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Factors affecting investment bank initial public offering market share☆

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Abstract

This paper examines the effect of several factors on the market share of investment banks that act as book managers in initial public offerings (IPOs) between 1984 and 1995. For established banks, IPO first-day returns, one-year abnormal performance, abnormal compensation, industry specialization, analyst reputation, and association with withdrawn offers have a significant impact on changes in market share. These factors have a more significant effect on market share changes in low-volume IPO markets. These factors have a less significant effect on market share, statistically and economically, for less established banks, consistent with the notion that less reputation is placed at risk.

JEL classification: G24; C21

Keywords: Initial public offerings; Analyst reputation; Mispricing; Withdrawal; Compensation

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1. Introduction

Corporate finance activities, including the issuance of securities, provide significant revenues for investment banks. The Securities Industry Association (1997), for example, reports that NYSE securities firms received over $11 billion in underwriting fees in 1996 amounting to approximately 10% of total revenues for these firms. Investment banks compete aggressively for new underwriting business. This behavior is particularly true in the market for initial public offerings (IPOs), since underwriting fees as a percentage of proceeds raised are greater for IPOs than for seasoned equity or debt offerings. Also, the investment bank in an initial public offering is commonly retained to underwrite a firm's subsequent security offerings (see James, 1992). An issuer's choice of investment bank is argued to depend on a number of qualitative and quantitative factors, such as the 'quality of the bank's people' (Eccles and Crane, 1988, p. 110), the pricing and performance of past deals underwritten by the bank and the bank's research capability.[1] This paper examines the relation between several quantifiable factors and an investment bank's ability to generate underwriting business, as proxied by changes to its IPO market share.

A study of market share changes has two advantages. First, Eccles and Crane (1988) note that market share is highly correlated with investment bank profitability. Identification of the relative importance of quantifiable factors in explaining market share changes should, therefore, have practical significance. Second, market share is commonly used in the academic literature as a proxy for investment bank reputation (Megginson and Weiss, 1991; Dunbar, 1998). Banks are credible third party information producers because they lose economic rents from future issues if their information is inaccurate and can expect to gain rents from future issuers if their information is accurate. Market share changes are a reasonable proxy for changes to expected future economic rents.[2] A study of market share changes, therefore, also provides insights into how reputation evolves.

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[1] Smith (Wall Street Journal, February 1, 1996, p. C1) discusses the role of such factors in AT&T's selection of a lead bank to underwrite the IPO of Lucent Technology. Siconfoli (Wall Street Journal, December 19, 1996, p. C1) discusses the importance of IPO pricing and investment bank research in underwriter selection. Raghavan (Wall Street Journal, March 25, 1997, p. C1) also discusses the importance of research in attracting underwriting business. Soja (1992) presents a detailed examination of the factors used by EASAL Corporation in selecting an investment bank to take it public.

[2] Investment bank reputation is argued to play an important role in resolving information frictions in the new issues market for IPOs (see, for example, Booth and Smith, 1986; Beatty and Ritter, 1986; Benveniste and Spindt, 1989; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994).

Market share changes from an initial year to the following year are related to abnormal first-day returns, one-year abnormal returns, abnormal underwriting fees, industry specialization, changes to the reputation of the bank's analysts, and the fraction of withdrawn offerings underwritten by the bank in the initial year. In Booth and Smith's (1986) model, investment banks use their reputation to certify that an issue is not overpriced. While overpricing damages reputation, Beatty and Ritter (1986) also argue that the first-day return is costly since future issuers would avoid banks that leave too much money on the table (i.e. price lower than necessary). While this argument motivates the inclusion of abnormal IPO first-day return as an independent variable, recent evidence of long-run abnormal returns for IPOs (Ritter, 1991; Loughran and Ritter, 1995) suggests that the first-day return may not be a complete measure of mispricing. Consequently, I include long-run abnormal returns, covering one year, as an independent variable. Investment bank fee policy can also be used to enhance a bank's ability to generate future underwriting business. Less-established banks could reduce fees to attract business, whereas established banks could increase their fees as compensation for the rental of their reputation.

The industry specialization of an investment bank as reflected by their selection of IPOs should also affect its future market share. Concentrating efforts in a particular industry can enhance a bank's ability to compete for underwriting business, since pricing should be improved due to information spillovers (Booth and Chua, 1996). Well-established banks, possessing resources to develop expertise in several industries, are likely to diversify. The reputation of the bank's analysts is likely to have a positive effect on market share. Finally, Dunbar (1998) argues that withdrawals should harm a bank's ability to compete for future business, as issuers would avoid banks associated with past failures.

The empirical evidence in this paper can be summarized as follows. For investment banks with an established reputation, initial overpricing has a negative effect on market share changes, consistent with Booth and Smith's (1986) reputation theory. Very positive first-day returns also have a negative effect on market share changes. Future issuers appear to avoid banks that leave too much money on the table. One-year abnormal stock performance has a positive effect on investment bank market share changes. Negative abnormal spreads result in increased market share, inconsistent with the popular notion that banks do not cut fees to attract business (Lowenstein, Wall Street Journal, April 10, 1997, p. C1; Chen and Ritter, 1999). Industry specialization has a negative impact on market share changes. For reputable banks, improvements to the reputation of the bank's analysts have a positive effect on market share changes. Finally, withdrawals have a negative effect on market share changes for established investment banks. These factors have an insignificant effect on market share changes for less established banks, consistent with the notion that less reputation is placed at risk.

There are several other studies that examine the role of investment bank reputation in the IPO market.[3] Most studies treat reputation as exogenous, and examine how reputation affects the pricing and performance of IPOs. Carter et al. (1998), for example, find that underpricing is less positive, and one-year abnormal performance is more positive, for IPOs underwritten by reputable investment banks.[4] In contrast, only a few papers examine the effect of past IPO performance on investment bank reputation. Beatty and Ritter (1986) find that abnormal first-day returns have a negative effect on investment bank market share. Several recent papers have also considered the effect of long-run IPO performance on market share (Nanda and Yun, 1997; Nanda et al., 1995; Beatty and Vetsuypens, 1995). This paper adds to this literature by examining the effect of several factors on market share. Also, the existing market share studies examine changes over only two periods. This paper considers market share changes over many periods, allowing an examination of the stability of the relations among the specified variables. I find that the relation between these factors and market share changes is stronger, economically and statistically, in declining IPO markets.

The organization of the remainder of this paper is as follows. In Section 2, hypotheses regarding the determinants of investment bank reputation changes are developed. The data and empirical methods are described in Section 3. Evidence on the impact of IPO first-day returns, one-year abnormal returns, abnormal spread, industry specialization and analyst reputation on market share is presented in Section 4. The effect of these factors on market share in growing and declining markets is examined in Section 5. The effects of withdrawals are considered in Section 6. In Section 7, I present a case analysis that examines the role of pricing, performance, industry specialization, and analyst reputation in the growth of market share for Friedman Billings Ramsey Group. Finally, I summarize the paper in Section 8.

2. Investment bank market share, reputation and offering characteristics

2.1. First-day returns for initial public offerings

Potential investors in an initial public offering face an asymmetry of information commonly referred to as a lemons problem (Akerlof, 1970): since insiders

[3] Reputation-based models have been developed for product markets (e.g. Klein and Leffler, 1981; Allen, 1984), and applied to different forms of financial intermediation (e.g. DeAngelo (1981) and Titman and Trueman (1986) examine auditor reputation; Barry et al. (1990) examine the role of venture capitalists in the capital raising process; James and Wier (1990) examine the role of borrowing relationships on the pricing of initial public offerings). I am not aware of any empirical studies in these areas that examine why reputation changes, however.

[4] Also see Balvers et al. (1988), Johnson and Miller (1988), Tinic (1988), Carter and Manaster (1990), and Carter and Dark (1992).

have better information regarding the true value of their firm, they have an incentive to offer securities when they are overvalued by investors. Booth and Smith (1986) argue that this problem can be ameliorated if insiders credibly certify that they are not selling overpriced securities. One certification mechanism is to hire an investment bank to manage the offering. This mechanism is credible if banks lose expected economic rents from future issues by being associated with an overpriced offering. Market share for the investment bank should decrease in the future since investors would be reluctant to trust the pricing of future issues by that bank. While overpricing could be the result of honest mistakes, market participants would find it difficult to determine the true reason for mispricing. Reputation, therefore, should be damaged any time inaccurate information is produced which results in inaccurate pricing (see Chemmanur and Fulghieri, 1994).

While investors are concerned about overpricing, future issuers should be concerned about underpricing. As noted by Beatty and Ritter (1986), the first-day return presents a cost to issuers because it results in a greater dilution of the original owner's claims. Future issuers, therefore, would likely resist using a bank that leaves too much money on the table. The effect of the first-day returns of an initial public offering on market share, therefore, depends on the relative importance of these two constituents. If satisfying future issuers is more important, market share changes should be negatively related to IPO first-day returns. If satisfying future investors were more important, the opposite relation would hold. If both constituents are important, avoiding extreme mispricing enhances market share, such that the relation between initial returns and market share would be non-monotonic. These market share effects should be more significant for established banks since more reputation is placed at risk.

2.2. Long-run performance of initial public offerings

Recent evidence on long-run underperformance of IPOs (Ritter, 1991; Loughran and Ritter, 1995) suggests that offerings are not correctly valued in the early aftermarket. Under this view, an offering's first-day return would not be an entirely appropriate measure of mispricing. Negative abnormal long-run performance would arise because the IPO was initially overpriced, and positive abnormal long-run performance would arise because the IPO was initially underpriced. If investors and future issuers share this view of long-run performance, the market share effects due to long-run IPO performance should be identical to those due to first-day returns.

A different view emerges from the certification model of Chemmanur and Fulghieri (1994). In their model they posit two types of firms attempting a public offering: firms that have good prospects after the offering and firms which have poor prospects after the offering. Investment banks evaluate firms, and only market those firms which are believed to have good prospects. A bank's

reputation evolves based on its ability to accurately screen for good performers. Taking a firm public that actually has good prospects enhances reputation, whereas taking a firm public that does not hurts reputation. Empirically, firms with good prospects should have positive abnormal long-run performance, and those firms with poor prospects should have negative abnormal long-run performance. Thus, being associated with an offering that has positive long-run performance should enhance reputation, and being associated with an offering having negative long-run performance should damage reputation. It should be noted that similar predictions emerge if issuers believe that positive aftermarket performance is due to underwriter aftermarket support.

In Chemmanur and Fulghieri's model, the Bayesian updating of investment bank reputation is such that accurate screening has a greater effect on the reputation of those firms with established reputations. That is, being associated with a good offering has a more positive effect on the reputation of an established investment bank while being associated with a poor offering has a more negative effect on the reputation of established banks.

