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On the marketing of IPOs ☆

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Abstract

Derrien [2005. Journal of Finance 60, 487–521] and Ljungqvist et al. [2006. Journal of Business] build upon the work of Miller [1977. Journal of Finance 32, 1151–1168] and claim that issuers and the regular customers of investment bankers benefit from the presence of sentiment investors (noise traders) in the market for an initial public offering (IPO). Thus we argue that investment bankers have an incentive to promote an IPO to induce sentiment investors into the market for it. Consistent with this motivation and these models, we expect that the promotional efforts of investment bankers should influence the compensation of investment bankers, the valuation of an IPO, its initial returns and trading, the wealth gains of insider shareholders, and the likelihood that an issuer switches investment bankers for a subsequent seasoned equity offering. Examining data for a sample of IPOs from 1993 through 2000, we find evidence consistent with these predictions and so with the proposition that an investment banker's ability to market an IPO to sentiment investors is important.

JEL classifications: G24; G32

Keywords: Initial public offering; Marketing; Underpricing; Investment banking

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1. Introduction

The role of marketing, and particularly promotion, in the pricing and trading of securities is limited in most asset pricing models. This partially stems from the frequent treatment of investors as possessing the same information and identical likelihood functions, which results in homogeneous expectations about a security's returns. When one or another of these presumptions is dropped (e.g., Harris and Raviv, 1993) and short-selling is allowed (e.g., Lintner, 1969), security market prices reflect an averaging of heterogeneous investor expectations, producing an unbiased estimate of a security's value. When both of these conditions fail to hold, security prices reflect the valuations of more optimistic investors and thereby represent biased estimates of security values.

Miller (1977) suggests that heterogeneous investor expectations are a characteristic of initial public offerings (IPOs) of common stock because of their high degree of value uncertainty. Given that IPOs face potentially severe short sale constraints in early trading, Miller claims that the early aftermarket prices of IPOs, facing widely divergent investor valuations, can be biased upward. He contends that this accounts for the substantial run-up in price of some IPOs.

In contrast to Miller, much of the research on IPO underpricing presumes that the observed early aftermarket prices are unbiased estimates of share value (e.g., Rock, 1986; Tinic, 1988). However, the presumption that early aftermarket prices are unbiased estimates of share values is inconsistent with recent findings. For example, Mitchell et al. (2002) and Lamont and Thaler (2001) find some equity carve-out IPOs trade for more than their parent company, thus violating the value additivity principle. Further, and more important for Miller's claims, Ofek and Richardson (2003) demonstrate a relation between the tightness of short-sale constraints and initial returns for a sample of Internet IPOs. In additionally, Ofek and Richardson show that relaxation of short sale constraints through the expiration of lock-ups has dramatic effects on the aftermarket pricing of these stocks, which should not occur if aftermarket prices are unbiased estimates of their true value. While this evidence is consistent with the long-run underperformance of IPOs (e.g., Ritter, 1991; Houge et al., 2001), Ofek and Richardson's results suggest that the adjustment process could be much shorter than considered in such studies.

Building upon Miller's work, Derrien (2005) and Ljungqvist et al. (2006) argue that issuers and regular (institutional) customers of investment bankers benefit from the presence of sentiment investors or noise traders in the market for an IPO. If correct, then an investment banker's efforts to promote an IPO, particularly to retail investors, should benefit both the issuer and the investment banker's regular customers. Consequently, an investment banker's ability to promote an issue to retail investors should influence the issuer's decision to use the same investment banker in subsequent equity offerings. So investment bankers have an incentive to create demand for an IPO by promoting it.

Our results are consistent with the notion of investment bankers using promotion to induce retail investors into the market for an IPO with results benefiting the issuing firm, the investment banker, and its regular investors. Specifically, we find that investment bankers' compensation is positively correlated with their promotional efforts; offer price revisions are positively correlated with promotional efforts; offer price valuations tend to exceed that of comparable firms when pre-offer publicity is greater; the average size of initial trades is negatively correlated with pre-offer publicity; initial returns are positively correlated with pre-offer publicity; insider wealth gains tend to exceed their dilution losses

when more pre-offer publicity is associated with their IPO; and issuers remain with lead investment bankers when the bankers are effective at generating pre-offer publicity, but when they are not; issuers tend to switch to lead investment bankers that can generate more pre-offer publicity for their subsequent seasoned equity offerings. Altogether, this evidence is consistent with an investment banker's promotional activity attracting sentiment investors to an IPO to the benefit of the issuer, the investment banker, and the investment banker's regular customers.

The paper is organized as follows. Section 2 explains the role of promotion in IPO markets and its implications within the context of the models of Derrien and Ljungqvist et al. Section 3 describes the sample, sources of data, and variable definitions. Section 4 reports the findings, and Section 5 summarizes the results.

2. The effects of marketing on IPOs

According to Kuhn (1990, p. 269), an investment banker's marketing campaign for an IPO is critical.

> This campaign, as much as anything that precedes or follows it, will determine the success or failure of the IPO. The key is to stimulate investor demand for the stock so that, as in basic economics, the demand will exceed the supply.

Similarly, the investment newsletter the *Fleet Street Letter* (November 2003, vol. 66, no. 11, p. 1) stated:

> Before a company gets to market through an IPO, it spends a fortune on hype, paperwork, and publicity to create demand. The buzz is stirred up before the shares are released. So you never get in cheap. And the ones that are cheap are usually not worth holding five minutes.

To understand these statements one must recognize the relation among the marketing of an IPO, its offer price valuation, its initial return, and how different parties benefit from these relationships.

The models of Derrien (2005) and Ljungqvist et al. (2006) are relevant to understanding the relation of promotion to IPO issuance. Ljungqvist et al. assume that there are two types of investors [sentiment investors and regular (institutional) investors] but recognize that the issuer is prohibited from price discrimination and, therefore, legally bound to set a uniform offer price. The investment banker adjusts the offer size so that the valuation of an IPO in aftermarket trading only partly reflects the valuation of the sentiment investor. This permits the investment banker to set the offer price above its true value while providing an opportunity for regular investors to profit by flipping their shares to sentiment investors in early aftermarket trading. The net result is that both the issuer and the investment banker's regular customers benefit from the presence of sentiment investors.

Derrien also assumes that there are two types of investors, institutional investors and individual investors (noise traders, which are equivalent to Ljungqvist et al. sentiment investors). However, Derrien focuses on the cost of stabilizing an IPO in aftermarket trading instead of on an investment banker's offer price recommendation. A key parameter in his model is the bullishness of noise traders or individual investors, which he assumes is

determined by current market conditions. Given Derrien's specification of the investment banker's objective, he provides an explanation for the partial adjustment of the offer price to public information observed in Bradley and Jordan (2002) and Lowry and Schwert (2004). Like Ljungqvist et al., Derrien predicts that the investment banker sets the offer price to allow the issuer to benefit from a higher valuation than appropriate, given institutional investor valuations. Institutional investors thus benefit from selling their allocations to sentiment investors (i.e., noise traders), who have higher valuations.

Derrien and Ljungqvist et al. demonstrate that issuers and investment bankers' regular customers benefit from the presence of sentiment investors (noise traders). In both models it is the sentiment investors (noise traders) that overpay. Evidence consistent with either of these models is provided in Derrien using French IPO data; Dorn (2003) using German IPO data; Cornelli et al. (2006) using European gray market data; and Purnanandam and Swaminathan (2004) using U.S. data. Interestingly, Purnanandam and Swaminathan conclude their study by noting that investment bankers often aggressively market IPOs and that such marketing efforts warrant further study.

While the models of Derrien and Ljungqvist et al. suggest that the issuer and regular customers of an investment banker benefit from the presence of sentiment investors, neither model considers that an investment banker might promote an issue in such a way as to induce sentiment investors into the market for an IPO. Such a possibility, however, is consistent with the premise that investment bankers act as marketing agents for issuers. Supporting this premise, Degeorge et al. (2004) find in the French IPO market that book-built issues attract more press than auctions, but only after the book-building route is selected. They also find that analysts affiliated with the lead underwriter issue more frequent and favorable recommendations than they would under an auction process. These favorable recommendations occur even following poor stock performance.

