Underwriter Compensation and the Returns to Reputation*

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March 22, 2012

Abstract

Underwriter reputation and compensation are both topics that have received considerable attention but the question of whether underwriter fee structures provide adequate incentives for investment banks to build and maintain their reputation remains unresolved. We examine this question for equity underwriting and find that underwriters with higher reputations earn significantly higher underwriting revenues. For example, underwriters with the highest Carter-Manaster (CM) reputation ranking of 9 receive around $10 million per IPO, on average, whereas underwriters with rankings below 9 receive around $3 million. When we control for differences in characteristics of issues underwritten by banks of different reputations while also accounting for endogenous matching between issuers and underwriters, we find that CM9 underwriters earn a premium of $2.6 ($2.0) million per IPO (SEO). When spreads are measured as a percentage of proceeds, CM9 IPO underwriters receive a reputational premium of 1.79 to 3.21 percentage points from an average IPO spread of 6.71% while a third of the 4.28% spread that CM9 SEO underwriters receive, on average, is attributable to their higher reputation. Overall, our findings show that a significant premium to reputation is evident for different measures of underwriter reputation and model specifications, and provide compelling evidence of statistically and economically significant returns to reputation building in equity underwriting.

Keywords: Underwriter compensation, returns to reputation; public equity offerings; equity underwriting; investment banking

JEL classification: G24, G32, L14, L15

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* We are grateful to Anis Samet, Paul Spindt, and seminar participants at the American University of Sharjah for valuable discussions and comments. We thank Seth Hoelscher and Ashley Newton for research assistance. We are responsible for any remaining errors.

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Abstract

Underwriter reputation and compensation are both topics that have received considerable attention but the question of whether underwriter fee structures provide adequate incentives for investment banks to build and maintain their reputation remains unresolved. We examine this question for equity underwriting and find that underwriters with higher reputations earn significantly higher underwriting revenues. For example, underwriters with the highest Carter-Manaster (CM) reputation ranking of 9 receive around $10 million per IPO, on average, whereas underwriters with rankings below 9 receive around $3 million. When we control for differences in characteristics of issues underwritten by banks of different reputations while also accounting for endogenous matching between issuers and underwriters, we find that CM9 underwriters earn a premium of $2.6 ($2.0) million per IPO (SEO). When spreads are measured as a percentage of proceeds, CM9 IPO underwriters receive a reputational premium of 1.79 to 3.21 percentage points from an average IPO spread of 6.71% while a third of the 4.28% spread that CM9 SEO underwriters receive, on average, is attributable to their higher reputation. Overall, our findings show that a significant premium to reputation is evident for different measures of underwriter reputation and model specifications, and provide compelling evidence of statistically and economically significant returns to reputation building in equity underwriting.

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Underwriter Compensation and the Returns to Reputation

The collapse of Lehman Brothers and the near-collapse of Bear Stearns and Merrill Lynch during the 2008 financial crisis have refocused attention on the importance of investment bank reputation. Investment banks operate in an asymmetric information environment that typifies the classic Akerlof (1970) lemons problem,[1] which makes it more difficult for high quality investment banks to credibly distinguish themselves from low quality investment banks and requires them to expend significant resources in building and maintaining their reputations.[2]

However, while a considerable body of finance literature has focused on how firms can benefit by engaging the services of high reputation underwriters,[3] to our knowledge there is no direct evidence on whether high reputation underwriters earn reputational premiums on their underwriting spreads relative to low reputation underwriters that would warrant making significant investments in reputation building. Chen and Ritter (2000) document that in the late 1990's, gross underwriting spreads on the large majority of U.S. initial public offerings (IPOs) raising between $20 million to $80 million were exactly seven percent ("the seven percent solution"), which suggests that high reputation underwriters earn no reputational premia relative to low reputation underwriters. Subsequent studies of underwriter compensation have focused largely on the question raised by the findings of Chen and Ritter (2000) of whether the seven percent solution is the result of underwriter collusion in the IPO market. Hansen (2001) argues

[1] See Ritter (2003) for a review.

[2] Klein and Leffler (1981), Shapiro (1982), and Allen (1984) argue that high quality sellers can differentiate themselves by investing resources in developing a reputation for high quality and then charging a premium for their products. Diamond (1989, 1991) advances a similar argument for high quality borrowers. Chemmanur and Fulghieri (1994a) develop a model in which underwriter fees are increasing in their reputation. Hansen and Torregrosa (1992) propose that underwriters should be compensated for the monitoring services they provide. To the extent that more reputed underwriters provide more corporate monitoring, they should expect to receive higher compensation.

[3] See, for example, Titman and Trueman (1986), Booth and Smith (1986), Carter and Manaster (1990), Megginson and Weiss (1991), Chemmanur and Fulghieri (1994a), Carter, Dark, and Singh (1998), Habib and Ljungqvist (2001), Krigman, Shaw, and Womack (2001), Logue, Rogalski, Seward, and Foster-Johnson (2002), and Ritter and Welch (2002).

against collusion, noting that the 7% spread is not abnormally profitable and IPO underwriters compete on other dimensions including reputation. However, Abrahamson, Jenkinson, and Jones (2011) provide evidence in support of implicit collusion, noting that the seven percent solution has become even more prevalent in the U.S. since the study of Chen and Ritter (2000); in the 1998-2007 period, 95.4% (77%) of U.S. IPOs between $25 million and $100 million ($100 million and $250 million) had 7% spreads, while European IPO spreads were three percentage points lower on average, not clustered at a single number, and declining.

Viewed from the standpoint of returns to underwriter reputation, all these studies point to another puzzle – at least on the surface, the seven percent solution provides no premium for high-reputation IPO underwriters. Indeed, James (1992) finds that higher reputation underwriters tend to charge lower percentage fees in IPOs, and Fernando, Gatchev, and Spindt (2005) find a similar negative relation between SEO percentage spreads and underwriter reputation. It is possible that measuring underwriter compensation as a percentage of the size of the offering and then comparing percentage spreads across offerings may not capture other cross-sectional differences in issues that are attributable to differences in underwriter reputation.[4]

In this paper, we directly identify underwriter returns attributable to reputation by studying the relation between underwriter reputation and the spreads associated with underwriting equity offerings. We employ three metrics of underwriter returns in equity underwritings derived from Carter (1992), Chemmanur and Fulghieri (1994b), Krishnaswami, Spindt, and Subramaniam (1999), Benveniste, Ljungqvist, Wilhelm, and Yu (2003), and Fernando, Gatchev and Spindt (2005): (a) underwriter dollar revenue per underwritten IPO; (b) underwriter dollar revenue per underwritten SEO; and (c) underwriter dollar revenue per underwritten IPO firm over a 10-year

[4] These include differences in issue size, risk, cost, and likelihood of repeat offerings. See, for example, Carter and Manaster (1990), Beatty and Welch (1996), Altinkiliç and Hansen (2000), and Fernando, Gatchev, and Spindt (2005).

period starting at the IPO. Specifically, we examine the association between these metrics and the Megginson-Weiss and Carter-Manaster measures of underwriter ranking.

Overall, our findings indicate significant returns associated with reputation building in equity underwriting. In univariate analyses, we find that more highly reputed underwriters, as measured by either the Megginson-Weiss market share ranking or Carter-Manaster tombstone ranking, earn higher dollar revenues per IPO, per SEO, and per IPO client over a 10-year period starting at the IPO. Univariate sorts of IPOs and SEOs into deciles according to the Megginson-Weiss ranking of the lead underwriter reveal that average and median dollar spreads in both IPOs and SEOs are monotonically or nearly monotonically increasing in the Megginson-Weiss decile, with the most highly reputed underwriters in the top Megginson-Weiss decile (the "bulge bracket") earning average and median gross dollar spreads that are 8 to 10 times larger than those earned by underwriters in the bottom decile. We document the same pattern when sorting IPOs and SEOs according to the lead underwriter's Carter-Manaster ranking, with underwriters that have the highest Carter-Manaster ranking of 9 earning significantly larger mean and median gross dollar spreads in IPOs and SEOs than their less reputable peers. Similarly, when we examine the total dollar spreads that lead underwriters earn from their IPO clients in public equity and debt offerings over a 10-year period starting at the IPO, we find that in addition to higher average dollar spreads in the IPO, more reputable underwriters earn higher total spreads from follow-on equity and debt offerings. Our univariate tests therefore reveal that reputable underwriters earn substantially larger revenues in IPOs, SEOs, and per IPO client over a 10-year period.

We also examine underwriter revenues in a multivariate context. Prior studies have shown that issue and firm characteristics, such as issue size and firm risk, significantly affect underwriting costs and the spreads charged in equity offerings (Altinkiliç and Hansen, 2000). For the same issuer and offering, a theory of positive returns to underwriter reputation (e.g., as in Chemmanur and Fulghieri, 1994a) would predict that a high reputation underwriter should receive a premium for its services relative to a less reputable underwriter, but existing literature

has largely failed to provide empirical support for this prediction, especially while accounting for other factors that can explain underwriter compensation.[5] We revisit this question by analyzing spreads in IPOs and SEOs in a multivariate context that controls for factors known to influence underwriter compensation in SEOs and IPOs. Our regression results indicate that, while issue and market characteristics account for a large portion of the differences in dollar spreads between high and low reputation underwriters, all else equal, higher underwriter reputation results in significantly higher compensation in both IPOs and SEOs.

For IPOs (SEOs), our estimates indicate that a one standard deviation increase in the Megginson-Weiss ranking corresponds to an increase in the dollar spread of around $177,000 ($250,000), relative to a mean IPO (SEO) spread of $5.22 ($5.55) million (spreads are measured in 2010 dollars). Similarly, a one unit increase in the Carter-Manaster ranking (e.g., a move from a ranking of seven to eight) corresponds to a spread increase of around $59,000 for IPOs and $172,000 for SEOs. When we alternatively use a dummy variable specification of the Carter-Manaster ranking, equal to one for the highest ranking of 9 and zero otherwise, we find an average spread premium of $332,000 in IPOs and $497,000 in SEOs for underwriters with a Carter-Manaster ranking of 9 (CM9) relative to underwriters with rankings below 9. Regressions of total IPO client revenues over a 10-year period (starting at the IPO) on underwriter reputation reveal similar findings – high reputation underwriters earn significantly higher total revenues from their IPO clients even after controlling for issue and firm characteristics.

We also reexamine our findings after accounting for non-randomness in the matching between issuers and underwriters.[6] We use a Heckman (1979) two-stage estimation to account for

[5] Fernando, Gatchev, and Spindt (2005) document a positive relation between underwriter reputation and the fee revenues they earn from subsequent underwritings for IPO clients, controlling only for IPO market capitalization, but they do not examine how underwriter reputation is related to their fees for underwriting individual IPOs or SEOs.

[6] Carter and Manaster (1990), Beatty and Welch (1996), and Fernando, Gatchev, and Spindt (2005) show that higher reputation underwriters tend to match with larger and higher quality firms.

the endogeneity of issuer-underwriter matching and observe an even larger statistically significant effect of reputation on gross spreads in IPOs and in SEOs. Our estimates from the Heckman model indicate that, for underwriting the same IPO, CM9 banks receive approximately $1.4 to $2.6 million more in underwriter spreads than banks with Carter-Manaster rank less than 9 would receive. We note that these estimates are substantially higher than the premium estimates of $0.3 million to $0.5 million from our multivariate regression models. In effect, when estimating the returns to reputation, the Heckman (1979) selection model takes into account the positive assortative matching where high reputation underwriters match with higher quality firms, leading to an additional benefit to the underwriter.

On a percentage basis (dollar spread expressed as a percentage of proceeds), our estimate of the premium that reputable (CM9) underwriters receive in IPOs is approximately 1.79 to 3.21 percentage points, which is economically significant when compared to the average CM9 IPO spread of 6.71%. For SEOs, our findings are similar. CM9 banks receive approximately $2.0 million more in underwriter spreads than banks with Carter-Manaster rank less than 9. On a percentage basis, the premium received by CM9 underwriters is approximately 1.67 percentage points, which again is economically significant relative to the average CM9 SEO spread of 4.28%. We conclude that reputable underwriters earn an economically and statistically significant reputational premium for their services in IPOs and in SEOs even after accounting for the endogenous matching of issuers and underwriters. While the question of whether there is implicit collusion across banks does not fall within the scope of our study, what we do show is that notwithstanding the seven percent solution, there are substantial returns to reputation and significant variation across underwriters in the reputation component of underwriting spreads. These findings provide valuable new insights into the returns to reputation building in equity underwriting while contributing to the corporate reputation literature.

The rest of the paper is organized as follows. In Section I we motivate our empirical analysis by briefly reviewing the existing economics and finance literature on returns to

reputation including in the context of securities underwriting. Section II discusses our data and methodology. Section III reports the findings from our empirical analysis. Section IV concludes.

