Underwriting Costs of Seasoned Equity Offerings: Cross-Sectional Determinants, Technological Change, and Pricing Benefits, 1980-2008 *

Charles W. Calomiris
Margarita Tsoutsoura

ABSTRACT

We analyze the costs of underwriting seasoned equity offerings (SEOs), integrating themes from prior work to provide a comprehensive analysis for the period 1980-2008. Firm attributes related to the difficulty of marketing SEOs account for important differences in costs. Small firms with high marginal products of capital, volatile stock returns, and high leverage pay higher underwriting costs. Fixed cost is a very small component of underwriting cost, substantially less than $100,000 (in 1990 dollars). Most of the fixed cost associated with underwriting resides in expenses rather than the fees paid to underwriters or dealers. Variation in underwriting costs associated with the size of proceeds mainly reflects firm characteristics that shift marginal cost, rather than economies of scale in SEO underwriting. The nature of the underwriting process also matters. Fully marketed transactions have much higher costs than other transactions. Using more than one lead underwriter raises the fees paid to market the offering. SEO underwriting technology has substantially improved over time and cost reduction has been concentrated among small firms, who have been able to access equity markets much more economically over time. We also investigate the benefits of choosing to spend more on underwriting. Spending more than is predictable based on firm or deal characteristics significantly raises the price of an SEO during the offering.

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I. Introduction

Seasoned equity offerings (SEOs) are an important source of funding for public companies. The physical cost of placing seasoned equity offerings into the market is large and contributes significantly to the cost of equity capital. Furthermore, the cross-sectional variation of the physical costs of placing seasoned equity offerings into the market are significant, and can contribute substantially to cross-sectional variation among firms in their cost of raising capital.

The total cost to a firm of accessing external equity finance through an SEO is calculated as the rate of return demanded by investors who purchase the stock (the total amount of stock sold multiplied by the sum of the risk-free rate plus the firm's beta multiplied by the equity risk premium) divided by the proceeds received by the firm from the equity offering (the amount of stock sold less the total expenses from accessing the market, including underwriting fees and other expenses). For example, assume that two firms, A and B have respective stock market betas of 1 and 1.2. Assume that A pays 15% in physical costs (underwriting fees and expenses) to place its shares, while B pays 3% (which we will show are realistic possible values). Assume that the risk-free rate is 5% and the equity risk premium is 6%. The cost of equity capital for A is (11%/0.85) = 12.94%. The cost of equity capital for B is (12.2%/0.97) = 12.58%. In this example, A has a higher equity cost of capital than B despite A's lower beta.

As previous studies have shown, the physical costs of placing equity can exceed 15% for small, growing firms with highly uncertain prospects (proxied, for example, by high research and development expenditures). Such firms tend to exhibit high estimated marginal products of capital (Calomiris and Himmelberg 2000, Gilchrist and Himmelberg 1999), which reflect their high costs of external equity finance.

In addition to the physical costs of accessing the equity market, to the extent the announcement of a firm's SEO produces a price decline in the market (e.g., as the result of an adverse-selection problem, as modeled in Myers and Majluf 1984), a lower market price contributes further to the cost of the offering. For example, a 3% decline in the price of equity in response to the announcement of an SEO would raise A's cost of equity capital to (11%/(0.97 x 0.85)) = 13.34%. It is not correct to argue, however, that all firms', or even the average firm's, cost of capital rises because of price reactions to equity offering announcements. Some issuing firms are overvalued "lemons," and issue equity at low cost. The 13.34% cost of capital derived here assumes that the share price fall is temporary and the result of adverse-selection concerns that will subsequently be revealed to the market as unwarranted (after the equity offering).

Despite the importance of underwriting costs and price reactions to equity offerings in determining firms' costs of equity finance, in comparison to the literature relating to the pricing of equity risk, there is a relatively small empirical literature measuring the determinants of those costs. Furthermore, that literature is diverse and has not been integrated into a comprehensive analysis of the determinants of underwriting costs.

Some studies explore differences in market structure across countries or across time that affect underwriting costs (Mendelson 1967, Calomiris 1995, Calomiris and Raff 1995, Calomiris 2002). Others focus on cross-sectional differences in firms' underlying characteristics (reflecting, in particular, opacity differences that presumably affect marketing costs of the offering) in determining underwriting costs (e.g., Hansen and Torregrossa 1992, Calomiris and Himmelberg 2000, Altinkilic and Hansen 2003). Others examine effects of the structure of the underwriting transaction on underwriting costs, including whether warrants are attached, whether it is a public offering, and whether it is "fully marketed" (e.g., Mendelson 1967, Hansen and Pinkerton 1982,

Bhagat, Marr, and Thompson 1985, Ritter 1987, Hansen 1989, Denis 1991, Sherman 1992, Bortolotti, Megginson, and Smart, 2008, Gao and Ritter 2010). Other studies consider the corporate financing context in which the equity underwriting occurs, including the extent to which institutional investors participate as buyers, whether other equity offerings had occurred in preceding years, and whether the equity underwriter was also a lender to the firm (e.g., Hansen and Torregrossa 1992, Calomiris and Pornrojnangkool 2009). Still other studies have argued that the nature of the underwriter is an important contributor to underwriting cost (e.g., Carter and Manaster 1990, Calomiris and Pornrojnangkool 2009).

In addition to the diversity of questions addressed and regressors employed, studies have varied according to their definitions of costs (total costs inclusive of all fees and expenses vs. only the fee or gross spread paid to underwriters and dealers), which transactions they study (all equity underwritings, or only SEOs, "pure" SEOs vs. those that are connected to other securities), which datasets are employed (some studies collect raw data either from SEC filings or proprietary sources, while others use SDC, and others use Dealogic), and their methods of analysis (e.g., some studies have only estimated average costs, while others – Altinkilic and Hansen 2003 – have estimated the shape of the cost function by modeling fixed costs and the shape of the marginal cost function when considering the determinants of underwriting costs).

To our knowledge, there is no paper that has integrated the discussion of all the contributors to variation in underwriting costs within a comprehensive empirical study. Furthermore, no study has analyzed the simultaneous determination of underwriting cost and price reactions to announcements of offerings. The two costs should be interrelated, since greater marketing efforts presumably would raise the physical costs of the offering, but could reduce the adverse-selection costs of a price reduction in the market.

This paper addresses these two gaps in the literature. For purposes of comparability over time and across issues, we focus only on pure SEO underwritings.[1] We examined data from three sources (raw data from SEC filings, data from SDC, and data from Dealogic). We encountered some inconsistencies in data, which led us to rely primarily on SEC filings and secondarily on Dealogic measures (to measure aspects of transactions not described in SEC filings). We found SDC data often to be unreliable for purposes of measuring underwriting costs.

While the list of influences we consider does not include every variable described in earlier studies (due to data limitations), we are able to integrate the main determinants analyzed previously into a single model of underwriting costs, which captures aspects of (1) firm attributes, (2) offering attributes, (3) underwriter attributes, (4) corporate financing context, and (4) technological progress over time in underwriting. Furthermore, we consider differences in modeling the cross-sectional variation of the various components of costs (pure expenses, fees to underwriters, and fees to dealers). We also consider the shape of the cost function – the size of fixed costs and the question of whether marginal costs rise with the amount issued. Finally, we examine the tradeoff between the two elements of offering cost: spending more on underwriting and suffering more of a price reduction during an SEO. We analyze the extent to which choosing to spend more on underwriting results in a pricing benefit.

Section II reviews the literature. Section III reviews data sources. Section IV presents our findings. Section V concludes.

[1] We exclude IPOs because their underpricing costs are large and likely to vary inversely with direct costs. While the costs of SEOs also include price reactions, as discussed above, the two phenomena are not comparable or of similar magnitude (see Tinic 1988 for evidence of cross-sectional differences in underpricing related to marketing costs, and see Benveniste and Spindt 1989 for a discussion of the economics of IPO underpricing). Thus, for purposes of comparability, we decided to exclude IPOs. We also exclude offerings that combine other securities with SEOs, again, for purposes of ensuring comparability. An alternative approach would be to include these other transactions in a unified framework and model the effects of differences in these contracts. While this may be a fruitful approach, the variety of such transactions and their relatively small sample size make that approach very challenging at present.

II. Literature Review

Some of the early theoretical and empirical work on equity underwriting costs modeled those costs as a function of the volatility of equity prices, and conceived of spreads as compensation for the risk underwriters bore by stabilizing prices in the post-offering market**.** But as the literature has evolved (see the discussions in Hansen 1986, Booth and Smith 1986, Beatty and Ritter 1986, Ritter 1987, Eckbo and Masulis 1994, Calomiris and Raff 1995, and Calomiris and Himmelberg 2000, Ritter 2003, Eckbo, Masulis, and Norli 2007), the theoretical influence of information economics has prompted greater attention to the role of underwriters in the mitigation of adverse-selection costs associated with asymmetric information. It has become increasingly recognized that, particularly in the case of SEOs, underwriters bear little price risk, and that the cost of underwriting largely reflects the costs associated with marketing equity in a way that satisfies investors' concerns about the prospects of the issuer.

Those costs include physical aspects of due diligence, legal and financial analysis, printing and transmitting material, and placing the underwriter's reputation and resources at risk through the representations made during the underwriting, especially given the legal liability of the underwriter for ensuring accuracy. Other physical costs include selling the offering to investors via the underwriter's "road show" or other communications to investors via the dealer network. These expenditures are intended to provide information to the market that reassures investors that the SEO is motivated by the legitimate desire to invest profitably, rather than by the desire to sell overpriced shares to imperfectly informed investors. When a firm seeks to issue new shares, the market tends to react negatively to that news (see Myers and Majluf 1984, Rock 1986, James and Wier 1990). The point of expending underwriting costs in advance of selling

the SEO into the market is to mitigate the adverse reaction of the market to the news of the offering and thereby improve the pricing that the offering receives.

The literature has identified characteristics of the issuer, the offering, the underwriter, or the corporate financing context of the offering that are correlated with underwriting costs, and that plausibly can be interpreted as reflecting aspects of the firm or the transaction that either increase or decrease the confidence that an investor has in the value of the equity being sold.