2.3. Investment bank compensation

Booth and Smith (1986) argue that firms may be willing to accept more positive first-day returns when using a less reputable investment bank if the bank reduces its fees. Investment banks are willing to accept lower fees since significant economic rents can be generated once their reputation is established. Thus, all else equal, reductions in fees should have a positive impact on the future prospects of less well-established banks. For established investment banks, there could also be a positive relation between changes in market share and demanded fees. Banks that expect increased future market share place more at risk in current offerings and, therefore, could charge higher fees. This argument should not be interpreted as a sort of Veblen equilibrium, where quantity demanded increases with price because higher priced goods carry snob appeal. My argument is more in the spirit of rational expectations. Firms that expect increased future business charge more for current offerings because more reputation is placed at risk. Over time, as their expectations are, on average, realized, we should empirically observe a positive relation between fees and market share changes.

2.4. Analyst reputation

It is widely argued that investment bank research plays an important role in the selection of IPO underwriters. Soja (1992), for example, argues that EASEL Corporation's selection of Donaldson, Lufkin, and Jenrette as a lead investment bank in their 1990 IPO was largely due to the strength of their analyst, Scott Smith. Smith was selected in 1989 as a member of *Institutional Investor's*

All-American Research Team. The presence of strong analysts is likely to be attractive to issuers for several reasons. Michaely and Womack (1999) note that analysts currently play an active role in underwriting for new issues. The presence of a reputable analyst should, therefore, increase an issuer's confidence that its IPO will receive a high valuation. Like investment bank reputation, analyst reputation should also play a role in certifying to potential investors that the offering is not overpriced. This certification is desirable to issuers since more fully certified issues are generally priced at higher levels (Booth and Smith, 1986; Balvers et al., 1988).

Analysts in banks having an underwriting relationship with a firm are also more likely to make earnings forecasts and recommendations to buy an IPOs shares in the first few months after the IPO.[5] The market generally responds positively to this coverage and Stickel (1992) finds that the reaction is most positive for analysts included in *The All-American Research Team listing*. Lin and McNichols (1997) posit that issuers select investment banks that have more a favorable view of the firm's prospects. If the bank's views are correct, and it takes time for others in the market to realize the accuracy of the bank's views, then there will be a positive relation between analyst coverage and stock returns. Alternatively, positive analyst coverage may drive market demand, even if irrationally. In either case, original shareowners that do not sell their entire holdings in the IPO should prefer to use banks that have highly respected analysts.

2.5. Industry specialization

Booth and Chua (1996) argue that information spillovers arise when several IPOs occur in the same industry over a reasonably short period of time. These information spillovers lower the cost and improve the precision of IPO valuation (see Merton, 1987; Mauer and Senbet, 1992). Concentrating underwriting efforts in a particular industry should, therefore, increases a bank's market share, since pricing of offerings is likely to be improved. Industry specialization is also likely to be an optimal strategy for smaller, less-established investment banks that would find it difficult to establish a team of analysts and bankers with expertise in several industries. Concentration in a particular industry is also risky, however, since the industry makeup of firms going public changes over time. Larger, established investment banks, therefore, are likely to attempt to market offerings in several industries to ensure a more stable market presence.

[5] See Michaely and Womack (1999), Dunbar et al. (1999), Ali (1994), Dugar and Nathan (1995) and Lin and McNichols (1997).

2.6. Withdrawals of initial public offerings

Dunbar (1998) finds that a significant fraction of IPOs are withdrawn after they are filed with the Securities and Exchange Commission. The possibility of failure has severe repercussions for issuers. Dunbar (1998) and Ritter (1987) find that failed offerings rarely return to the public marketplace. Less than 8% of issues that have previously failed ever are completed, and these successful IPOs generally occur several years after the failed initial attempt. As noted by Lerner (1994, p. 31), firms that withdraw 'may be lumped with other businesses whose offerings did not sell because of questionable accounting practices or gross mispricing'. Withdrawals should damage investment bank reputation since future issuers are less likely to use investment banks associated with past failures. Consistent with this expectation, Dunbar (1998) finds that investment banks demand greater fees in offerings that they believe are more likely to be withdrawn.

3. Data and methods

To compute investment bank market share, I first collect data on all successful firm-commitment IPOs of equity between 1984 and 1995 from Securities Data Corporation's (SDC's) New Issues database. I restrict the sample to securities offered by U.S. corporations, and exclude closed-end fund offerings and real estate investment trust offerings. I also exclude offerings of American Depositary Receipts, and bundles of warrants and common stock, referred to as units. For each offering, I obtain data on the offering date, the book manager of the offering, the gross domestic proceeds raised in the offering, excluding overallotments, the offering price and the underwriter spread. Aftermarket price and return data are obtained from the Center for Research in Security Prices (CRSP). Offerings by firms without CRSP data are included in the market share analysis. For those offerings by firms with CRSP data, the first-day return is defined as

$$100[P_1 - P]/P, \tag{1}$$

where P_1 is the closing price at the end of the first-day of trading and P is the offering price. I also compute the one-year abnormal return for each issuing firm, defined as its buy-and-hold return from the end of the first-day of trading to the end of the one year anniversary of the IPO, minus the compounded return on the market. I use the CRSP NYSE/AMEX value-weighted index, with dividends, for IPOs that initially list on the New York or American Stock Exchanges. I use the Nasdaq composite index for all other IPOs. Returns are calculated to the end of the one-year IPO anniversary or until the issuing firm stops trading. The findings documented later are unaffected if one-year abnormal performance is calculated using a common calendar end point of the end of the year for all IPOs. The cross-sectional relations are also qualitatively

unaffected if abnormal returns are calculated by subtracting the buy-and-hold return on a firm matched by size, as in Loughran and Ritter (1995), or by size and book-to-market, as in Barber and Lyon (1997). Market portfolio-adjusted returns are used to minimize any potential errors-in-variables problems in my market share regressions.

For each year from 1984 to 1994, I identify all unique investment banks that act as book managers in at least one offering in that year. The market share for each bank in a given year is defined as the sum of the gross proceeds raised in offerings where the bank acts as book manager, divided by the sum of the gross proceeds raised in all offerings in that year. I also consider alternative definitions of market share based on fees received. Specifically, I define market share as the sum of fees, or spread per share multiplied by the number of shares, in all offerings where the bank acts as book manager, divided by the sum of all fees charged in the year. I also considered defining fees as the sum of the gross spread and offering expenses. The results in the remainder of the paper are similar when these measures of market share are used.

Table 1 provides descriptive statistics on IPOs for each year between 1984 and 1994. The table reports the number of offerings, the number of unique book managers, the mean book manager market share, the Herfindahl index, the mean first-day return, the mean percentage underwriting fees, the mean one-year abnormal return, the total gross proceeds raised, and the mean offering size. The average percentage underwriting price is the cash spread divided by the offering price, multiplied by 100. All means are calculated over the number of IPOs in the year. The number of offerings ranges from 130 in 1990 to 523 in 1993. The number of book managers varies from 51 in 1989 and 1990 to 128 in 1994. Not surprisingly, the number of book managers drops dramatically after the 1987 market crash from 113 in 1987 to 61 in 1988. The number of offerings, the total proceeds raised, and the average offering size also drop after 1987. The average offering size has otherwise been generally increasing, from \$10.6 million in 1984 to \$24.5 million in 1995, peaking at \$35.0 million in 1993 in constant 1984 dollars. The mean first-day return ranges from 7.3% in 1984 to 15.2% in 1990. The mean percentage underwriter fee has been declining over time from 8.16% in 1984 to 7.40% in 1992, although this mean does not hold the size of the offering constant. Interestingly, the drop in the number of book managers after the 1987 market crash has no significant impact on the average spread. Mean abnormal one-year market adjusted returns, exclusive of the first-day, range from -9.29% in 1987 to 8.85% in 1994.

The average market share of book managers ranges from 2.44% in 1994 to 5.55% in 1989. The Herfindahl index is a commonly used measure of market concentration. Formally, it is calculated as

$$\sum_{i=1}^{99} \left(100 \frac{v_i}{V}\right)^2, \tag{2}$$

Table 1
Descriptive statistics on the initial public offering market between 1984 and 1994

The market share for a book manager in a given year is the sum of the gross proceeds raised in IPOs in which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in all IPOs in that year. The Herfindahl index is the sum of the squared percentage of market shares. IPO first-day return is defined as $100(P_1 - P)/P$, where P is the offering price and P_1 is the closing price for the firm at the end of its first-day of public trading. Percentage underwriter spread is the gross spread per share, divided by the offering price per share. Abnormal one-year percentage stock return is the buy and hold return from the end of the first-day of trading to the IPO's first anniversary, or until the firm is delisted, whichever comes first, minus the return on the market. Market return is taken from the Center for Research in Security Prices (CRSP) NYSE/AMEX value-weighted index over the same period, if the firm lists on the New York or American Stock Exchanges, and the Nasdaq composite index, otherwise. All proceeds are measured in constant January 1984 dollars. All means are measured over the number of IPOs in the year.

Year	Number of IPOs	Number of book managers	Mean market share of book manager (%)	Herfindahl index for book mgr.	Mean IPO underpricing (%)	Mean % underwriter spread	Mean 1 yr abnormal % stock return	Total gross proceeds raised (B$)	Mean IPO gross proceeds (M$)
1984	250	93	3.24	576.9	7.30	8.16	8.86	2.64	10.60
1985	261	85	3.73	894.7	10.60	7.96	3.49	4.75	18.20
1986	538	119	3.46	624.8	8.60	7.62	0.36	13.70	25.50
1987	378	113	3.67	901.7	8.60	7.70	− 9.29	9.75	25.80
1988	152	61	4.85	857.2	9.80	7.71	7.40	3.11	20.50
1989	133	51	5.55	1478.0	14.00	7.52	1.73	3.67	27.60
1990	130	51	5.54	1091.3	15.20	7.48	− 8.64	3.05	23.40
1991	301	74	4.69	841.2	12.10	7.21	− 5.48	10.21	33.90
1992	413	100	4.25	846.2	10.40	7.28	2.78	14.07	34.10
1993	523	122	3.19	660.8	12.90	7.27	− 1.50	18.30	35.00
1994	412	128	2.44	478.4	9.80	7.40	8.85	10.10	24.50

where v_i is the gross proceeds raised by the bank in a single industry, and V is the total proceeds raised by the bank. Individual industries are identified using 2-digit Standard Industrial Classification (SIC) codes. The Department of Justice classifies industries as highly concentrated if this index is greater than 1800, moderately concentrated if the index is between 1000 and 1800, and unconcentrated if the index is less than 1000 (see Saunders, 1996). In most years, the underwriting industry would be described as unconcentrated. The index jumps dramatically in 1989 to 1478, however. Although the industry would only be classified as moderately concentrated in that year, the increase in the Herfindahl index of over 600 points from 1988 to 1989 might have attracted the attention of the antitrust division of the Department of Justice if it was the result of a horizontal merger.