I. Background

Highlighted by the seminal work of Akerlof (1970), the notion that reputation is valuable provides an important underpinning for a large body of the economics and finance literature. Several authors, including Klein and Leffler (1981), Shapiro (1982), and Allen (1984), have advanced theoretical models where higher reputation sellers earn higher reputational rents by investing in and maintaining their reputations. In analyzing the impact of borrower reputation in borrower-lender arrangements, Diamond (1989) finds that borrowers who acquire a high reputation benefit from reduced incentive problems, while Diamond (1991) finds that highly reputed borrowers also benefit from reduced monitoring needs. Chemmanur and Fulghieri (1994a) develop a model in which underwriter fees are increasing in underwriter reputation.

The finance literature has paid considerable attention to the reputation rankings of investment banks that underwrite initial public offerings (IPOs) and seasoned equity offerings (SEOs), but extant studies on the effects of reputational differences across underwriters have been motivated almost exclusively from the perspective of how equity-issuing firms benefit by engaging the services of high reputation underwriters.[7] In particular, the literature has focused on examining how underwriter reputation is related to IPO underpricing.[8] However, the link between IPO underpricing and underwriter reputation is tenuous at best. Beatty and Ritter (1986) and

[7] See, for example, Titman and Trueman (1986), Booth and Smith (1986), Carter and Manaster (1990), Megginson and Weiss (1991), Chemmanur and Fulghieri (1994a), Carter, Dark, and Singh (1998), Habib and Ljungqvist (2001), Krigman, Shaw, and Womack (2001), Logue, Rogalski, Seward, and Foster-Johnson (2002), and Ritter and Welch (2002). The methodologies for ranking underwriters based on their reputation fall into two broad approaches. In the first approach, Carter and Manaster (1990) measure underwriter reputation by their relative placement on "tombstone" announcements of successful securities offerings. In the second approach, Megginson and Weiss (1991) measure underwriter reputation by their market share.

[8] See, for example, McDonald and Fisher (1972), Logue (1973), Tinic (1988), Carter and Manaster (1990), and Carter, Dark, and Singh (1998).

Dunbar (2000) find that IPO underpricing leads to a loss in market share for the underwriter. James (1992) finds that higher IPO underpricing reduces the likelihood that the underwriter is employed by the firm in subsequent offerings. Nanda and Yun (1997) find that higher underpricing is associated with a decrease in the lead underwriter's market value. McDonald and Fisher (1972), Logue (1973), Tinic (1988), Carter and Manaster (1990), and Carter, Dark, and Singh (1998) find that higher underwriter reputation is associated with less underpricing which, taken together with the aforementioned studies, would seem to suggest positive returns to underwriter reputation. However, Beatty and Welch (1996) and Cooney, Singh, Carter, and Dark (2001) find that IPO underpricing is positively related to underwriter reputation, while Logue et al. (2002) find no relation at all between underwriter reputation and underpricing. The findings of Loughran and Ritter (2004) suggest that the level of IPO underpricing is not a robust proxy for underwriter reputation.

Smith (1992) shows that Salomon Brothers experienced a significant loss in underwriting market share following its 1991 bond trading scandal. Similarly, Beatty, Bunsis, and Hand (1998) provide indirect evidence on the value of underwriter reputation by showing that underwriters who are subject to SEC investigations experience large declines of IPO market share, which they attribute to loss of reputational capital. While suggesting a possible cross-sectional relation between underwriter reputation and compensation, these studies do not directly examine this question. In a more general context, Karpoff and Lott (1993) and Karpoff, Lee, and Martin (2008) provide extensive evidence of reputational penalties associated with corporate criminal fraud and accounting violations.

While a positive relation between reputation and returns is often assumed in a variety of markets, few empirical studies have attempted to estimate directly the returns to reputation. An exception is the recent literature studying the returns that participants in online auctions generate by enhancing their reputation, including McDonald and Slawson (2000), Melnik and Alm (2002), Dewan and Hsu (2004), Livingston (2005), Dewally and Ederington (2006), and Houser and

Wooders (2006). These studies provide evidence that more reputed sellers command higher prices in online auctions and the higher reputation increases the likelihood of a sale.

Despite the considerable focus on investment bank reputation, no such evidence of returns to reputation currently exists in the investment banking literature. Chen and Ritter (2000) show that IPO underwriting spreads are clustered at 7%. Fixed percentage spreads that are do not vary across underwriters would suggest that underwriters do not earn any incremental rents to increases in their reputation. The findings of Chen and Ritter (2000) are strongly supported by Abrahamson, Jenkinson, and Jones (2011) who show that the seven percent solution is even more prevalent in the 1998-2007 period of their study than it was during the 1985-1998 period of the Chen and Ritter (2000) study, with 95.4% of U.S. IPOs between $25 million and $100 million, and 77% of U.S. IPOs between $100 million and $250 million having spreads of exactly seven percent. Indeed, James (1992) finds that higher reputation underwriters tend to charge lower percentage fees in IPOs, which would suggest that the returns to reputation in IPO underwriting are negative, and Fernando, Gatchev, and Spindt (2005) find a similar negative relation between SEO percentage spreads and underwriter reputation. It is possible that measuring underwriter compensation only as a percentage of the size of the offering and then comparing percentage spreads across offerings may not capture other cross-sectional differences in issues that are attributable to differences in underwriter reputation. In particular, studies by Carter (1992), Chemmanur and Fulghieri (1994b), Krishnaswami, Spindt, and Subramaniam (1999), and Fernando, Gatchev and Spindt (2005) show that more reputable underwriters associate with firms that are more likely to undertake future public offerings. Fernando, Gatchev and Spindt (2005) also show that these firms have larger IPO and SEO proceeds, possibly due to the ability of high reputation underwriters to increase the selling price of the offering. Therefore, the seven percent solution notwithstanding, these studies suggest the possibility that more reputable underwriters will earn higher revenues from their clients due to their higher frequency and market value of public offerings.

II. Data and Methodology

A. General Sample

We collect data on securities offerings from the New Issues Database of the Securities Data Company (SDC). We include issues marketed in the United States by U.S. firms during 1980 to 2010. Offerings of closed-end funds, American depositary receipts (ADRs), real estate investment trusts (REITs), unit offerings, and competitive bid offerings are excluded. We also exclude a small number of offerings with missing data on proceeds and/or gross spreads. We use the remaining offerings to compute the market share based reputation measure discussed below. All proceeds exclude overallotment options, and we express all dollar amounts in January 2010 U.S. dollars using the GDP implicit price deflator.[9] In some of our analyses, we also use data on public straight and convertible debt offerings, which are collected from SDC.

Our first underwriter reputation measure is based on Megginson and Weiss (1991). For a set of underwriters I and for every year t, we define the three-year moving average (t-3, t-2, t-1) of IPO and SEO proceeds lead-underwritten by underwriter j as x_{jt}.[10] Then the Megginson-Weiss ranking for underwriter j is equal to:

$$MWR_{jt} = \frac{\ln x_{jt}}{\max_{i \in I}\left[\ln x_{it}\right]} \times 100 \tag{1}$$

This measure of underwriter quality is market-share based and is a continuous variable on the interval [0,100]. In year t, the underwriter with the highest three-year moving average of IPO and SEO proceeds over the previous three years (t-3, t-2, t-1) would have a Megginson-Weiss ranking of 100. Our definition of this measure is very similar to that used by Aggarwal, Krigman,

[9] The GDP implicit price deflator is from the Federal Reserve Economic Data (FRED) database.

[10] For offers with multiple lead underwriters we split the proceeds equally among all lead banks.

and Womack (2002).[11] Some of the offerings in our sample are lead-underwritten by multiple underwriters, especially among offerings that occur after 1999. For these offerings, we use the Megginson-Weiss ranking of the lead underwriter with the highest ranking in our empirical analysis. In unreported analyses, we have used the average rank of the lead underwriters with similar results.

Our second measure of underwriter reputation is the Carter-Manaster (CM) ranking, which is based on an underwriter's relative position in IPO tombstone announcements. This measure is developed by Carter and Manaster (1990) and extended by Carter, Dark, and Singh (1998) and Loughran and Ritter (2004). The CM ranking is equal to zero for the lowest reputation underwriters and nine for the highest reputation underwriters. CM rankings are collected from Jay Ritter's website and are available from 1980 to 2009. Thus, our analysis of Carter-Manaster rankings is restricted to offerings that occurred within this time frame. As with the Megginson-Weiss ranking, we use the Carter-Manaster ranking of the lead underwriter with the highest ranking in cases where the offering has multiple lead underwriters.

B. IPO Sample

For the IPO sample, we select only public offerings of common stock that SDC defines as "Original IPOs," common stock that has never traded publicly in any market and the firm offers it for the first time in the U.S. public market. The issue must be defined as common stock in CRSP (share code of 10, 11, or 12) and must be listed on the CRSP daily files no later than 40 trading days after the IPO date. We also require that the firm has accounting data in Compustat from its first annual report after the IPO. To prevent outliers from influencing our results, we eliminate very small and very large offerings -- those with proceeds of less than $5 million or more than $1

[11] Aggarwal, Krigman, and Womack (2002) compute the Megginson-Weiss ranking using the three-year moving average of proceeds over years *t*-2, *t*-1, and *t*, whereas we use years *t*-3, *t*-2, and *t*-1. We do not include proceeds from year *t* in our computation because doing this would induce a mechanical positive correlation between the year *t* reputation ranking and year *t* gross spreads.

billion -- which correspond roughly to the 1st and 99th percentile during our sample period. We also exclude a small number of offerings without sufficient data to compute the lead underwriter's Megginson-Weiss and Carter-Manaster reputation rankings. Our final sample consists of 6,423 IPOs. Panel A of Table I reports descriptive statistics on offering and firm characteristics for the IPO sample.

C. SEO Sample

For the SEO sample, we select issues that are defined as common stock in CRSP and undertaken by firms listed in the daily CRSP files during the 50 trading days prior to the offering. We further require accounting data in Compustat from the most recent fiscal year ending prior to the offering. We exclude very small and very large SEOs – offerings with proceeds less than $5 million or more than $2 billion -- to eliminate the influence of outliers. The final SEO sample consists of 9,159 offerings. Panel B of Table I reports descriptive statistics for the SEO sample.

[Insert Table I about here]

D. Underwriter Returns

We use three measures of underwriter returns. Our first measure of underwriter returns is based on Benveniste et al. (2003) and Fernando, Gatchev, and Spindt (2005) and is equal to the revenue earned by the underwriter per underwritten IPO. Our second measure of underwriter returns, revenue per underwritten SEO, is derived from extending the same idea to SEOs. Our third measure of underwriter returns is the revenue per underwritten firm over a 10-year period starting at the IPO. This measure of underwriter returns combines the findings in Carter (1992), Chemmanur and Fulghieri (1994b), Krishnaswami, Spindt, and Subramaniam (1999), and Fernando, Gatchev and Spindt (2005).

For a particular security offering, we use the gross spread as a proxy for revenue. For our third measure, we use the sum of the IPO gross spread and gross spreads from the IPO client's

SEOs and public straight and convertible debt offerings earned by the IPO lead underwriter during a 10-year period starting on the IPO date.

Table II presents descriptive statistics on underwriter reputation measures, total proceeds, and gross spreads in IPOs and SEOs for the 65 underwriters with the highest total IPO and SEO proceeds during the last decade of the sample period (2001-2010). The underwriters in Table II are listed according to total underwritten proceeds from highest to lowest. Goldman Sachs ranks highest in terms of total proceeds and also has the highest average gross spread in IPOs ($18.7 million) and highest average gross spread in SEOs ($12.9 million). Goldman Sachs also has the highest average annual Megginson-Weiss ranking of all underwriters during this period and the highest possible average annual Carter-Manaster ranking of 9. The top six underwriters in terms of total proceeds also possess the six highest average annual Megginson-Weiss rankings, and all have the highest possible Carter-Manaster ranking of 9. In contrast, of the underwriters that are not in the top six, only Deutsche Bank has an average annual Carter-Manaster rankings of 9. This is consistent with the significant positive correlation between the Carter-Manaster rankings and market share documented in Megginson and Weiss (1991) and Carter, Dark, and Singh (1998).

[Insert Table II about here]

E. Regression Methodology

E.1. Modeling Spreads in SEOs and IPOs

In our multivariate analyses, we utilize OLS regressions to control for factors other than underwriter reputation that have been shown to influence underwriter spreads in common stock offerings. For spreads in individual SEOs and IPOs, we follow Altinkiliç and Hansen (2000) and model the gross spread as inclusive of a fixed component and a variable component. Formally, we can express the gross spread of a given offering as:

$$Spread = K + P \times V_{spread}\,, \tag{2}$$

where *Spread* is the total dollar compensation paid to the underwriter(s), K is the fixed component of the spread, P is the dollar amount of proceeds, and V_{spread} is the variable cost per dollar of proceeds. This model views underwriters as producers of proceeds with both fixed and variable costs and assumes that spreads reflect these costs. The fixed component, K, covers the underwriters' setup expenses that are independent of the issue size. These may include taxes, expert fees, SEC registration fees, legal and litigation expenses, and bank overhead expenses. It is important to note that the fixed component of the spread is fixed only in the sense that, for a given underwriting syndicate and issuing firm, it does not vary with the size of the offering. For a given firm, the underwriters' remaining variable costs, $P \times V_{spread}$, are expected to be increasing in proceeds, since greater levels of underwriting service are required to market and place larger offerings.