Mendelson (1967) showed that indicators of relatively "seasoned" firms (especially size) were useful in predicting the cross-section of underwriting costs, that attributes of offerings (i.e., the presence of warrants) were important, and that attributes of underwriters played a secondary role. Smaller firms paid higher underwriting costs, ceteris paribus, offerings with warrants cost more, and larger underwriters charged less, ceteris paribus, a finding that Mendelson attributed in part to the fact that larger underwriters tended to attract relatively seasoned firms.

Various authors (including Hansen and Pinkerton 1982, Booth and Smith 1986, Denis 1991, Hansen and Torregrossa 1992) found that greater volatility of a firm's equity is associated with a higher underwriting cost. Hansen and Torregrossa (1992) found that a number of variables associated with differences in information cost, even after controlling for stock price risk, mattered for underwriting costs. Those variables include firm size (larger size was associated with lower cost), and the involvement of institutional investors as buyers (more involvement was associated with reduced cost). Chemmanur, He, and Hu (2009) present additional evidence on the role that institutional investor participation plays in reducing the cost of accessing the market. Calomiris and Himmelberg (2000) show that underwriting costs are positively related to: smaller sales, higher estimated marginal product of capital, higher intensity of research and development spending, and other corporate characteristics that they argue are associated with greater opacity

of the firm. Halouva (1996) found that the characteristics identified as measures of opacity by Calomiris and Himmelberg (2000) tend to decline over time following a firm's IPO.

Altinkilic and Hansen (2003) find that the extent of SEO issuance activity matters for gross spreads. They show that the three-month average of past SEO offerings for industrial firms enters positively in the gross spread regression.

Mendelson (1967) argued that changes in the structure of the market has occurred from 1949 to 1961 (most obviously, the development of institutional investors as block buyers), which had reduced marketing costs, and that this was reflected in the reduced cost of underwriting (holding constant firms' attributes) and the increased propensity of smaller firms to undertake equity offerings (see also Friend, Blume and Crockett 1970, and Securities and Exchange Commission 1971). Calomiris (1995) and Calomiris and Raff (1995) further documented these trends found that there had been significant improvements in the costs of underwriting between 1950 and 1971, and that these improvements were especially pronounced in the underwriting costs faced by small manufacturing firms. Calomiris and Raff (1995) found that, on average, gross spreads as a percentage of offerings declined from 9.2% in 1950 to 7.7% in 1971, buy that the participation of smaller firms increased substantially over time, and their costs of offering declined more dramatically. Calomiris (2002) examined changes in underwriting costs during the 1980s and 1990s and showed that the patterns identified by Mendelson (1967) and Calomiris and Raff (1995) for earlier periods are also present in recent decades. Underwriting costs have continued to decline over time, but that decline is not uniform across issuers; smaller firms have enjoyed greater reductions in underwriting costs than larger firms.

Calomiris and Raff (1995) also found that their period similar findings to Mendelson (1967), Smith (1977), Hansen (1989), and others for other periods regarding rights offerings.

Rights offerings, ceteris paribus, were less expensive than public offerings. They also found that rights offerings had declined dramatically as a percentage of offerings from 1950 to 1971 (from 21% of the sample in 1950 to 5% in 1971), further corroborating the role of structural changes in the market in reducing the costs of public offerings and encouraging public offerings.

Aspects of the approach chosen to marketing the SEO (other than the distinction between rights offerings and public offerings) have also been shown to contribute to large cross-sectional differences in underwriting costs. Hansen and Pinkerton (1982) Ritter (1987), and Hansen (1989) point out that issuers can choose either to avoid the use of underwriters (and place directly into the market) or engage an underwriter in a "best efforts" underwriting (in which no firm commitment to a price is provided). Although doing so is cheaper, these arrangements are generally not favored because they are less successful in attracting buyers at favorable prices. Bhagat, Marr, and Thompson (1985) and Denis (1991) show that shelf registrations under Rule 415 are also cheaper, but that firms that need "underwriter certification" to access the market will still tend to use fully marketed offerings, despite the higher underwriting cost and slower access to the market (see also Bethel and Krigman 2008).

Shelf offerings have the advantage of allowing a company to retain the option to time the market by deciding quickly to issue shares off of the shelf, but the cost is that the shares cannot be fully marketed (with a road show) when the offering is accelerated. Gao and Ritter (2010) offer one approach for explaining the use of accelerated offerings, showing that the choice of offer type and marketing intensity is a way to change the elasticity of demand for the offer. Accelerated offers have become more common since 2000. According to Bortolotti, Megginson, and Smart (2008), in 2004 more than half of SEOs were accelerated deals.

Calomiris and Raff (1995) examined the proportion of gross spreads that were paid to dealers, and found that this proportion fell somewhat for smaller offerings (from 61% of the spread in 1950 to 53% in 1971), but remained constant at roughly 58% for larger offerings. Hansen (1986) reports that, on average, the dealers concession in his sample from a subsequent period was 55% of the gross spread. This is similar to the proportion we report below (54%) for our later sample. Thus there is a remarkable constancy of this proportion over a long period of time. Since dealers bear little price risk, these data on dealers' concessions suggest that reductions in spreads primarily reflected reductions in marketing costs of equity offerings. More generally, these data confirm the central importance of marketing costs (rather than the cost of bearing the risk of price change) in determining the gross spread.

The choice of underwriter and the overall corporate financing context in which the SEO occurs has also been shown to affect underwriting cost. Drucker and Puri (2005) find that universal banking relationships that mix lending and equity underwriting tend to be associated with lower equity underwriting charges. Calomiris and Pornrojnangkool (2009) dispute that finding, and show that when one controls for differences in firms' riskiness, and other characteristics of equity offerings, that result is reversed. Consistent with Rajan (1992) stronger banking relationships permit banks to extract quasi rents from clients, which take the form of higher underwriting fees charged by relationship bankers.[2]

Calomiris and Pornrojnangkool's (2009) study of gross spreads for all equity offerings (SEOs and IPOs) identifies additional characteristics of firms, underwriters, transactions, and the corporate financing context in which the offering occurs that are associated with significant cross-sectional differences in underwriting fees. Many of those variable confirm preexisting

[2] Calomiris and Pornrojnangkool (2009) find some evidence of offsetting benefits associated with closer relationships, consistent with economic theory, which they argue can help explain why firms would enter into closer relationships despite the quasi rent extraction that this entails.

findings, and some are new (indicated by an *). Those variables, and their effects on costs (denoted by + or -) include: firm size (-), offering size (-), price volatility (+), whether the prior period is one in which many equity offerings are occurring (-)*, whether an equity offering has occurred in the period prior to the instant one (-)*, whether the underwriter is a stand-alone investment bank rather than a universal bank (+)*, whether the offering is jointly underwritten (+)*, whether the stated purpose of the offering is to finance the acquisition of assets (+)*, whether the offering is a shelf registration (-).

In summary, the literature has identified a wide range of observable variables – firm characteristics, issue characteristics, bank characteristics, market conditions, and characteristics of the context in which the offering occurs – which are associated with cross-sectional differences in underwriting costs. Those observed patterns are broadly consistent with a view of underwriting costs that sees those costs as resulting from the costs of resolving information problems for investors in order to improve the price received for the offering.

Fixed cost

From an early date, the literature on underwriting costs has noted that smaller offerings tend to have higher costs (expressed as a percentage of the offering amount). That pattern has been visible in U.S. underwriting cost data going back to the beginning of the 20th century (Calomiris and Raff 1995), and has been a subject that has occupied the literature since Mendelson (1967). There are three potential sources of connection between the amount of the issue and its average underwriting cost: (1) a fixed cost per issue (which implies a higher average cost for smaller issues), (2) a higher marginal cost for smaller issuers, who incidentally tend to issue smaller amounts of stock (i.e., an upward shift in the marginal cost curve for smaller

issuers), and (3) variation in the shape of the marginal cost curve depending on the amount issued relative to the amount of stock outstanding (which could complicate the relationship between offering size and average cost implied by the first two influences).

The fixed cost problem is challenging because, absent a functional form for the cost function, it can be very difficult to disentangle the contributions of each of these three effects to the observed association between issuance size and underwriting cost as a proportion of issuance size (hereinafter "percentage underwriting cost"). To understand the problem, consider Figure 1. The hypothetical data points in Figure 1 could reflect constant marginal cost functions (the solid, flat lines) that vary across firms because of differences in firms' opacity. Or, the hypothetical data points could reflect a common marginal constant marginal cost and a common fixed cost component (the dotted line). Finally, in the presence of both a common fixed cost and shifting marginal cost, if adverse-selection problems become more acute as the proportion of the offering relative to outstanding stock rises (e.g., because management's incentives to issue large amounts to share losses with imperfectly informed investors may be particularly pronounced as that ratio rises), then the cost functions may be U-shaped (the solid U-shaped lines).

Assuming that one can observe marginal cost shifters (characteristics of offerings that make them require greater sales effort), assuming that fixed costs are not firm-specific, and assuming that the U-shape is a function of the ratio of issue amount relative to outstanding stock, one can deal with the identification problem of separating fixed and variable costs. Of course, there are many other possibilities, including firm-specific fixed costs, and more complicated marginal cost functions in which characteristics that produce shifts in cost also affect the shape of the cost curve. Those complications, if taken into account, would make it difficult to separate fixed and variable costs.

Under the simplifying assumptions of common fixed cost, common curve shape, and characteristics of firms and offerings that shift curves independently of their shape, however, it is possible to construct a model that can identify fixed and marginal costs empirically. This approach is undertaken by Altinkilic and Hansen (2003). In addition to estimating a more reduced-form approach (which simply includes ln(proceeds) alongside other explanatory variables in various regressions), Altinkilic and Hansen (2003) report structural estimation results which are based on the identifying assumptions described above. This structural estimation, more generally, takes the following form. For firm i's issuance:

$$(UC/Proceeds)_i = \Sigma f_j(MC\ shifters)_{ij} + a(1/Proceeds)_i + b(Proceeds/MVE)_i + e_i\ ,$$

where UC is total underwriting cost (inclusive of all fees and expenses), MC shifters are firm or offering characteristics that shift marginal cost, MVE is the market value of equity, and e is the regression residual.

