *more* likely in these situations. We also find that non-Internet technology firms are significantly less likely than firms in the other category to grant IPO options, even though average underpricing is substantially higher for such firms (38% for technology, compared to 13% for other; see Table 6). Finally, we include underpricing of IPOs in the same industry grouping (Internet, technology, finance, and other) over the prior six months. To the extent that lagged average underpricing contains information on individual firms' expected underpricing, we would expect this variable to be positively related to IPO options.<sup>17</sup> However, this lagged underpricing measure is not significant at conventional levels.

<sup>16</sup>Ittner, Lambert, and Larcker (2003), Murphy (2003), and Anderson, Banker, and Ravindran (2000) document the extensive use of options in the Internet-related sector.

<sup>17</sup>For several reasons, this variable is unlikely to be a perfect measure of expected initial returns. For example, our reading of prospectuses indicates that some firms announce that they will grant IPO options prior to the filing of the IPO, and for these firms initial returns between the filing and the offering are irrelevant. In addition, over the 1985–1997 period Lowry and Schwert (2002) find that initial returns prior to the filing have no explanatory power for a firm's eventual underpricing. However, because some firms decide to grant IPO options after the filing, because the characteristics of initial returns were so different during the bubble period, and because executives can overestimate the persistence of initial returns, we include this variable as one more potential measure of expected initial returns.

Table 7  
 Probit regressions explaining the prevalence of IPO and pre-IPO options

	Dependent variable is 1 if executive receives IPO options, 0 otherwise		Dependent variable is 1 if executive receives pre-IPO options, 0 otherwise	
	Any executives	CEO	Any executives	CEO
	(1)	(2)	(3)	(4)
Intercept	-0.15 (-0.7)	-0.43 (-1.9)	0.33 (1.5)	0.54 (2.6)
Options granted before IPO? (0,1 dummy variable)	-0.70 (-5.8)	-0.11 (-1.0)		
Executive pre-IPO ownership (fraction, excluding pre-IPO options)	-0.06 (-0.4)	-0.72 (-3.1)	-0.77 (-4.5)	-2.16 (-9.6)
Average underpricing in industry over prior six months.	0.22 (1.0)	0.11 (0.4)	0.49 (1.5)	0.14 (0.6)
VC-backed (dummy)	-0.35 (-3.3)	-0.43 (-3.7)	0.72 (5.3)	0.29 (2.8)
Underwriter Rank	0.08 (3.3)	0.03 (1.1)	0.01 (0.2)	-0.05 (-2.0)
Technology firm	-0.36 (-2.9)	-0.49 (-3.6)	0.71 (4.9)	0.46 (3.8)
Internet firm	-0.57 (-2.3)	-0.57 (-2.1)	0.18 (0.6)	0.02 (0.1)
Finance firm	-0.30 (-1.5)	-0.17 (-0.9)	-0.38 (-1.9)	-0.22 (-1.1)
1999 or 2000 year dummy	-0.11 (-0.8)	-0.10 (-0.7)	0.14 (0.9)	0.13 (0.9)
Number of observations	873	873	873	873
Pseudo- <i>R</i> -squared	0.09	0.07	0.23	0.16

*Note:* The sample consists of IPOs between 1996 and 2000. Executive pre-IPO ownership equals shares owned by the top executives as a fraction of shares outstanding prior to the IPO. Average underpricing in industry over prior six months equals the average underpricing (in decimal form) across all IPOs in the same industry classification, i.e., Internet, other technology, finance, or other. All other variables are defined in Table 1. Asymptotic *t*-statistics are shown in parentheses.

Looking at Column 1, across all top executives, the presence of pre-IPO options is significantly negatively related to the presence of IPO options. However, this relation is not significant for the CEO. Results in Column 2 show that the probability that the CEO receives IPO options is negatively related to his or her pre-IPO ownership (excluding pre-IPO options).

