Underpricing Of IPOs By Bulge-Bracket Underwriters Acting As Lead Managers And Sole Book Runners

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Abstract

During the dot-com period, prestigious investment banks earned record profits underwriting technology IPOs, but some companies going public also lost funds, potentially, by accepting offer prices well below the opening price or closing price of the first trading day. Several prestigious underwriters have paid penalties, to the NASD and the SEC, to settle allegations about improper distribution of shares of IPOs of stock. However, the fines assessed by regulators have not been the same across investment banks. This study analyzes short-term underpricing and money left on the table by the most prestigious investment banks, bulge-bracket underwriters, when they underwrite initial public offerings of common stock. I find evidence that seems to indicate that some prestigious investment banks consistently underprice IPOs much less than some other banks when they act as lead underwriters and sole book runners.

Introduction

It is common knowledge that initial public offerings (IPOs) are, on average, underpriced. During the dot-com period the size and the frequency of the underpricing increased dramatically. However, the degree of underpricing might not have been the same across IPOs underwritten by prestigious investment banks. *The Wall Street Journal* has published articles detailing the “abnormal” commissions, earned by prestigious underwriters, associated with IPOs priced during those years, as well as the severe penalties paid by those underwriters suspected of engaging in “spinning” during the IPO process. For example, on December 11, 2001, an article in *The Wall Street Journal* described that “during the height of the boom, in 1999 and 2000, the powerful securities unit of Zurich's Credit Suisse Group reaped more than \$700 million in fees for helping bring tech upstarts public -- far more than any rival.” CSFB agreed to pay \$100 million in penalties to the NASD and the SEC, to settle allegations about improper distribution of shares of IPOs of stock.

Nevertheless, the penalties assessed by regulators have not been the same across investment banks. If some prestigious banks benefited more from underwriting IPOs, as might be indicated by the size of the fines, it might be possible that IPO underpricing is dependent on the type of investment bank selected to handle the initial public offering.

The purpose of this study is to provide some new insights in the IPO literature by examining the underpricing practices of the most prestigious investment banks when they handle the issue as sole book runners and single lead underwriters. I examine short-term underpricing and money left on the table by bulge-bracket underwriters when they truly perform as sole book runners and single lead managers of an initial public offering of common stock. For example, a recent article by Logue et al. (2002) finds that “premarket underwriter activities are the most significant determinant of new issue underpricing.” Consequently, if an underwriter is the sole book runner of the issue, underpricing might be attributed, in large part, to the practices and methods used by the single lead manager who is handling key underwriting activities and receiving the largest allocation of shares.

The next section presents a summary of previous studies. The following section contains the methodology and data. The empirical results are presented next. The final section contains the conclusion.

Previous Studies

Previous empirical studies have revealed that, on average, IPOs are underpriced (see Ibbotson (1975) and Rock (1986)). While there have been numerous studies trying to explain the underpricing process, we still don't know why companies are willing to lose some of the proceeds in the process of going public, or why companies would choose some underwriters that might consistently underprice more than some others. Assuming that the most prestigious underwriters provide similar services, and charge similar fees, would a company going public select a prestigious investment bank that consistently underprice IPOs more than some other prestigious bank?

A recent paper by Loughran and Ritter (2000) points out that during the period of 1990–1998, companies going public left more than \$27 billion dollars on the table. They explain that the money left on the table might not be that relevant since the founders of firms increased their wealth, in the process of going public, by hundreds of millions of dollars. Thus, according to Loughran and Ritter's prospect argument, IPO issuers care about the change in their wealth, not the level of wealth. However, Loughran and Ritter do not explain why companies going public do not avoid lead underwriters that consistently tend to leave large amounts of money on the table.