For each book manager having a positive market share in a given year, I compute its market share in the subsequent year. The change in market share from the initial to the subsequent year is the focus of much of the remainder of this paper. In Sections 4 and 5, I relate changes in market share to first-day returns, investment bank fees, one-year IPO performance, industry specialization of offerings underwritten by a book manager in the initial year, and changes to analyst reputation. In Section 6, I also consider the effect of withdrawn offerings. The annual measurement period for market share is admittedly arbitrary. Beatty and Vetsuypens (1995, p. 7) argue that a longer measurement period 'offers the advantage of smoothing out random year-to-year fluctuations in IPO pricing and underwriting market share that might otherwise add noise to the data'. On the other hand, a longer period makes it more difficult to isolate the effects of individual offerings on market share. The appropriate measurement period is ultimately an empirical question. I replicate the analysis in the remainder of the paper using non-overlapping two-year periods to measure market share, generating results not reported here. The results are qualitatively similar, although the R^2's for the market share regression are generally higher using annual data.

There are two main criticisms of this sort of market share analysis. First, Nanda and Yun (1997) note that investment banks are involved in many offerings in a year. While the pricing in one offering may enhance reputation, for example, the pricing in another may damage it. It is not clear what aggregate measure of first-day returns, investment bank fees or one-year performance, would be appropriate to relate to changes in market share. I account for this problem by considering different aggregate measures that account for the distribution of these variables across offerings in a given year. As noted previously, the use of shorter periods to measure market share also makes it easier to isolate the effects of individual offerings.

A second criticism, initially raised by Tinic (1988), is that market share changes may arise due to changes in the IPO market over time. For example, an investment bank that specializes in small offerings could have a large market

share in one year if there are relatively more small offerings marketwide, and a lower market share in the following year if there are fewer small offerings. The reduction in market share would not necessarily be due to mistakes made in offerings in the initial year. To account for this possibility, I consider alternative definitions of the market for IPOs. Since previous studies find a segmentation of investment banking based on the riskiness of offerings (Hayes, 1971; Johnson and Miller, 1988; Carter and Manaster, 1990), I classify different market segments based on offering size, a commonly used risk proxy. Specifically, I examine the market share of investment banks in small offerings, comprising those less than \$10 million in constant 1984 dollars, separate from large offerings, comprising those greater than \$10 million.

Table 2 presents the distribution of annual market share measures for the full sample of IPOs, and the large and small market segments. For the full sample, the mean annual market share is 3.75%, and ranges from 0.002% to 32.660%. The largest market share in the sample belonged to Goldman Sachs in 1989. To

Table 2
Distribution of annual book manager market share measures for initial public offerings from 1984 to 1994

Market shares are reported for different segments of the IPO market. All dollar values are measured in constant January 1984 dollars. The market share for a book manager in a given year in a particular segment is the sum of the gross proceeds raised in that segment for which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in IPOs in that segment for the year. Segments examined include the market of all IPOs, the market of small IPOs, defined as offerings with gross proceeds less than or equal to \$10 million, and the market of large IPOs, defined as offerings with gross proceeds greater than \$10 million. The Herfindahl index in each year for each segment is the sum of the squared percentage market shares for book managers in that segment. Means and medians are measured over the number of IPOs in the year.

	All IPOs	Small IPOs	Large IPOs
Mean number of IPOs per year	317.4	126.3	191.1
Mean book managers per year	90.6	70.7	39.0
Percentage book manager market share per year			
Mean	3.745	2.149	5.784
Minimum	0.002	0.012	0.057
Median	1.516	1.640	4.219
Maximum	32.660	10.730	34.890
Mean annual Herfindahl index	841.0	275.3	987.2
Change in percentage market share from initial to following year			
Mean	− 0.257	− 0.892	− 0.411
Minimum	− 14.500	− 7.420	− 17.600
Median	− 0.101	− 0.674	− 0.227
Maximum	20.750	9.630	21.630

compute market share changes, I only examine banks that have some successful offerings in the initial year. The average market share change is, therefore, biased downward because I ignore cases where a bank has no offerings in the initial year. The mean change in market share is slightly negative at −0.257%, ranging from −14.500% (Lehman Brothers from 1985 to 1986) to +20.750% (Goldman Sachs from 1988 to 1989). This variability suggests that the use of static measures of reputation, such as Carter and Manaster's (1990) tombstone rankings, later updated by Carter et al. (1997), may not be appropriate for studies covering a long time period. In the market for small offerings, the mean market share is 2.149% and ranges from 0.012% to 10.730%. The largest market share in this subsample belonged to Josephthal, Lyon in 1989. The mean change in market share is more significantly negative at −0.892%. The change in market share ranges from −7.420% (H.J. Meyers from 1989 to 1990) to 9.630% (Merrill Lynch from 1987 to 1988). In the market for large offerings, the mean market share is 5.784% and ranges from 0.057% to 34.890%. The largest market share in this subsample belonged to Goldman Sachs in 1989. The mean change in market share is slightly negative at −0.411%. It ranges from −17.600% (Lehman Brothers from 1985 to 1986) to 21.630% (Goldman Sachs from 1988 to 1989).

The mean annual Herfindahl index is 841.0 for the market of all IPOs, 275.3 for the market of small IPOs, and 987.2 for the market of large IPOs. This evidence suggests that the market for large offerings is most concentrated and the market for small offerings is least concentrated. In no case, however, would the IPO underwriting industry be considered highly concentrated.

4. Investment bank market share of successful IPOS

To measure the impact of the quantitative factors on market share, I carry out regressions of the change in market share from an initial year to a subsequent year on measures of first-day returns, investment bank fees, one-year IPO performance, industry specialization of offerings underwritten by a book manager in the initial year, and changes to analyst reputation. To identify the effect of IPO first-day returns on market share, I first define a measure of abnormal first-day returns. Beatty and Ritter (1986) and Beatty and Vetsuypens (1995) argue that there are normal, or predictable, levels of first-day returns given offering characteristics. Only deviations from that level should affect market share. To identify this normal first-day return, I carry out separate regressions, over rolling four-year periods, of the first-day return on the gross proceeds of the offering, the logarithm of the gross proceeds, a dummy variable taking the value 1 if the offering price is below the filing range, and a dummy variable taking the value 1 if the offering price is above the filing range. The size variables are included as proxies for risk, as commonly done in the literature (e.g. Beatty and

Ritter, 1986; Tinic, 1988). The dummy variables are included since Hanley (1993) finds that first-day returns depend on the price adjustments made in the offering process. First-day returns are significantly higher in offerings where the offering price is above the initial filing range. It is important to control for price adjustments in a study of market share changes since issuer's attitudes to more positive first-day returns are likely to be different in cases where there is a positive price adjustment. Even though money appears to be left on the table, issuers are likely to be happy since the offering price is higher than expected. A higher offering price is generally associated with higher proceeds for the offering, presumably greater than would have been obtained if some other bank had been used.

The first-day return regression results are reported in Table 3. The gross proceeds variable generally has a significantly positive effect on first-day return whereas the logarithm of gross proceeds variable has a significantly negative effect on first-day return. This is consistent with a U-shaped relationship between offering size and first-day return. The first-day return minimizing offering size would be $-\beta_2/\beta_1$ where β_2 is the coefficient on the logarithm of size and β_1 is the coefficient on size (see Hansen and Torregrosa, 1992). The first-day return minimizing offering size ranges from \$55 million in 1984 to \$370 million in 1993 and is generally increasing over time. The coefficient on the dummy variable taking the value 1 if the offering price is below the filing range is generally significantly negative, and a dummy variable taking the value 1 if the offering price is above the filing range is generally significantly positive, consistent with Hanley (1993). In the market share regressions, the abnormal first-day return for an IPO in a given year is defined as the actual percentage return minus the predicted first-day return, using the estimated regression results for the predicted return, where the sample period ends in the year of the IPO.

To identify the effect of investment bank fees on market share, I similarly define a measure of abnormal fees for each IPO, since the theory in Section 2 argues that market share should be affected by fees that are unexpected. I carry out separate regressions over rolling four-year periods of the percentage spread, calculated as the gross spread per share divided by the offering price, on the gross offering proceeds and the natural logarithm of the gross offering proceeds. These two independent variables are commonly used in the literature (e.g. James, 1992; Hansen and Torregrosa, 1992; Dunbar, 1998). The spread regressions are reported in Table 4. The two independent variables explain a significant proportion of the variation in spread with an average R^2 of 0.55, ranging from 0.43 to 0.62. The gross proceeds variable generally has a significantly positive effect on spreads whereas the logarithm of gross proceeds variable has a significantly negative effect on spreads. This is consistent with a U-shaped relationship between offering size and spreads. The spread minimizing offering size ranges from \$100 million in 1984 to \$900 million in 1990 and is generally increasing over time. In the market share regressions, abnormal spread is

Table 3
Regressions of IPO initial return on offering characteristics

The sample in each regression includes IPOs from the four years ending in the year noted, for the period 1984–1994. The dependent variable is defined as $100[P_1/P - 1]$, where P is the offering price and P_1 is the closing price for the firm at the end of its first-day of public trading. Independent variables include the gross proceeds raised in the IPO in millions of dollars, the natural logarithm of the gross proceeds raised in the offering, a dummy variable taking the value 1 if the offering price is above the initial filing range, and a dummy variable taking the value 1 if the offering price is below the initial filing range. Regression t-statistics are provided in parentheses.

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Intercept	31.00[a]	26.00[a]	23.80[a]	20.50[a]	20.70[a]	23.20[a]	28.40[a]	33.60[a]	32.20[a]	22.50[a]	18.70[a]
	(13.2)	(14.0)	(15.9)	(14.7)	(14.9)	(12.3)	(10.6)	(10.1)	(11.3)	(11.9)	(11.6)
Gross proceeds	0.18[a]	0.06[b]	0.04[a]	0.02[a]	0.02[a]	0.03[b]	0.04[a]	0.07[a]	0.05[a]	0.01[b]	0.03
	(3.1)	(2.1)	(3.0)	(2.7)	(2.7)	(2.5)	(2.6)	(3.3)	(3.7)	(2.0)	(0.4)
Logarithm of gross proceeds	− 9.90[a]	− 6.60[a]	− 5.60[a]	− 4.60[a]	− 4.40[a]	− 5.40[a]	− 7.00[a]	− 8.10[a]	− 7.30[a]	− 3.70[a]	− 2.53[a]
	(−7.6)	(−7.3)	(−8.6)	(−7.7)	(−7.7)	(−7.0)	(−6.4)	(−6.3)	(−7.0)	(−5.8)	(−4.6)
Offering price above range	18.40[a]	17.90[a]	16.70[a]	11.30[a]	9.50[a]	10.20[a]	10.30[a]	10.80[a]	12.60[a]	14.70[a]	12.80[a]
	(6.1)	(6.9)	(7.3)	(4.2)	(3.8)	(3.4)	(3.0)	(3.7)	(6.0)	(11.2)	(11.7)
Offering price below range	− 8.70[a]	− 9.10[a]	− 9.60[a]	− 9.10[a]	− 9.30[a]	− 9.30[a]	− 9.30[a]	− 9.30[a]	− 8.90[a]	− 8.60[a]	− 7.00[a]
	(−4.4)	(−5.7)	(−7.4)	(−7.3)	(−7.1)	(−5.2)	(−3.7)	(−3.5)	(−4.8)	(−7.2)	(−7.4)
Number of observations	1115	1117	1535	1370	1276	1155	773	701	964	1349	1628
R^2	0.11	0.12	0.11	0.09	0.10	0.08	0.08	0.09	0.11	0.16	0.14

[a]Significance at 1% level.
[b]Significance at 5% level.