Finally, we find that IPOs engaging top underwriters are more likely to grant IPO options, while IPOs backed by venture capitalists are less likely to grant IPO options. Because venture capitalists generally have substantial board representation and wield considerable influence within companies, they have the capacity to limit managerial self-dealing, such as the granting of IPO options.

The regressions in Columns 3 and 4 of Table 7 suggest that pre-IPO options are negatively related to pre-IPO share ownership, a finding that is consistent with the

expected benefits of stock options. If an executive owns few or no shares in a company, stock options provide significant benefits in terms of motivating him or her to act in the best interests of the shareholders. In contrast, if the executive already owns a substantial share of the company, the benefits of stock options are greatly lessened and it is not surprising that fewer options are granted. Top executives of finance firms are significantly less likely to have pre-IPO options, while executives of technology firms are significantly more likely to have pre-IPO options. This potentially reflects the fact that finance firms tend to have more cash, meaning a greater portion of compensation can be cash-based, while the technology firms tend to have less cash and therefore more stock- and option-based compensation.

Finally, we find that firms backed by venture capital are more likely to have pre-IPO options (Columns 3 and 4). This contrasts with the finding in Columns 1 and 2 that such firms are *less* likely to have IPO options. To some extent, the positive relation between pre-IPO options and venture backing could reflect the fact that firms backed by venture capital are generally start-up firms without a lot of cash, meaning that options are an especially attractive way to compensate executives. However, it also casts some doubt on the extent to which venture capitalists curtail managerial influence—many of these pre-IPO options have extraordinarily low exercise prices, meaning they both enrich management substantially and also dilute the value of other shares when they are exercised.

#### 4.3. Two-stage least squares results

Under the managerial influence hypothesis, both the option-granting decision and the underpricing decision are endogenously determined by the company's most senior executives. Table 8 addresses these endogeneity issues by estimating the determinants of IPO options and IPO underpricing in a simultaneous system of regressions. The dependent variable in the first-stage Probit regression in Column 1 is a binary variable equal to one if any executive receives IPO options, and the dependent variable in the first-stage OLS regression in Column 2 is underpricing. The identifying variable for IPO options is a dummy variable for pre-IPO options (which should be correlated with IPO options but uncorrelated with underpricing), and the identifying variable for IPO underpricing is the return on an equally weighted market portfolio over the 15 days prior to the offering (this variable is correlated with underpricing but should be unrelated to IPO options under the plausible assumption that decisions regarding IPO option grants are made at least 15 days before the offering).

The first-stage regressions in Table 8 are similar to those presented earlier in this paper. One thing to note is that the two identifying variables are significant where expected: pre-IPO options are significantly related to IPO options but not to underpricing, and market returns prior to the IPO are significantly related to underpricing but not to IPO options. The second-stage regressions address the managerial influence hypothesis after controlling for endogeneity. The Probit regression in Column 3 shows that the decision to grant IPO options is not significantly related to the expected initial returns. Similarly, the regression in Column 4 indicates that the presence of IPO options does not cause executives to underprice the offering by a greater amount. Under the managerial-influence hypothesis, both of these coefficients are predicted to be significantly positive. Therefore, even after

Table 8  
Two-stage least-squares regressions explaining IPO options and IPO underpricing