An alternative approach to identifying fixed cost, suggested by Calomiris and Himmelberg (2000), is to and impose identifying restrictions on the fixity of costs for some elements of underwriting cost, without imposing the assumptions of a common fixed cost for all firms or a common U-shaped marginal cost. The broad components of underwriting cost are (1) the non-fee expenses, (2) fees to the underwriting syndicate for organizing and underwriting the offering, and (3) the sales commission, or "dealers concession," fees. Calomiris and Himmelberg (2000) argue that fixed costs should be virtually zero for dealers' concessions.

Rather than attempting to make specific assumptions about the relative presence or absence of fixed cost across these three categories, we will follow the Altinkilic and Hansen

(2003) reduced-form and structural approaches to estimation of underwriting costs. We also investigate the qualitative assumptions of the alternative approach by considering results for the reduced-form and structural versions of estimations separately for three measures of underwriting cost: (1) a broad measure of all fees and expenses as a proportion of proceeds, (2) gross spread (total underwriting fees, including the dealers' concession) as a proportion of proceeds, and (3) only the dealers' concession as a proportion of proceeds. This allows us to investigate whether fixed costs (as identified by Altinkilic and Hansen's two approaches) are relatively large for some components of underwriting cost than for others. We will find that, indeed, this is the case: fixed costs are a smaller percentage of dealers' concessions than of syndicate fees, and a smaller percentage of syndicate fees than of non-fee expenses.

III. Data

In this section, we describe out dataset. We first describe the types of SEOs. We then describe how we assembled our data base, and define the regressors used in our study.

Types of SEOs

Seasoned equity offerings can be classified into three types by their offer methods: fully marketed offers, accelerated offers, and rights offerings. Rights offers are virtually nonexistent in the U.S (Gao and Ritter, 2010). Accelerated offers are defined to include bought deals and accelerated bookbuilt offers. Accelerated seasoned equity offerings (SEOs) have become more common during the last decade (Bortolotti, Megginson, and Smart, 2008). The most important differences between fully marketed SEOs and accelerated SEOs is the amount of marketing effort expended and the speed with which the offering is brought to market.

In a fully marketed SEO, the issuer chooses one or more investment banks to market the offer and set the price. The book-runner's role includes forming the syndicate and being in charge of the entire process. The process of a fully marketed SEO is similar to bookbuilt initial public offerings (IPOs). The lead underwriter "certifies" the quality of the issuing company, gathers information about investors' demand and builds an order book, which is used to help determine the offer price. The marketing function of the investment bank usually includes a road show in order to develop an interest for the offer. During the road show the issuer's management and the investment bankers meet with institutional investors, analysts, and securities sales personnel. In a fully marketed SEO it usually takes 2-3 weeks between the announcement date and the date the trading begins for the new shares.

In a bought deal, the issuer announces the amount of stock it wishes to sell and investment banks bid for these shares, usually by submitting bids shortly after the market's close. The bank that offers the highest net price wins the deal and then re-sells the shares on the open market or to its investors, usually within 24 hours (Gao and Ritter, 2010).

In accelerated bookbuilt offers, banks submit proposals where they specify the gross spread but not necessarily an offer price, for the right to underwrite the sale of the shares (so they do not initially purchase the whole issued from the issuer). The winning bank then usually forms a small underwriting syndicate and begins marketing the shares to investors. The offer price is then negotiated between the issuer and the bank. The bookbuilding procedure does not include a road show and the underwriting process is typically completed within 48 hours. In accelerated SEOs (both bought deals and accelerated bookbuilt offers) the shares are usually allocated exclusively to institutional investors.

Sample Selection

We start with all U.S. common stock seasoned equity offerings in the SDC database between January 1st, 1980 and December 31st, 2008. We exclude utilities (SIC codes 4900–4949) and financial firms (SIC codes 6000–6999). Excluded are also rights offerings, pure secondary offerings[3], American Depository Receipts (ADRs), best efforts and non-Securities and Exchange Commission (SEC)-registered offers, closed-end funds and Real Estate Investment Trusts (REITs). We also exclude any SEOs that combine SEOs with other securities offerings (e.g., warrants). This yields a sample of 4001 SEOs. Furthermore, to be included in our sample, the issuer needs to be listed on CRSP and display pricing data for at least 180 days before the offering. Data about the issuer also must be available from COMPUSTAT for the year before the offering. Under these restrictions, the final sample includes 3028 SEOs.

To identify the offering method (accelerated vs. fully marketed), we use Dealogic's classifications. According to Gao and Ritter (2010), Dealogic's data are more accurate than those reported in Thomson Financial Securities Data Company's (SDC) new issues database classifications. Based on our own analysis of the accuracy of SDC underwriting cost data, we concur with that assessment. Dealogic, however, only covers SEOs after 1991. Thus, for regressions reported here that include data prior to 1991, we exclude the offering method from our analysis.

Data on bank-firm relationships – specifically the data field identifying a relationship in which the underwriter is also a lead lender (not just a loan participant) for the issuing firm – were supplied by Calomiris and Pornrojnangkool (2009). These data were only collected by Calomiris and Pornrojnangkool for the period 1992-2002. Including these variables in our analysis,

[3] In pure secondary SEOs the shares are being sold by existing shareholders rather than by the issuing firm, similarly to block trades in the open market.

therefore, as in the case of our use of the Dealogic data on offering method, substantially reduces the sample period. Thus, once again, we only include this variable in some of the regressions reported in Section IV.

Because we discovered numerous errors in the SDC database, because Dealogic's data only begin in 1991, and because we wanted to ensure accuracy and consistency in our data collection for a long period of time, we hand-collected data on underwriting costs and proceeds from SEC filings using the EDGAR database for the entire period 1980-2008.

To adjust for the effect of inflation when making comparisons of nominal quantities of proceeds, sales, or other variables over time, we deflate nominal quantities using the producer price index. All nominal amounts are expressed in units of 1990 dollars.

Descriptive statistics

Table 1 provides a list of all the variables we analyze and definitions and descriptive statistics about them. The rationale for including each of these variables, which were identified in previous studies, is described in Section II.

Table 2 describes the number of SEOs per year in the sample. SEOs are less frequent in 1985-1989 but activity picks up in 1990-2000. Table 3 analyzes the SEOs by total amount of dollars raised and summarizes their underwriting costs. Larger issues have lower gross spreads than smaller issues. Seasoned equity offerings with proceeds of between $10 and $20 million display a 7.67% mean total cost percentage (including non-fee expenses and all fees) and 6.68% mean gross spread (including only fees), while SEOs with $50 to $80 million in proceeds

averaged a 5.66% total cost and a 5.32% gross spread. The dealer's concession costs (a subset of the gross spread) follows a similar pattern.

Table 4 reports the number of offers with each offering method by year as well as their mean total costs. The number of bought deals and accelerated bookbuilt offers has increased substantially since 2000. In 2007, there were 13 bought deals and 25 accelerated bookbuilt offers. Thus, accelerated offers comprise 30% of all offers in 2007, but before 2000 accelerated deals were very rare. The size of offerings increased after the late 1990s. Average proceeds are $52.2 million in 1991 and $110.93 million in 2007.

Table 4 Column XIV shows that the total costs have decreased over the years. The mean total cost for all SEOs was 8.14% in 1991 but dropped to 5.02% in 2008. Table 4 allows us to observe whether the decline in underwriting costs is across all offering methods or is due to the higher frequency of accelerated offers. The various methods have different marketing costs and speed to market and this would create a variation in underwriting costs. Accelerated deals have lower marketing costs and therefore lower underwriter fees and expenses. Table 4 analyzes the total costs by offering method. We observe that the total costs for the fully marketed deals have decreased from 7.74% in 1991 to 6.23% in 2008. The average total costs for accelerated bookbuilt and bought deals do not decline over the years. Table 4 suggests that the large decrease in the total costs from SEOs partially reflects the higher frequency of accelerated offers.

Table 5 divides the sample, for the 1980s, 1990s, and 2000s, into quartiles according to the magnitude of total underwriting costs relative to proceeds. The table reports average underwriting costs relative to proceeds for each quartile in each sub-period, as well as the average size of proceeds and the average sales of issuers. Table 5 shows that the costs of

underwriting, and the gap between low- and high-quartiles of underwriting cost, have changed over time. The 1990s saw a large increase in average underwriting cost for relatively high-cost issuers, relative both to the 1980s and the 2000s. This bulge in underwriting cost reflected the high rates of participation of smaller firms raising smaller amounts in the market. Table 5 reinforces the importance of analyzing changes over time in the costs of underwriting within a regression framework. Large changes over time in the degree of participation of small firms can distort impressions about the trend in costs over time. As we will show below, controlling for the composition of the pool of firms participating in the market, there has been a steady reduction in the costs of underwriting, and that cost savings has been particularly pronounced for smaller firms. If one did not control for changes in the composition of firms, one would arrive at a false impression of a U-shaped pattern in the costs of underwriting over time.

IV. Regression Results

Non-Structural Estimation

We begin with a non-structural model of underwriting costs. We consider three alternative definitions of the dependent variable: (1) total underwriting costs as a percentage of proceeds (UC), (2) the total fees, or "gross spread" paid to underwriters and dealers, as a percentage of the proceeds of the offering (GS), which includes all payments to syndicate managers, participants and dealers for placing the offering, and (3) the dealers' concession as a percentage of proceeds (DC). DC is a subset of GS, which is a subset of UC.

Non-structural models of UC, GS, and DC in Tables 6-8 begin with a simple model that assumes that underwriting costs are a constant percentage of proceeds (and therefore vary with ln

proceeds), which is the same for all firms. That model (equation 1) is rejected by the data for each dependent variable, as equations (2)-(5) show. The equation (2) specifications include the most basic list of firm-specific average cost determinants – logs of proceeds, sales, sales squared, the market value of equity (MVE), as well as recent stock return volatility, and the log ratio of sales to plant property and equipment (a proxy for the marginal cost of fixed capital, which according to Gilchrist and Himmelberg 1999 is a useful measure of the shadow cost of external finance for the firm). Small, risky firms with high shadow costs of external finance should have greater opacity and therefore require greater marketing costs in underwriting, and they do. The market value of equity is included in addition to sales to capture the potential effect of increasing costs of underwriting when proceeds are high relative to the market value of equity.