Table 4
Regressions of investment bank IPO spread on offering characteristics

The sample in each regression includes IPOs from the four years ending in the year noted, for the period 1984–1994. The dependent variable is defined as 100[SP/PR], where SP is the gross spread per share in the offering and PR is the offering price. Independent variables include the gross proceeds to be raised in the IPO in millions of dollars, and the natural logarithm of the gross proceeds. Regression *t*-statistics are provided in parentheses.

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Intercept	10.50[a]	10.30[a]	10.10[a]	10.00[a]	10.00[a]	9.90[a]	9.90[a]	10.00[a]	10.10[a]	10.20[a]	10.30[a]
	(166.2)	(166.5)	(188.2)	(173.7)	(140.7)	(127.6)	(94.1)	(77.8)	(119.6)	(166.2)	(150.7)
Gross proceeds	0.012[a]	0.005[a]	0.003[a]	0.002[a]	0.002[a]	0.002[a]	0.001[b]	0.002[b]	0.002[a]	0.002[a]	0.002[a]
	(7.0)	(6.1)	(6.5)	(5.4)	(4.4)	(4.0)	(2.4)	(2.6)	(5.1)	(6.1)	(7.1)
Logarithm of gross proceeds	− 1.20[a]	− 1.10[a]	− 1.00[a]	− 1.00[a]	− 1.00[a]	− 0.90[a]	− 0.90[a]	− 0.90[a]	− 0.90[a]	− 0.90[a]	− 0.90[a]
	(− 34.8)	(− 36.7)	(− 43.2)	(− 39.4)	(− 32.4)	(− 29.4)	(− 21.7)	(− 18.9)	(− 31.2)	(− 39.0)	(− 41.4)
Number of observations	1211	1181	1618	1424	1326	1195	790	713	974	1365	1646
R^2	0.62	0.61	0.59	0.58	0.50	0.48	0.44	0.43	0.61	0.62	0.60

[a]Significance at 1% level.
[b]Significance at 5% level.

defined as the actual percentage spread minus the predicted spread, using the estimated regression results for the predicted spread, where the sample period ends in the year of the IPO. Similar results are obtained in the remainder of the paper if fees include offering expenses.

Industry specialization is measured using a Herfindahl index. The change in analyst reputation is defined as

$$[100(\text{Rank}_t - \text{Rank}_{t-1})/\text{Rank}_{t-1}], \tag{3}$$

where Rank_t is the bank's *Institutional Investor's All-American Research Team* ranking in the initial year of the market share change analysis. Unranked banks are assigned the lowest ranking conferred in each year. I use a percentage change measure, relying on this transformation to emphasize changes near the top of the ranking. For example, a movement from ranking 3 to ranking 2 is a percentage change of -33%. A bank initially ranked 15 would have to increase to 10 to have the same magnitude of change. As this example demonstrates, this measure is negative when an analyst's reputation improves. Qualitatively similar results, albeit weaker economically and statistically, are obtained if I use the raw change in ranking, or the change in the number of analysts employed by the bank who are included in the *All-American Analysts* rankings.

Descriptive statistics of the independent variables used in the market share analysis are reported in Table 5. Specifically, I report the equally weighted averages and standard deviations of these variables measured over the number of book managers in the sample. In the first row of Table 5, for example, I measure the average of the mean abnormal first-day return for each bank in the sample. Since I am not averaging over the number of IPOs in the sample, this average of mean regression residuals can be different from zero. The first column of Table 5 reports the means and standard deviations of variables in the market for all IPOs. The second column looks at a subset of investment banks having greater than 1.5% market share in a year. This subset of banks, which I refer to as reputable banks, is considered separately in later analyses. The mean abnormal first-day return is -0.41% for all banks, and -0.15% for IPOs marketed by reputable banks. The abnormal spread is slightly negative, although variation in spread is greater for reputable banks. One-year abnormal performance is slightly negative for the full sample, but slightly positive for IPOs marketed by reputable banks, a result consistent with Carter et al. (1998). Industry specialization is lower for reputable banks. The mean percentage change in analyst ranking is 1.15% for the full sample, and 5.70% for reputable banks. Finally, the percentage of withdrawn IPOs is 8.6% for the full sample, and 15.0% for reputable banks. The third and fourth columns of Table 5 report similar statistics in the market for small offerings. Abnormal first-day return is slightly more negative in this market. One-year abnormal performance is negative and lower for IPOs by reputable banks. Banks have greater industry specialization in this market, largely due to the fact that many banks are

Table 5
Average values for variables describing the market for IPOs, 1984–1994

Data is taken from Securities Data Company and includes all IPOs issued from 1984–1994. The sample is divided into large and small subsamples, Large IPOs are those with gross proceeds in excess of $10 million in constant January 1984 dollars. Small IPOs are those with gross proceeds less than $10 million in constant January 1984 dollars. The sample is also broken down based on the reputation of the book managing investment bank in the IPO. Reputable book managers have a market share in a given market segment in the initial year of greater than 1.5%. The descriptive statistics are measured over the number of book managers in the sample. Standard deviations are in parentheses. Industry specialization for the investment bank is defined as $\sum_{i=1}^{99}(v_i/V)^2$, where v_i is the gross proceeds raised by the bank in an industry with 2-digit Standard Industrial Classification (SIC) code i and V is the total proceeds raised by the bank. The percentage change in overall ranking is defined as the bank's Institutional Investor *All-American* Research team ranking in the subsequent year, divided by the ranking in the initial year, minus one, where unranked banks in a given year are allocated the lowest ranking. The proportion of withdrawn IPOs is the value of offerings by the book manager that are unsuccessful in the initial year, measured at the expected offer price, divided by the value of withdrawn offerings plus successful offerings. Abnormal first-day return is the actual minus predicted first-day return. The first-day return is measured as $100[P_1/P - 1]$, where P is the offering price and P_1 is the closing price for the firm at the end of its first-day of public trading. Predicted values are taken from the regression model in Table 3 estimated using IPOs from three years before the offer through the year of the offer. Abnormal spread is the actual minus predicted percentage spread. Percentage spread is the gross spread divided by the offering price. The predicted spread is taken from the regression model in Table 4 estimated using IPOs from three years before the offer through the year of the offer. The abnormal one-year percentage stock return is the buy-and-hold return from the end of the first-day of trading to the last day of trading in the calendar year of the offering, or until the firm stops trading, whichever comes first, minus the return on the market. Market return is taken from CRSP's NYSE/AMEX value-weighted index if the firm lists on the New York or American Stock Exchanges, and the Nasdaq composite index, otherwise, over the same period.

	All IPOs		Small IPOs		Large IPOs	
	All banks	Reputable banks	All banks	Reputable banks	All banks	Reputable banks
Mean abnormal first-day return	− 0.41	− 0.15	0.14	− 0.08	− 0.06	0.01
	(19.8)	(4.9)	(1.1)	(1.1)	(0.5)	(0.2)
Minimum abnormal first-day return	− 6.77	− 14.3	− 0.05	− 0.49	− 0.31	− 0.51
	(18.1)	(9.6)	(1.2)	(1.2)	(0.6)	(0.5)
Maximum abnormal first-day return	8.24	24.7	0.31	0.29	0.52	0.20
	(31.50)	(31.60)	(1.30)	(1.50)	(0.60)	(0.30)

Mean abnormal spread	0.17	− 0.07	− 1.65	− 1.87	0.06	0.28
	(1.00)	(0.30)	(20.2)	(14.60)	(11.1)	(5.30)
Minimum abnormal spread	− 0.12	− 0.79	− 5.30	− 8.74	− 7.34	− 13.40
	(1.10)	(0.80)	(19.00)	(13.90)	(13.60)	(9.90)
Maximum abnormal spread	0.44	0.52	2.40	6.13	11.50	24.50
	(1.10)	(0.30)	(25.50)	(21.40)	(25.20)	(31.90)
Mean abnormal one-year return	− 3.40	4.70	− 3.90	− 5.60	− 1.40	4.40
	(58.40)	(24.30)	(65.30)	(43.50)	(44.80)	(25.60)
Minimum abnormal one-year return	− 30.80	− 62.30	− 19.60	− 37.80	− 35.20	− 59.70
	(61.50)	(26.70)	(65.90)	(41.80)	(50.30)	(27.20)
Maximum abnormal one-year return	33.80	114.70	14.70	34.60	48.50	108.40
	(93.30)	(101.60)	(84.00)	(84.90)	(92.50)	(99.70)
Industry specialization	0.69	0.33	0.80	0.60	0.62	0.34
	(0.32)	(0.20)	(0.28)	(0.30)	(0.33)	(0.22)
Change in analyst rank (%)	1.15	5.70	1.07	2.94	2.48	5.71
	(20.90)	(50.30)	(20.20)	(33.80)	(31.20)	(50.50)
Percentage withdrawn	8.56	15.00	4.60	4.30	10.80	15.40
	(17.50)	(16.80)	(13.80)	(16.00)	(18.50)	(17.10)
Number	964	151	743	248	425	150

involved in only one IPO. The fifth and sixth columns of Table 5 report similar statistics in the market for large offerings. One-year abnormal performance is more positive for IPOs in this market. Also, banks in the market for larger IPOs have lower industry specialization.

My initial market share regression analyses, reported in Table 6, use the mean values of abnormal first-day return, one-year abnormal performance, and abnormal spread in all offerings that an investment bank underwrites in the initial year as independent variables. If there are no offerings where all of these

Table 6
Regression of change in book manager market share on mean offering characteristics

The sample for this analysis consists of all book managers having at least one successful IPO in a given year for IPOs between 1984 and 1994. The dependent variable in the regressions is the change in percentage market share in a given segment of the IPO market from the initial year to the following year,such that the first market share change is from 1984 to 1985 and the last market share change is from 1994 to 1995. The market share for a book manager in a particular segment is the sum of the gross proceeds raised in that segment for which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in all IPOs in that segment for the year. Segments examined include the market of all IPOs, the market of small IPOs, which are defined as offerings with gross proceeds less than or equal to \$10 million in constant 1984 dollars, and the market of large IPOs, which are defined as offerings with gross proceeds greater than \$10 million in constant 1984 dollars. Independent variables are defined in Table 5. In addition, a dummy variable is included which takes on the value 1 if the market share of the book manager in the market segment examined is greater than 1.5% labeled as the reputable book manager dummy. The regressions include non-interactive variables but they are generally not reported. Regression *t*-statistics are provided in parentheses.