Dependent variable	First-stage results		Second-stage results	
	IPO options to any executive	Underpricing(%)	IPO options to any executive	Underpricing(%)
Intercept	−0.46 (−1.5)	−49.63 (−3.5)	−0.74 (−2.0)	−42.77 (−2.9)
IPO Underpricing (\$ per share) (Instrument)			−0.01 (−1.5)	
IPO Options granted (Instrument)				−20.02 (−0.8)
Options granted before IPO? (0,1 dummy variable)	−0.63 (−5.0)	4.19 (0.7)	−0.61 (−4.8)	
Market Return 15 days before IPO	−0.02 (−1.5)	3.22 (5.8)		3.11 (5.5)
Executive pre-IPO ownership	−0.04 (−0.2)	−2.82 (−0.3)	−0.05 (−0.3)	−3.07 (−0.4)
Ln(Assets)	0.08 (2.4)	−3.48 (−2.3)	0.06 (1.7)	−2.93 (−1.7)
Overhang	−0.05 (−2.7)	4.64 (5.5)	−0.03 (−1.1)	4.31 (4.5)
Underwriter Rank	0.07 (2.4)	3.65 (2.8)	0.09 (2.9)	4.12 (2.9)
VC-backed (dummy)	−0.39 (−3.5)	10.11 (2.0)	−0.33 (−2.8)	7.50 (1.2)
Technology firm	−0.21 (−1.7)	1.25 (0.2)	−0.20 (−1.6)	−0.32 (−0.0)
Internet firm	−0.18 (−1.0)	51.60 (6.6)	0.11 (0.4)	50.26 (6.1)
Finance firm	−0.35 (−1.5)	−10.04 (−0.9)	−0.40 (−1.7)	−12.39 (−1.1)
Nasdaq Index	0.07 (1.0)	7.74 (2.4)	0.11 (1.4)	8.18 (2.5)
1999 or 2000 year dummy	−0.12 (−0.8)	14.78 (2.1)	−0.04 (−0.3)	13.97 (1.9)
Number of observations	836	836	836	836
R-squared	0.11	0.33	0.11	0.33

*Note:* The sample consists of IPOs between 1996 and 2000. The first-stage regression shown in Column 1 is estimated using probit, and the fitted value from this regression is used as the IPO options instrument in the second stage OLS regression shown in Column 4. The first-stage regression shown in Column 2 is estimated using OLS, and the fitted value from this regression is used as the IPO underpricing instrument in the second stage regression shown in Column 3, which is estimated using probit. Executive pre-IPO ownership equals shares owned by the top executives as a fraction of shares outstanding prior to the IPO. All other variables are defined in Tables 1 and 3. *T*-statistics are shown in parentheses.

controlling for potential endogeneity, we find no evidence of the expected positive relation between executive stock options and IPO underpricing.<sup>18</sup>

<sup>18</sup>While two-stage least squares regressions have the advantage of controlling for potential endogeneity, they are frequently quite sensitive. To check the robustness of results, we have included a variety of other explanatory variables in alternative specifications. However, main inferences on the relation between IPO options and underpricing remain the same.

## 5. Discussion

If managers can influence either the terms of their option grants or the price offered to IPO investors, then we expect a positive relation between IPO options and IPO underpricing. Our primary finding—that IPO underpricing is unrelated to the existence or magnitude of IPO options—is inconsistent with the view emerging in the literature that executives influence compensation and IPO pricing decisions in a way that increases their personal wealth.

### 5.1. Do managers influence the offer price?

Managers granted options at the offer price have clear incentives to seek lower offer prices relative to the anticipated aftermarket price. Our tests for a relation between IPO options and underpricing control for the executive's expected loss from underpricing due to his or her pre-IPO shareholdings and pre-IPO option holdings. Our failure to detect a positive relation therefore suggests to us that executives have little influence over the offer price in initial public offerings.

Our findings contrast sharply with the conclusions of Ljungqvist and Wilhelm (2003), who present two compelling pieces of evidence in favor of the managerial influence hypothesis: a positive relation between the proportion of family and friends shares and underpricing, and a negative relation between the proportion of CEO pre-IPO ownership and underpricing. In order to investigate the Ljungqvist and Wilhelm “family and friends” result, we replicate their results on our sample and confirm that IPOs with these directed share plans have higher initial returns. However, while family and friends shares are positively related to initial returns (suggesting a *lower* offer price), we find that they are also positively related to the price update (suggesting a *higher* offer price). Overall, our evidence suggests that at least a portion of the positive relation between underpricing and family and friends shares reflects the tendency of firms to increase family and friends shares in response to higher levels of underpricing, rather than such shares actually *causing* higher underpricing.