We argue that the process of promoting new security issues is an important feature of security issuance. In fact, it is prior investment banker promotional behavior that triggered the Blue Sky laws and the Securities Act of 1933. The basic purpose of these laws is not to prohibit the promotion of securities, but "to assure the availability of adequate reliable information about securities which are offered to the public" (Ratner, 1998, p. 33). This legal regime created three phases to securities registration: the pre-filing period, the waiting period, and the post-effective period [see Soderquist and Gabaldon, 1998; Johnson, 1991, for further discussion of these periods and the associated rules]. While different rules apply to each of the periods, none of the rules prevents the firm or its investment banker from generating publicity about the firm, though the content of this publicity is restricted differently across the three periods.[1] Although the form and content of publicity are restricted, investment bankers can promote awareness of a firm by communicating with potential investors, including retail investors, during the waiting period.

Barber and Odean (2002) reveal one method that might be used by investment bankers to promote an issue to attract retail investors and enhance their bullishness on an IPO. Using brokerage records, Barber and Odean find that retail investors are more likely to purchase attention-grabbing stocks. Similarly, Tetlock (2006) analyzes the affect of the Wall Street Journal (2003) "Abreast of the Market" column and finds that either the media report investor sentiment before the sentiment is fully incorporated into market prices or the media directly influence investors' attitudes toward securities. In addition, Frieder and

[1]The Securities Act Release No. 5, 180 (August 16, 1971) discusses the publicity that is allowed.

Subrahmanyam (2005) determine that individual investors are more likely to hold stock in highly visible companies. These results suggest that an investment banker's efforts to promote an IPO through increased media coverage increase retail interest in that stock. This is consistent with the "2004 Capital Markets Handbook" (Securities Industry Association, 2004) which describes how investment bankers who are intent on attracting retail investors might use pre-offer publicity to promote retail investor awareness and interest in an issue.

While we focus on the role of publicity in our analyses, we are aware that the methods of marketing IPOs to retail investors are changing as a result of the development of the Internet. For example, road show information is increasingly being made available to retail investors via the web. In addition, in 1997, the Securities and Exchange Commission (SEC) issued a no-action letter in conjunction with a joint venture of NBC (National Broadcasting Company) and Microsoft to transmit videos of road shows to subscribers. Pursuing the same strategy, Charles Schwab and Company Inc. received SEC approval in 1999 to make road show meetings available in a password-protected Internet environment. Further, investment bankers increasingly supplement road shows with presentations on the Internet through Yahoo, NetRoadshow Inc., and Bloomberg Financial Marketing Service.

Irrespective of how the investment banker communicates with potential investors, we believe that marketing an issue to retail investors serves the interests of the issuer, the investment banker's regular customers, and therefore, the investment banker. Consequently, based in part on our interpretation of what drives some of the parameters in Derrien's model or Ljungqvist et al., model, we test the following four predictions. First, pre-issue publicity attracts retail (noise) investors to an IPO. Second, attracting retail investors through publicity is good for issuers. Third, attracting retail investors through publicity is good for an investment bank's regular IPO investors. Fourth, attracting retail investors through publicity is good for investment banks.

Although we do not focus on analyst coverage as part of the marketing effort, it is clear from Dunbar (2000), Krigman et al. (2001) and Degeorge et al. (2004) that such coverage is important to issuers.[2] For example, Krigman et al. find that issuers generally switch underwriters to obtain additional sell-side analyst coverage, which suggests that firms view this as important to increasing investor awareness of their firms.

3. Description of our sample and data

To examine the role of promotion on IPO issuance, we begin by identifying all IPOs with offer dates between January 1, 1993 and December 31, 2000 from the Securities Data Company's (SDC) New Issues database. The beginning sample year is 1993 because the Trade and Quote (TAQ) data, required for some of our variables, were first available in 1993. We end our sample period at December 31, 2000, the end of the Internet IPO period. From the original list of U.S. IPOs, we filter out unit IPOs (IPOs with warrants), IPOs of foreign firms, IPOs with an offer price of less than $5, IPOs of financial service entities [e.g., financial service firms with a two digit standard industrial classification (SIC) code

[2]The Securities Industry Association's "2004 Capital Markets Handbook" (Securities Industry Association, 2004, p. 96) points out that "the historical practice of bringing the research analyst 'over the wall' ended with SEC Release No. 34-45908 (May 10, 2002). However, as the Wall Street Journal (2003) points out, it is still standard practice in Europe to use analysts to help market IPOs.

Table 1
Industrial distribution of sample

Industry definitions follow Department of Commerce delineations, which Clarke (1989) suggests are economically meaningful. The chi-square statistic for the table equals 293.68 and is significant at the 1% marginal significance level.

Industry	1993	1994	1995	1996	1997	1998	1999	2000	Total
Agriculture, forestry, and fisheries (01 – 09)	0	2	3	1	9	3	1	0	19
Mineral (10 – 14)	16	9	4	13	11	1	3	5	62
Construction (15 – 17)	7	4	2	7	4	4	1	2	31
Manufacturing (20 – 39)	208	162	171	205	147	70	72	128	1,163
Transportation, communication, and utilities (40 – 49)	39	31	35	47	33	22	50	35	292
Wholesale and retail trade 50 – 59)	66	46	39	72	45	32	32	12	344
Service (70 – 89)	81	84	139	247	152	105	256	148	1,212
Total	417	338	393	592	401	237	415	330	3,123

between 60 and 69], IPOs of limited partnership interests, and IPOs that are not firm-commitment offerings. The resulting sample contains 3,123 firm-commitment IPOs.

Table 1 indicates the incidence of sample IPOs by year and industry grouping. We find that the sample of IPOs is not distributed equally across industry. Therefore we include dummy variables for industry groupings in subsequent analyses, in which accounting for industry effects might be important. We partition our sample into two periods, 1993–1997 and 1998–2000, to determine whether the Internet period influences our conclusions. While differences exist in the sample values for our different variables over these two periods, our conclusions are the same across the subperiods. Consequently, we restrict our reporting to the full sample results.

For each of these IPOs, we collect data from a variety of sources. We extract the original high and low filing prices, the offer date, the offer price, shares offered, amount offered, total investment banker compensation, and total selling concession from SDC. We extract the first trading day closing price and shares outstanding after the offering from the Center for Research in Security Prices (CRSP).[3] We obtain net sales, total assets, and the number of employees for the fiscal year prior to an IPO's offer date from Standard and Poor's Compustat database. We collect data on a number of aspects of trading during the first trading day from TAQ. We obtain news data from the LexisNexis database.

One variable of interest in our study is the initial return of an IPO, measured as the difference between the first trade day closing price and the offer price relative to the offer price. Table 2 illustrates that the mean initial return of our sample IPOs substantially

[3]When the first day closing price is not available on CRSP, we obtain this information from SDC's New Issue database. However, no inference drawn in this study changes if we examine only observations for which CRSP data are available.

Table 2
Descriptive sample statistics

Initial return represents the first day return of an IPO. *Amount sold* represent the dollar value of the amount of stock sold in the offering. *Float* represents the ratio of the number of shares issued in the offering to the number of shares issued and outstanding after the offering. *Sales* are the IPO's firm net sales for the fiscal year prior to its offering date. *SDmid* is the standard deviation of the midpoints of the bid-ask spreads during the first trading day. *Average trade size* is the average size of a trade on the first day of trading. *Revision* is the difference between the offer price and midpoint of the initial filing price relative to the mid-point of the initial filing range. $P/S_{IPO} - P/S_{industry}$ equals the price-to-sales ratio of the IPO using its prior year sales less the median of the price-to-sales ratios of its industry. *Nasdaq return* represents the Nasdaq return over the 15 days prior to the offer date for an IPO's industry. *HPR* is an IPO's holding period stock return from offering to the minimum of three years or delisting date. *Total compensation* represents the total amount paid to investment bankers. *Selling concession* represents the total amount paid to investment bankers for selling the issue. *Headlines* represent the number of headlines with the company name. *Full text* is the number of news stories with the company name in the text. *Ranking* equals an investment banker ranking from Loughran and Ritter (2003) but converted to integer rankings.