	All IPOs	Small IPOs	Large IPOs
Reputable book manager dummy (RBM)	1.86[a]	− 1.25[a]	1.62[b]
	(5.7)	(− 3.5)	(2.4)
RBM × mean abnormal first-day return	− 0.17[a]	0.24[b]	1.44
	(− 5.5)	(2.3)	(1.3)
RBM × Mean abnormal spread	0.67	− 0.02[b]	− 0.17[a]
	(1.2)	(− 2.5)	(− 3.6)
RBM × Mean abnormal 1 yr return	0.003	0.007[a]	0.007
	(0.5)	(2.9)	(0.7)
RBM × Industry specialization	− 6.09[a]	0.26	− 5.80[a]
	(− 8.2)	(0.6)	(− 4.6)
RBM × %change in analyst rank	− 0.02[b]	− 0.01	− 0.02
	(− 2.4)	(− 0.5)	(− 1.0)
Number of observations	964	743	425
Adjusted R^2	0.08	0.17	0.07

[a]Significance at 1% level.
[b]Significance at 5% level.

variables can be measured for a given investment bank, that bank is dropped from the analysis. This situation typically arises when aftermarket price data is unavailable. The first regression in Table 6 examines changes in market share based on the entire sample of IPOs. In addition to mean abnormal first-day return, mean one-year abnormal return, and mean abnormal spread, independent variables in this regression include industry specialization and the percentage change in analyst rank. Since the theory outlined in Section 2 suggests a differential impact of these independent variables on market share based on the initial reputation of the investment bank, I create a dummy variable which takes the value 1 if the investment bank has an established reputation in that it has a market share greater than 1.5% in the initial year, and zero otherwise. Since this definition of reputation is arbitrary, I attempted other cutoffs such as 0.5%, 1%, and 2%. The results are not qualitatively affected by the choice of cutoff value. This dummy variable is included along with its interactions with other independent variables. The table only reports these interactive variables, since non-interactive variables are insignificant. This result is consistent with the variables having a greater impact on market share for investment banks with more established reputations.

For the regression results for the sample of all IPOs, the coefficient on mean abnormal first-day return interacted with the reputation dummy is significantly negative, indicating that excessive underpricing damages market share. The coefficients on mean abnormal spread and mean one-year abnormal return, both interacted with the reputation dummy, are positive, but not significant. The coefficient on industry specialization interacted with the reputation dummy is significantly negative, indicating that diversification is optimal for established banks. Since many banks underwrite only one offering in a year, the negative coefficient on the industry specialization variable could be capturing the effect of the quantity of offerings on market share changes. Those banks would have a Herfindahl index of 1. The results in Table 6 are unaffected, however, when I exclude banks involved in fewer than 3 offerings in a year.[6] The percentage

[6] While this result is inconsistent with Booth and Chua's (1996) information spillover theory, I only examine an indirect implication of their theory. A more direct implication of their theory is that industry concentration helps a bank to increase its market share of future offerings *in that industry*. Therefore, I examine market share changes in 8 industries, defined by a 2-digit SIC code, which have at least 3 IPOs in each year of my study. These industries include chemicals and allied products; machinery except electrical; electrical and electronic machinery equipment and suppliers; measuring, analyzing, and controlling instruments, photographic, medical and optical goods, watches and clocks; wholesale trade – durable goods; miscellaneous retail; banking; and business services (SIC codes 28, 35, 36, 38, 50, 59, 60, and 73, respectively). For banks having at least a 1.5% market share in these industries in one year, only 18.2% have an increased industry market shares in the following year. Also, only 12.5% of the banks having the highest market share in one of these industries in a given year repeat as the market leader the following year. This more direct evidence is also, therefore, inconsistent with Booth and Chua's information spillover theory.

change in analyst ranking has a significantly negative effect on market share changes, suggesting that improvements to analyst reputation have a positive effect on a bank's ability to compete for underwriting business.

Regression (2) in Table 6 replicates Regression (1) in that table for the market of small initial public offerings. The coefficient on mean abnormal first-day return interacted with the reputation dummy is significantly positive. In the market for small IPOs, overpricing damages market share. The coefficient on the mean abnormal spread interacted with the reputation dummy is significantly negative. Reputable banks can increase market share in this market by cutting fees, inconsistent with the popular notion that investment banks do not compete on cost. The coefficient on the mean abnormal one-year return is significantly positive. Positive one-year abnormal performance is viewed as evidence of effective investment bank screening (Chemmanur and Fulghieri, 1994), or successful aftermarket support. The percentage change in analyst ranking and industry specialization variables are also not significant in this market. It should be noted that when I exclude industry specialization interacted with investment bank reputation, in unreported regressions, industry specialization is positive and statistically significantly. In the market for small IPOs, generally dominated by less well-established investment banks, an industry focus is beneficial.

Regression (3) in Table 6 replicates Regression (1) in that table for the market of large initial public offerings. The regression results are similar to that found in the market for all IPOs. One notable exception is that the coefficient on the mean abnormal spread interacted with the reputation dummy is significantly negative, as in the market for small IPOs.

To assess the economic significance of the independent variables in the market share regressions, I calculate the absolute percentage change in market share for reputable banks, given a one standard deviation increase in each variable. The economic significance of variables for non-reputable banks is negligible. Formally, economic significance is measured as

$$|(C_i + \mathrm{CI}_i) \times \mathrm{SD}_i|, \tag{4}$$

where C_i is the regression coefficient for non-interacted variable i (not reported), CI_i is the regression coefficient for variable i interacted with the reputation dummy variable and SD_i is the standard deviation of variable i for reputable banks. This calculation captures changes to market share given a normal variation in each variable. The results are reported in Fig. 1. In the markets for all IPOs and for large IPOs, industry specialization has the most significant effect on market share changes. In the market for small IPOs, the percentage change in analyst rank and mean abnormal one-year return variables have the most significant effect on market share changes.

It should be noted that these regressions likely underestimate the importance of analyst reputation on market share. Analyst ranking, as defined here using

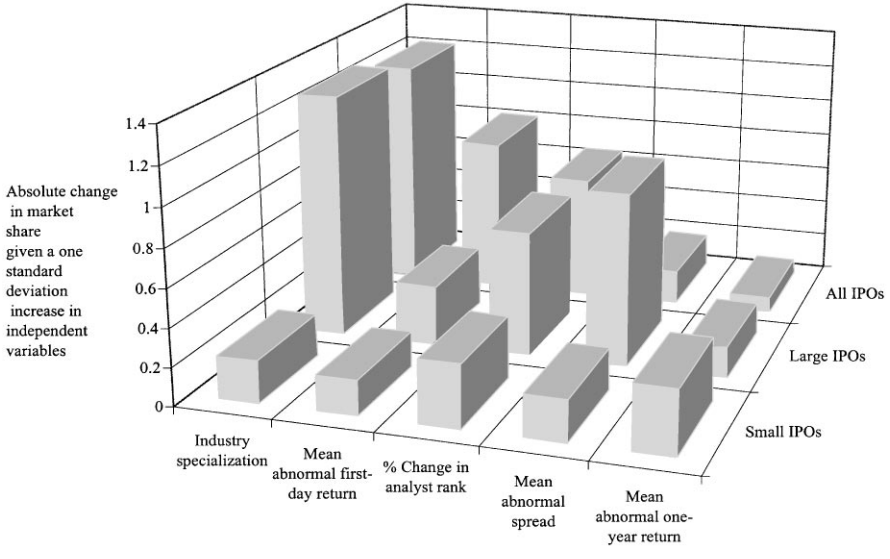

Fig. 1. Absolute percentage change in market share for reputable banks between 1984 and 1994, given a one standard deviation increase in mean offering characteristics. Market segments examined include the market of all IPOs, the market of small IPOs, and the market of large IPOs, using an offering size of $10 million in constant 1984 dollars to distinguish large from small offerings. Reputable banks are defined as those having an initial market share greater than 1.5% in the market segment examined. The percentage change in market share, given a one standard deviation increase in mean offering characteristics, is determined by multiplying the regression coefficient for the independent variables in Table 6, specifically, the sum of the non-interacted and interacted coefficients, by the standard deviation of that variable for reputable banks in the market segment examined.

Institutional Investor, is a crude measure of reputation. Donaldson, Lufkin, and Jenrette, for example, fell from an analyst ranking of fifth in 1986 to eighth in 1987 even though their number of *All-American Analysts* remained unchanged at 28. Did their reputation really decline 60%? Also, I focus on overall bank analyst ranking, whereas most issuers are concerned about the reputation of analysts covering their industry. Finally, it should be noted that while analyst reputation changes have a relatively modest impact on market share changes, the analyst rank in one year is by far the most important variable in explaining the level of future investment bank IPO market share. To show this, I replicated the regressions in Table 6 replacing the change in market share variable with a variable measuring only the market share in the subsequent year as the dependent variable. I also replaced the change in analyst rank variable with the level of analyst rank in the initial year as an independent variable. Analyst rank

was approximately five times more important, as defined in Eq. (4), than the other variables in this regression. Also, it should be noted that investment banks that have ranked analysts underwrite approximately 78% of IPOs, by value, over the 1985–1995 period.

These market share changes regressions are replicated in Table 7 using different measures of abnormal first-day returns, abnormal spread and one-year abnormal returns. Specifically, the minimum and maximum value for these variables for a given investment bank are included as independent variables. The first regression in Table 7 examines changes in market share based on the market of all IPOs. Non-interactive variables are not reported, since they are insignificant. Consistent with the findings in Table 6, the coefficients on industry specialization and the percentage change in analyst ranking interacted with investment bank reputation are significantly negative. The maximum abnormal first-day return interacted with the reputation dummy is significantly negative, consistent with the findings for average first-day return in Table 6. The minimum first-day returns interactive variable is positive, but not significant. Minimum one-year abnormal return interacted with the reputation dummy is significantly positive, consistent with the findings for average one-year abnormal return in Table 6. Maximum one-year abnormal return interacted with the reputation dummy is insignificantly negative.

The minimum abnormal spread interacted with the reputation dummy is significantly negative. Table 7 provides additional support for the finding that repuTable banks can increase market share by cutting fees. Maximum abnormal spread interacted with the reputation dummy is significantly positive. This result is consistent with reputable banks charging higher fees as compensation for their reputation. An alternative interpretation is that the IPO underwriting industry was not in equilibrium over this period. Institutions increasingly have become important buyers of IPOs. This change has benefited the bulge bracket banks, which include CS First Boston, Goldman Sachs, Lehman Brothers, Merrill Lynch, Morgan Stanley, and Salomon Brothers, with their extensive institutional distribution networks. The abnormal spread variable could be capturing this institutional trend, since bulge banks tend to charge high spreads in large offerings where economies of scale would lead to lower fees. To formally examine this possibility, in unreported results I replicate Regression (1) of Table 7 including a dummy variable that takes the value 1 if the underwriter is a bulge bank. The coefficient on this variable is significantly positive, with a point estimate is 1.17. The maximum abnormal spread variable is not significant in this regression and it is the only significantly affected variable in this regression. Also, the economic significance of the maximum abnormal spread variable drops by approximately 40%. The impact of the bulge bank dummy variable is similar in all the regressions reported in this paper. Therefore, the maximum abnormal spread variable in Regression (1) of Table 7 is capturing the increased impact of bulge banks.