Tables 6-8 next consider how costs have changed over time in equations (3) and (4). Equation (3) contains a time trend and an interaction between time and the log of sales. Equation (4) adds industry indicator variables. UC, GS and DC show a declining cost trend, but this is largely confined to smaller firms, as indicated by the interactive effect of time and sales (we will return to discuss this interaction in more detail below). This size-biased technological progress corroborates the findings of Mendelson (1967), Calomiris and Raff (1995), and Calomiris (2002) for earlier periods. The main beneficiaries of improvements in SEO underwriting efficiency over time have been smaller firms. UC and DC do not show as large a decline in costs over time as GS, indicating that cost declines have been more pronounced in fees paid to underwriters.

Finally, Tables 6-8 consider additional variables relating to the firm's finances and the underwriting structure, which have been identified as potentially important in other studies, specifically leverage, the Carter-Manaster (CM) indicator of high quality of the lead underwriter (which in our study takes a value of 1 if the CM indicator takes the value of 9 or greater, and

zero otherwise), and an indicator variable that takes a value of 1 if the underwriting is led by more than one bank, and zero otherwise. The CM indicator is positive (11 basis points) only for the DC specification in Table 8, and statistically is not significant in the UC and GS regressions. A positive effect of the CM index only in the DC regression, which is confirmed in subsequent similar non-structural regressions reported below, indicates a greater willingness for bulge-bracket investment bankers to pay higher sales commissions. The MULTIBANK variable was identified as significant by Calomiris and Pornrojnangkool (2009), and is positive and significant in Tables 6-8. MULTIBANK may reflect unobservable opacity in the issuing firm that necessitates more than one bank's involvement, and/or may reflect costs of coordination when more than one bank is charged with leading an underwriting. Leverage enters positively and sometimes significantly, indicating that higher leverage, even after controlling for volatility, indicates higher marketing costs.

Altinkilic and Hansen (2003) find market activity positive and significant for GS in 1990-1997. In our sample, their measure (the prior three months of SEO proceeds) is not significant for GS or DC, although it is positive and somewhat significant for UC.

Structural Estimation

The structural estimation of the underwriting cost function follows the approach of Altinkilic and Hansen (2003). Our approach, like theirs, includes the reciprocal of proceeds and the ratio of proceeds to MVE. These regressors impose identifying restrictions on the cost function to derive estimates of fixed cost and to measure the upward slope of marginal cost as

proceeds rise relative to MVE. Altinkilic and Hansen (2003) include volatility as a firm-specific cost shifter. We add additional firm-specific variables, consistent with our findings in Tables 6-8.

In reporting structural estimates for GS and DC in Table 9 we explore the extent to which fixed costs are present in the different components of underwriting cost. Consistent with Calomiris and Himmelberg's (2000) conjecture, fixed costs are concentrated in non-fee expenses (which are excluded from GS). Using the Altinkilic and Hansen (2003) identification assumptions, GS or DC account for between one-third and one-half of total fixed costs. Non-fee expenses average 0.8% of proceeds, while GS averages 6.2% of proceeds. Thus, even though non-fee expenses are a small fraction of total underwriting costs, most of fixed costs are contained within that category.

Our implied estimates of fixed costs for GS in Table 9 are much less than those of Altinkilic and Hansen (2003). Their estimates (scaled to match our variable definitions) imply coefficients on the reciprocal of proceeds ranging from 0.22 to 0.26. Our estimates range between 0.05 and 0.10. Adding firm-specific cost shifters to our specifications reduces the implied estimates of fixed costs. While Altinkilic and Hansen (2003) estimate 1990-dollar fixed costs of roughly $222,000, our estimates imply fixed costs of less than $100,000 (1990 dollars).

Our estimates of the slope of the marginal cost with respect to the ratio of proceeds to MVE in Table 9 are also smaller than that of Altinkilic and Hansen (2003). They estimate coefficients that range between 2.2 and 2.6; our estimates range between 1.1 and 1.8, and the lower end of that range resulted when we added additional explanatory variables to the model. We conclude that improving the specification to include more marginal cost shifters results in a smaller elasticity of cost with respect to higher amounts of proceeds.

In results not reported here, we investigated whether our smaller coefficients for fixed cost and the elasticity of cost with respect to the ratio of proceeds relative to MVE reflected our different time period. Altinkilic and Hansen (2003) study the period 1990-1997, which is the middle of our sample period. When we confine our sample to that period, however, we arrive at nearly identical parameter estimates. A more likely explanation of the differences between our findings and theirs is the greater sampling restriction in our study. We only include "pure SEO" transactions in our data base (SEOs with no other securities attached), while it seems that their sample includes a broader range of issues. That may account for the differences in our findings.

In unreported results we repeat the analysis in Table 9 for UC. As expected, including non-free expenses in measured underwriting cost results in larger estimated fixed cost. The coefficients on 1/Proceeds in the UC regressions range between 0.12 and 0.15. The results for the structural regressions are generally similar to the non-structural regressions in Tables 6-8. Overall, however, the goodness of the fit, measured by adjusted R-squared, for the structural models tends to be a bit lower than in the comparable non-structural models.

Fully Marketed SEOs vs. Others

As discussed in Sections II and III, the structure of the underwriting effort can vary across issues. Some SEOs are fully marketed, while others are not. Prior studies have shown that fully marketed offerings tend to have higher underwriting costs, and that the proportion of fully marketed SEOs has fallen over time, as shown in Table 4.

Using data on deal structures from Dealogic, which are only available beginning in 1991, we included an indicator variable for fully booked offerings in our analysis. Table 10 reports

results analogous to those of Tables 6-8, but include the fully booked offering indicator variable. Note that the sample period is shorter than in Tables 6-8. For purposes of comparison, we repeat the baseline specifications reported in Tables 7 and 8 for this truncated sample period. In unreported results we repeat the analysis for UC.

The fully marketed indicator variable is significant and positive, and raises costs by about 2% of proceeds. An interesting question is whether including the fully marketed indicator reduces the measured technological improvement in underwriting over time, which was found in Tables 6-8. The coefficients on time and the time-log sales interactions are almost identical in the GS regressions to those of Table 7, indicating that the cost reductions for GS over time for smaller firms are not a reflection of the diminished use of fully marketed offerings. In contrast, the coefficients in column 7 and 8 on time and the time-log sales interactions in the DC regression are smaller in absolute value than those of Table 8, indicating that the measured improvement in concessions over time is somewhat muted when one takes account of the changing structure of transactions. The coefficients on time for gross spread are much larger in Table 10 than in Table 6, and the time-log sales interactions are similar. We will discuss this much larger time effects more fully below.

The use of shelf registration is related to the use of expedited, non-fully marketed SEOs. Calomiris and Pornrojnangkool (2009) include a shelf registration indicator to capture issuer decisions to engage is less of a marketing effort. We include a shelf registration indicator variable to see whether it adds any additional explanatory power over and above the fully marketed indicator. Not surprisingly, the incremental contribution of including the shelf registration indicator is negligible in the presence of the fully marketed indicator

In unreported specifications we explore the additional variable, Matched Lender, to investigate whether the combining of lending and underwriting within the same banking relationship leads to quasi rent extraction (i.e., higher underwriting fees). Consistent with Calomiris and Pornrojnangkool (2009), we find a positive effect of Matched Lender on GS, although it is not statistically significant. Our sample, unlike that of Calomiris and Pornrojnangkool (2009), does not include IPOs, which may account for the weaker statistical significance of this effect on GS.

Comparing Time Effects Across Specifications

Table 11 summarizes the coefficients for time and its interaction with log sales from the last columns of Tables 6-8, and as well as from table 9 and the unreported specifications that repeat Table 10 for UC and DC. We report these coefficients, together with their standard errors and the means and standard deviations of log sales for each of the regression samples actually used in each of the specifications. These statistics allow us to explore two closely related questions: (1) to what extent do the regressions suggest similar or different conclusions about which size categories of firms experienced reductions in underwriting cost over time, and (2) to what extent are the differences in coefficient estimates related to differences in the sizes of firms present in the various samples?

With respect to the latter question, it is conceivable that, as the result of differences in the means and standard deviations of ln sales across the sub-samples, the implications for cost improvement over time may be more similar across regressions than the coefficients suggest. Table 11 shows, however, that the means and standard deviations of ln sales are quite similar

across the various regression samples. Thus, the regressions have different implications for which size categories of firms experienced cost reductions over time. According to the coefficient estimates from Table 6, only firms that are about one standard deviation smaller than the mean or smaller experienced improvements in total underwriting costs over time. In contrast, according to the coefficient estimates from Table 10 and the unreported specifications that repeat Table 10 for UC and DC , almost all firms (that is, all firms whose size was not more than about two standard deviations above the mean) experienced cost savings. Despite these differences in size cutoffs, all the specifications agree that small firms benefited the most from technological improvements in underwriting over time.

Price Improvement and Underwriting Expenditure

In the previous sections we identified characteristics of the issuer and the offering that predict the physical cost of placing a seasoned equity offering. Another component of the total cost of an SEO is the potential price decline in the market upon the announcement of the equity offering. The literature has interpreted the price decline upon the announcement of the equity offering as a result of adverse selection (Myers and Majluf, 1984), or the result of downward-sloping demand curves. It follows that there should be a tradeoff between the two components of cost; higher expenditure on marketing the offering (e.g., more presentations to investors or more detailed presentations) should mitigate the effect of adverse selection and price pressure, and thereby, result in higher pricing of the offering (what we will refer to as “price improvement”) relative to the price that would obtain if the firm chose to undertake less of a marketing effort.

Because underwriting expenditure and price improvement are determined jointly by a common set of influences, modeling the presumably positive effect of the decision to undertake

greater underwriting effort on price improvement is challenging. A valid instrument would be a variable that affects underwriting cost exogenously, but which has no direct impact on stock price. Unfortunately, all observables related to a firm's opacity or other relevant characteristics (which we have shown are useful in predicting underwriting costs) also should matter directly for the announcement effect of the SEO on the stock price.