Variables	Mean	Median	Standard deviation	Number of IPOs
Initial return (percent)	28.95	11.11	55.36	3,026
Amount sold ($ millions)	88.298	42	294.689	3,123
Float	0.454	0.295	0.597	3,114
Sales ($ million)	225.521	42.02	1155.33	2,273
Sdmid	0.742	0.3242	1.262	2,073
Average trade size	3050.52	2247.37	3147.25	2,076
Revision	0.036	0	0.256	3,076
$P/S_{IPO} - P/S_{industry}$	62.199	−1.338	7.876	2,456
HPR (percent)	19.22	−42.31	2.337	3,104
Nasdaq Return (percent)	1.12	1.44	5.10	3,125
Total compensation	4,661,684	2,817,500	9,260,623	3,070
Selling concession	2,520,577	1,497,600	5,366,759	3,070
Ranking	7.231	8	2.185	3,088
Headlines	14.94	6	36.946	3,123
Full text	25.46	16	43.39	3,123

exceeds the sample median initial return, which is consistent with the effects of price stabilization discussed in Aggarwal (2000).

Because prior research (e.g., Dunbar, 1996)) shows that investment banker compensation is related to the amount sold in the offering, a second variable of interest is the amount sold in the offering, which we measure at the offer price. Table 2 illustrates that substantial variation was evident in the amount sold during our sample period.

Related to the amount sold is the float of an IPO. Specifically, we define the *float* of an issue as the number of shares offered in the IPO relative to the number of shares issued and outstanding after the offering. The securities law literature refers to this as public float. *Float* is of interest as the ability to short a stock is related to the availability of traded stock. For example, Ofek and Richardson (2003) find that an increase in the number of traded shares at the expiration of lock-ups is negatively correlated with a stock's price and measures for the tightness of short-sale constraints. Thus the larger the float, the easier it is to short the stock and the less binding the short-sale constraint is. Once again, Table 2 suggests that a rather substantial difference is found between the mean and median of this variable's sample distribution, which indicates its skewness.

Since Ritter (1984), researchers have used a firm's pre-IPO net sales as a proxy for its size and, therefore, for the asymmetric information risk associated with its IPO. We explore

other alternatives (e.g., total assets, number of employees, firm age) but derive similar results and, therefore, only focus on sales. Specifically, we use Compustat data to determine the net sales of a firm that is going public for the fiscal year ending no later than its offer date. The statistics reported in Table 2 suggest a substantial variation in firm sizes within our sample. Given that a firm's net sales is a non-negative random variable, we use its logarithmic transformation as our firm size measure in subsequent regression analyses.

Miller (1977) emphasizes value uncertainty as the key determinant of divergent investor valuation of an IPO. Consequently, we measure value uncertainty by the initial aftermarket price volatility. Specifically, to avoid the effects of bid-ask bounce, we compute the standard deviation of the midpoint between bid and ask quotes during the first trading day (*SDmid*). *SDmid* should be positively correlated with the divergent investor valuations of an IPO during its first trading day. Table 2 shows substantial value uncertainty and divergent investor valuations associated with IPOs during our sample period.

Derrien and Ljungqvist et al. suggest that sentiment investors (bullish noise traders) should influence the initial trading in a stock. This characterization is consistent with the Barber and Odean (2002) findings that retail investors tend to be attention-driven and trade in response to news stories; thus providing additional justification for our promotional measures. To capture retail trading activity, we construct two variables from the TAQ data. The first variable, *small trading*, represents the proportion of trades that are less than one thousand shares. The second variable, *average trade size*, is the average trade size during the IPO's first trading day.[4] However, since we derive the same conclusions using either measure, we focus only on the average trade size measure in subsequent analyses.

Offer price revision is also of interest in this study. Benveniste and Spindt (1989) interpret offer price revision as capturing demand information garnered from an IPO's road show. Bradley and Jordan (2002) and Lowry and Schwert (2004) show, however, that these revisions do not fully impound publicly available information. Derrien addresses this and claims that offer price revisions should not fully impound market movements if investment bankers are to reduce their potential stabilization costs. Following Hanley (1993), we define the offer price revision, *revision*, as the difference between the offer price and the midpoint of the initial filing range relative to the midpoint of the initial filing range. The sample statistics in Table 2 not only indicate substantial variation in this variable, but also revisions downward as well as upward occurring.

From Kim and Ritter (1999), we create a measure of an IPO's offer price valuation by computing the price-to-sales ratio for each sample IPO with available data using pre-offer sales (from Compustat), the number of shares outstanding after the offer (from CRSP) and offer price (from SDC). We compute the price-to-sales ratio for each firm within an IPO's industry for the fiscal year corresponding to the IPO's offer year and use the median of these values as a measure of the typical valuation of firms within the IPO firm's industry. Using these two ratios, we create a dummy variable that takes on the value one if the IPO's offer price valuation exceeds its industry's typical valuation and zero otherwise. Table 2 shows that, while the valuation of the average IPO exceeds the valuation of firms in its industry, the median IPO valuation is below the valuation of firms within its industry.

[4]Our interpretation of average trade size as a proxy for retail trading is consistent with the evidence in Barber et al. (2005).

As a measure of post-IPO performance, we compute *HPR*, the holding period return, for all sample IPOs with CRSP data from offering until the minimum of delisting date or three years. Although the appropriate methodology for computing long-run returns is a substantial issue, *HPR* is adequate for our purposes and consistent with the definition used by Derrien (2005).

As a control in a number of analyses, we also compute *Nasdaq return*, which equals the Nasdaq return over the 15 days prior to the offer date for an IPO. This variable mirrors the market return measure used by Bradley and Jordan (2002) and is used to control for market movement prior to an IPO's offer date. The sample statistics reported in Table 2 for this variable indicate that its distribution is fairly symmetric.

In our analyses, we also use a number of variables associated with investment bankers and the marketing of IPOs. From SDC data, we focus on two measures of compensation. *Total compensation* captures the total dollar compensation paid to investment bankers. *Selling concession* captures the total dollar compensation paid to investment bankers for selling the issue. The basic statistics reported in Table 2 reveal a substantial variation in both of these payments.

In addition, we use data on investment banker ranking *(ranking)* developed by Loughran and Ritter (2004), which is a corrected and extended version of the Carter et al. (1998) rankings.[5] Although Loughran and Ritter use a scale that adds 0.1 to the Carter et al. rankings, we convert their rankings back to integer values. Table 2 shows that average rankings are high during both of our sample periods, which is consistent with higher ranked investment bankers underwriting more offerings than lower ranked investment bankers.

Finally, we analyze pre-offer date marketing efforts by focusing on one of the measurable effects of marketing: pre-offer publicity. We employ two measures for the pre-offer date publicity associated with an IPO: (1) the number of news articles that mention the firm's name in the headline (*headlines*) and, (2) the number of articles that mention the firm's name in the text (*full text*). The Securities Industries Association's "2004 Capital Markets Handbook" suggests that the marketing strategy for an IPO is mapped out at the all hands meeting, as all the members of the IPO team plan a timetable for going public and assign certain duties to each member. From IPO filings, we discern that six months is a reasonable estimate of the time from the all hands meeting to the time when the issue begins trading. To create these counts, we conduct searches of LexisNexis for each sample firm beginning six months prior to its offer date. Specifically, for the headlines measure, we use the LexisNexis headlines and lead paragraph search criteria, while for the full text measure we use the full text search criteria. This search results in more than 79,500 news articles.

Effective promotional efforts should result in more publicity (i.e., more news stories written about the firm) for an IPO. Kuhn (1990, p. 270) points out that the publicity effort is an important part of the promotional campaign:

> Outside public relations counsel is also engaged by some issuers to advise and assist in many aspects of the IPO campaign, including drafting of press releases, press contacts, roadshows, and other public, professional and media events.

[5]We acknowledge the generosity of Jay Ritter for providing these data on his website. See Appendix 3 of Loughran and Ritter (2003) for a description of their ranking methodology.

These proxies perhaps do not capture the full range of options available to an investment banker to promote public awareness of a firm, (e.g., oral communication with potential investors or Internet presentations to potential investors). Nevertheless, we feel that our metrics are likely to be highly correlated with broader measures. Further, and just as important, our measures are consistent with the focus on the role of noise traders or sentiment investors in Derrien's and Ljungqvist et al. models.