Regarding the relation between CEO pre-IPO ownership as a fraction of shares outstanding and underpricing, Ljungqvist and Wilhelm find (and we confirm) that this relation is only significant for Internet firms. However, it is not clear why CEOs of only Internet firms would negotiate harder for a higher offer price.

Our findings are also inconsistent with Rocholl's (2005) evidence regarding the effects of IPO options in Germany. Rocholl finds that top managers in approximately 80% of German Neuer Markt IPOs during 1997–2001 are granted IPO options. Further, these IPOs are significantly more underpriced than IPO companies in which no top executives hold IPO options. Notably, executives in Germany rarely own shares of their company prior to the IPO, suggesting that, on average, the net dollar gain of IPO options (net of any dilution effects) is much greater. However, to the extent that we have sufficiently controlled for pre-IPO ownership (which we have attempted to do in a variety of ways), this should not drive the difference in results. It is possible that German executives have more control over the IPO offer price, and that this explains the differences in our findings.

### 5.2. Do managers influence their stock option arrangements?

Managers with influence over either the timing or the structure of their stock option arrangements, but who are constrained to accept at-the-money options, will clearly prefer

IPO options to options granted at fair market value subsequent to the IPO. Our findings that IPO options are unrelated to IPO underpricing, were used less frequently during the Internet bubble period, and are least prevalent among Internet and other technology firms (which have the highest underpricing) are inconsistent with the emerging literature on managerial influence over compensation plans. We discuss whether this inconsistency can be at least partially reconciled by various factors.

First, managerial influence is plausibly very different in pre-IPO firms relative to that in established public corporations. Our sample includes both “founding CEOs” who likely have substantial influence over their boards, and “hired-hand CEOs” who are appointed by boards composed of active investors and often venture capitalists. Founding CEOs are likely to have the power to obtain IPO options, but even with such options they would likely be large net losers from underpricing (because they typically hold substantial amounts of pre-IPO equity). In contrast, hired-hand CEOs generally hold less pre-IPO equity, meaning they can gain substantially from IPO underpricing if they have IPO options. However, such CEOs may have less influence over a board that typically controls the majority of the pre-IPO equity, particularly if the Board includes active investors.

The extent to which active investors (e.g., venture capitalists) on an IPO firm’s Board limit managerial self-dealing is an open question. Our findings provide somewhat contradictory evidence. The result in Table 7 that IPO options are less prevalent in IPOs backed by venture capitalists supports the idea that active investors on the board (as proxied by venture-capital backing) do not cater to managerial desires to receive such options. However, while venture capitalists grant fewer IPO options, Table 8 shows that they grant more options *prior* to the IPO, suggesting that they do cater to managerial desires.

Regardless of the extent to which active investors such as venture capitalists limit IPO options, these dynamics provide at best only a partial explanation for the lack of a relation between IPO underpricing and IPO options. There are a number of executives with little pre-IPO ownership who successfully obtain substantial numbers of IPO options: Table 2 indicates that executives in the highest gain/loss category would gain an average of \$1.1 million per dollar of underpricing. These executives would benefit considerably from underpricing, yet their companies’ IPOs are not significantly more underpriced than those of other similar firms.

Second, as discussed above, the managerial benefits of IPO options can be achieved through grants of pre-IPO options at nominal exercise prices far below actual market prices. Our results suggest that IPO options and pre-IPO options are substitutes and, as shown in Tables 5 and 6, pre-IPO options are especially prevalent in Internet firms and during the bubble period. At first it seems possible that these pre-IPO options “crowd out” IPO options that would otherwise have been offered. However, the fact that these same types of firms are most likely to grant options shortly after the IPO casts doubt on this idea. It remains puzzling that firms with the highest levels of underpricing do not substitute away from post-IPO options toward IPO options, when the monetary benefits to executives of doing so would be so great.

Finally, our results suggest that the emerging literature claiming that managers influence their stock-option arrangements is potentially overstated. Yermack (1997) provides evidence that managers’ influence over the timing of their stock options results in approximately a 2% increase in the value of their options; Heron and Lie (2007) suggest that managers obtain such gains by backdating options. Yet we find no evidence that

executives of IPO firms influence the timing (or backdating) of their IPO option grants, despite the fact that the potential gain is an average 40% during our sample period.