This transfer of wealth, between pre-issue shareholders and new investors, became a popular issue as the number of technology companies going public increased. For example, on July 27, 2000, the shares of Corvis Corp. rose 135 percent to end the session at \$84.72, after the IPO of 31.63 million shares priced at \$36. The transfer of wealth was about \$1.5 billion. Thus, it would seem natural to ask: do all lead underwriters acting as sole book runners and single lead managers underprice IPOs in the same manner? Or, does the evidence suggest that some prestigious lead underwriters consistently underprice IPOs more than others?

This study examines the underpricing evidence, from the IPOs priced during the years 1998-2000, by the six largest investment banks that, reportedly, are among the most prestigious lead underwriters of IPOs.

Several studies have indirectly touched this issue in the past. For example, Michaely and Shaw (1994) examine IPOs priced by underwriters during the period 1984-1988. Their study finds that more prestigious investment banks (higher capitalized) underprice IPOs less than less prestigious investment banks. Beatty and Welch (1996) find, by using IPOs underwritten by 50 investment banks during the 1992-1994 period, that higher-quality underwriters (based on market share) underprice more, especially among smaller firms. Carter, Dark, and Singh (1998) examine IPOs during 1979-1991, and find that IPOs managed by more reputable underwriters are associated with less short-run underpricing. One of the underwriter reputation measures used by Carter, Dark, and Singh, assigns the most prestigious rank to those underwriters considered bulge-bracket banks, with a leading role in high-quality securities underwriting. Dunbar (2000) analyzes IPOs during the period 1984-1994, and shows that underwriters who leave too much money on the table lose IPO market share over time. Dunbar measured investment bank reputation in terms of market share. Dunbar also shows that bulge-bracket underwriters (Goldman Sachs, Morgan Stanley, Lehman Brothers, Merrill Lynch, CS First Boston, and Salomon Brothers) charge higher fees, due to their reputation, when they underwrite IPOs.¹

¹ However, a recent article by Chen and Ritter (2000) found that most U.S. underwriters charge the same fee, 7%, for underwriting IPOs in the \$20-\$150 million range.

Data and Methodology

In this study, I examine three popular short-term underpricing measures (first-day returns):

UP1 → First day opening price divided by the offer price (%)

UP2 → First day closing price divided by the offer price (%)

MLT → Money left on the table (first day closing price minus offer price multiplied by the number of shares)

The initial sample included all the IPOs of common stock priced during January 1, 1998 – December 31, 2000, by the six bulge-bracket underwriters mentioned in Dunbar's study, acting as sole book runners and single lead managers of the issue: Goldman Sachs (GS), Morgan Stanley Dean Witter (MSDW), Lehman Brothers (LB), Merrill Lynch (ML), Credit Suisse First Boston (CSFB), and Salomon Smith Barney (SSB). The selection of bulge-bracket banks also minimizes the "size effect" problem, as large, prestigious banks usually underwrite larger IPOs. Many of the IPOs had more than one lead manager, thus they had to be deleted. Also, even though an investment bank was listed as a single lead underwriter, the IPO was included in the sample only if a single investment bank acted as sole book runner and had a significant larger allocation of shares, twenty percent or more, than the other underwriters participating in the IPO. IPOs of American Depositary Receipts, and unit offerings were not included in the sample. The final sample included 282 common stock IPOs with a single lead manager acting as a sole book runner.

The information was obtained from the SEC Edgar's web site (www.sec.gov/edgar) by using the 424B prospectus filings of the companies going public. The rest of the IPO information was gathered from several popular IPO web sites (Hoover's IPO Central, www.ipo.com, www.ipofinancial.com, and www.ipomonitor.com, among others).