To get a bird's eye view of our data, we read in detail a random sample of 5,452 news articles based on 225 IPOs. We find that over 99% of these articles were non-negative, primarily descriptive stories, and that greater than 98% of the stories were published in national news outlets. These figures are consistent with the description in the "2004 Capital Markets Handbook" on how investment bankers can use publicity to attract retail investors. In addition, we find that greater than 93% of the stories occurred between the filing date and the offer date. Nevertheless, in our analysis of offer price revisions, we also use an alternative headline measure, computed from only the filing date to the offer date.

4. Analysis

To test our four predictions, we examine a number of relationships. To test whether pre-issue publicity attracts retail investors, we focus on whether retail trading in an IPO is significantly correlated with pre-offer publicity (Section 4.4). To test whether attracting retail investors is good for an investment banker's regular IPO investors, we consider whether the initial returns of IPOs are positively related to both the pre-offer publicity and recent market movements (Section 4.5). To test whether attracting retail investors is good for issuers, we examine whether offer price revisions (Section 4.2), offer price valuations (Section 4.3), and insider wealth gains (Section 4.6) are positively and significantly correlated with pre-offer publicity. And finally, to test whether attracting retail investors is good for investment bankers, we explore whether investment banker compensation (Section 4.1) and the propensity of an issuer to use an investment banker for a subsequent equity offering (Section 4.7) is correlated with its pre-IPO publicity. We organize these analyses in order of the natural progression of events: from contracting with an investment banker for an IPO to deciding whether to use the investment banker again for a subsequent equity offering. We proceed in this manner because the analyses are sequentially dependent.

4.1. Analysis of investment banker compensation

Issuers compensate investment bankers by the gross spread, which can be partitioned into components; e.g., the selling concession that ostensibly represents the portion of total compensation paid for selling the issue. For any given IPO, investment bankers provide marketing, pricing, and distribution services and potentially stabilize the issue in aftermarket trading. If issuers value an investment banker's marketing efforts then issuers should compensate the bank for this service. Therefore, our first prediction is that investment bankers are compensated for their promotional efforts.

To examine this question, we consider the effect of pre-issue publicity, offer size, and stabilization efforts on the total compensation and selling compensation paid to

investment bankers.[6] However, in this analysis we differ from prior studies (e.g., Altinkilic and Hansen, 2000; and Hansen, 2001) in that we treat as our dependent variables the total dollar compensation and the total dollar selling compensation, not scaled versions (e.g., total dollar compensation divided by total amount sold). We do this for two reasons. First, it is not clear, when regressing the ratio of total compensation to total amount sold on the total amount sold, whether the relationship is driven by the correlation between total compensation and the total amount sold or the correlation between the total amount sold with itself. Second, if there are economies and diseconomies of scale in underwriting (Altinkilic and Hansen, 2000), then there should be a nonlinear relationship between total compensation and the total amount sold, which is distorted if we use their ratio as our dependent variable.

With these considerations in mind, we regress the logarithm of total investment banker compensation and the logarithm of total selling compensation on four variables. The first variable is the logarithm of the amount sold, which captures the distributional efforts of investment bankers. The second variable is the square of the logarithm of the amount sold. If there are economies of scale in IPO underwriting, then this variable should have a significantly negative coefficient. The third variable is the logarithm of the number of pre-issue headlines associated with an IPO. If investment bankers are paid for marketing an issue, then one would expect a significantly positive coefficient on this variable. Finally, we include a dummy variable for whether an issue was likely stabilized or not in aftermarket trading. To create this variable, we used the methodology in Asquith et al. (1998) to fit a mixture distribution to our sample IPO initial returns. Based upon a Bayesian algorithm, we assign the value one to a stabilization dummy variable if the issue was likely to have been stabilized in aftermarket trading.

We report the results from the above implied regressions in Table 3. The reported results demonstrate that these regressions explain much of the variation in either total investment banker compensation or total selling compensation. In fact, the high R^2 values could give rise to concerns that they result from extreme outliers or clusters in the data. However, we derive similar results using least absolute deviation regressions, trimmed sample regressions, regressions using only one year of data, and regressions using variables expressed in deviations from their means. Consequently, we are confident that our results are legitimate and validate our re-specification of these compensation regressions. Further, our results have several important implications.

First, consistent our conjecture, we find that both total investment banker compensation and total selling compensation are significantly and positively correlated with pre-issue publicity. These results suggest that issuers pay investment bankers for their marketing, or promotional, efforts.

Second, the significant negative sign on the square of the logarithm of the total amount sold is consistent with significant economies of scale in IPO issuance. Comparing this result with the evidence reported in Altinkthc and Hansen (2000) suggests that IPO underwriting is subject to more significant economies of scale than seasoned equity underwriting.

And finally, the significant negative sign on the coefficient of the stabilization dummy for the total compensation regression and the insignificance of this coefficient for the selling

[6]We do not include initial returns (pricing measure) in this list as we subsequently show that it is significantly and positively correlated with marketing efforts. Initial return also obtains a significantly positive sign when substituted for pre-issue publicity, but the regressions are less explanatory than the ones that we report.

Table 3
Analysis of compensation paid to investment bankers

Ln(total compensation) equals the logarithm of the total compensation paid to investment bankers. *Ln(selling concession)* is the logarithm of the total compensation paid to investment bankers for selling the issue. *Ln(amount sold)* represents the dollar value of the amount sold in the offering. *Ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one over the period beginning six months prior to the offer date to the offer date. *Price stabilization* is a dummy variable that takes on the value one if the issue is identified as likely stabilized in aftermarket trading. We estimate standard errors in each regression using Huber-White estimators and report *p*-values associated with the null hypothesis that the coefficient equals zero within parentheses.

Variable	Ln(total compensation)	Ln(selling concession)
Constant	11.649	10.743
	(0.00)	(0.00)
Ln(amount sold)	0.884	0.969
	(0.00)	(0.00)
$(Ln(amount\ sold))^2$	−0.003	−0.009
	(0.05)	(0.00)
Ln(Headlines)	0.010	0.009
	(0.00)	(0.00)
Price stabilization	−0.044	−0.002
	(0.00)	(0.79)
F statistic	25,218.38	15,209.90
	(0.00)	0.00)
R-squared	0.98	0.97
Number of observations	3,068	3,047

compensation regression is most interesting for it is consistent with the notion that investment bankers compete for business. Ellis et al. (2000) provide evidence that lead investment bankers make profits on their stabilization efforts in IPOs. If true, then in a competitive market, bankers should be willing to exchange compensation for stabilization profits. Our evidence is consistent with such behavior. The fact that the coefficient on this variable is insignificant for the selling concession reinforces this conclusion because the compensation for providing stabilization should accrue only to the lead investment banker(s). Consequently we interpret this evidence as consistent with the notion that investment bankers compete with one another to manage IPO offerings.

4.2. Analysis of offer price revisions

One of the most significant ways that an issuer can benefit from investment banker promotion efforts is if these efforts produce a higher offer price. According to Benveniste and Spindt (1989), offer price revisions should impound public and private information on investor demand gathered during the book-building process. Consistent with this interpretation, Cornelli and Goldreich (2001) report evidence that investment banker allocations are correlated with the informativeness of investors' bids. Because we believe that pre-offer publicity influences retail or noise traders, we should find that offer price revisions are positively correlated with our pre-offer publicity measure after controlling for market movements and other factors if investment bankers incorporate this information in offer price revisions. Such revisions would represent an important benefit to issuers.

To address this conjecture, we examine the effects of pre-offer publicity on offer price revisions by regressing offer price revisions on our pre-offer publicity variable, a variable for recent market returns, and control variables from other studies. Specifically, to measure recent market returns, we follow Bradley and Jordan (2002) and proxy the market's return with the return of the Nasdaq index over the 15 trading days prior to the offer date. In addition, we use a firm size measure (logarithmic transformation of net sales) to control for the asymmetry of information associated with an IPO as Ljungqvist and Wilhelm (2003) demonstrate that this is a significant influence on these revisions. We use our price uncertainty measure, *SDmid*, to capture the value uncertainty associated with an IPO. One might expect that, in the face of significant value uncertainty, offer price revisions would be greater as the collection of demand information becomes more important. Finally, we include the ranking of the lead investment banker, whether or not the issue was venture backed and whether or not the issue was listed on the NYSE; all of which were significant in either the Benveniste et al. (2003) or the Lowry and Schwert (2004) analysis of IPO offer price revisions.