Table 7
Regression of change in book manager market share on extreme offering characteristics

The sample for this analysis consists of all book managers having at least one successful IPO in a given year for IPOs between 1984 and 1994. The dependent variable in the regressions is the change in percentage market share in a given segment of the IPO market from the initial year to the following year, with the first market share change occurring from 1984 to 1985, and the last market share change occurring from 1994 to 1995. The market share for a book manager in a particular segment is the sum of the gross proceeds raised in that segment for which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in all IPOs in that segment for the year. Segments examined include the market of all IPOs, the market of small IPOs, defined as offerings with gross proceeds less than or equal to \$10 million, and the market of large IPOs, defined as offerings with gross proceeds greater than \$10 million. All proceeds are measured in constant January 1984 dollars. Independent variables are defined in Table 5. In addition, a dummy variable, the reputable book manager dummy (RBM), is included which takes on the value 1 if the market share of the book manager in the market segment examined is greater than 1.5%. The regressions include non-interactive variables, but they are generally not reported. Regression *t*-statistics are provided in parentheses.

	All IPOs	Small IPOs	Large IPOs
Reputable book manager dummy (RBM)	2.93[a]	− 0.95	− 3.3[b]
	(4.2)	(− 1.5)	(− 2.2)
RBM × Minimum abnormal first-day return	0.02	0.52[b]	− 0.29
	(1.4)	(2.4)	(− 0.3)
RBM × Maximum abnormal first-day return	− 0.04[a]	− 0.31	0.76
	(− 6.6)	(− 1.4)	(0.7)
RBM × Minimum abnormal spread	− 0.91[a]	− 0.01	− 0.01
	(− 4.5)	(− 0.7)	(− 0.4)
RBM × Maximum abnormal spread	1.16[a]	− 0.01	− 0.03
	(2.6)	(− 1.4)	(− 1.5)
RBM × Minimum abnormal 1 yr return	0.01	0.00	0.02[c]
	(1.6)	(0.0)	(1.9)
RBM × Maximum abnormal 1 yr return	− 0.001	0.003	− 0.001
	(− 0.6)	(1.3)	(− 0.3)
RBM × Industry specialization	− 7.39[a]	− 0.05	− 6.93[a]
	(− 8.6)	(− 0.1)	(− 4.1)
RBM × % Change in analyst rank	− 0.03[a]	− 0.01	− 0.02
	(− 3.0)	(− 0.5)	(− 1.1)
Number of observations	964	743	425
Adjusted R^2	0.13	0.17	0.07

[a]Significance at 1% level.
[b]Significance at 5% level.
[c]Significance at 10% level.

Table 8
Regression of change in book manager market share on extreme offering characteristics in high-volume and low-volume IPO markets

The sample for this analysis consists of all book managers having at least one successful IPO in a given year for IPOs between 1984 and 1994. High-volume IPO markets are two-year periods where the annual number and value of IPOs in the second year exceeds the mean annual number and value of IPOs from 1984 to 1995. The initial years for these high-volume markets include 1985, 1986, 1990, 1991, 1992, 1993 and 1994. Low-volume IPO markets are two-year periods where the annual number and value of IPOs in the second year is less than the mean annual number and value of IPOs from 1984 to 1995. The initial years for low-volume markets include 1984, 1987, 1988, and 1989). The dependent variable in the regressions is the change in percentage IPO market share from the initial year to the following year, such that the first market share change is from 1984 to 1985, and the last market share change is from 1994 to 1995. The market share for a book manager is the sum of the gross proceeds raised for which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in all IPOs for the year. Independent variables are defined in Table 5. In addition, a dummy variable, the reputable book manager dummy (R.B.M.), is included which takes on the value 1 if the market share of the book manager in the market segment examined is greater than 1.5%. The regressions include non-interactive variables, but they are not reported. Regression t-statistics are provided in parentheses.

	High-volume IPO markets	Low-volume IPO markets
Reputable book manager dummy (RBM)	2.48[a]	4.04[a]
	(3.2)	(2.9)
RBM × Minimum abnormal first-day return	0.06[a]	− 0.03
	(3.3)	(− 1.1)
RBM × Maximum abnormal first-day return	− 0.03[a]	− 0.03[a]
	(− 4.5)	(− 3.0)
RBM × Minimum abnormal spread	− 1.55[a]	0.39
	(− 6.3)	(1.0)
RBM × Maximum abnormal spread	0.64	2.62[a]
	(1.2)	(3.3)
RBM × Minimum abnormal 1 yr return	0.01[c]	0.002
	(1.8)	(0.2)
RBM × Maximum abnorma 1 yr return	0.00	− 0.005
	(0.4)	(− 1.3)
RBM × Industry specialization	− 5.33[a]	− 11.2[a]
	(− 5.6)	(− 6.4)
RBM × % Change in analyst rank	− 0.003	− 0.05[a]
	(− 0.2)	(− 3.7)
Number of observations (Adjusted R^2)	657 (0.16)	307 (0.32)

[a]Significance at 1% level.
[c]Significance at 10% level.

Table 9
Regression of change in book manager market share of successful and unsuccessful IPOs on mean offering characteristics

The sample for this analysis consists of all book managers having at least one successful IPO in a given year, or one unsuccessful offering filed in a given year, for IPOs between 1984 and 1994. The dependent variable in the regressions is the change in percentage market share in a given IPO market segment from the initial year to the following year, such that the first market share change is from 1984 to 1985, and the last market share change is from 1994 to 1995. The market share for a book manager in a particular segment is the sum of the gross proceeds raised in that segment plus the sum of expected proceeds from unsuccessful IPOs for which the investment bank acts as book manager, divided by the sum of the gross proceeds raised in all IPOs in that segment plus the sum of expected proceeds from unsuccessful filings for the year. The expected proceeds are the average of the high and low prices multiplied by the number of shares noted in the initial IPO filing. Segments examined include the market of all IPOs, the market of small IPOs, defined as offerings with gross proceeds less than or equal to \$10 million in constant 1984 dollars, and the market of large IPOs, defined as offerings greater than \$10 million in constant 1984 dollars. Independent variables are defined in Table 5. In addition, a dummy variable, the reputable book manager dummy (RBM), is included which takes on the value 1 if the market share of the book manager in the market segment examined is greater than 1.5%.Regressions include non-interactive variables, but they generally are not reported. Regression t-statistics are provided in parentheses.

Independent variables	All IPOs	Small IPOs	Large IPOs
Reputable book manager dummy (RBM)	2.32[a]	− 1.06[a]	2.04[a]
	(6.7)	(− 3.0)	(3.0)
RBM × Mean abnormal first-day return	− 0.15[a]	0.25[b]	1.28
	(− 5.1)	(2.5)	(1.2)
RBM × Mean abnormal spread	0.31	− 0.01[b]	− 0.16[a]
	(0.6)	(− 2.0)	(− 3.5)
RBM × Mean abnormal 1 yr return	− 0.002	0.01[a]	0.002
	(− 0.3)	(2.7)	(0.3)
RBM × Industry specialization	− 5.48[a]	0.22	− 5.05[a]
	(− 7.8)	(0.5)	(− 4.2)
RBM × % change in analyst rank	− 0.02[a]	− 0.003	− 0.02
	(− 2.6)	(− 0.3)	(− 1.2)
Proportion withdrawn	− 0.002	− 0.002	− 0.002
	(− 0.5)	(− 0.5)	(− 0.2)
RBM × proportion withdrawn	− 0.042[a]	− 0.007	− 0.046[a]
	(− 4.8)	(− 0.8)	(− 2.9)
Number of observations	964	742	425
Adjusted R^2	0.08	0.15	0.07

[a]Significance at 1% level.
[b]Significance at 5% level.

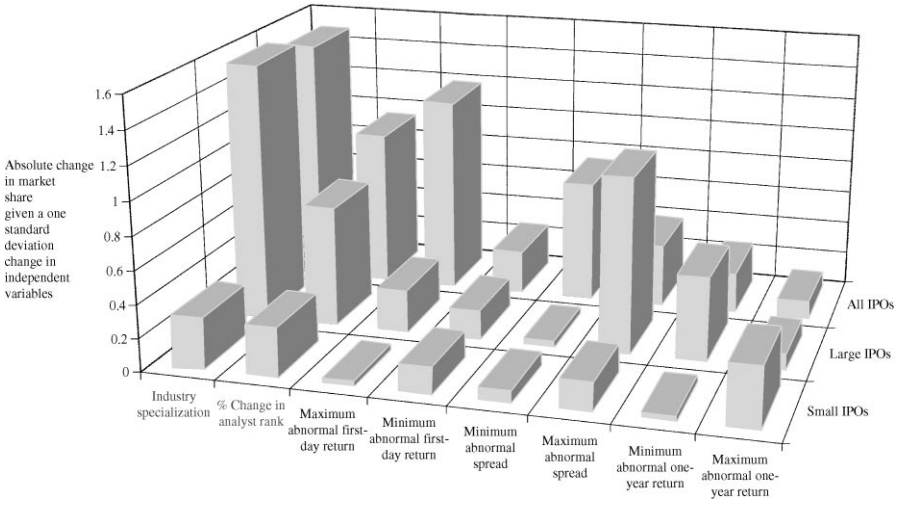

Fig. 2. Absolute percentage change in market share for reputable banks between 1984 and 1994, given a one standard deviation increase in extreme offering characteristics. Market segments examined include the market of all IPOs, the market of small IPOs, and the market of large IPOs, using an offering size of $10 million in constant 1984 dollars to distinguish large from small offers. Reputable banks are defined as those having an initial market share greater than 1.5% in the market segment examined. The percentage change in market share, given a one standard deviation increase in mean offering characteristics is determined by multiplying the regression coefficient for the independent variables in Table 7, specifically, the sum of the non-interacted and interacted coefficients, by the standard deviation of that variable for reputable banks in the market segment examined.

Regression (2) in Table 7 replicates Regression (1) in that table for the market of small offerings. The minimum first-day returns interactive variable is significantly positive, consistent with the findings in Table 6 for average first-day returns. None of the other variables have a significant effect on market share in this market. Regression (3) in Table 7 replicates Regression (1) in that table for the market of large offerings. The regression results are qualitatively similar to that found in the market for all IPOs, although only the minimum abnormal one-year return and industry specialization variables are significant.