Empirically, Equation (2) can be estimated as follows:

$$Spread_i = (\gamma_0 + \gamma' Z_i) + Proceeds_i \left(\beta_0 + \beta' X_i\right) + \varepsilon_i, \tag{3}$$

where for offering i, Z_i is a vector of determinants that influence the fixed component of the spread and X_i is a vector of determinants that influence the variable component of the spread. Empirically, the coefficient vector β' can be estimated by including interactions between proceeds and the variables in X_i on the right-hand side of the regression. As in Altinkiliç and Hansen (2000), as determinants of the variable component of the spread in SEOs, we include the relative size of the offering (offer proceeds scaled by the pre-issue market value of the issuer's common equity), the standard deviation of the issuer's daily stock returns during a 255 trading day period that ends 20 trading days prior to the offering, and total SEO proceeds in the US market during the three months prior to the offering. Greater relative issue size should increase placement costs for underwriters since more certification is needed to offset rising adverse selection costs (Altinkiliç and Hansen, 2000; Hansen, 2001).

Return volatility may proxy for information asymmetry between investors and the firm's managers, which raises certification and marketing costs (Booth and Smith, 1986; Denis, 1991; Altinkiliç and Hansen, 2000; Hansen, 2001). Greater return volatility may also increase the premium on the underwriter's short put option that would necessitate buying the issuer's shares at the offer price and reselling them at the lesser of the offer price and prevailing market price (Bhagat and Frost, 1986; Hansen and Torregrosa, 1992; Altinkiliç and Hansen, 2000; Hansen, 2001). Total SEO proceeds during the three months prior to the offering serves as a proxy for primary capital market activity, with which underwriters' costs may vary. As argued by Altinkiliç and Hansen (2000), greater financing activity could reflect greater investment opportunities and hence lower adverse selection, which would lower the certification costs of underwriting. Greater levels of financing may also reflect higher investor demand for new issues, which could lower marketing costs due to lower levels of effort required to place the offering. On the other hand, higher demand for underwriting services may put upward pressure on spreads if the underwriting industry is capacity constrained.

As additional determinants of the variable portion of the spread in SEOs, we also include the firm's return-on-assets (ROA) as a measure of operating performance, a dummy variable for whether the offering is shelf registered, and the proportion of secondary shares offered. ROA is measured with data from Compustat and is defined as operating income before depreciation scaled by total assets from the firm's last annual report before the offering. Firms with better operating performance may require less certification and lower marketing costs (Burch, Nanda, and Warther, 2005), which would lower the spread. We use SDC to determine which offerings are shelf registered. Several studies have shown that shelf registration has a negative effect on underwriting spreads and the cost of issuing equity (Kidwell, Marr, and Thompson, 1987; Allen, Lamy, and Thompson, 1990; Denis, 1991; Burch, Nanda, and Warther, 2005). We collect data on the amount of secondary shares in the offering from SDC. Mikkelson, Partch, and Shah (1997) suggest that secondary sales are associated with better timing of IPOs with good earnings

prospects. Better timing may lower the spread if it coincides with periods of high investment opportunities, since adverse selection costs may be lower when investment opportunities are high. In addition, Logue and Lindvall (1974) note that more insiders can raise bargaining power with underwriters, while Dunbar (1995) and Hansen (2001) find that IPO spreads decrease as secondary sales increase.

For IPOs, we use controls that are analogous to those for SEOs, with the exception that we do not control for shelf registration, since a trivial portion of IPOs are shelf registered. We measure relative issue size in IPOs as proceeds scaled by the firm's market value of common equity on the first day that the firm appears in CRSP, up to 40 trading-days after the IPO. We measure the standard deviation of daily returns over a 255 trading day period that starts 41 trading days after the IPO. We measure the firm's ROA with data in Compustat from the firm's first annual report after the IPO.

Regarding the fixed component of the spread, initially we consider a parsimonious specification of Equation (3) which allows the fixed component of the spread to vary with the reputation of the lead underwriter. Empirically, this is accomplished by including a measure of underwriter reputation as a right-hand side variable. A positive coefficient on the underwriter reputation measure would indicate an average premium earned by reputable underwriters. In some specifications, we also include year dummy variables, thus allowing the fixed component of the spread to vary over time.

The regression models we estimate initially do not allow the variable component of the spread to vary with the underwriter's reputation, which may be unrealistic since pricing technologies and capacity for risk-bearing may vary across underwriters of differing reputations. We subsequently allow for differences in variable costs across underwriters, by alternatively estimating spread equations separately for reputable underwriters and less reputable underwriters using an approach that also adjusts for the endogeneity of issuer-underwriter matching (discussed below). In these analyses, we follow Fang (2005) and regard underwriters with a Carter-Manaster

ranking of 9 as one group and those with a ranking below 9 as another. Estimating the spread equation separately for underwriters with CM rankings of 9 and for underwriters with rankings below 9 has the relative advantage of allowing all parameters in the model to differ for the two groups of underwriters. It has the relative disadvantage that underwriter reputation must be reduced to a discrete binary variable, which will reduce the power of the tests to detect a significant relation between spreads and reputation if the true spectrum of underwriter reputations is not adequately described by two discrete categories.

E.2. Accounting for Endogenous Issuer-Underwriter Matching

A potential drawback of estimating regressions of underwriting spreads on underwriter reputation measures is that the approach assumes a random matching between issuers and underwriters. However, as suggested by existing theoretical and empirical literature, the matching between issuers and underwriters is likely not random. Carter and Manaster (1990) and Beatty and Welch (1996) observe that high quality banks underwrite less risky offerings. Fernando, Gatchev, and Spindt (2005) present a formal theory that predicts positive assortative matching in primary equity markets, and find that reputable underwriters tend to match with larger firms, less risky firms, and firms that are more likely to survive and issue equity in the future. Fang (2005) documents similar empirical findings in primary debt markets. Thus, reputable underwriters may have an incentive to underwrite high quality issues precisely out of concerns over preserving their reputational capital. From the perspective of issuers, observable factors, such as firm size and risk, and unobservable factors, such as private information known to managers, may influence the firm's decision to seek the services of a reputable underwriter. Likewise, the decision of an underwriter to match with an issuer may be based on observable factors as well as unobservable information known only to the issuer and underwriter. To the extent that these unobservable factors also influence the spread that issuer's must pay to float an issue, the regression estimates of the effect of underwriter reputation on spreads will be biased. As described in Heckman

(1979), this problem amounts to an omitted variable bias, since the unobserved factors that drive both issuer-underwriter matching and spreads cannot be explicitly included as right-hand side variables in an OLS regression.

To account for the endogeneity of issuer-underwriter matching, we utilize the two-stage estimation method proposed by Heckman (1979). The first stage involves the estimation of an issuer-underwriter matching equation via a probit model. The response variable in the first stage is binary and equals one if the issuer employs a "reputable" underwriter and zero otherwise. In the second stage, the spread is modeled separately for offerings by reputable banks and for offerings by less reputable banks. The spread is regressed on a set of chosen determinants and the Inverse Mills Ratio, which is a selection variable. The Inverse Mills Ratio is predicted with parameter estimates from the first-stage probit equation, and its inclusion in the second-stage equation offsets the bias in the error term, thereby solving the endogeneity problem. The approach assumes that the error terms from the first and second stage equations are jointly normally distributed. This type of model is used by Dunbar (1995) to study the use of warrants as underwriter compensation and by Fang (2005) to study the price and quality of bond underwriting services. It is a generalization of the models used in Gande, Puri, and Saunders (1999), Schenone (2004), and Bharath et al. (2011).

As discussed above, the second stage spread equation is estimated separately for offerings by reputable banks and less reputable banks, which allows all parameters of the spread equation to differ across reputable and less reputable underwriters. We define reputable banks as those with a Carter-Manaster ranking of 9 and less reputable banks as those with a Carter-Manaster ranking below 9. Inferences on the effect of underwriter reputation can be drawn from a counterfactual analysis as discussed in Heckman, LaLonde, and Smith (1999). For firms that employ reputable banks, the hypothetical spread that the firm would pay if it employed a less reputable bank can be predicted using parameter estimates from the less reputable banks' spread equation. The difference between the spread actually paid and this hypothetical spread provides

an estimate of the premium to reputation. Likewise, for firms that employ less reputable banks, the hypothetical spread that the firm would pay if it employed a reputable bank is predicted using parameter estimates from the reputable banks' spread equation and compared to the spread actually paid.

III. Empirical Results

A. Univariate Analyses of Underwriter Reputation and Earned Spreads

In Table III, we conduct univariate examinations of the association between underwriter spreads and spreads in IPOs and SEOs. In Panel A, we sort the IPO sample into deciles according to the lead underwriter's Megginson-Weiss ranking and compute mean and median gross spreads (measured in millions of 2010 dollars) for each decile.[12] When moving from the first Megginson-Weiss decile (low reputation) to the tenth decile (high reputation), we observe a monotonic increase in both average and median gross IPO spreads, with an average (median) gross spread of $1.21 ($0.92) million corresponding to the first decile and $12.13 ($8.04) million corresponding to tenth decile. We also sort the IPO sample according to the lead underwriter's Carter-Manaster rank. Again, moving from the lowest-reputed underwriters (Carter-Manaster rank of 0) to the most reputed underwriters (Carter-Manaster rank of 9) we observe a monotonic increase in mean gross IPO spreads, with the lowest-rank decile having the lowest mean (median) of $0.85 ($0.69) million and the highest-rank decile having the highest mean (median) of $9.99 ($7.03) million.

[Insert Table III about here]

In Panel B of Table III, we conduct the same type of analysis for the SEO sample. When sorted into deciles according to the Megginson-Weiss ranking, we observe a near-monotonic increase in mean and median SEO spreads when moving from the lowest ranking decile to the

[12] When sorting observations according to the Megginson-Weiss reputation ranking, there are a large number of ties, primarily due to the fact that many underwriters do more than one offering per year, but an underwriter's Megginson-Weiss ranking remains constant within a given calendar year. Observations that are tied with one another are always included in the same decile and, thus, decile sizes may differ slightly.

highest, with means (medians) of $1.97 ($1.41) million and $10.43 ($7.08) million for the lowest and highest deciles, respectively. In Panel B of Table III, when we sort the SEO sample by Carter-Manaster ranking, we find that the underwriters with rankings of 1 have the lowest mean (median) gross spread of $1.05 ($0.81) million and the underwriters with the highest ranking of 9 have the highest mean (median) gross spread of $8.16 ($5.46) million.

Overall, the findings reported in Table III are indicative of a positive association between gross IPO and SEO spreads and underwriter reputation. Figure I provides a visual view of the relation between gross spreads and underwriter Megginson-Weiss (Panel A) and Carter-Manaster (Panel B) reputation, with similar conclusions.

[Insert Figure I about here]

In Table IV, we conduct a univariate examination of the association between underwriter reputation and total spreads earned from IPO clients during a 10-year period starting on the IPO date. This analysis considers spreads earned by the IPO lead underwriter in public security offerings by the IPO firm during a 10-year period starting on the IPO date, which includes the IPO, subsequent SEOs, and subsequent debt offerings. This analysis is restricted to firms that conducted an IPO during 1980-2000. In addition, we consider only IPOs with a single lead underwriter during this period.

[Insert Table IV about here]

In Panel A of Table IV, we sort the sample into deciles according to the Megginson-Weiss reputation ranking. The results show that, apart from earning higher spreads at the IPO stage of a firm, higher reputation underwriters are more likely to be lead underwriters for subsequent equity and debt offerings by the same firm during the 10 years after the IPO.

For low reputation underwriters (decile 1), 4.3% of their IPO clients have a subsequent equity offering and 0.9% have a subsequent debt offering lead by the IPO underwriter. In contrast, the clients of high reputation underwriters (decile 10) are more likely to use the IPO underwriter in the future, with 33.8% issuing seasoned equity and 13.9% issuing debt with the

same lead underwriter. As shown in the table, higher reputation underwriters receive substantially higher revenues from underwriting both subsequent debt and subsequent equity offerings over the 10-year period after the IPO. Combining all spreads from the IPO, any subsequent SEO, and any debt offering, we find that mean total spreads earned by IPO lead underwriters in public common stock and debt offerings from their IPO clients during a 10-year period are monotonically increasing with the Megginson-Weiss decile. The low reputation underwriters in the first decile earn, on average, $1.24 million from their IPO clients while the high reputation underwriters in the tenth decile earn an average of $15.04 million from their IPO clients over a 10-year period.