Column 1 of Table 4 reports the results of estimating the implied regression model. Our most important result is that we find a positive significant coefficient on pre-offer publicity, which is consistent with the claim that publicity brings sentiment investors into the market for an IPO and that investment bankers incorporate information on their demand in offer price revisions. In addition, we find a positive significant coefficient on the Nasdaq return variable, which is consistent with prior evidence (e.g., Bradley and Jordan, 2002) and both Derrien's and Ljundqvist et al. models.

However, given that one could argue that pre-filing publicity should be incorporated into the filing price range, the relationship between pre-offer publicity and offer price revisions could be understated. As a consequence, we refine our pre-offer publicity measure to capture only news stories between an IPO's filing date and offer date. We substitute this measure, *ln(Headlines2)*, for *ln(Headline)* in the first regression to derive the regression results reported in Column 2 of Table 4. Once again, we find that offer price revisions are positively correlated with pre-offer publicity. Because the results in Columns 1 and 2 are essentially the same here, and in all subsequent analyses, we shall report only in subsequent tables the broader pre-offer publicity measure, *ln(Headlines)*.[7]

The evidence that offer price revisions are significantly correlated with pre-IPO publicity provides an insight into the results of Krigman et al. (2001). Krigman, Shaw, and Womack examine a sample of IPOs to determine the influences of a firm's decision to switch from their IPO's lead investment banker to another investment banker for subsequent equity offerings. Krigman, Shaw, and Womack find that nonswitching firms have an upward price revision relative to the midpoint of the initial filing range, which we use as our revision variable. If an investment banker's promotional efforts effectively attract sentiment investors into the market for an IPO and the investment banker accordingly adjusts the offer price, then, as Kuhn (1990) suggests, firms should be less likely to switch underwriters when these upward revisions occur. If revisions were simply the result of market movements or the investment banker simply collecting demand information from their regular investors, an issuer would have less incentive to stay with its lead investment

[7]For the same reason, we report only the pre-offer publicity measure, *ln(Headline)*, instead of also including *ln(Full Text)*. Because there is no significant inference involving *ln(Headline)* that would change if we were to use *ln(Full Text)*, we select one metric to reduce clutter.

Table 4
Analysis of offer price revisions

The dependent variable in each regression represents the offer price revision, which is defined as the difference between the offer price and midpoint of the initial filing price relative to the midpoint of the initial filing range. *Ln(Sales)* equals the logarithm of the firm's net sales for the fiscal year prior to its offering date. SD*mid* is the standard deviation of the mid-points of the bid-ask spreads during the first trading day. *Ranking* represents an investment banker's ranking from Loughran and Ritter (2003) but converted to integer rankings. *Nasdaq return* is the Nasdaq return over the 15 days prior to the offer date. *Ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one over the period six months prior to its offer date. *Ln(Headlines2)* equals the natural logarithm of the number of headlines with the company name plus one between the filing date and offer date. *Venture* is a dummy variable that takes on the value one if a venture backed IPO. *NYSE* is a dummy variable that takes on the value one if the IPO is to be listed on the NYSE. We estimate standard errors using Huber-White estimators and report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses. Each estimated equation includes unreported industry dummy variables to control for industry-related effects.

Variables	(1)	(2)
Constant	−0.133	−0.080
	(0.00)	(0.03)
ln(Sales)	−0.004	−0.001
	(0.11)	(0.86)
Sdmid	0.103	0.101
	(0.00)	(0.00)
Ranking	0.009	0.005
	(0.00)	(0.07)
Venture	0.032	0.026
	(0.01)	(0.05)
NYSE	−0.039	−0.028
	(0.00)	(0.10)
NASDAQ return	0.533	0.511
	(0.00)	(0.00)
ln(Headlines)	0.014	—
	(0.00)	
Ln(Headlines2)	—	0.017
		(0.00)
F statistic	38.05	33.49
	(0.00)	(0.00)
R-squared	0.34	0.28
No. of observations	1384	1488

banker simply because the offer price was higher than expected. In Section 4.7, we provide evidence consistent with this interpretation.

4.3. Analysis of offer price valuations

The above evidence shows that offer price revisions are positively and significantly correlated with pre-offer publicity, allowing issuers to benefit from their investment banker's promotional activities. However, a further implication of both Derrien's and Ljundgqvist, Nanda, and Singh's models is that the greater the bullishness of noise traders, the more likely the investment banker is able to raise the offer price above its true valuation and the more likely the price drops once short-sales constraints become

nonbinding. If pre-offer publicity affects investor sentiment (noise trader bullishness), then, according to these models, a positive correlation should be expected between pre-offer publicity and relative offer price valuations. Such a relationship would represent another benefit to issuers from their investment bankers' marketing efforts.

To test this relationship, we examine the effect of pre-offer publicity on an IPO's relative offer price valuation, while controlling for selected influences. Given Derrien's model, we are specifically interested in how different factors influence the odds of an IPO's valuation exceeding that of comparable firms. Consequently, we focus on a dummy variable that takes on the value one if the IPO's offer price valuation exceeds the median valuation of traded firms within its industry ($P/S_{\text{IPO}} > P/S_{\text{industry}}$).

The additional controls that we use are firm size, price uncertainty, investment banker ranking, venture capitalist backing, and prior market returns. Because larger firms could possess fewer growth prospects, their valuation might be less than the industry median. In contrast, IPOs with greater price uncertainty should be associated with an offer price valuation that exceeds the industry norm. Better investment bankers should be more successful at marketing the IPO and obtaining a valuation that exceeds that of comparable firms. If venture capital backing certifies the quality of the IPO firm, this should increase the offer price valuation so that it is higher than comparable firms. The greater the recent market returns, the more likely that bullish noise traders will be drawn to the market for IPOs, with accompanying higher price valuation.

Column 1 of Table 5 reports the results of the regression model. Most of the results are consistent with expectations, and, most important, greater pre-offer publicity is associated with a greater likelihood that the IPO's offer price valuation exceeds those of firms within its industry. The coefficient on the venture capitalist backing variable is negative, which is inconsistent with the venture capitalist certification hypothesis. According to this result, if being backed by a venture capitalist does certify an issue, such certification does not translate into a higher offer price valuation than comparable firms. Alternatively, venture capitalists could bring firms to market that have fewer growth prospects than other firms in their industry.

While these results are consistent with Derrien's model, another aspect of his model indicates that such valuations should be negatively correlated with an IPO's future stock performance. To test this, we add our post-IPO stock performance variable, *HPR*, to the prior regression model and report the results in Column 2 of Table 5. We find a negative coefficient on *HPR*. This is evidence that offer price valuations are biased upward, a result that is consistent with Derrien's model.

In summary, our evidence suggests that issuers benefit from investment bankers marketing efforts that increase the likelihood of offer price valuations exceeding those of other firms in their industry.

4.4. Analysis of initial IPO trading

We predicted earlier that pre-offer publicity attracts retail investors or noise traders. This prediction is based upon both Derrien's and Ljungqvist et al. models. Their models imply that sentiment investor (noise trader) demand is the primary determinant of price run-ups in initial IPO trading. Consequently, one should expect retail investor trading to be positively correlated with the pre-offer publicity measure if publicity draws these investors into the IPO market.

Table 5
Analysis of offer price valuations

The dependent variable in each regression is a binary variable that takes on the value one if the price-to-sales ratio of the IPO at its offer price exceeds the median price-to-sales ratios of its industry. *Ln(Sales)* equals the natural logarithm of an IPO's net sales for the fiscal year prior to its offering date. *Nasdaq return* is the Nasdaq return over the 15 days prior to the offer date. *Ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one. *Ln(ATS)* represents the natural logarithm of the average trade size during the first day of trading. *HPR* is an IPO's holding period stock return from offering to the minimum of three years or delisting date. We estimate the coefficients of the regressions using logistic regression analysis, using Huber-White type estimators for the variances and report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses.