To assess the economic significance of the independent variables in these market share regressions, I again examine their economic significance, as defined in Eq. (4). The results are reported in Fig. 2. In the markets for all IPOs and for large IPOs, industry specialization has the most significant effect on market share changes. In the market for small IPOs, the percentage change in analyst rank and maximum abnormal one-year return have the most significant effect on market share changes.

5. Market share in high-volume and low-volume IPO markets

Since this study of market share changes covers a reasonably long time period, I also examine whether the relation between market share changes and the independent variables changes over time. Specifically, I replicate the regressions in Tables 6 and 7 for two subperiods, high-volume and low-volume IPO markets. Table 8 displays the results using the regression model of extreme characteristics from Table 7 separately for IPOs in high- and low-volume IPO markets. The conclusions from re-estimations of other regressions in Tables 6 and 7 using average characteristics or limiting the sample to large or small IPOs are similar. High-volume IPO markets are defined as two-year periods in which the annual number and value of IPOs in the second year exceeds the mean annual number and value of IPOs from 1984 to 1995. Initial years for the two-year periods included in the high-volume subperiod are 1985, 1986, 1990, 1991, 1992, 1993, and 1994. Low-volume IPO markets are two-year periods in which the annual number and value of IPOs in the second year is less than the mean annual number and value of IPOs from 1984 to 1995. Initial years for the two-year periods included in the low-volume subperiod are 1984, 1987, 1988, and 1989.

The explanatory power of the regression for high-volume markets is slightly higher, with an adjusted R^2 of 0.16, than that for the full period, with an adjusted R^2 of 0.13 (see Table 7). The variables have an even more significant effect on market share changes in low-volume IPO markets, with an adjusted R^2 of 0.32. The minimum abnormal first-day return has a significantly positive effect on market share changes in high-volume markets, and an insignificantly negative effect on market share in low-volume markets, suggesting that overpricing is only punished in high-volume markets. In low-volume markets, it is more important to satisfy future issuers by not underpricing, even if the practice or appearance of overpricing hurts investors. The minimum abnormal one-year return has a significantly positive effect on market share changes only in high-volume markets. The minimum abnormal spread has a significantly negative effect on market share changes in high-volume markets, and an insignificantly positive effect on market share changes in low-volume markets. Therefore, cutting fees only helps to attract underwriting business in high-volume markets. The maximum abnormal spread has an insignificantly positive effect on market share changes in high-volume markets, and a significantly positive effect on market share changes in low-volume markets. In contrast to the findings for the full sample, the significant relation in low-volume markets is not affected by the inclusion of a bulge investment bank dummy. The percentage change in analyst rank has a significantly negative effect on market share only in low-volume markets. Together with the evidence for maximum abnormal spreads, this suggest that there is a flight to quality banks in low volume markets indicating that the presence of the most reputable banks is enhanced. The effect of all other variables is similar in the two markets.

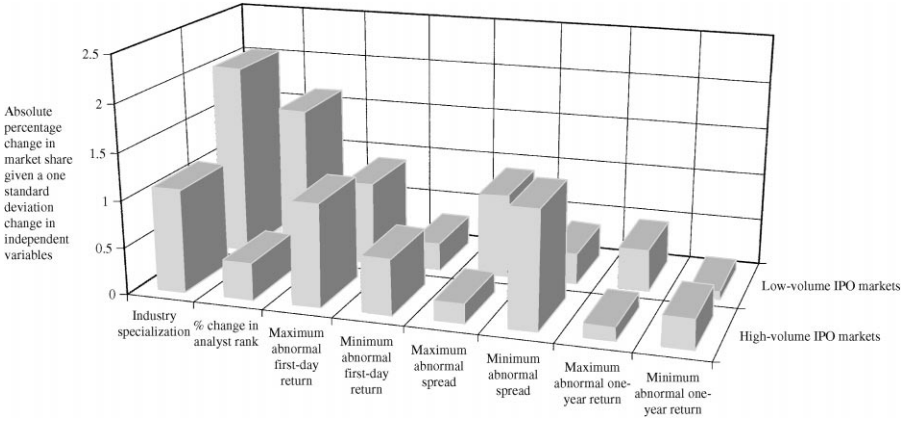

Fig. 3. Absolute percentage change in market share for reputable banks in high-volume and low-volume IPO markets between 1984 and 1994, given a one standard deviation increase in extreme offering characteristics. High-volume IPO markets are two-year periods where the annual number and value of IPOs in the second year exceeds the mean annual number and value of IPOs from 1984 to 1995. The initial years for high-volume markets include 1985, 1986, 1990, 1991, 1992, 1993 and 1994. Low-volume IPO markets are two-year periods where the annual number and value of IPOs in the second year is less than the mean annual number and value of IPOs from 1984 to 1995. The initial years for low-volume markets include 1984, 1987, 1988, and 1989. Reputable banks are defined as those having an initial market share greater than 1.5%. The percentage change in market share, given a one standard deviation increase in mean offering characteristics is determined by multiplying the regression coefficient for the independent variables in Table 8, specifically, the sum of the non-interacted and interacted coefficients, by the standard deviation of that variable for reputable banks in the market segment examined.

To assess the economic significance of the independent variables in these market share regressions, I report their economic significance, as defined in Eq. (4). The results are reported in Fig. 3. In low-volume IPO markets, industry specialization and the percentage change in analyst rank have the most significant effect on market share changes. In high-volume IPO markets, the minimum abnormal spread, the maximum abnormal first-day return, and industry specialization have the most significant effect on market share changes.

Overall, the factors affecting investment bank IPO market share depend on market conditions. In high-volume markets, more banks are required to handle the increased volume. In such an environment, banks with less reputable analysts can increase their presence by cutting fees. Interestingly, performance on past deals, represented by short and long run abnormal returns, is also more important in high-volume markets. In declining markets, issuers are primarily attracted to banks with the greatest reputations.

6. The effect of withdrawals on investment bank market share

In this section, I examine whether being associated with withdrawn offerings has a significant effect on market share changes. SDC's new issues database also provides information on all withdrawn firm-commitment offerings. For each withdrawn offering, I obtain data on filing date, the book manager of the offering, the expected number of shares to be sold in the offering, excluding overallotments and the low and high filing prices. For each investment bank associated with a successful offering in a given year, I search SDC's withdrawn offering database for failed offerings that are filed by that bank in the same year. I then compute the percentage of withdrawn offerings for that investment bank as the sum of expected proceeds in withdrawn offerings divided by total proceeds potentially underwritten by the bank, calculated as total gross proceeds of successful offerings plus expected proceeds from withdrawn offerings. The expected proceeds in a withdrawn offering is defined as the average of the low and high filing price multiplied by the number of shares initially filed. Between 1984 and 1994, there were 717 withdrawn offerings included in the SDC database. The value of these filings is $19.62 billion, in 1984 dollars. The fraction of withdrawn offerings, by number, is relatively uniform over time, with a low of 8% in 1989 and a high of 24% in 1990 (see Dunbar, 1998).

The percentage of withdrawn offerings for each investment bank is included as an independent variable in market share regressions similar to those reported in the previous section. An important difference, however, is the definition of market share. Previously, I defined market share as the percentage of successful offerings underwritten by an investment bank in a given year. In this section, market share is based on all offerings, successful or withdrawn, underwritten by an investment bank. Formally, market share for each bank in a given year is defined as the sum of the gross proceeds raised in offerings, plus the sum of expected gross proceeds in withdrawn offerings for which the bank acts as book manager, divided by the sum of the gross proceeds raised in all offerings in that year plus the sum of expected gross proceeds in all withdrawn offerings filed in that year. This analysis, therefore, addresses whether withdrawals affect a bank's ability to compete for future offerings, regardless of the outcome of the offering.

Regressions of the changes in this total market share measure are reported in Table 9. Independent variables are the same as those from Table 4 plus the percentage of withdrawn offerings. Most non-interactive variables are not reported, since they are insignificant. The effect on market share of variables examined previously is similar to that reported in Table 6. The first regression in Table 9 examines the market of all IPOs. The percentage of withdrawn offerings has a negative, although statistically insignificant, effect on total market share. The percentage of withdrawn offerings interacted with the reputation dummy is significantly negative. This finding suggests that failures have a negative impact on the ability of reputable banks to compete for future business. The economic

significance of the percentage of withdrawn offerings, as defined in Eq. (4), is similar to that for the mean abnormal first-day return (see Fig. 1). Regressions (2) and (3) replicate Regression (1) for the market of small and large IPOs, respectively. The percentage of withdrawn offerings has a significantly negative effect on market share only in the market for large IPOs.

The effect of withdrawals on market share changes would arguably be less significant in periods of significant market declines. To check this possibility, I create a dummy variable which equals 1 if the investment bank withdraws an IPO from October 16, 1987 to December 31, 1987 or August 1, 1990 to October 31, 1990. The three-month return on the Nasdaq composite index leading up to all months noted was less than -17%, which is more than two standard deviations lower than the mean three-month return from January 1984 to December 1994. When I include this variable in the market share change regression, it is significantly negative. Surprisingly, an investment bank's market share is more significantly reduced if withdrawals occur during significantly declining markets. Goldman Sachs' market share declined from 19.8% in 1990 to 13.0% in 1991, for example, even though its two withdrawals occurred between August and October 1990. Similarly, Donaldson, Lufkin, and Jenrette's market share declined from 3.1% in 1987 to 1.9% in 1988, even though its only withdrawal occurred on October 17, 1987, the day of the market crash. The evidence is similar when I consider less extreme definitions of down markets, such as using more than one standard deviation below the mean 3-month return. This finding suggests that banks are rewarded when they are able to complete IPOs in down markets.

Similar regressions to those in Table 7 are run where extreme values of the abnormal first-day return, the abnormal spread, and the one-year abnormal returns variables are included as independent variables instead of their means. The results are not reported here. The coefficients on the percentage withdrawn variables are qualitatively similar to those reported in Table 9. I also re-estimated the regressions for IPOs in high-volume and low-volume markets. The percentage withdrawn interacted with the reputation dummy variable has a significantly negative effect on market share changes in both growing and declining markets. The economic significance of withdrawals, as defined in Eq. (4), is approximately twice as great in declining markets, however. This finding is consistent with the conclusion from Section 5 that past investment bank performance is more important in declining markets.

While this analysis has uncovered a significant relation between withdrawal and market share, it is likely that this relation is understated. So that the abnormal first-day return, abnormal spread and one-year abnormal return could be included in the analysis, only investment banks with some successful offerings are examined in Table 9. There are many investment banks that are only involved in failed offerings in a given year, however. Changes in market share for these banks are examined in Table 10. The first column of Table 10

Table 10
Withdrawn IPOs, 1984–1994

Market shares for book managers only associated with withdrawn offerings in a given year are reported for different segments of the IPO market. The market share for a book manager in a given year in a particular segment is the sum of the expected gross proceeds in that segment, in constant January 1984 dollars, for unsuccessful filings where the investment bank acts as book manager, divided by the sum of the gross proceeds raised in successful IPOs in that segment for the year plus the sum of the expected gross proceeds from unsuccessful filings in that year, in constant January 1984 dollars. Segments examined include the market of all IPOs, the market of small IPOs, where gross proceeds or expected gross proceeds less than or equal to $10 million in constant 1984 dollars, and the market of large IPOs, where gross proceeds or expected gross proceeds greater than $10 million in constant 1984 dollars. The mean market share statistics are measured over the number of book managers.