In this section we focus on identifying the price impact of underwriting decisions that are revealed *after* the announcement of the SEO. As we will explain, there should be a positive association between, on the one hand, the unpredictable amount of underwriting expenditure undertaken during the marketing period (i.e., the window of time between the announcement date and the date of the offering), and, on the other hand, the price improvement that occurs during the marketing period.

At the date (t) when the SEO is announced, a vector of firm characteristics (c) that captures firm opacity is known to the market. As our regressions in Tables 6 through 10 show, many of those characteristics are useful for predicting the costs expended on underwriting. In particular, the gross spread (GS) for underwriting the SEO of firm i can be expressed as:

(1) $GS_{i,\ t+x} = g(c_{i\ t}) + e_{i,\ t+x}$, where $g' > 0$.

e is the error term from the regression that uses c to predict GS. Although the vector c is observable at time t, GS is observed only at the date the offering is completed (t+x), which is when it is announced to the market, which means that the expected value at time t of $e_{i,\ t+x}$ is zero.

The vector of characteristics (c) may also be correlated with the extent to which market prices change at date t as the result of the announcement of the SEO. In theory, (as shown in Figure 2) firms with greater opacity should see a greater marginal benefit from expending

resources on underwriting, and therefore, in equilibrium greater opacity is associated with higher underwriting cost (which is why the derivatives of g with respect to measures of opacity are positive, as reported in Tables 6 through 10). Presumably, however, firms with higher opacity do not spend so much more on underwriting that they actually eliminate entirely the effects of their greater opacity. Thus, we would expect that, at date t, idiosyncratic returns of firms announcing a stock offering – i.e., raw returns less a vector of betas for that firm ($\beta_{i,\ t-1}$) multiplied by a vector of market factors ($dPM_{t-1,\ t}$) – would be negative on average, and that firms with greater opacity would display more negative idiosyncratic returns. In other words:

(2) $(dP_{t-1,\ t} - \beta_{i,\ t-1}\ dPM_{t-1,\ t}) = \pi_t(c_{i,t}) + \lambda_{it}$, where $\pi_t' < 0$ and λ_{it} is an error term.

Indeed, several studies have found that smaller, more opaque firms tend to experience larger negative announcement effects for idiosyncratic returns (Billett, Flannery and Garfinkel, 2006).

Although π_t' is negative, it is interesting to consider the relationship between idiosyncratic returns *after* the announcement date and the error term in equation (1). A positive $e_{i,\ t+x}$ indicates that issuers and their underwriters agreed to expend an unexpectedly high amount on underwriting during the period between t and t+x. Presumably, this residual reflects the beliefs of the underwriter/issuer about the value of communicating more information to the market.

Assume that the underwriter/issuer is privy to information not known by the market, and also has an expectation of how much the market would respond to additional favorable disclosure of that information in the marketing of the SEO (based on the underwriter's experience in selling to the market in the past). The underwriter/issuer's belief about the "information elasticity of demand" for the stock – how much the price of the stock will rise during the marketing effort as the result of additional expenditure on communicating facts to the

market credibly – is the basis for deciding whether to spend more than expected on underwriting effort. In other words:

(3) $e_{i,\,t+x} = \mu(\omega_{it}) + \delta_{i,\,t+x}$, where ω_{it} is the expected information elasticity of demand, and $\mu' > 0$.

Because ω_{it} is private information known by of the underwriter/issuer at time t, but not by the market, it cannot effect the idiosyncratic returns (modeled in equation 2) observed at time t. But the additional underwriting effort is based on an expectation of significantly affecting the market price during the time interval between t and t+x. Indeed, the expectation of the underwriter/issuer is that spending an additional dollar of e (the marginal cost of discretionary underwriting effort) exceeds the marginal benefit (an increase in the stock price) is what justifies the expenditure of additional effort on the underwriting.

Thus, it follows that:

(4) $(dP_{t,\,t+x} - \beta_{i,t}\, dPM_{t,\,t+x}) = z_{t+x}(e_{i,\,t+x}) + n_{i,\,t+x}$, where $z'_{t+x} > 0$ and $n_{i,\,t+x}$ is an error term.

The central implication of this model is that $z'_{t+x} > 0$. In other words, discretionary decisions to spend more than expected on underwriting reflect in anticipation of a positive reaction by the market should predict higher idiosyncratic returns for the issuer during the interval from t to t+x on $e_{i,\,t+x}$.[4]

[4] A positive association between the residual gross spread and price improvement is not the only possibility one can imagine. It is also possible that underwriters and/or issuers learn during the marketing period that they are facing an unexpectedly difficult challenge of marketing the SEO (call this the surprisingly "hard-sell" scenario). Under this scenario, a positive gross spread residual could indicate an idiosyncratic negative market perception of the firm, which elicits greater than average marketing effort conditional on observed issuer and offering characteristics. In the hard-sell scenario, a positive gross spread residual could be associated with price decline during the marketing period as the result of a market learning process. The hard-sell scenario, which has opposite implications to our model, may apply in some cases. If so, our estimated positive coefficients for idiosyncratic returns over the period from t to t+x, reported below, understate the average price improvement effect of decisions to spend more on underwriting.

Table 12 reports regression results that predict gross spreads for the subset of our sample that undertook fully marketed offerings. To maintain comparability within the sample, and to be able to define a consistent time frame for a marketing window, we include only fully marketed offerings in our analysis. The results are quite similar to those reported in Table 7

Table 13 reports regression results for price improvement, which is regressed on the residual gross spreads derived from the regressions in Table 12. Price improvement is defined using excess returns, after removing Fama-French factors from raw stock returns. The marketing window is defined as the period beginning eleven days prior to the offering and ending one day prior to the offering. That window covers the interval of time subsequent to the announcement date (which, for fully marketed offerings, occurs more than two weeks prior to the offering) and prior to the offering date, at which point underwriting costs are disclosed.[5]

We find a significant, positive association between the residual gross spread and price improvement in excess returns. We interpret this as evidence that when underwriters/issuers decide to expend more on underwriting (presumably because they perceive that there is a high marginal benefit to expending more on underwriting), their efforts actually improve the stock price during the marketing of the SEO.

The magnitude of the effect is economically significant. The standard deviation of the residual gross spread is 0.8 percent. Thus, a decision to expend one standard deviation above the zero mean of the residual gross spread implies a price improvement of greater than one percent in the stock price.

[5] The absence of any disclosure of underwriting cost information during the marketing window is not crucial to our analysis. Market participants may be able to observe greater marketing effort by the underwriter, and thus, may be able to infer a higher residual gross spread. If, as our results indicate, there is a positive correlation between residual gross spread and price improvement, and if market participants are able to receive information during the marketing window about the residual gross spread, they would view a positive residual gross spread as a positive signal about expected price improvement, since a positive residual indicates issuer confidence in the marginal benefit of additional underwriting expenditure.

V. Conclusion

We analyze cross-sectional and intertemporal differences in the costs of underwriting seasoned equity offerings (SEOs). Our study integrates themes from prior work, and provides a comprehensive analysis of the factors affecting underwriting costs in the U.S. for the period 1980-2008.

We find that firm attributes that proxy for differences in the difficulty of marketing SEOs account for important shifts in the costs of underwriting across firms. Ceteris paribus, small firms with high marginal products of capital, volatility stock returns, and high leverage pay higher underwriting costs.

The nature of the underwriting process chosen (fully marketed vs. more expedited marketing) is also important in determining underwriting costs. After accounting for other influences, fully marketed transactions, are associated with underwriting costs that are much higher (by 2% of the amount of proceeds) than other transactions.

Other structural characteristics of the SEO transaction, including the number of lead underwriters, and possibly, the depth of the relationship between the lead underwriter and the issuer (which is not highly statistically significant in our results), raise the cost of underwriting.

In non-structural specifications, we find that bulge bracket banks (those with high CM scores) pay higher concessions to dealers, but this effect does not appear in constrained (structural) models; indeed, in structural models, UC and GS are lower when bulge bracket firms manage underwritings. These structural models, however, tend to be slightly dominated in overall fit by the non-structural models. Overall, we conclude that the effect of investment bank reputation on underwriting costs is not clear or robust.

An active market – the volume of offerings immediately preceding the SEO – is associated with higher underwriting cost, but this appears not to be a robust influence on underwriting costs. For some sample periods (the 1990s) this effect appears strong, but not for other sub-periods.

Fixed costs are a very small component of underwriting costs. The fixed cost component of SEO underwriting appears to be substantially less than $100,000 (in 1990 dollars). Most of the fixed costs associated with underwriting reside in expenses rather than the fees paid to underwriters or dealers. Variation in underwriting costs as a fraction of proceeds that is associated with the size of proceeds is largely the result of firm characteristics that shift marginal cost, rather than economies of scale in SEO underwriting.

The technology of SEO underwriting has substantially improved from 1980 to 2008. As was true in the 1950s, 1960s, and 1970s, cost reduction has been concentrated among small firms, who have been able to access equity markets much more economically over time.

We also investigate the benefits of choosing to spend more on underwriting cost during the underwriting process. We find that choosing to spend more than is predictable based on firm or deal characteristics significantly raises the price of an SEO during the offering. A decision to expend one standard deviation more in gross spread implies a price improvement of greater than one percent in the stock price.