Variable	(1)	(2)
Constant	0.998	0.972
	(0.00)	(0.01)
Ln(Sales)	−1.331	−1.343
	(0.00)	(0.00)
Sdmid	0.410	0.395
	(0.00)	(0.00)
Ranking	0.314	0.321
	(0.00)	(0.00)
Venture	−0.279	−0.268
	(0.06)	(0.07)
NASDAQ return	0.810	0.683
	(0.59)	(0.65)
Ln(Headlines)	0.361	0.373
	(0.00)	(0.00)
HPR	—	−0.034
		(0.07)
F statistic/chi-square	221.50	227.87
	(0.00)	(0.00)
Pseudo-*R* squared	0.38	0.39

To examine this prediction, we regress our measure of retail trading during the first day of trading on our pre-offer publicity variable. Given that average trade size, *ATS*, is a non-negative random variable, we use *Ln(ATS)* as the regressand. Greater retail trading should be associated with a smaller *ATS*. In addition to the pre-offer publicity measure, *Ln(Headline)*, we include a number of control variables.

These control variables include firm size (*Ln(Sales)*), public float (*Float*), price uncertainty (*SDmid*), an investment banker ranking measure (*Ranking*), Nasdaq pre-offer return (*Nasdaq return*), and whether an IPO is venture capitalist backed (*Venture*) or not. We expect larger firms to be associated with larger average trade sizes stemming from restrictions on institutional investment. With larger public float, short-sell restrictions are less likely to be binding and more institutional trading is expected. Higher ranked investment bankers might be more capable marketers to retail investors. Venture capital backed firms could be more attractive to retail investors if they perceive such backing as certifying the quality of the IPO. Recent market returns could induce more retail investors into equity markets, and particularly IPO markets.

Column 2 of Table 6 reports the results of estimating the regression model. We find that average trade sizes during initial trading in an IPO are significantly and negatively correlated with pre-offer publicity. Adding offer price revisions to this equation does not change this conclusion. Further, as noted earlier, using alternative small trading activity measures does not change this conclusion. This result is consistent with the notion that pre-offer publicity associated with an IPO brings retail investors into the market for that IPO. This evidence is also consistent with the Barber and Odean (2002) evidence for seasoned equities. In addition, the negative and significant effect of pre-offer Nasdaq returns on average trade size during initial trading is consistent with Derrien's assumption that increased equity market returns attract retail investors to IPO equity markets. And finally, the evidence that average trade size during initial trading is positively associated with an IPO's public float is consistent with the notion that retail investor trading dominates initial trading when institutional investors expect short-sale constraints to be binding. Such a result is consistent with both Derrien and Ljungqvist et al.

Table 6
Analysis of small trading activity

Ln(ATS) represents the natural logarithm of the average trade size during the first day of trading. *Ln(Sales)* equals the natural logarithm of the net sales of a firm for the fiscal year prior to its offering date. *Float* represents the ratio of the number of shares issued in the offering to the number of shares issued and outstanding after the offering. *SDmid* represents the standard deviation of the mid-points of the bid-ask spreads during the first trading day. *Ranking* represents an investment banker's ranking from Loughran and Ritter (2003) but converted to integer rankings. *Venture* is a dummy variable that takes on the value one if the IPO firm was backed by a venture capital firm. *Nasdaq return* represents the Nasdaq return over the 15 days prior to the offer date. *Ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one within six months prior to the offer date. We estimate standard errors using Huber-White estimators and report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses.

Variables	*Ln(ATS)*
Constant	7.383
	(0.00)
Ln(Sales)	0.151
	(0.00)
Float	0.434
	(0.00)
SDmid	−0.344
	(0.00)
Ranking	0.005
	(0.68)
Venture	−0.145
	(0.68)
NASDAQ return	−1.991
	(0.68)
Ln(Headlines)	−0.072
	(0.68)
F statistic	89.40
	(0.68)
R-squared	0.46
Number of observations	1,401

4.5. Analysis of initial IPO returns

Our third prediction is that attracting retail investors through publicity is good for an investment banker's regular IPO investors. If the regular investors of investment bankers are to benefit from their promotional efforts, then they should be able to sell their allocations at higher prices in early market trading. Consequently, we expect to observe a significantly positive correlation between pre-offer publicity and initial IPO returns.

In this connection we note that, according to Benveniste and Spindt (1989), offer price revisions should impound public and private information on investor demand gathered during the book-building process. However, Benveniste and Spindt's model also implies that these revisions should fully capture publicly available information, which is inconsistent with the evidence of Bradley and Jordan (2002) and Loughran and Ritter (2002) who find that initial returns are correlated with prior market returns.

Both Derrien and Ljungqvist et al. explain this evidence by stating that underwriters serve both issuers and their regular investors by exploiting sentiment investors. In these models, the valuations of sentiment investors in conjunction with short selling constraints determine the large initial returns of IPOs. Because it is a scarcity of securities that prevents regular or institutional investors from shorting the stock, we should expect IPO initial returns to be positively correlated with pre-offer publicity and pre-offer market returns and negatively correlated with the issue's public float. Further, because both models suggest a partial adjustment of the offer price to public information, we should expect initial IPO returns to be positively correlated with pre-offer publicity and market returns even after controlling for offer price revisions.

To test these expectations, we estimate the following regression models. First, we regress initial IPO returns on our pre-offer publicity measure and pre-offer market returns measure, along with various control variables. Column 1 of Table 7 reports the results of this regression model.[8] Consistent with our expectations, we find that initial returns are positively correlated with pre-offer publicity. Thus, the regular customers of investment bankers clearly benefit from promotional efforts.

To address further the question of whether Benveniste and Spindt (1989) or the Derrien and Ljungqvist et al. models better explain initial IPO returns, we expand the regression model to include our offer price revision measure and report results in Column 2 of Table 7. We find that prior stock market performance and pre-offer publicity continue to be significant influences on IPO returns even after accounting for offer price revisions, reflecting a partial adjustment to public information. These results are consistent with Derrien and Ljungqvist, Nanda, and Singh but not with Benveniste and Spindt (1989), which asserts that these influences should be impounded fully in the offer price revisions.

Because Derrien and Ljungqvist, Nanda, and Singh imply that it is bullish noise traders or retail investors that drive IPO prices upward, a significantly negative correlation should exist between average trade sizes and initial IPO returns. We examine this by introducing our retail trading activity measure and dropping the pre-offer publicity measure. We do this because we have just shown that pre-offer publicity affects both offer price revisions

[8]Our regression model is a standard linear regression model that assumes the population of IPO returns is homogeneous. If we drop this assumption and allow for price stabilization as in Asquith et al. (1998), we draw similar inferences to those reported for nonstabilized IPOs, though not for stabilized IPOs. Nevertheless, to facilitate comparison with prior research, we report only the results from the standard linear regression model.

Table 7
Analysis of initial returns

The dependent variable in each regression is the initial return for an initial public offering (IPO). *Ln(Sales)* is the natural logarithm of the firm's net sales for the fiscal year no later than its offering date. SD*mid* represents the standard deviation of the midpoints of the bid-ask spreads during the first trading day. *Ln(ATS)* is the logarithm of the average trade size during the first day of trading. *Float* represents the ratio of the number of shares issued in the offering to the number of shares issued and outstanding after the offering. *Revision* equals the difference between the offer price and midpoint of the initial filing price relative to the midpoint of the initial filing range. *Ranking* represents an investment banker's ranking from Loughran and Ritter (2003), but converted to integer rankings. *Venture* is a dummy variable that takes on the value one if the IPO firm was backed by a venture capital firm. *Nasdaq return* is the Nasdaq return over the 15 days prior to the offer date. *Ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one within six months prior to the offer date. We estimate standard errors using Huber-White estimators and report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses. Each estimated equation includes industry dummy variables, which we do not report.