In Panel B of Table IV, we sort the sample into ten groups according to the Carter-Manaster ranking and observe mean total spreads earned from IPO clients over a 10-year period of $0.85 million for underwriters with a Carter-Manaster ranking of zero and $13.24 million for underwriters with a Carter-Manaster ranking of 9. Moreover, the mean total spreads earned from IPO clients over a 10-year period tend to increase with the Carter-Manaster ranking, although not monotonically. The findings reported in Table IV suggest that highly reputed underwriters tend to earn larger total revenues from their IPO clients because they earn higher spreads in IPOs as well as larger spreads in subsequent SEOs and public debt offerings by their IPO clients. The latter result is consistent with the finding of Fernando, Gatchev, and Spindt (2005).

B. Multivariate Analyses of SEO and IPO Gross Spreads

B.1. No Correction for Endogenous Issuer-Underwriter Matching

In Table V, we estimate regressions that examine gross IPO and SEO underwriting spreads. Both for IPOs and for SEOs, most of the control variables have the expected influence on spreads. The results indicate that the variable component of the spread is rising with the size of the offering relative to firm size and the issuer's return volatility. It is decreasing in the proportion of secondary shares and is also lower for SEOs that are shelf registered. These results are consistent with prior studies. The firm's return on assets (ROA) does not influence IPO and SEO

spreads significantly, nor does the amount of issue activity in the IPO or SEO market during the three months prior to the offering.

[Insert Table V about here]

Of primary interest is that, for both IPOs and SEOs, all three reputation measures have positive coefficients that are statistically significant at the 1% level. Examining the coefficient estimate from specification (1) for IPO spreads, we find that a one standard deviation (9.29) increase in the Megginson-Weiss ranking corresponds to around $176,510 (9.29×0.019 million) increase in the gross spread underwriters received from the IPO, on average. We can also compare the difference between underwriters in the lowest to those in the highest MW reputation deciles. Given that the difference in MW reputation between the two extreme deciles is 28.02 (99.90-70.98), after controlling for issue and market characteristics, the difference in gross proceeds between the two extreme deciles is $532,380 (28.02×0.019 million) per IPO. In specification (2), the coefficient on the Carter-Manaster ranking implies that a one unit increase in the ranking corresponds to a $59,000 increase in the IPO gross spread. Equivalently, relative to underwriters with the lowest CM rank of 0, underwriters with the highest CM rank of 9 receive an additional gross spread of $531,000 (9×0.059 million) per IPO. The results in specification (3) suggest that the returns to reputation are most pronounced for the highest reputation underwriters; the IPO spreads received by underwriters with a Carter-Manaster ranking of 9 are larger by around $332,000 relative to the spreads received by underwriters with rankings below 9.

Examining the coefficient estimates from the models of SEO spreads (specifications (4), (5), and (6)), we find that a one standard deviation (7.55) increase in the Megginson-Weiss ranking corresponds to around $250,000 increase in the gross spread underwriters received from an SEO, on average (specification (1)). When comparing underwriters in the two extreme deciles of MW reputation, we find that, relative to underwriters in the lowest decile, underwriters in the highest reputation decile receive an additional gross spread of $793,650. In specification (2), the coefficient on the Carter-Manaster ranking implies that a one unit increase in the ranking

corresponds to a $172,000 increase in the SEO gross spread so that, relative to underwriters with a ranking of 0, underwriters with a ranking of 9 receive an additional $1.548 million per SEO. Similarly, in specification (3), we find that the SEO spreads received by underwriters with a ranking of 9 are larger by $497,000 relative to the spreads received by underwriters with a ranking below 9.

The findings from the multivariate regression models in this section show that a significant part of the higher spreads received by high reputation underwriters is due to the positive relation between issue size and underwriter reputation. However, even after controlling for issue size and other issue characteristics, we find a statistically and economically significant return to underwriter reputation both from IPOs and from SEO. Furthermore, our findings suggest that, for IPOs, the returns to reputation are especially high for the highest reputation underwriters. Even though the returns to reputation in SEOs are higher than in IPOs, on average, the returns to reputation appear to be more evenly distributed across underwriter reputation.

B.2. Correcting for Endogenous Issuer-Underwriter Matching

In this section we examine the effect of underwriter reputation on IPO and SEO spreads after accounting for the endogeneity of issuer-underwriter matching. To explicitly model issuer-underwriter matching and to control for the effect of endogenous matching on IPO and SEO spreads, we use the two-step estimation method described in Section II.E.2. Furthermore, we use two different approaches to model issuer-underwriter matching. The first approach uses the actual firm and offer characteristics while the second approach standardizes the firm and offer characteristics by subtracting the annual mean and dividing by the annual standard deviation of each variable. The second approach is motivated by the findings of Fernando, Gatchev, and Spindt (2005) that issuer-underwriter matching is relative and not absolute. Because our findings are qualitatively similar across the two approaches, in the discussion that follows we focus on the estimates from the first approach, using the actual firm and offer characteristics.

Both for IPOs and SEOs, we first estimate the probability that the issue is underwritten by a "reputable" underwriter (Carter-Manaster rank of 9). As independent variables in the IPO sample, we include the natural logarithm of proceeds, a dummy variable of whether the IPO is VC-backed, the natural logarithm of the market value of common equity, the standard deviation of the issuer's stock returns, ROA, and a dummy variable of whether the firm pays a dividend. The independent variables in the SEO sample also include a dummy variable of whether the SEO is shelf registered,[13] the natural logarithm of one plus the total amount of common stock proceeds (expressed in millions of 2010 dollars) raised by the issuer from 1980 to the date before the offering, and the natural logarithm of one plus the number of common stock offerings conducted by the issuer during the same period (prior issue frequency). In the second-stage model, the spread is modeled separately for more reputable banks and less reputable banks to allow for different parameters in the spread equation across the two groups. The model is estimated with year dummy variables to allow for time variation in the fixed component of the spread and the explanatory variables.

The estimates from the two stages of the selection model are reported in Table VI (IPOs) and Table VII (SEOs). For the sake of brevity, we focus our discussion on the estimated returns to underwriter reputation from IPOs and from SEOs, reported in Table VIII Panel A and Panel B, respectively. When examining Panel A of Table VIII, we find that underwriters with CM ranking of 9 earn an average spread of $9.99 million per IPO, which is $2.65 million higher than the average hypothetical spread that underwriters with CM ranking below 9 would earn when underwriting these same issues. The difference is statistically significant at the 1% level. To provide further perspective, when expressed as a percentage of proceeds, a reputable (CM9) underwriter earns a percentage spread of 6.71% from the average IPO. The average hypothetical

[13] Shelf registration is only available for larger offerings, and reputable underwriters may desire shelf registered offerings due to their lower placement costs (Kidwell, Marr, and Thompson, 1987; Allen, Lamy, and Thompson, 1990; Denis, 1991).

percentage spread that less reputable banks would earn to underwrite these same issues would have been 3.51%, indicating an average premium of 3.21 percentage points for the services of a reputable underwriter. For IPOs underwritten by banks with CM ranking below 9, the average dollar spread actually earned is $2.93 million, which is $1.92 million lower than the hypothetical spread of $4.85 million that CM9 banks would earn when placing these IPOs. On a percentage basis, we observe that the hypothetical spread that CM9 banks would earn when underwriting the IPOs of less reputable (sub-CM9) banks is 9.03 percentage points higher (16.5% hypothetical versus 7.48% actual) than the actual percentage spread earned by sub-CM9 banks. This difference is striking but can be explained by the fact that IPOs underwritten by less reputable banks tend to be relatively smaller offerings by lower quality firms.

[Insert Tables VI, VII, and VIII about here]

In Panel B of Table VIII, we conduct the counterfactual comparison of actual spreads and hypothetical spreads in SEOs. CM9 underwriters earned an average spread of $8.16 million, or 4.28% when the spread is expressed as a percentage of proceeds. The average hypothetical dollar and percentage spreads that sub-CM9 banks would earn to underwrite these SEOs are $6.14 million and 2.61%, respectively, implying average dollar and percentage reputation premiums of $2.02 million and 1.67 percentage points, respectively. These differences are statistically significant at the 1% level. For the offerings underwritten by sub-CM9 banks, the average dollar spread actually earned is $3.26 million, which is $1.57 million lower than the hypothetical spread of $4.83 million that CM9 banks would earn when placing these SEOs. On a percentage basis, the hypothetical spread that CM9 banks would earn when underwriting the SEOs of sub-CM9 banks is 5.09 percentage points higher (10.46% hypothetical versus 5.37% actual) than the actual percentage spread earned by sub-CM9 banks.

The estimates from the first two stages of the models, reported in Table VI for IPOs and Table VII for SEOs, are generally consistent with the findings of prior studies. In the first-stage selection model (Panel A of both tables), for both IPOs and SEOs, the probability of matching

with a reputable underwriter increases with the size of the offering and firm size and decreases with the issuer's return volatility. Other variables that are positively related to the reputation of the underwriter are VC backing for IPOs and shelf registration and the dividend dummy for SEOs. For the IPO sample, the dividend dummy is not statistically significant while ROA is negatively related to the reputation of the underwriter.

The estimates from the second stage of the model, reported in Panel B of Table VI (IPOs) and Panel B of Table VII (SEOs), indicate that, for both IPOs and SEO, higher relative issue size increases the spread more steeply when banks are less reputable. The variable portion of the cost is also more sensitive to prior 3-month IPO activity (for IPOs) and to return volatility (for SEOs) for lower reputation underwriters relative to higher reputation underwriters. These findings could be due to less reputable underwriters having lower risk-bearing capacity and facing higher costs of marketing the issue to investors when publicly observable information indicates that the issue is of lower quality. Reputable underwriters may possess superior information production, certification, and monitoring abilities, which mitigate the above-mentioned problems. We further find that the inverse Mills ratio is significantly negative for high reputation underwriters, for both IPOs and SEOs. The statistical significance of this variable underscores the importance of accounting for endogenous matching among issuers and underwriters. The negative coefficient implies that there are unobservable factors that simultaneously increase the likelihood that an issuer matches with a reputable underwriter and decreases the spread. This is consistent with unobservable aspects of firm quality (e.g., favorable private information) simultaneously influencing the matching of firms and underwriters and the costs of placing the issue.

The findings presented in this section provide strong evidence that, the endogenous matching between issuers and underwriters notwithstanding, reputable underwriters earn significant premium for their services both in IPOs and in SEOs.

B.3. Total Spreads Earned from IPO Clients over a 10-Year Period

In Table IX, we estimate regressions with total spreads earned from IPO clients over a 10-year period that starts on the IPO date as the dependent variable. The dependent variable is the sum of the IPO spread and any spreads from subsequent SEOs and public debt offerings that were underwritten by the IPO lead underwriter during the 10-year period following the IPO.

As independent variables, we include our three measures of underwriter reputation and a set of control variables. Modeling of the dependent variable in this analysis is complicated by the fact that it potentially consists of spreads from multiple offerings of different types. Thus, we do not use the model for individual offerings from Table V. Rather, we utilize a parsimonious set of control variables that consists of various offering and firm characteristics. These include the size of the IPO (proceeds), the market value of the firm at the time of the IPO, the volatility of the issuer's daily stock returns during a 255 day period that starts 41 trading days after the IPO, and the return-on-assets reported by the firm in its first annual report after the IPO. Larger firms are likely to raise larger amounts of proceeds at the IPO stage and in subsequent security offerings, which should correspond to larger underwriting revenues for the underwriter. Thus, we expect a positive coefficient on the firm's market value of common equity. Similarly, larger IPOs correspond to larger revenues for the underwriter at the IPO stage and we conjecture that firms that conduct larger IPOs might be more likely to raise larger amounts of follow-on capital. Hence, we expect a positive coefficient on IPO proceeds. The effects of risk (standard deviation of returns) and profitability (ROA) are ambiguous. On one hand, riskier firms and less profitable firms may have lower survival rates and may, therefore, raise lower amounts of follow-on capital. On the other hand, riskier firms and less profitable firms may be more likely to have greater needs for external capital after the IPO stage due to lower internally generated cash flows.

[Insert Table IX about here]

In all regression specifications in Table IX, we find that the proceeds of the IPO and the market value of the issuer at the time of the IPO have positive and statistically significant

coefficients. Also in all specifications, the coefficient on the standard deviation of the issuer's daily stock returns is significantly negative (at the 5% level) while the coefficient on the firm's ROA at the time of the IPO is insignificant.