To determine whether or not some prestigious lead underwriters underprice more than others, two types of tests are conducted. First, regression analysis is used to determine the effect of specific characteristics of the IPO on the underpricing measure:

$$(1) \quad UP = b_0 + b_{1.5}IB + b_6LUSH + b_7RATIO + b_8FLOAT$$

where:

UP = Underpricing measure: UP1 or UP2

IB = Investment Bank: Dummy variable (0,1) for five of the six lead underwriters

LUSH = Number of shares allocated to sole book runner ÷ IPO shares (%)

RATIO = Shares allocated to sole book runner ÷ Shares allocated to next largest underwriter (%)

FLOAT = IPO shares ÷ Total Shares Outstanding (%)

$$(2) \quad LNMLT = b_0 + b_{1.5}IB + b_6LNREV + b_7LNFO + b_8LNMC$$

where:

LNMLT = Underpricing measure: MLT (natural logarithm)

IB = Investment Bank: Dummy variable (0,1) for five of the six lead underwriters

LNREV = Natural logarithm of the previous year's Revenue of company going public (Millions of dollars)

LNFO = Natural logarithm of Final Offer Amount (Millions of dollars)

LNMC = Natural logarithm of Market Capitalization (Millions of dollars)²

² The second equation only included 236 observations, as companies without revenues and IPOs with zero or negative money left on the table were excluded.

Second, a two-sample t-test (independent means, unequal variances) is used to determine whether or not some lead underwriters consistently underprice more than some others.

Results

Table I presents the summary statistics for the complete data set. The median revenue of companies going public was \$9.5 million. The final offer amount ranged from \$27 million to \$2.87 billion. The number of shares allocated to single lead underwriters, as a proportion of total shares, was 41 percent. However, the percentage of shares assigned to the lead underwriter can be as low as 20 percent or as high as 75 percent. Sole book runner's allocation of shares, compared to the shares allocated to the next largest underwriter, ranged from 22 percent to 344 percent. Some companies only sold 5 percent of their total shares in the IPO, while others sold 100 percent (the average was only 18 percent). The offer price was around \$15 with a maximum of \$38 and a minimum of \$6. The opening and closing prices, on the first day of trading, ranged from \$6 to almost \$300, with a median around \$24. IPO underpricing, as measured by UP1 (UP2), ranged from almost negative 20 percent (negative 27 percent) to almost 900 percent (733 percent), with an average of 88 percent (96 percent). Average money left on table was \$116 million, with a maximum of \$1.5 billion (minimum of negative \$33 million). Finally, Credit Suisse First Boston (CSFB) was the lead manager of the IPOs with the highest short-term underpricing (UP1, UP2, and MLT), while Goldman Sachs (GS) was the lead manager of the lowest underpriced IPOs (UP1 and UP2).

**Table I: Summary Statistics: IPOs Underwritten by the
Six Largest Investment Banks as Lead Managers (1998-2000)**

N = 282	MEAN	MEDIAN	STD DEV	MAX	MIN
REV	\$97,132,410	\$9,572,500	\$526,340,510	\$7,952,000,000 (MSDW)	\$0 (several)
FO	\$126,532,160	\$76,250,000	\$234,744,550	\$2,870,000,000 (ML)	\$27,000,000 (ML)
LUSH	41.05%	41.02%	6.01%	75% (ML)	20.40% (ML)
RATIO	96.42%	100%	46.65%	344.44% (CSFB)	22.22% (SSB)
FLOAT	18.27%	16.32%	10.73%	100% (SSB)	5.32% (GS)
MC	\$824,367,743	\$480,559,405	\$1,535,127,963	\$17,117,500,000 (ML)	\$76,736,330 (CSFB)
IPO PR	\$16.08	\$15	\$5.61	\$38 (MSDW)	\$6 (SSB)
IPO OP	\$33.77	\$23.00	\$33.62	\$299 (CSFB)	\$6.16 (SSB)
IPO CP	\$34.91	\$24.69	\$31.65	\$250 (CSFB)	\$6.72 (SSB)
UP1	88.51%	54.77%	107.04%	896.67% (CSFB)	-19.23% (GS)
UP2	96.46%	63.13%	107.08%	733.33% (CSFB)	-26.92% (GS)
MLT	\$115,942,047	\$47,265,000	\$194,743,791	\$1,541,013,600 (CSFB)	-\$33,000,000 (CSFB)