Variables	(1)	(2)	(3)
Constant	−0.016	0.026	0.729
	(0.59)	(0.00)	(0.00)
Ln(Sales)	−0.014	−0.011	−0.003
	(0.02)	(0.04)	(0.55)
Sdmid	0.418	0.383	0.361
	(0.00)	(0.00)	(0.00)
Float	−0.095	−0.083	−0.051
	(0.01)	(0.01)	(0.03)
Ranking	0.010	0.005	0.007
	(0.04)	(0.30)	(0.09)
Venture	0.021	0.002	−0.012
	(0.35)	(0.97)	(0.52)
NASDAQ return	1.231	1.022	0.826
	(0.00)	(0.00)	(0.00)
Ln(Headlines)	0.026	0.023	—
	(0.00)	(0.00)	
Revision	—	0.427	0.328
		(0.00)	(0.00)
Ln(ATS)	—	—	−0.093
			(0.00)
F statistic	74.68	68.32	98.43
	(0.00)	(0.00)	(0.00)
R-squared	0.72	0.75	0.76
Number of observations	1,360	1,340	1,415

and retail trading activity, and so multicollinearity becomes a potential issue. Column 3 of Table 7 reports these results, which suggest that, as average trade size increases, initial returns drop. This result is exactly what one would expect if retail trading activity is driving up IPO prices in the face of short-sale constraints (our float variable). Consequently, these results reinforce the stories told in Derrien and Ljungqvist et al.

Reese (2003) and Ho et al. (2001) also find that pre-offer IPO publicity influences an IPO's initial returns. However, we interpret our publicity variable as a proxy for the efforts of investment bankers to promote retail interest in an IPO, while they interpret it as simply a proxy for investor sentiment.

Several problems arise with the notion that pre-offer publicity is simply a reflection of investor sentiment. First, the Barber and Odean (2002) results make it clear that media reporting determines investor sentiment instead of investor sentiment determining media reporting. Second, it explains neither our earlier correlation between investment banker compensation and pre-offer publicity nor our later correlation between investment banker switching and pre-offer publicity. Third, Degeorge et al. (2004) provide evidence suggesting that the publicity associated with a French IPO is significantly greater once the book-building method is selected. And finally, the notion that investor sentiment determines media reporting is predicated upon the notion that reporters are writing stories based upon conversations with investors, not writing stories based upon news releases, interviews, or presentations arranged by the firm or its investment bankers. The first mechanism is inconsistent with the Kuhn (1990) statements regarding the importance of publicity and also inconsistent with media economics (see Hamilton, 2003). The fact that so many companies spend money on public relations personnel and activities reinforces this point. This notion also fails to explain where journalists are obtaining their information. During the registration period, security analysts cannot generate printed information about the firm, so information about these firms must come from either the firm or from its investment bankers.

4.6. *Analysis of insider benefits*

One of our predictions is that issuers benefit from the promotional efforts of investment bankers. However, if an investment banker's promotional efforts benefit the issuer and the regular investors of the investment banker, then these efforts might also benefit the IPO's pre-offer shareholders. Such an implication would be consistent with Ljungqvist, Nanda, and Singh's model.

Loughran and Ritter (2002) show that, when a firm goes public, those who do not sell stock in the offering gain from the increased price of their stock (wealth effects) and lose from the sale of stock for less than its early traded price (money on the table or dilution effects). Loughran and Ritter claim that a firm's insiders consider both effects when determining whether or not they will be better off as a result of the offering.

Bradley and Jordan (2002) simplify Loughran and Ritter's expressions for the wealth and dilution effects as follows: wealth effects = (P-midpoint)(shares retained) and dilution effects = (P-OP)(shares sold), where P is the market price, shares retained represent the shares not initially sold in the offering, shares sold include secondary offerings, OP is the offer price, and midpoint is the midpoint of the initial filing range. We calculate these values for our sample firms, estimating the shares retained as the difference between the shares issued and outstanding after the offering (from CRSP) less the number of shares offered initially, including over-allotment shares (from SDC's New Issue database). While the inclusion of over-allotment shares biases downward the estimate of insider wealth gains from an offering, it correctly captures the additional shares that are often sold in nonstabilized IPOs. Using these estimates, we create a dummy variable that takes on the value one if the wealth effects are greater than the dilution effects and zero if not.

Table 8 reports differences in the number of headlines, initial returns, and float for these two groups of IPOs. If pre-offer publicity entices sentiment investors into the market for an IPO and insiders of an issuer benefit from their valuations, then pre-offer publicity should

Table 8
Insider wealth gains

Headlines represent the number of headlines with the company name. *Float* is the ratio of the number of shares issued in the offering to the number of shares issued and outstanding after the offering. *Initial returns* represent the return from the offer price to the first trading day's closing price. Wealth effects equal (*P*-midpoint)(shares retained) and dilution effects equal (*P*-*OP*)(primary shares sold), where *P* is the market price, shares retained represent the shares not initially sold in the offering (shares issued and outstanding after the offering less shares issued in the offering), *OP* is the offer price, and midpoint is the midpoint of the initial filing range. While we report the results for analysis of variance tests, the inferences are the same if we use tests of median differences.

Group	Headlines	Initial returns	Float
Wealth effects > dilution effects	16.59	45.01%	0.289
Wealth effects < dilution effects	12.30	6.16%	0.412
F statistic (*p*-value)	40.11	405.01	322.59
	(0.00)	(0.00)	(0.00)

be significantly larger for IPOs in which insider wealth gains exceed dilution losses. Table 8 strongly affirms this implication: Insiders benefit when their investment banker is able to effectively promote an issue so that the aftermarket price is higher than the offer price.[9] Table 8 also indicates the importance of float as a factor in the trade-off between wealth gains and dilution losses. In models that differentiate between investors (e.g. sentiment versus regular investors), the supply of stock must be limited so that the marginal valuation of the stock in initial trading is determined by exuberant sentiment investors. In other words, insiders can reduce the underpricing of an offering by selling more stock and retaining less.

To examine the evidence in Table 8 further, we perform a logistic regression on a binary variable that takes on the value one if the wealth effects dominate the dilution effects for an IPO. As shown earlier, an IPO's returns are significantly influenced by its pre-offer publicity and its initial public float. Consequently, we regress the initial return variable on these variables and use the residuals from this regression as our proxy for the separate effect of underpricing on insider wealth gains. In addition to the pre-offer publicity variable, the public float variable, and the initial return residual variable, we include the logarithm of the dollar amount of the IPO offering given that Ljungqvist, Nanda, and Singh's model suggests that investment bankers increase the offer size when they expect a large increase in the number of sentiment investors wishing to buy a stock.

Column 2 of Table 9 reports the results of the logistic regression. The evidence suggests that increasing pre-offer publicity or reducing the initial public float for an IPO increases insider wealth gains. Further, the effects of these influences on initial returns do not fully capture the effect of initial returns on insider wealth gains, which is consistent with the information momentum effect observed in Aggarwal et al. (2002). Aggarwal et al. (2002) show that high initial returns benefit managers by generating information momentum (publicity and analyst followings) that allows managers to sell their stock at higher prices. Finally, a larger offer size increases managerial wealth, given the initial public float, a result that is consistent with Ljungqvist et al.

[9]We find that these tests of differences are still significant at the 1% marginal significance level if we use medians instead of averages as reported in Table 8.

Table 9
Analysis of insider wealth gains

The dependent variable in the regression is a binary variable that takes on the value one if the wealth effects are greater than dilution effects. Wealth effects equal (*P*-midpoint)(shares retained) and dilution effects equal (*P*-*OP*)(primary shares sold), where *P* is the market price, shares retained represent the shares not initially sold in the offering (shares issued and outstanding after the offering less shares issued in the offering), *OP* is the offer price, and midpoint is the midpoint of the initial filing range. *Headlines* represent the number of headlines with the company name. *Float* is the ratio of the number of shares issued in the offering to the number of shares issued and outstanding after the offering. *Initial returns residuals* represent the residuals from regressing the initial returns of IPOs on *headlines* and *float*. *Ln(amtsold)* equals the logarithm of the dollar amount sold. We estimate standard errors using Huber-White estimators and report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses.