Focusing on our main variable, underwriter reputation, we find that all three reputation measures have positive coefficient that are statistically significant at the 1% level. Specification (1) indicates that a one standard deviation (9.29) increase in the Megginson-Weiss ranking is associated with an increase in total 10-year revenues from the IPO client of approximately $956,870. Furthermore, relative to underwriters in the lowest decile of MW reputation, underwriters in the highest decile of MW reputation garner an additional 10-year return of $2.984 million per IPO client (i.e., 0.103×(99.67-70.70) million). In specification (2), the coefficient on the Carter-Manaster ranking is positive and significant at the 1% level and implies that each unit increase in the Carter-Manaster ranking corresponds to an increase in total 10-year returns of $296,000. Therefore, relative to underwriters with a CM rank of 0, underwriters with a rank of 9 receive an additional return of $2.664 million per IPO client over a 10-year period. In specification (3) we use the Carter-Manaster dummy variable, which is also positive and significant at the 1% level. The coefficient estimate indicates that total 10-year spreads earned from the IPO client are larger by around $2.1 million for underwriters with the highest Carter-Manaster ranking of 9 relative to underwriters with rankings below 9.

In summary, we present results that, relative to lower reputation underwriters, higher reputation underwriters earn significantly higher spreads over the long-run from their IPO clients. Furthermore, the positive returns to reputation are especially pronounced for underwriters with the highest reputation. The substantial return to reputation earned by the most reputable underwriters should provide underwriters with a strong incentive to maintain their reputation.

IV. Conclusions

We study the returns to reputation in the context of equity underwriting to directly test the question of whether equity underwriters reap benefits from a higher reputation. To assess how underwriter reputation creates value for underwriters, we examine the association between two commonly used measures of underwriter reputation, the Megginson-Weiss market share ranking and the Carter-Manaster tombstone ranking, and three metrics of underwriter performance implied by the current literature: (a) revenue per underwritten IPO; (b) revenue per underwritten SEO; and (c) revenue per underwritten firm over a 10-year period starting at the IPO. Our findings indicate significant returns associated with reputation building in equity underwriting. Univariate analyses indicate that underwriters with higher reputation, as measured by either the Megginson-Weiss ranking or the Carter-Manaster ranking, earn significantly higher dollar revenues per IPO, per SEO, and per IPO client over a 10-year period starting at the IPO.

In multivariate models of spreads in IPOs and SEOs that control for factors other than underwriter reputation, we document significant average premiums earned by reputable underwriters that persist even after accounting for the endogenous matching of issuers and underwriters. While the question of whether there is implicit collusion across banks does not fall within the scope of our study, what we do show is that there are substantial returns to reputation and significant variation across underwriters in the reputation component of underwriting spreads. Our paper thus adds significant new insights into the returns to reputation building in equity underwriting, providing strong support for the theoretical economics and finance literature on the returns to reputation and filling an important void in the investment banking literature.

APPENDIX I. Variable Definitions

The table describes the variables used in the analysis. The main sample comes from the New Issues Database of the Securities Data Company (SDC). SDC provides data on issue proceeds, underwriter spreads, secondary shares offered, and shelf registration. In addition, the CRSP daily files provide data on share prices, shares outstanding, and daily returns while the Compustat annual files provide data on total assets, income before depreciation, and common dividends. We obtain investment bank Carter-Manaster rankings between 1980 and 2010 from Jay Ritter's website (http://bear.warrington.ufl.edu/ritter/ipodata.htm).

Variable	Definition
Proceeds	Total offering proceeds, excluding overallotment options, in millions of 2010 US dollars.
Spread	Total gross spread of the offering, in millions of 2010 US dollars.
Spread (%)	Spread as a percentage of proceeds.
MW ranking	The Megginson-Weiss ranking of the offering's highest ranked lead underwriter. Rankings are based on each bank's underwritten proceeds for the past three years. See Equation (1) in the paper.
CM ranking	The Carter-Manaster ranking of the offering's highest ranked lead underwriter.
Top CM ranking dummy	Equals one if the highest ranked lead underwriter of the offering has a Carter-Manaster ranking of 9. Equals zero otherwise.
VC dummy	Equals one if the IPO is venture capital backed. Equals zero otherwise
Market value	For SEOs; share price times shares outstanding twenty trading days before the offering. For IPOs; share price times shares outstanding on the first day with available CRSP data but at most 40 trading days after the IPO. Measured in millions of 2010 US dollars.
Std. dev. of daily returns	For SEOs (IPOs); standard deviation of percentage daily returns during a 255 trading day period that ends (begins) twenty (forty-one) trading days before (after) the offering.
ROA	For SEOs (IPOs); operating income before depreciation divided by total assets from the firm's last (first) annual report before (after) the offering.
Dividend payer dummy	For SEOs (IPOs); equals one if the firm reports a common dividend in its last (first) annual report before (after) the offering. Equals zero otherwise.
Ln(Prior issue frequency)	Natural logarithm of one plus the number of common stock offerings by the issuer between 1980 and the day before the offering.
Ln(Prior issue proceeds)	Natural logarithm of one plus the amount (in millions of 2010 US dollars) of proceeds raised by the issuer in common stock offerings between 1980 and the day before the offering.
Secondary	Secondary shares offered divided by total shares offered.
Shelf dummy	Equals one if the offering was shelf registered and zero otherwise.
Total IPO proceeds for prior 3 months	Total amount of proceeds from all SEOs in SDC during the three months prior to the offering, expressed in hundreds of billions of 2010 US dollars.
Total SEO proceeds for prior 3 months	Total amount of proceeds from all SEOs in SDC during the three months prior to the offering, expressed in hundreds of billions of 2010 US dollars.

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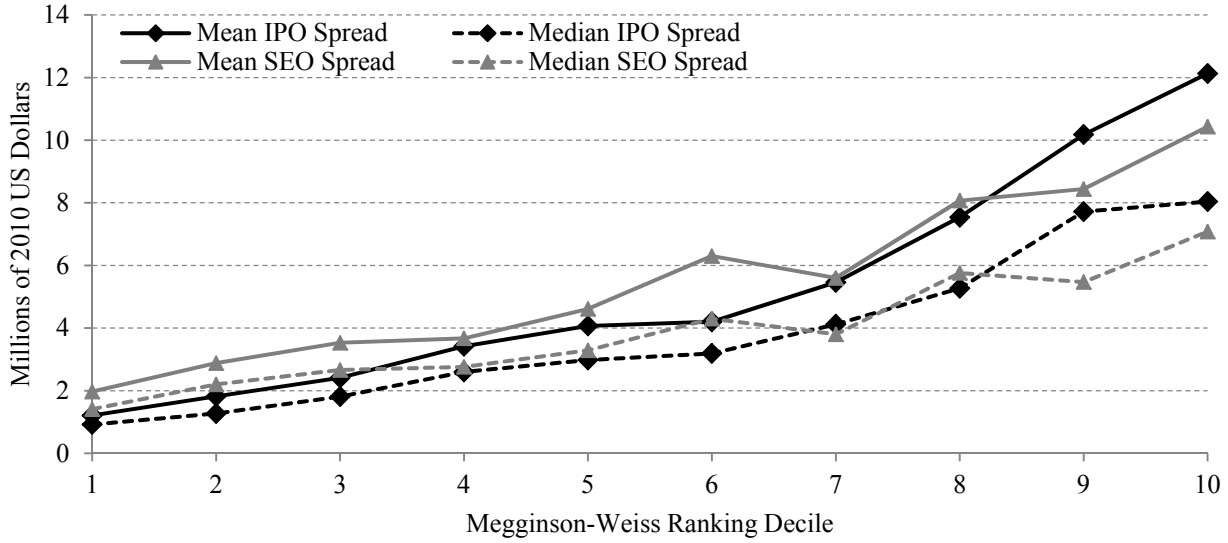
Figure I. Gross IPO and SEO Spreads by Underwriter Reputation Ranking

The figure plots mean and median spreads, measured in millions of 2010 US dollars, by lead underwriter Megginson-Weiss (Panel A) and Carter-Manaster (Panel B) reputation ranking deciles. To group offerings by Carter-Manaster ranking, we use the integer part of the CM ranking of the underwriter. (e.g., offerings by underwriters with CM of 8.7 are grouped with those by underwriters with CM of 8). For offerings with multiple lead underwriters, we use the reputation of the highest ranked lead underwriter to measure the underwriter reputation of the offering. The sample consists of common stock offerings from SDC with available data in CRSP and Compustat during 1980 and 2010. We exclude unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs.

Panel A: Megginson-Weiss Ranking



Panel B: Carter-Manaster Ranking

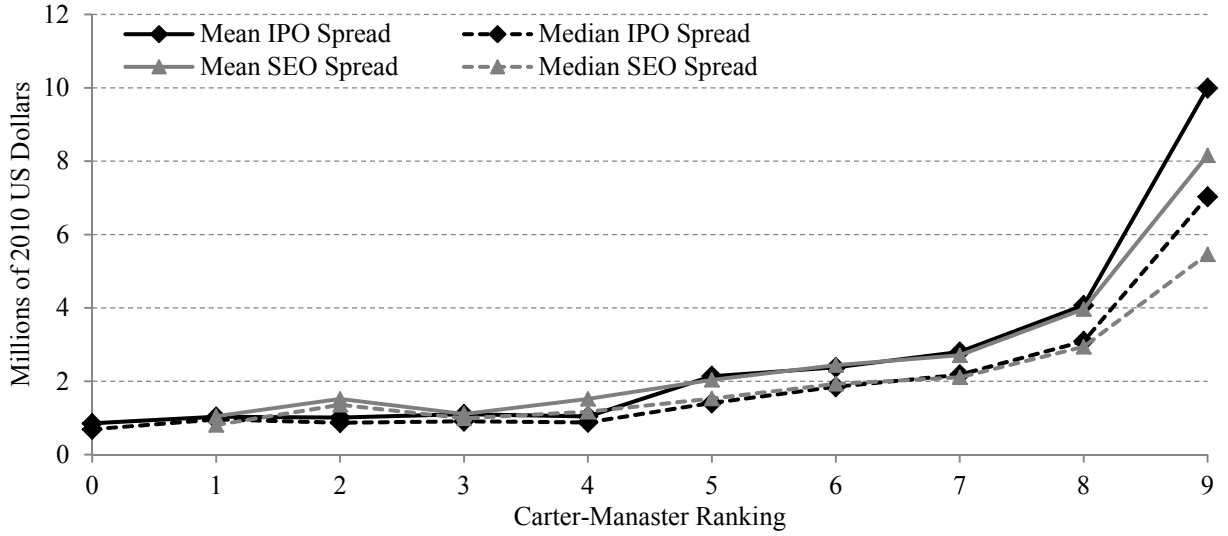


Table I. Descriptive Statistics for Sample IPOs and SEOs

The table reports descriptive statistics for a sample of 6,423 IPOs (Panel A) and a sample of 9,159 SEOs (Panel B). The main sample covers the years between 1980 and 2010 and comes from the New Issues Database of the Securities Data Company (SDC). SDC provides data on issue proceeds, underwriter spreads, secondary shares offered, and shelf registration. In addition, the CRSP daily files provide data on share prices, shares outstanding, and daily returns while the Compustat annual files provide data on total assets, income before depreciation, and common dividends. Megginson-Weiss (MW) rankings are computed as in Megginson and Weiss (1991). We obtain investment bank Carter-Manaster (CM) rankings from Jay Ritter's website. Proceeds, spreads, and market values are measured in millions of 2010 US dollars.

Variable	Mean	Standard deviation	25th percentile	Median	75th percentile
Panel A: IPOs (6,423 offerings)					
Offering characteristics					
Proceeds (millions of dollars)	79.92	114.46	21.70	43.89	87.39
Spread (millions of dollars)	5.22	6.59	1.58	3.07	6.04
Spread (%)	7.23	1.00	7.00	7.00	7.05
VC dummy	0.41	0.49	0.00	0.00	1.00
Secondary (proportion of shares offered)	0.14	0.22	0.00	0.00	0.24
MW Ranking	88.16	9.29	80.64	90.43	96.17
CM Ranking	7.28	2.10	6.00	8.00	9.00
Issuer characteristics					
Market value (millions of dollars)	401.3	894.7	72.8	159.0	381.6
Std. dev. of daily returns (%)	4.44	2.17	2.92	3.94	5.35
ROA	0.05	0.28	– 0.02	0.11	0.19
Dividend payer dummy	0.17	0.38	0.00	0.00	0.00
Panel B: SEOs (9,159 offerings)					
Offering characteristics					
Proceeds (millions of dollars)	140.22	204.80	34.76	73.86	154.61
Spread (millions of dollars)	5.55	6.81	1.76	3.41	6.41
Spread (%)	4.86	1.46	4.00	5.00	5.77
Shelf dummy	0.22	0.42	0.00	0.00	0.00
Secondary (proportion of shares offered)	0.26	0.37	0.00	0.00	0.47
MW ranking	91.96	7.55	87.46	94.50	98.27
CM ranking	8.04	1.38	8.00	8.83	9.00
Issuer characteristics					
Market value (millions of dollars)	1,597.4	6,281.8	187.0	484.4	1,296.3
Std. dev. of daily returns (%)	3.36	1.83	2.14	2.99	4.08
ROA	0.07	0.25	0.04	0.11	0.18
Dividend payer dummy	0.38	0.49	0.00	0.00	1.00

Table II. Summary Statistics by Lead Underwriter: Reputation Rankings and Gross Spreads, 2001-2010

The table reports summary statistics of lead underwriter reputation rankings and gross spreads in IPOs and SEOs for the period of 2001 to 2010 for the 65 underwriters with the largest total underwritten proceeds. Average annual Megginson-Weiss (MW) rankings and Carter-Manaster (CM) rankings are computed using only years, between 2001 and 2010, in which the underwriter existed. Spreads and proceeds are measured in millions of 2010 US dollars.