	All IPOs	Small IPOs	Large IPOs
Mean number of book managers associated with only withdrawn filings, per year	15.70	15.30	2.80
Mean percentage book manager market share for managers associated with only withdrawals	0.07	0.43	0.29
Mean change in percentage market share for book managers associated with only withdrawals	− 0.02	− 0.19	− 0.17
Percentage of cases where the market share for book managers only associated with withdrawals decreases in the subsequent year	83.20	80.30	90.30
Percentage of cases where the market share for book managers only associated with withdrawals in the subsequent year is zero	75.70	76.20	77.40

examines the market of all IPOs. There are approximately 16 book managers each year that are only involved in withdrawn offerings. The mean market share, expressed as a percentage of all offerings, both successful and failed, is 0.07%. The mean change in market share after the initial year is − 0.02%. In almost 80% of the cases, investment banks that are only associated with withdrawals do not attract any underwriting business the following year. Similar evidence is found when examining the markets for large and small IPOs. Investment banks that are only associated with withdrawals in a given year, therefore, find it difficult to attract any underwriting business in the future.

7. Friedman, Billings, Ramsey Group

Arlington, Virginia-based Friedman, Billings, Ramsey Group (FBR) was founded in 1989 as a research and trading firm. This investment bank has gone

from obscurity to the top of the IPO market in less than five years. FBR's first capital market transaction was an $81 million seasoned equity offering for Glendale Federal Bank in August 1993. Its first IPO was a $47.5 million offering for Prime Retail, a Real Estate Investment Trust, in March 1994. Between 1994 and 1997, FBR raised $2.45 billion in 28 IPOs. Its annual market share was in 1.1% 1994, 0.2% in 1995, 0.8% in 1996 and 5.4% in 1997. In December 1997, FBR itself went public. In the first quarter of 1998, FBR became the first non-bulge bracket firm in the 1990s to be the top-ranked IPO book manager in a single quarter. Its market share grew to 13.4%.[7]

To illustrate the impact of the factors examined previously in this paper, it is possible to trace the sources of FBR's success using these quantitative factors. The initial returns on FBR IPOs have not been unusual. In 1996 and 1997, the average initial return on FBR IPOs was 5.5%, compared to an overall average of 15.8%. FBR's average IPO abnormal initial return, using regression models described in Section 4, is close to zero. While the initial performance of FBR IPOs is not unusual, their long run performance has been significantly positive. The average one year abnormal return, calculated as the issuer return minus the return on the Nasdaq composite index, for FBR IPOs from January 1996 to May 1997 is 27%. FBR was rated first in IPO aftermarket performance by Securities Data Company in 1996 and CommScan EQUIDESK for the first eight months of 1997.

The underwriting spread in IPOs offered by FBR is almost always 7%. FBR's average abnormal spread, using regression models described in Section 4, is -0.7% in 1996 and 0.2% in 1997. In 1996, FBR was clearly competing on price. While their 7% spread is close to the industry average of 7.3%, FBR's IPOs were smaller in 1996, at $26.4 million, compared to an overall market average of $56.8 million. FBR has also maintained an industry focus. Approximately 90%, by value, of all FBR IPOs in 1996 and 1997 are in the financial services and real estate industries, the latter being real estate investment trusts. FBR maintains, by Wall Street standards, a large analyst staff to cover these industries, dedicating 40 out of 260 employees to their analyst activities in 1997. However, Institutional Investor has recognized none of FBR's analysts in its *All-American* rankings. Finally, since its inception, FBR has not been the book manager in a withdrawn security offering.

Given the evidence presented previously, FBR's performance would predict an enhanced market share. Positive aftermarket performance, reduced fees, industry focus in a less established bank, and high offering success rates all have

[7] Material presented in this Section draws from the following sources: articles in Fortune (August 18, 1997, p. 32), Investment Dealers Digest (June 8, 1998, p. 14) and the company's web site (Friedman et al., 1999).

a positive effect on market share. Interestingly, FBR emphasizes its research as a key factor affecting its growth, even though they do not have *All-American* analysts. This fact provides some anecdotal support for my contention that this variable, as used in my analysis, presents a noisy measure of reputation. These analysts work in teams following a few industries. They identify firms to take public that are changing, in need of capital, and are not appropriately valued by the market. Their success is evidenced by the low failure rate and positive post-offering performance of their IPOs. FBR recognizes that their industry focus also presents risks. In their IPO prospectus, the firm cites industry focus as a risk factor and notes that their reduced market share in 1995 was largely due the downturn in the financial services sector. To compensate for this risk, FBR recently began to cover the technology and consolidation industries. In addition, in December 1997, FBR entered a strategic alliance with PNC bank, the 12th largest commercial bank in the United States, at the time, based on asset size, to refer business to each other on an arms-length basis.

FBR cite three other factors that have had a positive impact on their growth. First, FBR maintains an active aftermarket for securities issued by companies for which FBR was book manager. As of November 1997, FBR was the top market maker in all of its Nasdaq-listed IPOs. Second, FBR has never been a defendant in a due diligence lawsuit, and has never been named as a defendant in a class action lawsuit alleging underwriter liability. Finally, FBR has a less than formal corporate culture. Employees dress informally, and enjoy non-traditional benefits such as corporate retreats, paid maternity leaves, and employee-directed company charitable donations. FBR argue that this culture has been the key ingredient to their success. It has allowed them to initially attract talent that would not normally be attracted to a start-up investment bank. These key employees have also stayed. FBR has maintained a staff turnover rate of approximately 3% per year, an extremely low rate by Wall Street standards. This stability has allowed FBR to develop their research team, which, in turn, has been the engine for their growth.

8. Conclusions

This paper examines the effect of short-term and one-year abnormal IPO performance, fees, industry specialization, analyst reputation, and association with withdrawals on investment bank IPO market share. The analysis considers different summary measures of these explanatory variables, and different segments of the IPO market. For the entire market of IPOs, the maximum abnormal first-day return of IPOs underwritten by an established bank has a significantly negative effect on its subsequent market share changes. This finding is consistent with banks losing market share if they leave too much

money on the table. The minimum abnormal first-day return of IPOs underwritten by an established bank has a positive effect on its subsequent market share changes. Banks lose market share if they are associated with overpriced IPOs, consistent with Booth and Smith's (1986) certification theory. Taken together, these results suggest that investment bank market share is enhanced when neither clientele, issuers nor investors, are harmed by the pricing of past deals.

The minimum abnormal one-year return of IPOs underwritten by an established bank in any one year has a positive effect on its subsequent market share changes. This finding is consistent with either accurate investment bank screening of clients (Chemmanur and Fulghieri, 1994), or aftermarket support. Since the evidence for one-year returns is the opposite of that for initial returns, the market does not appear to view one-year abnormal performance to be a consequence of initial mispricing.

The maximum abnormal underwriter spread in IPOs underwritten by an established bank has a positive effect on its subsequent market share changes. This finding is consistent with the view that reputable banks, which expect increased future market share, place more at risk in current offerings and, therefore, charge higher fees. Bulge-bracket underwriters largely drive this result, however. These banks experienced increased market share over this period, and charged higher spreads. Their success was more likely due to their ability to serve the growing institutional demand for IPOs than their fee policy. The minimum abnormal spread in IPOs underwritten by an established bank has a negative effect on its subsequent market share change. Reputable banks can also enhance market share by cutting fees, inconsistent with the popular notion that investment banks do not compete on cost.

Industry specialization has a negative effect on market share changes for established banks. Since the industry mix of IPOs changes over time, banks are best served by maintaining broad expertise. In addition, the percentage change in analyst rank has a negative effect on investment bank market share changes. This finding is consistent with the widely argued importance of research capability in explaining an issuer's choice of investment bank. Finally, withdrawals have a negative effect on the ability of investment banks to compete for future underwriting business. Since withdrawals are costly for issuers, banks associated with past failures lose market share.

Similar findings are obtained when the markets for small and large IPOs are examined. In the market for small IPOs, or offerings of less than $10 million, the effect of the independent variables on the market share of established banks is less significant, economically and statistically, however. The effect of industry specialization is also different in this market. Banks concentrating in particular industries increase market share in future years. This finding is consistent with the less well established banks in this marketplace benefiting from information spillovers that occur when taking similar firms public (see Booth and Chua,

1996). In the market for large IPOs, or offerings greater than $10 million, the effects of independent variables are economically similar to those identified in the market for all IPOs. Similar findings are also obtained when growing and declining IPO markets are considered separately. The economic and statistical significance of the independent variables is greater in declining markets.

In all markets considered, the independent variables have no reliable effect on the market share of less established banks. The lower statistical and economic significance of variables in the market for small IPOs is also consistent with the view that banks having a larger market share in the market for small IPOs are only moderately reputable. This evidence, therefore, is consistent with the theory outlined in Section 2 which argues that these factors have a less significant impact on the market share for less established banks since less reputation is placed at risk.

Overall, the analysis indicates that short-run and long-run performance, investment bank fees, industry specialization, analyst reputation, and association with withdrawals have a significant impact on market share changes for IPOs. Economically, industry specialization is the most important factor, followed by analyst reputation and initial IPO returns. This finding is potentially surprising since practitioners tend to emphasize the role of analysts in attracting underwriting business. My measure of analyst reputation is admittedly crude, however. Also, analyst reputation is the most significant factor in explaining the level of investment bank market share. Nonetheless, the findings in this paper suggest that investment banks should seriously consider other factors when attempting to increase their market share.

The analysis of FBR's growth in IPO market share from 1994 to 1997 supports this formal analysis. FBR's IPOs have had very positive aftermarket performance. FBR also initially followed a strategy of charging low fees and concentrating on industry segments. While FBR does not have any analysts include in the *All-American* rankings, research is a key driver for their success, providing anecdotal support for the contention that the analyst ranking change variable in my formal regressions does not fully capture the importance of analysts in helping investment banks attract IPO business.

Finally, while the explanatory power of the formal market share change regressions is relatively high, especially in low-volume IPO markets, much of the variation in market share changes remain unexplained. It would be worthwhile, therefore, to search for additional factors to better explain market share changes. Based on the FBR case study, possibilities include the presence of strategic alliances, aftermarket support, and corporate culture. The latter two dimensions could be captured by measuring market-making significance and staff turnover, respectively. Other possibilities include the investment bank's underwriting activities in other markets, such as debt or preferred stock, and financial scandals (see Smith, 1992).

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