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Figure 1: Alternative Shapes for Average Cost Curves for Three Issuers

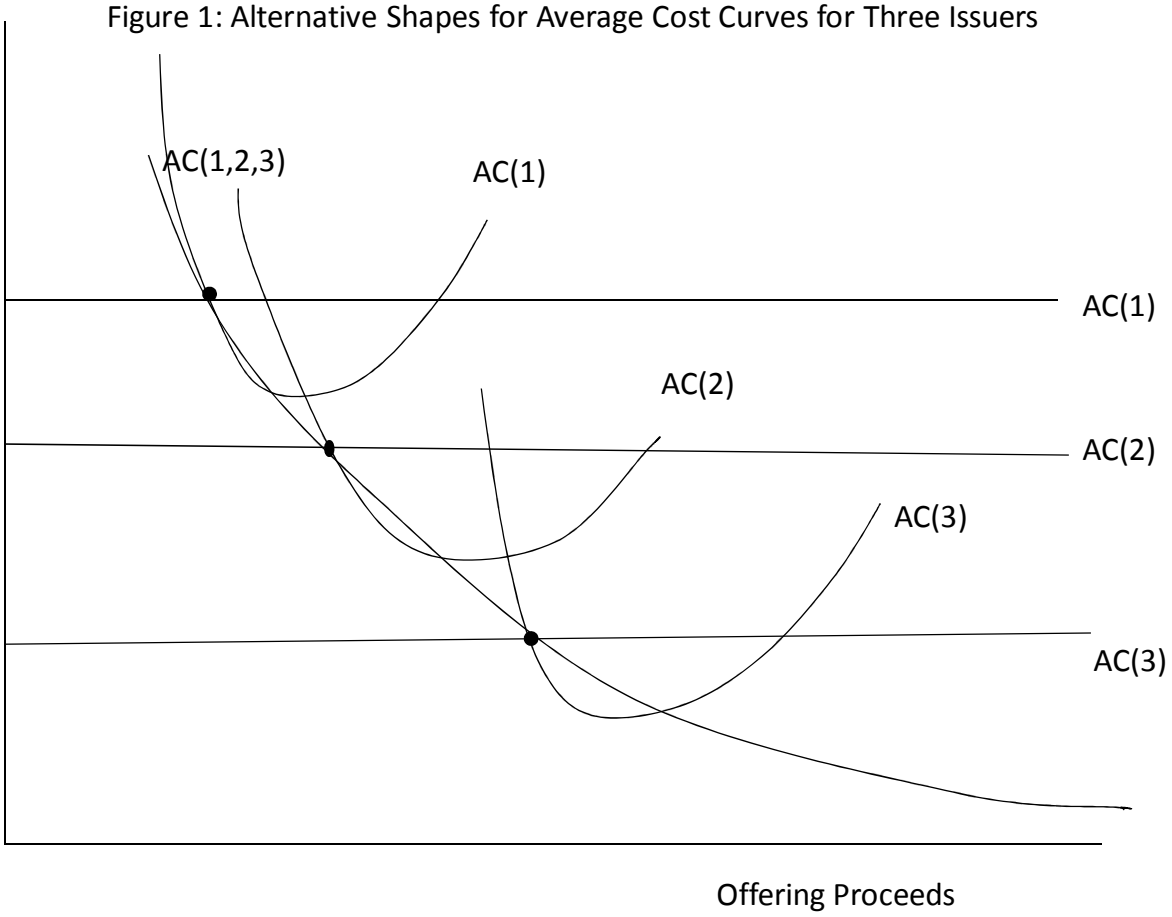

Figure 2: Opacity and Underwriting Effort in Equilibrium

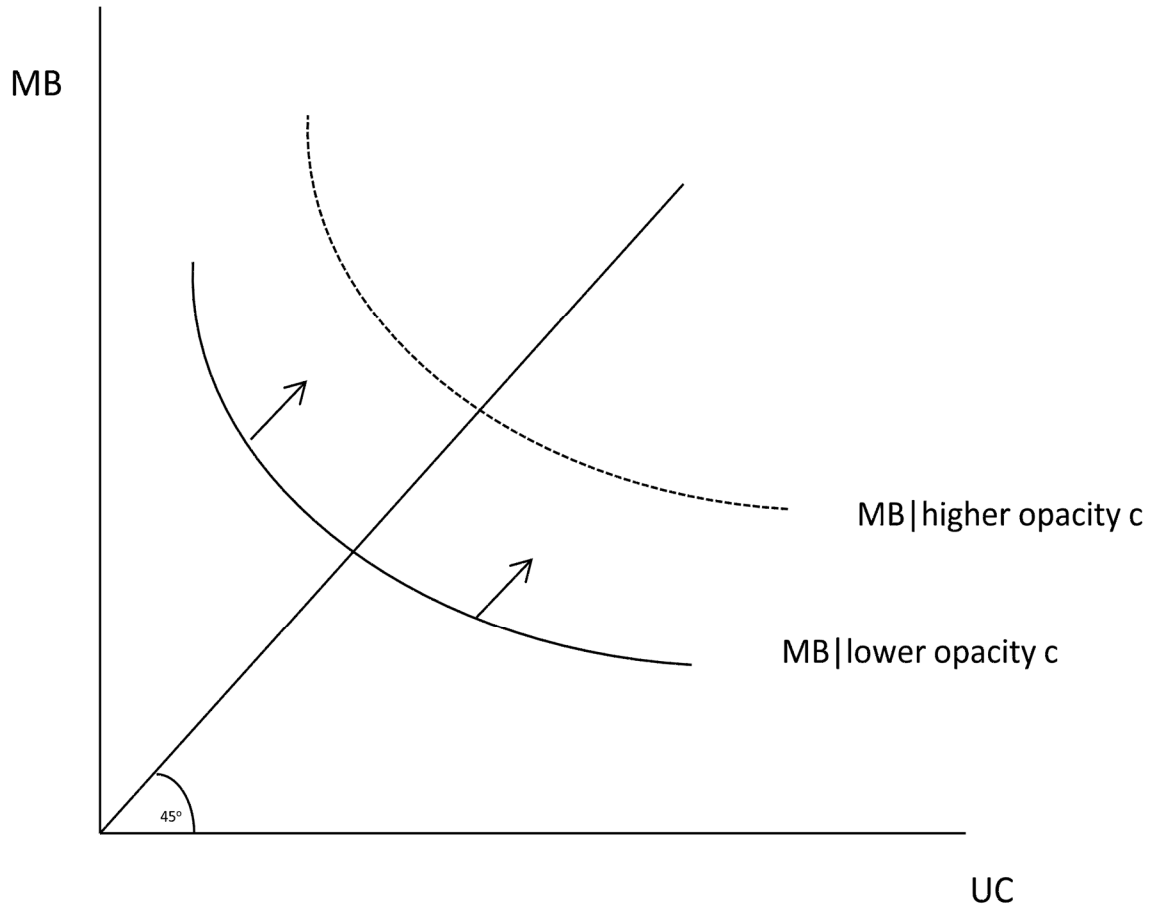

Table 1. Definitions of Variables and Summary Statistics

* Number of observations with value equal to one.

Variable	Description	Mean	St. Dev.	# of Obs.
Total Underwriting Costs	Total underwriting fees and expenses relative to proceeds	0.070	0.037	3021
Gross Spread	Total fees to managers, syndicate and dealers relative to proceeds	0.062	0.023	3021
Dealers Concession	Fees paid to dealers relative to proceeds.	0.035	0.013	2828
Proceeds	Millions of raised. Calculated in 1990 values.	75.430	195.610	3021
Ln Proceeds	Natural logarithm of proceeds	3.480	1.287	3021
Vol. 160days	Standard deviation of the common stock return for the 160 day period before the offering	0.037	0.018	2778
Ln Market Value	Natural logarithm of the market value of the equity of the company	18.791	2.358	2670
Ln Sales	Natural logarithm of annual sales	4.058	2.515	2729
Ln (Sales/PPE)	Natural logarithm of sales prelative to property, plant and equipment	0.979	1.560	2722
Leverage	Total Debt over book value of assets	0.267	0.266	2819
CM Index	Bookrunner's reputation using Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The indicator variable equals 1 if the Carter-Manaster Index is 9 or higher, 0 otherwise.	1,115*		3021
Multibank	Indicator variable equals 1 if there are multiple bookrunners and 0 otherwise	244*		3021
Matched Lender	An indicator variable equal to 1 if the lead underwriter is also a lender to the issuer, based on the Calomiris-Pornrojnangkool (2009) definition of a recent transaction, either before or after the underwriting.	42*		1077
Fully Marketed	Indicator variable equal to 1 if the deal is fully marketed and 0 otherwise	1,553*		1845
Shelf Regist.	An indicator variable equal to 1 if the deal is a shelf registration.	669*		3021
Time	Year; 1980= 1,… 2008=29			

Table 2. Distribution of common stock secondary offers 1980-2008

The sample consists of the common stock seasoned equity offerings in the SDC database between January 1st, 1980 and December 31st, 2008. Utilities (SIC codes 4900–4949) and financial firms (SIC codes 6000–6999) are excluded. Excluded are also rights offerings, pure secondary offerings, ADRs, best efforts and non-Securities and Exchange Commission (SEC)-registered offers, closed-end funds and REITs. The issuer needs to be listed on CRSP and have data for at least 180 days before the offering and also must have accounting information on COMPUSTAT for the year before the offering.

Year	Number of Issues	Percent
1980	118	3.9
1981	116	3.83
1982	74	2.44
1983	218	7.2
1984	50	1.65
1985	73	2.41
1986	86	2.84
1987	99	3.27
1988	35	1.16
1989	53	1.75
1990	50	1.65
1991	145	4.79
1992	138	4.56
1993	164	5.42
1994	109	3.6
1995	141	4.66
1996	160	5.28
1997	120	3.96
1998	75	2.48
1999	103	3.4
2000	119	3.93
2001	70	2.31
2002	80	2.64
2003	121	4
2004	126	4.16
2005	113	3.73
2006	93	3.07
2007	118	3.9
2008	61	2.01
Total	**3,028**	**100**

Table 3. Underwriting spreads of common stock secondary offerings, by size, 1980-2008

The sample consists of the common stock seasoned equity offerings in the SDC database between January 1st, 1980 and December 31st, 2008. Utilities (SIC codes 4900–4949) and financial firms (SIC codes 6000–6999) are excluded. Excluded are also rights offerings and pure secondary offerings. The issuer needs to be listed on CRSP and have data for at least 180 days before the offering and also must have accounting information on COMPUSTAT for the year before the offering. Total Cost is calculated as gross spread plus expenses. Proceeds is the total amount raised (1990 dollars, in millions).

Proceeds ($ millions)	**Number of Issues**	**Mean Total Cost (%)**	**Mean Gross Spread (%)**	**Mean Dealer's Concession (%)**
1.2 to $10	566	11.427	9.233	4.841
10 to $20	445	7.671	6.680	3.550
20 to $30	349	6.793	6.038	3.366
30 to $50	519	6.150	5.675	3.125
50 to $80	440	5.665	5.321	2.935
$80 +	702	4.572	4.370	2.443
Total	**3021**	**6.999%**	**6.173%**	**3.344%**

Table 4. Distribution of secondary equity offerings and spreads by offering method

The sample is described in Table 1. Seasoned equity offerings can be classified into fully marketed offers and accelerated offers. Accelerated offers include bought deals and accelerated bookbuild offers. Total cost is defined as gross spread plus expenses.