Underwriter	Total IPO and SEO proceeds	Average annual MW ranking	Average annual CM ranking	Number of IPOs	Gross IPO spreads (millions of dollars)					Number of SEOs	Gross SEO spreads (millions of dollars)				
					Mean	Med	Std. Dev.	Min	Max		Mean	Med	Std. Dev.	Min	Max
Goldman Sachs	134,909	100.0	9	141	18.7	15.3	12.4	2.8	58.6	313	12.9	10.0	10.4	0.4	60.1
Morgan Stanley	134,454	99.4	9	138	15.7	10.8	12.0	2.0	58.6	353	11.5	8.4	10.4	0.2	67.1
JP Morgan	94,397	97.1	9	142	15.5	11.1	12.6	2.9	54.4	417	10.8	8.0	9.7	0.1	60.1
Citigroup	94,150	98.1	9	82	16.7	11.1	12.7	2.9	54.4	257	12.9	8.4	11.9	0.1	66.2
Merrill Lynch	89,901	97.9	9	130	13.8	9.8	11.0	3.1	58.6	362	10.7	8.5	8.7	0.3	66.2
Credit Suisse	87,831	98.0	9	144	14.9	11.1	11.1	2.0	54.4	335	10.6	8.1	8.8	0.2	76.0
Lehman Brothers	68,301	96.5	8	97	14.0	9.2	11.0	2.0	54.4	246	9.8	7.0	9.3	0.0	54.0
UBS	51,928	94.2	8	79	14.0	10.1	11.3	2.5	44.8	277	8.0	5.1	8.5	0.3	60.5
Deutsche Bank	35,513	92.9	9	66	14.1	10.1	12.3	2.4	54.4	189	7.9	5.4	8.0	0.1	51.4
Bank of America	27,925	92.9	8	62	14.4	9.3	11.6	2.4	44.5	134	10.3	6.3	10.8	0.2	60.5
Bear Stearns	18,618	92.4	8	37	13.9	12.1	9.2	3.0	37.6	102	8.5	6.3	7.1	0.3	55.7
Barclays	18,305	92.8	8	12	16.2	14.1	10.0	4.4	38.9	63	9.0	6.0	9.2	0.4	44.9
Wachovia	13,456	85.9	7	21	13.1	10.0	9.1	4.4	37.6	60	6.2	5.7	4.9	0.1	19.1
Jefferies & Co Inc	9,006	84.9	5.3	29	9.0	6.3	7.1	1.5	37.6	99	4.7	3.1	6.3	0.5	54.0
Piper Jaffray	6,216	85.9	7	45	6.5	5.0	4.3	1.6	21.0	71	3.9	3.1	2.5	0.7	10.3
Friedman Billings Ramsey	6,150	85.7	5	25	8.5	6.7	6.0	0.7	27.0	39	5.3	3.8	5.8	1.0	35.9
Royal Bank of Canada (RBC)	5,955	82.5	7.3	11	6.0	4.1	6.7	1.1	25.3	44	4.7	3.6	4.1	0.8	19.8
Keefe Bruyette & Woods Inc	5,327	82.4	7	10	5.3	3.9	3.8	0.5	12.2	60	4.8	3.6	4.2	0.9	23.0
Wells Fargo	4,696	79.6	7	5	11.4	7.2	9.2	4.1	26.8	23	8.1	5.7	9.2	1.3	46.4
Thomas Weisel Partners	4,364	85.8	7.7	24	4.9	4.0	3.0	2.3	15.1	48	4.7	3.3	4.3	0.4	23.9
Raymond James	4,206	84.0	7	4	3.9	4.1	1.3	2.1	5.2	55	5.2	3.7	5.1	0.7	29.1
CIBC	4,138	87.0	8	16	9.7	4.8	8.8	1.8	26.1	54	4.8	3.8	3.6	1.0	22.0
SG Cowen Securities Corp	3,537	85.8	6	26	4.2	3.9	2.0	2.6	13.1	48	3.8	4.0	1.6	1.4	10.2
William Blair & Co	3,503	83.6	7	15	6.8	7.2	3.8	1.6	13.9	32	6.7	5.0	9.1	1.4	54.1
Sandler O'Neill Partners L.P.	3,409	79.1	8	6	2.9	2.6	1.6	1.3	5.9	46	5.2	2.5	6.2	0.9	28.8
Stifel Nicolaus & Co Inc	3,057	74.9	5	1	4.2	4.2	--	4.2	4.2	23	5.3	2.7	10.1	0.6	49.1
AG Edwards	3,035	84.0	7	6	6.0	3.7	6.4	2.6	18.9	31	3.5	2.8	2.6	0.7	10.8
SunTrust	1,699	78.6	6	4	6.6	4.5	4.8	3.7	13.8	19	4.6	3.5	3.0	0.9	10.0
Needham & Co Inc	1,664	81.2	5	4	3.6	3.7	0.9	2.5	4.4	44	2.4	2.1	1.3	0.6	9.1
Morgan Keegan Inc	1,389	78.2	7	4	4.9	5.0	1.4	3.4	6.2	9	9.4	3.5	19.1	1.2	60.1
Key Banc	1,360	82.3	5	2	6.1	6.1	0.7	5.6	6.5	10	4.4	4.2	2.6	0.9	9.4
Lazard	1,234	78.6	8.6	4	5.2	2.5	6.1	1.5	14.3	20	4.3	2.3	7.3	0.9	34.7

Table II – *Continued*

Underwriter	Total IPO and SEO proceeds	Average annual MW ranking	Average annual CM ranking	Number of IPOs	Gross IPO spreads (millions of dollars)					Number of SEOs	Gross SEO spreads (millions of dollars)				
					Mean	Med	Std. Dev.	Min	Max		Mean	Med	Std. Dev.	Min	Max
Roth Capital Partners Inc	1,198	76.7	4	3	1.9	1.8	0.3	1.7	2.3	29	1.6	1.3	1.2	0.4	5.0
Johnson Rice & Co	1,052	79.0	4	1	6.6	6.6	--	6.6	6.6	14	2.7	2.3	2.2	0.4	8.4
Oppenheimer & Co	995	77.8	7	7	5.4	3.8	3.1	2.1	9.3	23	2.3	1.9	1.9	0.6	9.5
BMO Nesbitt	986	79.4	5	2	13.1	13.1	5.9	8.9	17.3	12	6.2	3.7	6.9	1.3	25.7
Cowen & Co	916	83.1	7	3	3.4	3.1	0.7	3.0	4.2	9	2.9	2.5	1.6	0.6	4.8
WR Hambrecht & Co LLC	853	77.3	7	14	2.5	2.2	1.5	1.1	7.3	6	2.0	1.4	1.2	1.0	3.5
JMP Securities LLC	851	79.8	5.8	1	6.0	6.0	--	6.0	6.0	8	5.4	3.4	5.6	2.1	19.1
Fleet Boston	806	92.9	7	2	3.3	3.3	1.9	2.0	4.6	11	5.4	5.0	3.0	1.1	10.6
DA Davidson & Co Inc	773	76.8	4	3	4.7	4.6	2.1	2.6	6.9	9	2.2	2.1	1.5	0.3	5.3
Stephens Inc	713	78.1	7	3	5.4	4.7	2.5	3.4	8.3	11	4.3	3.3	4.6	0.7	17.7
Legg Mason Wood Walker Inc	592	77.6	7	2	5.6	5.6	2.1	4.1	7.1	11	3.2	2.5	1.4	1.4	5.9
Janney Montgomery Scott	554	74.5	5.8	2	3.2	3.2	3.0	1.1	5.4	21	1.4	1.0	1.0	0.3	4.3
ABN-AMRO	542	79.0	8	1	12.2	12.2	--	12.2	12.2	2	3.4	3.4	1.8	2.1	4.6
Pacific Growth Equities Inc	537	76.7	4	2	3.3	3.3	0.0	3.3	3.4	14	2.7	1.8	1.9	1.0	7.0
ThinkEquity Partners	492	77.4	5	4	2.4	2.0	1.1	1.5	3.9	7	2.1	2.1	1.6	0.3	4.1
Ferris Baker Watts Inc	471	78.6	5	2	3.6	3.6	2.8	1.6	5.5	6	0.9	0.8	0.3	0.5	1.3
Adams Harkness & Hill Inc	444	78.3	5	1	2.3	2.3	--	2.3	2.3	7	3.4	3.9	2.2	0.6	6.4
Leerink Swann & Co	405	75.3	4	2	7.5	7.5	7.7	2.1	13.0	7	2.7	2.2	1.6	1.1	4.7
BB&T Capital Markets	402	72.5	6.4	3	4.1	5.0	2.4	1.3	5.9	5	2.4	1.4	1.9	0.7	4.5
Ryan Beck & Co	281	74.9	5	1	1.3	1.3	--	1.3	1.3	2	1.6	1.6	0.3	1.4	1.9
First Albany Capital Inc	256	79.3	4	2	3.9	3.9	3.4	1.5	6.3	2	5.1	5.1	3.2	2.9	7.4
Wedbush	225	74.4	4	1	2.1	2.1	--	2.1	2.1	2	2.5	2.5	1.3	1.7	3.4
CE Unterberg Towbin	224	74.8	6	2	2.8	2.8	1.5	1.7	3.9	3	3.0	2.0	2.6	1.0	5.9
Merriman Curhan Ford & Co	185	74.3	4	1	1.5	1.5	--	1.5	1.5	2	1.9	1.9	0.4	1.6	2.2
Paulson Investment Co	178	73.5	3	8	1.3	1.1	0.7	0.7	2.8	1	0.5	0.5	--	0.5	0.5
Feltl & Co	158	73.6	4	4	1.6	1.6	0.2	1.3	1.8	1	0.4	0.4	--	0.4	0.4
Dain Rauscher	135	81.0	7	1	4.7	4.7	--	4.7	4.7	2	2.1	2.1	0.3	1.9	12.4
Ladenburg Thalmann & Co	132	71.2	6	3	1.8	1.6	0.5	1.5	2.4	2	1.4	1.4	0.9	0.8	2.1
McDonald Investments Inc	130	73.6	5	1	2.8	2.8	--	2.8	2.8	4	2.2	1.9	1.1	1.3	3.6
Maxim Group LLC	97	72.1	2.6	4	1.4	1.3	0.3	1.1	1.7	3	0.9	0.8	0.6	0.3	1.5
Advest Inc	86	71.4	6	2	1.4	1.4	0.9	0.7	2.0	2	1.5	1.5	0.1	1.4	1.6
Dawson James Securities	70	73.0	2	2	0.9	0.9	0.7	0.4	1.4	1	0.9	0.9	--	0.9	0.9
Neidiger, Tucker, Bruner Inc.	14	67.5	3	1	0.8	0.8	--	0.8	0.8	1	0.8	0.8	--	0.8	0.8

Table III. Gross Spreads in IPOs and SEOs by Underwriter Reputation

The table reports summary statistics of underwriter spreads in millions of 2010 US dollars for IPOs (Panel A) and SEOs (Panel B). Spread means, medians, standard deviations, and sample sizes are reported by lead underwriter Megginson-Weiss (MW) reputation ranking deciles and by Carter-Manaster (CM) reputation rankings. For each MW ranking decile, the table also reports the mean MW reputation rank (in parenthesis). To group offerings by Carter-Manaster ranking, we use the integer part of the CM ranking of the underwriter. (e.g., offerings by underwriters with CM of 8.7 are grouped with those by underwriters with CM of 8). For offerings with multiple lead underwriters, we use the reputation of the highest ranked lead underwriter to measure the underwriter reputation of the offering. The sample consists of common stock offerings from SDC with available data in CRSP and Compustat during 1980 and 2010. We exclude unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs.