REV = Previous year's revenue

FO = Final offer amount

LUSH = Number of shares allocated to sole book runner ÷ IPO shares (%)

RATIO = Shares allocated to sole book runner ÷ Shares allocated to next largest underwriter (%)

FLOAT = IPO shares ÷ Total Shares Outstanding (%)

MC = Market capitalization

IPO PR = Offer price

IPO OP = First day opening price

IPO CP = First day closing price

UP1 = First day opening price ÷ Offer price (%)

UP2 = First day closing price ÷ Offer price (%)

MLT = Money left on the table = (first day closing price ÷ offer price) x number of shares

Lead underwriter/sole book runner in parenthesis

Tables II and III show the results using regression analysis for the first two underpricing measures. When the first underpricing measure is used, UP1, Merrill Lynch (ML) seems to underprice IPOs much less than the other prestigious investment banks. Also, Credit Suisse First Boston (CSFB) and Morgan Stanley Dean Witter (MSDW), appear to underprice IPOs more than the other prestigious underwriters. The number of shares allocated to the lead underwriter (LUSH AND RATIO coefficients) does not appear to affect IPO underpricing, while the coefficient on the number of IPO shares, as a percentage of total outstanding shares (FLOAT), is statistically significant. In this case, the higher the FLOAT, the lower the IPO underpricing. Similar results are obtained when UP2 is used in the regression equation. The only difference is that Lehman Brothers (LB), along with Merrill Lynch, appears to underprice IPOs much less than the other underwriters.

TABLE II Regression Analysis Coefficients
 $UP1 = b_0 + b_{1.5}IB + b_6LUSH + b_7RATIO + b_8FLOAT$

Intercept	GS	LB	ML	MSDW	SSB	LUSH	RATIO	FLOAT
141.33*** (45.57)	24.09 (17.16)	-33.29 (20.20)	-38.18* (20.69)	53.70*** (18.36)	-31.74 (26.45)	-0.92 (1.05)	0.098 (0.13)	-1.55*** (0.60)
282 Obs	F-stat = 5.79		Adj R ² = 0.12					

Standard error in parenthesis

*** Significant at 1%

* Significant at 10%

TABLE III Regression Analysis Coefficients
 $UP2 = b_0 + b_{1.5}IB + b_6LUSH + b_7RATIO + b_8FLOAT$

Intercept	GS	LB	ML	MSDW	SSB	LUSH	RATIO	FLOAT
148.52*** (46.04)	10.74 (17.34)	-42.99** (20.41)	-45.85*** (20.90)	36.29* (18.55)	-36.97 (26.72)	-0.57 (1.06)	0.07 (0.13)	-1.69*** (0.60)
282 Obs	F-stat = 5.01		Adj R ² = 0.10					

Standard error in parenthesis

*** Significant at 1%

** Significant at 5%

* Significant at 10%

Table IV shows the results using money left on the table (natural logarithm). In this case, Lehman Brothers, Merrill Lynch, and Salomon Smith Barney appear to underprice IPOs significantly less than the other prestigious underwriters. Also, the higher the revenue of the company going public, the lower the money left on the table; the higher the final offer amount, the higher the money left on the table; the higher the market capitalization of the company going public, the lower the money left on the table.

TABLE IV Regression Analysis Coefficients
 $LNMLT = b_0 + b_{1.5}IB + b_6LNREV + b_7LNFO + b_8LNMC$

Intercept	GS	LB	ML	MSDW	SSB	LNREV	LNFO	LNMC
-2.69*** (0.7547)	0.120 (0.252)	-0.601** (0.301)	-0.620* (0.324)	0.140 (0.265)	-0.911** (0.364)	-0.145*** (0.048)	0.488* (0.269)	0.778*** (0.228)
236 Obs	F-stat = 15.97		Adj R ² = 0.338					