	Accelerated Bookbuild			Bought Deal			Fully Marketed				Total Number of SEOs		
Year	Number	Mean Proceeds	Mean Total Cost (%)	Number	Mean Proceeds	Mean Total Cost (%)	Number	Mean Proceeds	Mean Total Cost (%)	Type no Available	Total Number	Mean Proceeds	Mean Total Cost (%)
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(XI)	(XII)	(XIII)	(XIV)
1991	0	0.00	0.00%	0	0.00	0.00%	112	55.30	7.74%	33	145	52.20	8.14%
1992	0	0.00	0.00%	0	0.00	0.00%	115	51.33	9.77%	23	138	49.50	10.23%
1993	0	0.00	0.00%	0	0.00	0.00%	136	57.73	7.99%	28	164	52.23	9.17%
1994	0	0.00	0.00%	1	231.63	3.12%	89	55.81	8.45%	19	109	49.91	9.33%
1995	0	0.00	0.00%	0	0.00	0.00%	118	72.05	6.60%	23	141	66.63	7.20%
1996	0	0.00	0.00%	0	0.00	0.00%	145	67.50	8.10%	15	160	63.68	8.21%
1997	1	9.11	6.55%	1	57.42	4.30%	100	57.86	7.78%	18	120	56.58	8.11%
1998	1	59.37	4.74%	3	119.45	4.54%	61	105.39	6.97%	10	75	104.37	7.11%
1999	1	36.33	2.18%	6	157.20	4.52%	90	118.49	6.87%	6	103	122.33	6.75%
2000	1	55.04	5.17%	9	206.05	3.44%	102	166.64	6.48%	7	119	167.01	6.16%
2001	11	85.89	5.20%	15	74.72	4.59%	40	120.94	6.83%	4	70	102.08	6.00%
2002	15	199.09	4.98%	9	71.72	3.48%	54	108.42	6.23%	2	80	119.74	5.67%
2003	19	126.01	5.19%	17	141.24	2.30%	78	84.83	5.98%	7	121	107.45	5.30%
2004	20	250.97	4.68%	18	92.42	2.42%	85	94.70	6.17%	3	126	119.78	5.38%
2005	16	146.22	4.94%	18	118.87	2.30%	77	72.32	6.37%	2	113	90.88	5.54%
2006	18	124.77	5.60%	16	131.95	2.18%	57	71.88	6.15%	2	93	91.33	5.36%
2007	25	86.85	4.63%	13	101.52	2.83%	76	120.87	5.96%	4	118	110.83	5.34%
2008	31	471.86	4.67%	8	47.91	3.34%	20	116.04	6.23%	2	61	293.76	5.02%
Total	**159**	206.85	**4.93%**	**134**	113.66	**3.00%**	**1,555**	82.98	**7.24%**	**208**	**2,056**		

Table 5. Quartile Analysis of Underwriting Trends

Proceeds is the total amount raised.

Years 1980-89	**Q1**	**Q2**	**Q3**	**Q4**
Total Underwriting Cost	3.75%	5.44%	6.94%	10.52%
Mean Proceeds (1990 dollars, in millions)	96.33	24.67	13.76	5.23
Mean Sales (1990 dollars, in millions)	2031.01	278.59	140.52	21.70
Years 1990-99	**Q1**	**Q2**	**Q3**	**Q4**
Total Underwriting Cost	4.51%	6.45%	8.15%	14.28%
Mean Proceeds (1990 dollars, in millions)	172.09	56.81	31.87	9.67
Mean Sales (1990 dollars, in millions)	2027.22	206.76	103.80	21.63
Years 2000-08	**Q1**	**Q2**	**Q3**	**Q4**
Total Underwriting Cost	3.02%	5.33%	6.17%	7.66%
Mean Proceeds (1990 dollars, in millions)	375.71	132.52	84.45	70.56
Mean Sales (1990 dollars, in millions)	3048.98	586.57	274.50	113.02

Table 6. Total Underwriting Costs

The sample is described in Table 1. The dependent variable is total underwriting costs relative to proceeds. Proceeds is the total amount raised. Proceeds and sales are in 1990 dollars, in millions. Ln Proceeds is the natural logarithm of proceeds. Vol. 160days is the standard deviation of the common stock rate of return for the 160 day period before the offering. Ln Market Value is the natural logarithm of market value of the stock of the company. Ln Sales is the natural logarithm of sales and Ln Sales^2 is the LnSales squared. Ln Sales/PPE is the natural logarithm of sales relative to property, plant and equipment. Time is a time trend variable. Sales_time is sales*time. CM Index is the bookrunner's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. If there are multiple bookrunners, we use the maximum ranking among all the bookrunners. Multibank is an indicator variable equal to 1 if there are multiple bookrunners and 0 otherwise. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Ln Proceeds	-0.0182***	-0.0112***	-0.0119***	-0.0121***	-0.0125***
	(0.0007)	(0.0016)	(0.0017)	(0.0018)	(0.0019)
Vol. 160days		0.3773***	0.3451***	0.3550***	0.3506***
		(0.0419)	(0.0418)	(0.0418)	(0.0433)
Ln Market Value		-0.0022***	-0.0026***	-0.0024***	-0.0021***
		(0.0005)	(0.0005)	(0.0005)	(0.0005)
Ln Sales		-0.0028***	-0.0048***	-0.0051***	-0.0053***
		(0.0005)	(0.0007)	(0.0008)	(0.0008)
Ln Sales^2		0.0002**	0.0002**	0.0003***	0.0003***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Ln Sales/PPE		0.0012***	0.0011***	0.0013**	0.0018***
		(0.0004)	(0.0004)	(0.0005)	(0.0005)
Time			-0.0002**	-0.0001	-0.0002**
			(0.0001)	(0.0001)	(0.0001)
Ln Sales _time			0.0001***	0.0001***	0.0001***
			(0.0000)	(0.0000)	(0.0000)
Leverage					0.0081**
					(0.0033)
CM Index					0.0014
					(0.0017)
Multibank					0.0075***
					(0.0013)
Market Activity					0.0019**
					(0.0007)
Constant	0.1334***	0.1398***	0.1547***	0.2311***	0.2111***
	(0.0029)	(0.0060)	(0.0062)	(0.0054)	(0.0090)
N	3021	2503	2503	2503	2496
adj. R^2	0.383	0.427	0.438	0.441	0.447

Table 7. Gross Spread and Firm Characteristics

The sample is described in Table 1. The dependent variable is gross spread. Proceeds is the total amount raised. Proceeds and sales are in 1990 dollars, in millions. Ln Proceeds is the natural logarithm of proceeds. Vol. 160days is the standard deviation of the common stock rate of return for the 160 day period before the offering. Ln Market Value is the natural logarithm of market value of the stock of the company. Ln Sales is the natural logarithm of sales and Ln Sales^2 is the LnSales squared. Ln Sales/PPE is the natural logarithm of sales relative to property, plant and equipment. Time is a time trend variable. Sales_time is sales*time. CM Index is the bookrunner's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. If there are multiple bookrunners, we use the maximum ranking among all the bookrunners. Multibank is an indicator variable equal to 1 if there are multiple bookrunners and 0 otherwise. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Ln Proceeds	-0.0128***	-0.0054***	-0.0051***	-0.0049***	-0.0050***
	(0.0003)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Vol. 160days		0.1373***	0.1319***	0.1377***	0.1511***
		(0.0211)	(0.0208)	(0.0211)	(0.0216)
Ln Market Value		-0.0025***	-0.0025***	-0.0024***	-0.0022***
		(0.0003)	(0.0002)	(0.0003)	(0.0003)
Ln Sales		-0.0021***	-0.0047***	-0.0047***	-0.0045***
		(0.0003)	(0.0004)	(0.0005)	(0.0005)
Ln Sales^2		0.0000	0.0000	0.0000	0.0000
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln Sales/PPE		0.0011***	0.0010***	0.0012***	0.0015***
		(0.0003)	(0.0002)	(0.0003)	(0.0004)
Time			-0.0007***	-0.0006***	-0.0006***
			(0.0001)	(0.0001)	(0.0001)
Ln Sales _time			0.0002***	0.0001***	0.0001***
			(0.0000)	(0.0000)	(0.0000)
Leverage					0.0060***
					(0.0018)
CM Index					0.0001
					(0.0006)
Multibank					0.0086***
					(0.0009)
Market Activity					-0.0005
					(0.0005)
Constant	0.1063***	0.1287***	0.1390***	0.2290***	0.2248***
	(0.0012)	(0.0038)	(0.0040)	(0.0032)	(0.0049)
N	3021	2503	2503	2503	2496
adj. R^2	0.492	0.533	0.550	0.558	0.570

Table 8. Dealers Concession and Firm Characteristics

The sample is described in Table 1. The dependent variable is dealer's concession relative to proceeds. Proceeds is the total amount raised. Proceeds and sales are in 1990 dollars, in millions. Ln Proceeds is the natural logarithm of proceeds. Vol. 160days is the standard deviation of the common stock rate of return for the 160 day period before the offering. Ln Market Value is the natural logarithm of market value of the stock of the company. Ln Sales is the natural logarithm of sales and Ln Sales^2 is the LnSales squared. Ln Sales/PPE is the natural logarithm of sales relative to property, plant and equipment. Time is a time trend variable. Sales_time is sales*time. CM Index is the bookrunner's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. If there are multiple bookrunners, we use the maximum ranking among all the bookrunners. Multibank is an indicator variable equal to 1 if there are multiple bookrunners and 0 otherwise. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Ln Proceeds	-0.0065***	-0.0031***	-0.0031***	-0.0031***	-0.0032***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Vol. 160days		0.0703***	0.0652***	0.0654***	0.0660***
		(0.0133)	(0.0132)	(0.0131)	(0.0134)
Ln Market Value		-0.0010***	-0.0011***	-0.0011***	-0.0010***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Ln Sales		-0.0009***	-0.0021***	-0.0021***	-0.0022***
		(0.0002)	(0.0003)	(0.0003)	(0.0003)
Ln Sales^2		0.0000	-0.0000	0.0000	0.0000
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln Sales/PPE		0.0004***	0.0004***	0.0006***	0.0009***
		(0.0001)	(0.0001)	(0.0002)	(0.0002)
Time			-0.0003***	-0.0002**	-0.0002**
			(0.0001)	(0.0001)	(0.0001)
Ln Sales _time			0.0001***	0.0001***	0.0001***
			(0.0000)	(0.0000)	(0.0000)
Leverage					0.0042***
					(0.0009)
CM Index					0.0012***
					(0.0004)
Multibank					0.0028***
					(0.0006)
Market Activity					-0.0002
					(0.0002)
Constant	0.0561***	0.0636***	0.0691***	0.0970***	0.0706***
	(0.0007)	(0.0019)	(0.0021)	(0.0017)	(0.0031)
N	2828	2341	2341	2341	2334
adj. R^2	0.375	0.521	0.539	0.543	0.554