Panel A: Gross IPO spread (millions of 2010 US dollars)

MW ranking decile	Mean	Median	Std. dev.	N	CM ranking	Mean	Median	Std. dev.	N
1 (mean reputation: 70.98)	1.21	0.92	1.03	646	0	0.85	0.69	0.40	3
2 (76.36)	1.82	1.27	2.09	639	1	1.03	0.96	0.48	112
3 (80.76)	2.41	1.81	1.93	643	2	1.01	0.87	0.51	222
4 (85.00)	3.42	2.60	3.34	644	3	1.10	0.91	0.60	259
5 (88.72)	4.07	2.98	3.90	657	4	1.04	0.88	0.55	197
6 (91.63)	4.20	3.19	3.70	636	5	2.14	1.41	2.82	484
7 (94.07)	5.46	4.12	4.98	668	6	2.38	1.85	1.92	388
8 (96.16)	7.54	5.27	7.30	610	7	2.80	2.18	2.06	773
9 (98.40)	10.18	7.72	8.60	648	8	4.07	3.09	3.75	1,895
10 (mean reputation: 99.90)	12.13	8.04	10.85	632	9	9.99	7.03	8.95	2,090

Panel B: Gross SEO spread (millions of 2010 US dollars)

MW ranking decile	Mean	Median	Std. dev.	N	CM ranking	Mean	Median	Std. dev.	N
1 (mean reputation: 75.94)	1.97	1.41	2.19	916	0				0
2 (82.90)	2.88	2.20	2.68	916	1	1.05	0.81	0.57	23
3 (87.41)	3.53	2.66	3.02	918	2	1.52	1.36	0.88	40
4 (90.74)	3.67	2.76	3.96	916	3	1.11	0.99	0.66	56
5 (93.25)	4.61	3.29	5.21	918	4	1.52	1.17	1.20	139
6 (95.20)	6.30	4.30	6.95	936	5	2.04	1.53	2.13	485
7 (96.83)	5.60	3.80	6.42	902	6	2.44	1.93	1.92	430
8 (98.16)	8.07	5.76	7.65	912	7	2.71	2.11	2.23	956
9 (99.28)	8.44	5.47	9.07	917	8	3.97	2.94	4.20	2,755
10 (mean reputation: 99.99)	10.43	7.08	10.13	908	9	8.16	5.46	8.50	4,275

Table IV. Underwriter Reputation and Spreads per Client Over a 10-year Period Starting at the IPO

For ten different levels of underwriter reputation, the table reports the number of IPOs between 1980 and 2000 and means of the gross spread earned by the lead underwriter. The table further reports (i) the proportion of IPO firms with equity and debt offerings performed over a 10-year period after the IPO and underwritten by the IPO underwriter and (ii) means of all the gross spreads the IPO lead underwriter earns from subsequent equity and debt offerings by the same firm over a 10-year period after the IPO. The last column of the table reports means of the total spreads that an IPO lead underwriter earns from an IPO firm over a 10-year period, including the IPO and any subsequent equity and debt offerings. For each MW ranking decile, the table also reports the mean MW reputation rank (in parenthesis). To sort underwriters by reputation, Panel A uses Megginson-Weiss (MW) reputation rankings while Panel B uses Carter-Manaster (CM) reputation rankings. To group offerings by Carter-Manaster ranking, we use the integer part of the CM ranking of the underwriter. (e.g., offerings by underwriters with CM of 8.7 are grouped with those by underwriters with CM of 8). The sample consists of IPOs of common stock from SDC with available data in CRSP and Compustat during 1980 and 2010. We exclude unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. Spreads are measured in millions of 2010 US dollars.

	IPO			Subsequent SEOs		Subsequent debt offerings		Total spreads (10 years)
	N	Mean spread	Median spread	Prop.	Mean spread	Prop.	Mean spread	Mean spread
Panel A: MW ranking decile								
1 (mean reputation: 70.70)	540	1.147	0.870	4.3%	0.087	0.9%	0.009	1.244
2 (75.72)	543	1.538	1.151	8.8%	0.196	2.2%	0.062	1.796
3 (79.75)	537	2.227	1.601	13.6%	0.394	2.0%	0.084	2.705
4 (83.65)	546	3.092	2.386	18.9%	0.748	3.1%	0.055	3.895
5 (87.41)	536	3.565	2.725	27.1%	1.339	2.6%	0.089	4.993
6 (90.43)	541	4.134	3.142	29.6%	1.714	5.0%	0.156	6.004
7 (92.68)	535	3.952	3.069	25.4%	1.761	5.0%	0.190	5.902
8 (94.86)	542	6.090	4.520	25.3%	3.004	8.1%	0.806	9.899
9 (97.04)	540	7.446	5.116	24.6%	2.783	8.7%	0.810	11.039
10 (mean reputation: 99.67)	536	9.280	6.529	33.8%	4.900	13.4%	0.861	15.041
Panel B: CM ranking								
0	3	0.849	0.693	0.0%	0.000	0.0%	0.000	0.849
1	109	1.034	0.950	4.6%	0.044	0.0%	0.000	1.079
2	215	0.987	0.866	1.4%	0.023	0.9%	0.009	1.019
3	238	1.090	0.895	2.1%	0.028	1.3%	0.017	1.135
4	183	0.973	0.845	2.7%	0.027	1.6%	0.017	1.017
5	437	1.826	1.332	14.4%	0.385	2.1%	0.079	2.290
6	363	2.327	1.766	15.2%	0.466	1.9%	0.045	2.837
7	665	2.547	2.074	23.6%	0.904	5.3%	0.118	3.569
8	1746	3.876	3.026	23.8%	1.333	4.8%	0.214	5.423
9	1437	8.370	5.823	30.0%	4.057	9.3%	0.815	13.242

Table V. Regression Analysis of Underwriter Reputation and Gross IPO and SEO Spreads

The table reports estimates from regression models that examine the relation between underwriter reputation and IPO and SEO underwriter spreads. The sample comes from SDC and consists of IPOs and SEOs between 1980 and 2010 performed by firms with available data on CRSP and Compustat. The dependent variable is the gross spread expressed in millions of 2010 US dollars. As explanatory variables we include the reputation of the lead underwriter, where reputation is measured by the Megginson-Weiss (MW) ranking, the Carter-Manaster (CM) ranking, or a dummy variable of whether the lead underwriter has the highest CM ranking of 9. As additional explanatory variables we use the proceeds of the offering, proceeds relative to firm market value, the proportion of secondary shares to total shares offered, a dummy of whether the offering was shelf registered (for SEOs only), the standard deviation of daily returns of the offered stock, the firm's return on assets, and the market-wide total IPO or SEO proceeds for the three months prior to the offering. We further interact the proceeds of the offering with the rest of the explanatory variables. Offer proceeds, spreads, and firm market valuations are measured in millions while market-wide total proceeds are measured in hundreds of billions of 2010 US dollars. All models include year fixed effects (coefficients not reported for brevity). The reported *t*-statistics (in parenthesis) adjust for year and underwriter clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests.

Dependent variable: Gross spreads in millions of 2010 US dollars

	IPOs (6,423 offerings)			SEOs (9,159 offerings)		
	MW ranking	CM ranking	CM ranking equals 9 dummy	MW ranking	CM ranking	CM ranking equals 9 dummy
	(1)	(2)	(3)	(4)	(5)	(6)
Underwriter reputation	0.019***	0.059***	0.332***	0.033***	0.172***	0.497***
	(5.86)	(4.24)	(4.64)	(4.39)	(4.24)	(3.42)
Proceeds	0.050***	0.051***	0.050***	0.026***	0.026***	0.026***
	(11.87)	(12.08)	(12.13)	(23.27)	(28.57)	(26.89)
Proceeds / Market value	0.246	0.225	0.170	0.632*	0.630*	0.571
	(0.99)	(0.94)	(0.69)	(1.73)	(1.75)	(1.60)
Secondary (proportion of shares offered)	0.317**	0.326**	0.415***	0.174	0.158	0.168
	(2.33)	(2.15)	(2.94)	(1.08)	(0.96)	(0.99)
Shelf dummy				– 0.23	– 0.211	– 0.216
				(– 1.12)	(– 1.03)	(– 1.03)
Std. dev. of daily returns	– 0.082***	– 0.084***	– 0.087***	– 0.038	– 0.039	– 0.041
	(– 2.66)	(– 2.74)	(– 3.06)	(– 1.08)	(– 1.30)	(– 1.41)
ROA	0.120	0.121	0.168*	0.165	0.133	0.191*
	(1.14)	(1.17)	(1.73)	(1.47)	(1.21)	(1.76)
Total IPO proceeds for prior 3 months	0.340	0.330	0.479			
	(1.08)	(0.92)	(1.49)			
Total SEO proceeds for prior 3 months				0.377	0.353	0.332
				(0.72)	(0.73)	(0.68)

Table V – *Continued*

Dependent variable: Gross spreads in millions of 2010 US dollars

	IPOs (6,423 offerings)			SEOs (9,159 offerings)		
	MW ranking	CM ranking	CM ranking equals 9 dummy	MW ranking	CM ranking	CM ranking equals 9 dummy
	(1)	(2)	(3)	(4)	(5)	(6)
(Proceeds) × (Proceeds / Market value)	0.002	0.002	0.002	0.008***	0.008***	0.008***
	(0.46)	(0.43)	(0.51)	(3.29)	(3.70)	(3.83)
(Proceeds) × (Secondary)	– 0.002	– 0.003	– 0.003*	– 0.003	– 0.003	– 0.003
	(– 1.33)	(– 1.38)	(– 1.74)	(– 1.47)	(– 1.40)	(– 1.50)
(Proceeds) × (Shelf dummy)				– 0.005***	– 0.005***	– 0.005***
				(– 3.44)	(– 3.77)	(– 3.97)
(Proceeds) × (Std. dev. of daily returns)	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(2.72)	(2.99)	(3.05)	(5.18)	(5.44)	(6.16)
(Proceeds) × (ROA)	– 0.000	– 0.000	– 0.000	– 0.001	– 0.001	– 0.001
	(– 0.01)	(– 0.04)	(– 0.12)	(– 0.54)	(– 0.48)	(– 0.56)
(Proceeds) × (Total IPO proceeds	– 0.006	– 0.006	– 0.007			
for prior 3 months)	(– 0.99)	(– 1.29)	(– 1.37)			
(Proceeds) × (Total SEO proceeds				– 0.001	– 0.001	– 0.001
for prior 3 months)				(– 0.39)	(– 0.38)	(– 0.43)
Adjusted R-squared	0.9812	0.9810	0.9811	0.9134	0.9133	0.9134

Table VI. Two-Stage Regression Analysis of Underwriter Reputation and Gross IPO Spreads

The table reports estimates from two-stage Heckman models that examine the relation between underwriter reputation and IPO underwriting spreads while controlling for the endogenous matching between issuing firms and underwriters. The sample comes from SDC and consists of IPOs between 1980 and 2010 performed by firms with available data on CRSP and Compustat. Panel A reports estimates from probit models explaining whether firms match with an underwriter of the highest Carter-Manaster reputation ranking of 9. We estimate two models, one using the raw explanatory variables while the other using the variables standardized each year by subtracting the annual mean and dividing by the annual standard deviation. Panel B reports coefficient estimates from linear regression models that explain the gross underwriter spread (in millions of 2010 US dollars) while controlling for the selection modeled by Panel A. We estimate the regression model separately for offerings underwritten by the highest reputation underwriters (Carter-Manaster reputation ranking equal to 9) and for offerings underwritten by the remaining underwriters (Carter-Manaster reputation ranking below 9). Panel B further includes the variable "Inverse Mills Ratio", which adjusts for endogenous issuer-underwriter matching and is computed as described in Heckman (1979) using predicted values from the models in Panel A. In addition, Panel B models include year fixed effects (coefficients not reported for brevity). The reported t-statistics (in parenthesis) are computed using the method proposed by Greene (1981) for estimating consistent standard errors when using the Heckman approach. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests.