Standard error in parenthesis

*** Significant at 1%

** Significant at 5%

* Significant at 10%

Tables V, VI, and VII present the t-tests for the difference in means using the three underpricing measures. The results seem to support the idea that some prestigious underwriters underprice consistently more than some others, regardless of the short-term underpricing measure used. In this case, Morgan Stanley Dean Witter seems to underprice IPOs significantly more than any of the other bulge-bracket underwriters. Goldman Sachs appears to underprice IPOs more than the other underwriters, with the exception of Morgan Stanley Dean Witter. Credit Suisse First Boston underprices more than Lehman Brothers, Merrill Lynch, and Salomon Smith Barney. Finally, the results presented in Tables V-VII, suggest that IPO underpricing is about the same for Lehman Brothers, Merrill Lynch, and Salomon Smith Barney, and that these three underwriters consistently underprice IPOs much less than the other investment banks.

TABLE V T-tests: Difference in Means
UP1: First Day Opening Price Divided by the Offer Price (%)

	CSFB	GS	LB	ML	MSDW
GS	-1.6194 (0.0538)	-	-	-	-
LB	2.3632 (0.0099)	4.3339 (0.0000)	-	-	-
ML	2.2384 (0.0137)	4.0995 (0.0000)	-0.0169 (0.4933)	-	-
MSDW	-2.5337 (0.0065)	-1.3313 (0.0933)	-4.4893 (0.0000)	-4.3592 (0.0000)	-
SSB	3.3118 (0.0007)	5.2958 (0.0000)	1.1636 (0.1251)	1.1069 (0.1368)	5.1881 (0.0000)

P-values in parenthesis

TABLE VI T-tests: Difference in Means
UP2: First Day Closing Price Divided by the Offer Price (%)

	CSFB	GS	LB	ML	MSDW
GS	-0.8703 (0.1928)	-	-	-	-
LB	2.7309 (0.0037)	3.7255 (0.0002)	-	-	-
ML	2.3563 (0.0104)	3.2273 (0.0009)	-0.1055 (0.4582)	-	-
MSDW	-1.8983 (0.0303)	-1.2397 (0.1092)	-4.1307 (0.0000)	-3.7665 (0.0002)	-
SSB	3.0958 (0.0016)	3.9997 (0.0001)	0.6248 (0.2677)	0.6663 (0.2542)	4.3861 (0.0000)

P-values in parenthesis

TABLE VII T-tests: Difference in Means
MLT (LN): (First Day Closing Price Divided by the Offer Price)
times the Number of Shares

	CSFB	GS	LB	ML	MSDW
GS	-1.4670 (0.0726)	-	-	-	-
LB	2.2410 (0.0149)	3.2301 (0.0011)	-	-	-
ML	1.1124 (0.1370)	1.9754 (0.0282)	-0.6910 (0.2464)	-	-
MSDW	-1.9730 (0.0256)	-0.5488 (0.2922)	-3.5653 (0.0004)	-2.2887 (0.0141)	-
SSB	2.4170 (0.0115)	3.2748 (0.0015)	0.4059 (0.3435)	1.0089 (0.1596)	3.5722 (0.0007)

P-values in parenthesis

Conclusions

The evidence presented in this study seems to indicate that some bulge-bracket investment banks, acting as single lead underwriters and sole book runners, underprice IPOs significantly less than some other prestigious underwriters, regardless of the underpricing measure used. The number of IPO shares, as a percentage of total shares outstanding, seems to have a negative effect on short-term IPO underpricing. Revenue and market capitalization of the company going public appear to have a negative relationship with money left on the table. Finally, the final offer amount seems to have a positive relationship with money left on the table.

These findings might provide some helpful IPO underpricing information to companies going public. However, the findings are dependent on the sample period 1998-2000, the type of investment bank (bulge-bracket underwriters), and the number of shares allocated to the lead manager (at least 20 percent more than to the next underwriter).

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Notes