### 5.3. *IPO options in equity carve-outs*

Our sample includes a small number of equity carve-outs—about 4% of the sample.<sup>19</sup> The top executives of companies formed through carve-outs are typically former division managers of the parent company. As mid-level executives in the parent company, these division managers likely have less influence over either the offer price or the terms of their compensation, as compared to executives in other IPOs. In addition, because the equity carve-out is a division rather than an independent company prior to the IPO, pre-IPO ownership in the IPO company equals zero. Finally, executives of equity carve-outs are potentially more likely to receive IPO options, since they have not had the opportunity to receive options in their company prior to the IPO. Consistent with this last conjecture, 53% of the 36 carve-outs in our sample have IPO options, compared to only 33% of the overall sample.

In addition to being more likely to receive IPO options, executives of carve-out firms also receive an especially large number of IPO options and gain significantly from IPO underpricing. In particular, executives receiving options in equity carve-outs receive an average of 84,000 options, suggesting a gain of \$84,000 for each dollar of underpricing. In contrast, the average grant for executives receiving IPO options in conventional IPOs is only 24,000 options. Indeed, among executives whose net gain from underpricing is positive, the average net gain for executives receiving IPO options in equity-carve outs is \$4.3 million, far exceeding the \$565,000 average net gain for executives receiving IPO options in conventional IPOs.

The fact that the largest gains from IPO options are realized in equity carve-outs, whose executives arguably have little influence over either the offer price or their compensation package, runs counter to our primary hypotheses. We estimate all of our regressions excluding equity carve-outs, but we still find no relation between underpricing and either the incidence or magnitude of IPO options. Results continue to provide no support for the conjecture that managers successfully influence either the offer price or the terms of their compensation.

## 6. Conclusion

In about one-third of a random sample of US initial public offerings between 1996 and 2000, executives received stock options with an exercise price explicitly tied to the IPO offer price, rather than to a price determined by buyers and sellers in the stock market. For the typical executive receiving these “IPO options,” the gain from setting low offer prices far exceeds the cost due to dilution of pre-IPO share ownership. The prevalence and cross-sectional differences in IPO options suggest two powerful tests of influence by self-interested executives. First, to the extent that executives can influence the terms of the IPO, we expect underpricing to be higher in firms granting IPO options to their executives. Second, to the extent that executives can influence the timing and terms of their stock

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<sup>19</sup>Approximately 7% of the universe of IPOs within our sample period are carve-outs, but our random selection of 50% of IPOs results in a lower proportion of carve-outs in our sample.

option arrangements, we expect more IPO options to be granted when the anticipated underpricing is higher. For both of these tests, we expect more pronounced results for the CEO than for lower-level executives, since the CEO plausibly has greater influence over these decisions than any other single executive.

Under either version of the managerial-influence hypothesis—executive influence over either offer prices or the terms of their compensation—we expect a positive relation between executive stock options and IPO underpricing. However, we fail to find any evidence of such a relation. Our non-findings are convincingly robust: we have described only a small number of the sensitivity tests and alternative specifications we employ in our attempts to uncover the expected relation.

Given the clear managerial benefits of IPO options, our failure to detect any relation casts some doubt on the ability of executives to influence substantively either the IPO offer price or the timing of their option grants in connection with IPOs. Our results are consistent with other parties, such as underwriters or boards of directors, having greater influence than executives in such situations. These results run counter to the emerging literature claiming that managers blatantly take self-serving actions to improve their personal welfare at shareholder expense. One possible explanation for the contrast between our results and those in prior research is that the governance characteristics of firms going public (such as concentrated ownership by executives and active investors, including venture capitalists) are sufficient to curtail executive rent seeking in initial public offerings. Alternatively, our results suggest that the claims in the prior literature may be somewhat overstated.

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