Panel A: First-stage probit estimations of whether issuers match with underwriters of CM rank 9 (6,423 IPOs)

	Non-standardized variables	Standardized variables
Intercept	– 5.428***	– 0.572***
	(– 40.53)	(– 30.56)
Ln(Proceeds)	0.754***	0.472***
	(17.19)	(12.98)
Ln(Market value)	0.377***	0.314***
	(10.62)	(9.06)
Std. dev. of daily returns	– 0.034***	– 0.108***
	(– 2.99)	(– 4.65)
ROA	– 0.241***	– 0.037*
	(– 2.80)	(– 1.68)
Dividend payer dummy	– 0.023	– 0.020
	(– 0.40)	(– 1.03)
VC dummy	0.163***	0.043**
	(3.63)	(2.22)
Pseudo R-squared	0.368	0.204

Table VI – *Continued*

Panel B: Second-stage regressions explaining IPO underwriter spread in millions of 2010 US dollars (6,423 IPOs)

	Non-standardized variables in first stage		Standardized variables in first stage	
	Offerings by underwriters with CM ranking of 9	Offerings by underwriters with CM ranking below 9	Offerings by underwriters with CM ranking of 9	Offerings by underwriters with CM ranking below 9
Proceeds	0.047***	0.041***	0.046***	0.046***
	(58.30)	(31.91)	(50.22)	(66.93)
Proceeds / Market value	0.718***	0.224	1.064***	0.226***
	(3.02)	(1.51)	(3.98)	(2.81)
Secondary	0.557***	0.144	0.541**	0.050
	(2.69)	(1.14)	(2.56)	(0.78)
Std. dev. of daily returns	– 0.150***	– 0.019	– 0.063*	– 0.023**
	(– 4.95)	(– 1.20)	(– 1.87)	(– 2.56)
ROA	0.445**	– 0.037	0.218	– 0.022
	(2.28)	(– 0.37)	(1.09)	(– 0.39)
Total IPO proceeds for prior 3 months	1.209	– 1.512*	1.142	– 1.891***
	(1.17)	(– 1.92)	(1.17)	(– 4.34)
(Proceeds) × (Proceeds / Market value)	0.002**	0.010***	0.003***	0.005***
	(2.37)	(9.69)	(2.77)	(9.40)
(Proceeds) × (Secondary)	– 0.003***	– 0.005***	– 0.003***	– 0.004***
	(– 3.79)	(– 4.79)	(– 3.55)	(– 6.40)
(Proceeds) × (Std. dev. of daily returns)	0.002***	0.001***	0.001***	0.001***
	(10.63)	(5.26)	(8.29)	(11.71)
(Proceeds) × (ROA)	– 0.001	0.006***	0.001	0.004***
	(– 0.85)	(3.59)	(0.38)	(3.63)
(Proceeds) × (Total IPO proceeds	– 0.009**	0.027***	– 0.011**	0.032***
for prior 3 months)	(– 2.14)	(3.95)	(– 2.29)	(7.57)
Inverse Mills ratio	– 1.188***	1.497***	– 2.208***	0.844***
	(– 11.24)	(11.69)	(– 13.97)	(13.49)
Observations	2,090	4,333	2,090	4,333
R-squared	0.9762	0.9903	0.9774	0.9889

Table VII. Two-Stage Regression Analysis of Underwriter Reputation and Gross SEO Spreads

The table reports estimates from two-stage Heckman regression analyses that model SEO underwriting spreads while controlling for the endogenous matching between issuing firms and underwriters. The sample comes from SDC and consists of SEOs between 1980 and 2010 performed by firms with available data on CRSP and Compustat. Panel A reports estimates from probit models explaining whether firms match with an underwriter of the highest Carter-Manaster reputation ranking of 9. We estimate two models, one using the original explanatory variables while the other using the variables standardized each year by subtracting the annual mean and dividing by the annual standard deviation. Panel B reports coefficient estimates from linear regression models that explain the gross underwriter spread (in millions of 2010 US dollars) while controlling for the selection modeled by Panel A. We estimate the regression model separately for offerings underwritten by the highest reputation underwriters (Carter-Manaster reputation ranking equal to 9) and for offerings underwritten by the remaining underwriters (Carter-Manaster reputation ranking below 9). Panel B further includes the variable "Inverse Mills Ratio", which adjusts for endogenous issuer-underwriter matching and is computed as described in Heckman (1979) using predicted values from the models in Panel A. In addition, Panel B models include year fixed effects (coefficients not reported for brevity). The reported t-statistics (in parenthesis) are computed using the method proposed by Greene (1981) for estimating consistent standard errors when using the Heckman approach. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests.

Panel A: First-stage probit estimations of whether issuers match with underwriters of CM rank 9 (9,159 SEOs)

	Non-standardized variables	Standardized variables
Intercept	– 3.656***	– 0.099***
	(– 39.45)	(– 6.89)
Ln(Proceeds)	0.272***	0.265***
	(11.41)	(10.57)
Shelf dummy	0.216***	0.037**
	(5.67)	(2.37)
Ln(Market value)	0.372***	0.443***
	(19.19)	(16.32)
Std. dev. of daily returns	– 0.017*	– 0.105***
	(– 1.77)	(– 5.91)
ROA	– 0.091	– 0.037**
	(– 1.35)	(– 2.41)
Dividend payer dummy	0.105***	0.007
	(2.96)	(0.39)
Ln(Prior proceeds)	0.092***	0.226***
	(7.17)	(8.07)
Prior issue frequency	– 0.431***	– 0.235***
	(– 8.07)	(– 8.85)
Pseudo R-squared	0.236	0.196

Table VII – *Continued*

Panel B: Second-stage regressions explaining SEO underwriter spread in millions of 2010 US dollars (9,159 SEOs)

	Non-standardized variables in first stage		Standardized variables in first stage	
	Offerings by underwriters with CM ranking of 9	Offerings by underwriters with CM ranking below 9	Offerings by underwriters with CM ranking of 9	Offerings by underwriters with CM ranking below 9
Proceeds	0.026***	0.020***	0.025***	0.021***
	(54.02)	(41.41)	(53.91)	(41.63)
Proceeds / Market value	1.646***	– 0.208*	1.659***	– 0.208*
	(6.19)	(– 1.74)	(6.28)	(– 1.74)
Secondary	0.072	0.288***	0.069	0.288***
	(0.53)	(4.22)	(0.51)	(4.23)
Shelf dummy	– 0.576***	0.377***	– 0.526***	0.426***
	(– 4.04)	(4.45)	(– 3.72)	(5.02)
Std. dev. of daily returns	– 0.073**	0.002	– 0.046	0.018
	(– 2.10)	(0.15)	(– 1.28)	(1.05)
ROA	0.189	– 0.110	0.179	– 0.073
	(0.66)	(– 1.19)	(0.62)	(– 0.79)
Total SEO proceeds for prior 3 months	0.126	– 0.333	0.182	– 0.360
	(0.19)	(– 0.97)	(0.28)	(– 1.03)
(Proceeds) × (Proceeds / Market value)	0.006***	0.020***	0.006***	0.019***
	(9.98)	(21.21)	(10.16)	(21.01)
(Proceeds) × (Secondary)	– 0.002***	– 0.008***	– 0.002***	– 0.008***
	(– 5.18)	(– 16.35)	(– 5.30)	(– 16.32)
(Proceeds) × (Shelf dummy)	– 0.004***	– 0.012***	– 0.004***	– 0.012***
	(– 11.26)	(– 28.41)	(– 11.62)	(– 27.71)
(Proceeds) × (Std. dev. of daily returns)	0.002***	0.002***	0.002***	0.002***
	(18.02)	(19.37)	(17.71)	(19.31)
(Proceeds) × (ROA)	– 0.002	0.006***	– 0.002	0.006***
	(– 1.54)	(4.29)	(– 1.44)	(4.14)
(Proceeds) × (Total SEO proceeds	– 0.002	0.016***	– 0.002	0.016***
for prior 3 months)	(– 1.31)	(8.53)	(– 1.38)	(8.53)
Inverse Mills ratio	– 0.778***	– 0.771***	– 0.944***	– 0.786***
	(– 5.11)	(– 9.08)	(– 5.58)	(– 9.19)
Observations	4,275	4,884	4,275	4,884
R-squared	0.9107	0.8827	0.9108	0.8828

Table VIII. Premiums to Reputation Implied by Two-Stage Regression Analyses

The table reports estimates of the average implied premium earned in IPOs and SEOs, measured in millions of 2010 US dollars and as a percentage of proceeds, by underwriters with a Carter-Manaster (CM) ranking of nine. The sample comes from SDC and consists of offerings between 1980 and 2010 performed by firms with available data on CRSP and Compustat. For IPOs in Panel A (SEOs in Panel B) the estimated premiums are those implied by the parameter estimates from the two-stage regression analyses reported in Table VI (Table VII), which models the IPO (SEO) spread while controlling for the endogenous matching between issuing firms and underwriters. "Actual spread" is the actual gross spread paid by the issuer. For an offering by an underwriter with a CM ranking equal to 9 (below 9), "Hypothetical spread" is the implied spread that the issuer would have paid if it used an underwriter with CM ranking below 9 (equal to 9), predicted using parameter estimates from the second stage equation of underwriters with CM reputation below 9 (equal to 9). For an offering by an underwriter with CM reputation equal to 9 (below 9), the "Implied premium to reputation" is the actual (hypothetical) spread minus the hypothetical (actual) spread. For both IPOs and SEOs, estimates from two different models are presented separately, one in which the first-stage probit uses the original (non-standardized) explanatory variables and another in which the first-stage probit uses explanatory variables that are standardized each year by subtracting the annual mean and dividing by the annual standard deviation.***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests.

	Actual spread		Hypothetical spread		Implied premium to reputation	
	$ millions	%	$ millions	%	$ millions	%
Panel A: IPOs (6,423 Offerings)						
Non-standardized variables in first stage						
Underwriter CM reputation rank of 9	9.99	6.71	7.34	3.51	2.65***	3.21***
Underwriter CM reputation rank below 9	2.93	7.48	4.85	16.50	1.92***	9.03***
Standardized variables in first stage						
Underwriter CM reputation rank of 9	9.99	6.71	8.60	4.93	1.39***	1.79***
Underwriter CM reputation rank below 9	2.93	7.48	6.28	22.56	3.36***	15.08***
Panel B: SEOs (9,159 Offerings)						
Non-standardized variables in first stage						
Underwriter CM reputation rank of 9	8.16	4.28	6.14	2.61	2.02***	1.67***
Underwriter CM reputation rank below 9	3.26	5.37	4.83	10.46	1.57***	5.09***
Standardized variables in first stage						
Underwriter CM reputation rank of 9	8.16	4.28	6.13	2.6	2.03***	1.67***
Underwriter CM reputation rank below 9	3.26	5.37	5.06	11.14	1.80***	5.76***

Table IX. Underwriter Reputation and Spreads per Client Over a 10-year Period: Regression Analysis

The table reports estimates from regressions that examine the relation between underwriter reputation and the 10-year spreads that underwriters earn from their IPO clients. The sample comes from SDC and consists of single-lead IPOs from 1980 to 2000 performed by firms with available data on CRSP and Compustat. The dependent variable is the sum of all gross spreads (in millions of 2010 US dollars) earned by the IPO lead underwriter at the IPO stage as well as all subsequent debt and equity offerings performed by the IPO firm within 10 years of the IPO. As explanatory variables we use the reputation of the lead underwriter at the time of the IPO, where reputation is measured by the Megginson-Weiss (MW) ranking, the Carter-Manaster (CM) ranking, or a dummy variable of whether the lead underwriter has the highest CM ranking of 9. As additional explanatory variables we use IPO proceeds, IPO proceeds relative to firm market value, the proportion of IPO secondary shares to total shares offered, the standard deviation of daily returns of the IPO firm, the IPO firm's return on assets, and the market-wide total IPO proceeds for the three months prior to the offering. We further interact the proceeds of the offering with the rest of the explanatory variables. Proceeds, spreads, and firm market valuations are measured in millions while market-wide total proceeds are measured in hundreds of billions of 2010 US dollars. All models include year fixed effects (coefficients not reported for brevity). The reported *t*-statistics (in parenthesis) adjust for year and underwriter clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests.

Dependent variable: 10-year gross spreads in millions of 2010 US dollars (4,887 observations)

	MW ranking	CM ranking	CM ranking equals 9 dummy
	(1)	(2)	(3)
Underwriter reputation	0.103***	0.296***	2.099***
	(5.49)	(4.79)	(4.15)
Proceeds	0.080***	0.081***	0.079***
	(6.15)	(6.27)	(6.03)
Proceeds / Market value	– 1.061	– 1.178	– 1.506
	(– 1.10)	(– 1.21)	(– 1.54)
Secondary (proportion of shares offered)	– 0.502	– 0.466	0.086
	(– 0.93)	(– 0.88)	(0.16)
Std. dev. of daily returns	– 0.204**	– 0.221**	– 0.238**
	(– 2.10)	(– 2.20)	(– 2.38)
ROA	0.236	0.229	0.279
	(1.14)	(1.10)	(1.38)
Total IPO proceeds for prior 3 months	– 4.524	– 4.371	– 3.463
	(– 1.27)	(– 1.21)	(– 0.97)
(Proceeds) × (Proceeds / Market value)	– 0.014	– 0.015	– 0.013
	(– 0.94)	(– 1.00)	(– 0.85)
(Proceeds) × (Secondary)	– 0.005	– 0.005	– 0.006
	(– 0.70)	(– 0.71)	(– 0.86)
(Proceeds) × (Std. dev. of daily returns)	– 0.001	– 0.000	0.001
	(– 0.11)	(– 0.00)	(0.13)
(Proceeds) × (ROA)	– 0.005	– 0.005	– 0.006
	(– 1.15)	(– 1.13)	(– 1.36)
(Proceeds) × (Total IPO proceeds for prior 3 months)	0.048	0.045	0.035
	(0.96)	(0.91)	(0.70)
Adjusted R-squared	0.5239	0.5207	0.5240