Variable	Wealth > dilution
Constant	0.648
	(0.00)
Ln(amtsold)	0.396
	(0.00)
Ln(Headlines)	0.574
	(0.00)
Float	−5.910
	(0.00)
Initial returns residuals	5.988
	(0.00)
Chi-square statistic	247.10
	(0.00)
Pseudo-*R*-squared	0.27
Number of observations	2,804

This evidence and the evidence in Section 4.5 show that it is sentiment investors who are leaving money on the table. This result is consistent with Derrien and Ljungqvist et al. and with the empirical evidence in Dorn (2003), and Cornelli et al. (2006). Also consistent with this insider wealth maximizing hypothesis, Ang and Brau (2003) show that many IPO insiders use different concealment strategies to prevent outside investors from knowing how many shares they sell in the secondary market.

4.7. Analysis of issuer switching behavior

Earlier we provided evidence that issuers compensate investment bankers for their marketing efforts. Now, we examine the issue of whether issuers make future decisions on who should manage a subsequent equity issue on the basis of the effectiveness of an investment banker's IPO marketing efforts. If issuers care about such efforts, then they should reward investment bankers by retaining them for subsequent equity offerings (SEOs) when their marketing efforts are successful but switching to new lead bankers when efforts are ineffective.

We test this idea by examining several influences on an issuer's decision to switch lead IPO investment banker at its first SEO. We collect data from SDC's New Issue database to determine which IPOs in our sample subsequently engage in an SEO and cross-check these data against news stories on LexisNexis to ensure correct identifications. Because Ljungqvist and Wilhelm (2005) also consider the effect of insider wealth gains on issuer

switching behavior, we use their variables as a starting point for our analysis. Specifically, we compute the number of days between a firm's IPO offer date and its SEO offer date using data from SDC's New Issues database. However, we calculate holding period returns from offer date until the minimum of three years or delisting date as our measure of firm performance instead of using earnings per share. We also include an insider wealth dummy, not a CEO wealth dummy, because we believe it is important to capture IPO benefits for the entire board of directors. We obtain investment banker rankings from Loughran and Ritter (2003) and use Institutional Brokers' Estimate System data to identify whether or not an analyst with the lead investment banker issues a report on the company within one year of its offer date.

We employ logistic regression analysis to examine how these variables influence whether an issuer switches its lead IPO investment banker at the first SEO. Column 1 of Table 10 effectively replicates the significant results reported in Table 4 of Ljundgqvist and Wilhelm (2004). We find that an issuer decision to switch lead investment bankers is positively and significantly correlated with the length of time between the IPO and the SEO, the provision of an analyst report by the lead investment banker, and insider wealth gains (specifically, when insider wealth gains exceed their dilution losses).

To analyze the role of promotion and distribution, we substitute firm size, initial IPO returns, and pre-offer publicity into the prior equation and report the results in Column 2 of Table 10. We use a firm size measure in this analysis as the expected future SEO offer size should be correlated with firm size, not IPO offer size. We find that larger IPO issues and greater pre-offer IPO publicity makes issuers less likely to switch to another lead investment banker. These results are consistent with our earlier compensation results. Further, we observe that the insider wealth dummy continues to be significant and negatively correlated with the switching decision. These results are consistent with prior results and reinforce our premise that issuers value an investment banker's ability to market an IPO. This conclusion is also consistent with the evidence in Degeorge et al. (2004) on why book-building dominates auctions in French IPOs.

Given this evidence, we now examine whether switching lead investment bankers is associated with an increase in pre-offer publicity for the switching firm's SEO. To do this, we compute the number of news stories (headlines) associated with a seasoned equity offering of a sample firm over the six-month period prior to its SEO offer date. We then compute the difference between the number of news stories during the six months prior to its SEO offer date and the number of news stories during the six months prior to its IPO offer date. Finally, we compute the difference in this change between firms that do and do not switch investment bankers. This last difference controls for the expected number of news stories if the firm does not switch. This last difference is 4.91, which is significant at the 7% marginal significance level using a t test. More relevant, because these data are count data, we use a median test and find that this difference is significant at the 1% marginal significance level. Thus firms that switch lead investment bankers experience a significant increase in the pre-offer publicity associated with their SEO, which is consistent with the notion that issuers value investment bankers' promotional efforts.

5. Summary and conclusions

Derrien (2005) and Ljungqvist et al. (2006) build upon Miller (1977) and develop models of the IPO process implying that the issuer and regular customers of an investment banker

Table 10
Analysis of IPOs that switch their lead investment banker for their seasoned equity offering (SEO)

The dependent variable in each regression is a binary variable that takes on the value one if the firm switches lead investment bankers for its SEO. *HPR* is an IPO's holding period stock return from offering to the minimum of 3 years or delisting date. *Ln(days IPO to SEO)* represents the logarithm of the number of days from an IPO's offer date until its SEO date. *Rankings* are the investment banker rankings from Loughran and Ritter (2003) but converted to integer rankings. *Analyst report from lead manager* represents a dummy variable that takes on the value one if an analyst with the lead manager issues a report on the IPO within one year of its offer date. *ln(Sales)* is the natural logarithm of the firm's net sales for the fiscal year prior to its offering date. *Initial Returns* are the returns from the offer price to the first trading day closing price. *ln(Headlines)* equals the natural logarithm of the number of headlines with the company name plus one. *Wealth dummy* represents a dummy variable that takes on the value one if the wealth effect dominates the dilution effect for IPO insiders. Each regression is a logistic regression with Huber-White standard errors estimates. We report *p*-values associated with a null hypothesis that the coefficient equals zero within parentheses.

Variables	(1)	(2)
Constant	−5.184	−5.125
	(0.00)	(0.00)
HPR	−0.007	0.003
	(0.77)	(0.90)
Ln(days IPO to SEO)	1.311	1.376
	(0.00)	(0.00)
Wealth dummy	−0.381	−0.392
	(0.01)	(0.04)
Analyst report from lead manager	−0.456	−0.221
	(0.03)	(0.00)
Rankings	−0.383	−0.450
	(0.00)	(0.35)
Ln(Sales)	—	−0.128
		(0.01)
Initial return	—	−0.085
		(0.79)
Ln(Headlines)	—	−0.169
		(0.04)
Wald's chi-square statistic	224.93	193.49
	(0.00)	(0.00)
Pseudo-*R*-squared	0.24	0.26

benefit when sentiment investors are brought into the market for an IPO. If correct, then investment bankers have an incentive to attract these sentiment investors, and issuers should reward investment bankers with repeat business if they do this effectively. While an investment banker has several ways to attract sentiment (retail) investors, it is clear from Barber and Odean (2002) and Tetlock (2006) that generating publicity about the IPO is an effective method.

Consequently, we hypothesize that investment bankers promote an issue when they wish to induce retail investors or noise traders into the market for that IPO. Given this hypothesis and the models of Derrien (2005) and Ljungqvist et al. (2006), we predict the following. First, pre-issue publicity attracts retail (noise) investors to an IPO. Second, attracting retail investors through publicity is good for issuers. Third, attracting retail investors through publicity is good for an investment bank's regular IPO investors. Fourth, attracting retail investors through publicity is good for investment banks.

To examine these predictions, we use a sample of U.S. firm-commitment IPOs from 1993 through 2000. Consistent with our first prediction, we find a positive and significant correlation between retail trading activity during the first day of trading in an IPO and the IPO's pre-issue publicity. Consistent with our second prediction, pre-issue publicity is positively correlated with upward revisions in IPO offer prices and offer price valuations that are above comparable firms in their industry. In addition, we find that insider wealth gains exceed their dilution losses when more pre-issue publicity is associated with their IPO. Consistent with our third prediction, initial IPO returns are positively correlated with pre-issue publicity. And finally, consistent with our fourth prediction, we find that investment banker compensation is positively and significantly correlated with pre-issue publicity. Reinforcing the importance of marketing to issuers and investment bankers, we find that issuers are less likely to switch lead investment bankers when they are effective at promoting their IPO but, when they do switch, they often are able to increase the pre-offer publicity associated with their SEO.

These findings are consistent with the models in Derrien (2005) and Ljungqvist et al. (2006) and with the evidence in Dorn (2003), Cornelli et al. (2006), and Purnanandam and Swaminathan (2004). Our results also provide a different interpretation of what issuers value in their investment bankers, which builds on the notion that investment bankers are marketing agents for issuers.

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