Table 9. Gross Spread, Dealers Concession and Firm Characteristics / Comparison with Hansen

The sample is described in Table 1. The dependent variable is the gross spread in specifications 1-5 and dealers concession in 6-7. Proceeds, Ln Proceeds, Vol. 160 days, Ln Market Value, Ln Sales, Ln Sales^2, Ln Sales/PPE, Time, Sales_time, CM Index and Multibank are explained in Table 6. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

Dependent Variable:	**Gross Spread**					**Dealers Concession**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1/Proceeds	0.0982***	0.0715***	0.0576***	0.0529***	0.0488***	0.0594***	0.0388***
	(0.0117)	(0.0103)	(0.0102)	(0.0098)	(0.0095)	(0.0046)	(0.0039)
Proceeds/MVE	1.4564**	1.8458***	1.6497***	1.5377***	1.1374***	0.7593**	0.6509***
	(0.7083)	(0.2199)	(0.1732)	(0.1813)	(0.1675)	(0.3212)	(0.0933)
Vol. 160days	0.3055***	0.0826***	0.1110***	0.1259***	0.1325***	0.1455***	0.0525***
	(0.0242)	(0.0227)	(0.0227)	(0.0229)	(0.0228)	(0.0132)	(0.0135)
Ln Sales		-0.0021***	-0.0042***	-0.0046***	-0.0045***		-0.0018***
		(0.0003)	(0.0005)	(0.0006)	(0.0005)		(0.0003)
Ln Sales^2		-0.0002***	-0.0002***	-0.0002***	-0.0002***		-0.0001***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
Ln Sales/PPE		0.0020***	0.0019***	0.0022***	0.0025***		0.0012***
		(0.0003)	(0.0003)	(0.0003)	(0.0004)		(0.0002)
Time			-0.0008***	-0.0007***	-0.0006***		-0.0002**
			(0.0001)	(0.0001)	(0.0001)		(0.0001)
Ln Sales _time			0.0001***	0.0001***	0.0001***		0.00003**
			(0.0000)	(0.0000)	(0.0000)		(0.0000)
CM Index					-0.0029***		-0.0003
					(0.0006)		(0.0003)
Multibank					0.0066***		0.0016**
					(0.0010)		(0.0006)
Leverage					0.0100***		0.0059***
					(0.0018)		(0.0008)
Market Activity					-0.0004		-0.0001
					(0.0005)		(0.0002)
Constant	0.0426***	0.0651***	0.0786***	0.0977***	0.1757***	0.0235***	0.0467***
	(0.0009)	(0.0018)	(0.0031)	(0.0046)	(0.0053)	(0.0005)	(0.0022)
N	2591	2503	2503	2503	2496	2421	2334
adj. R^2	0.343	0.488	0.505	0.526	0.542	0.294	0.554

Table 10. Gross Spread, Dealers Concession and Firm Characteristics (Dealogic Sample)

The sample is described in Table 1. The dependent variable is the gross spread in specifications 1-6 and dealers concession in 7-8. Fully Marketed is an indicator variable equal to 1 if the deal is fully marketed and 0 otherwise. Proceeds, Ln Proceeds, Vol. 160 days, Ln Market Value, Ln Sales, Ln Sales^2, Ln Sales/PPE, Time, Sales_time, CM Index and Multibank are explained in Table 6. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

Dependent Variable:	**Gross Spread**						**Dealers Concession**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Proceeds	-0.0036***	-0.0041***	-0.0047***	-0.0050***	-0.0047***	-0.0050***	-0.0028***	-0.0028***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0003)	(0.0003)
Vol. 160days	0.0998***	0.1110***	0.0922***	0.1036***	0.0932***	0.1020***	0.0586***	0.0564***
	(0.0184)	(0.0186)	(0.0185)	(0.0181)	(0.0186)	(0.0184)	(0.0123)	(0.0126)
Ln Market Value	-0.0022***	-0.0021***	-0.0012***	-0.0011***	-0.0013***	-0.0011***	-0.0006***	-0.0006***
	(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
Ln Sales	-0.0041***	-0.0035***	-0.0039***	-0.0034***	-0.0039***	-0.0034***	-0.0016***	-0.0016***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0003)	(0.0003)
Ln Sales^2	-0.0001*	-0.0001**	-0.0001	-0.0001*	-0.0001	-0.0001*	-0.00003	-0.00003
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00002)	(0.00002)
Ln Sales/PPE	0.0010**	0.0011**	0.0007**	0.0009***	0.0008**	0.0009***	0.0006***	0.0006***
	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Time	-0.0009***	-0.0010***	-0.0004***	-0.0005***	-0.0005***	-0.0005***	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Ln Sales _time	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***	0.00005***	0.00005***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00001)	(0.00001)
Leverage		0.0033**		0.0041**		0.0041**	0.0029***	0.0030***
		(0.0018)		(0.0017)		(0.0017)	(0.0008)	(0.0008)
CM Index		0.0008		-0.0001		-0.0001	0.0009**	0.0009**
		(0.0007)		(0.0006)		(0.0006)	(0.0004)	(0.0004)
Multibank		0.0105***		0.0078***		0.0078***	0.0025***	0.0026***
		(0.0010)		(0.0009)		(0.0009)	(0.0006)	(0.0006)

Fully Marketed			0.0165***	0.0158***	0.0169***	0.0158***	0.0089***	0.0088***
			(0.0011)	(0.0010)	(0.0011)	(0.0011)	(0.0008)	(0.0008)
Shelf Regist.					0.0012*	0.0001		-0.0004
					(0.0007)	(0.0008)		(0.0004)
Market Activity						0.0004		0.0004
						(0.0005)		(0.0003)
Constant	0.1344***	0.1365***	0.1021***	0.1107***	0.1038***	0.0954***	0.0503***	0.0468***
	(0.0048)	(0.0049)	(0.0035)	(0.0046)	(0.0037)	(0.0054)	(0.0023)	(0.0031)
N	1787	1785	1646	1644	1646	1644	1517	1517
adj. R^2	0.542	0.567	0.630	0.649	0.630	0.648	0.593	0.594

Table 11. Comparing Time Effects Across Specifications

The table summarizes the coefficients for time and its interaction with log sales from the last columns of Tables 6-8, and 12-17.Sales are in 1990 dollars, in millions.

Tables 6-8 (Whole Sample)	**Total Underwriting Cost**	**Gross Spread**	**Dealers Concession**
Coef. Time	-0.0002***	-0.0006***	-0.0002***
	(0.0001)	(0.0001)	(0.0001)
Coef. Ln Sales _time	0.0001***	0.0001***	0.0001***
	(0.0000)	(0.0000)	(0.0000)
Mean Ln Sales	4.1911	4.1911	4.1983
St. Dev. Ln Sales	2.4735	2.4735	2.4602
No. of Obs.	2496	2496	2334
Tables 10 and repetition of table 10 with UC and DC as dependent variables. (1991-2008)	**Total Underwriting Cost**	**Gross Spread**	**Dealers Concession**
Coef. Time	-0.0021***	-0.0005***	-0.0001
	(0.0002)	(0.0001)	(0.0001)
Coef. Ln Sales _time	0.0003***	0.0001***	0.0000***
	(0.0000)	(0.0000)	(0.0000)
Mean Ln Sales	4.2347	4.2347	4.23018
St. Dev. Ln Sales	2.5202	2.5202	2.51136
No. of Obs.	1644	1644	1517

Table 12. Underwriting Cost (Gross Spread) and Firm Characteristics

The sample is described in Table 1. The dependent variable is gross spread. Fully Marketed is an indicator variable equal to 1 if the deal is fully marketed and 0 otherwise. Proceeds, Ln Proceeds, Vol. 160 days, Ln Market Value, Ln Sales, Ln Sales^2, Ln Sales/PPE, Time, Sales_time, CM Index and Multibank are explained in Table 6. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Ln Proceeds	-0.0065***	-0.0065***	-0.0065***	-0.0065***	-0.0065***	-0.0066***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Vol. 160days	0.1243***	0.1183***	0.1243***	0.1183***	0.1242***	0.1101***
	(0.0219)	(0.0216)	(0.0219)	(0.0216)	(0.0220)	(0.0221)
Ln Market Value	-0.0011***	-0.0009***	-0.0011***	-0.0009***	-0.0011***	-0.0009***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Ln Sales	-0.0039***	-0.0042***	-0.0039***	-0.0042***	-0.0039***	-0.0042***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)
Ln Sales^2	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln Sales/PPE	0.0006*	0.0008**	0.0006*	0.0008**	0.0006*	0.0008**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Time	-0.0005**	-0.0005**	-0.0005**	-0.0005**	-0.0005**	-0.0005**
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Sales_time	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Leverage		0.0051***		0.0051***		0.0053***
		(0.0014)		(0.0014)		(0.0014)
CM Index		0.0007		0.0007		0.0006
		(0.0007)		(0.0007)		(0.0007)
Multibank		0.0025		0.0025		0.0026
		(0.0013)		(0.0013)		(0.0013)
FM Shelf Regist.					-0.0001	-0.0007
					(0.0009)	(0.0009)
Market Activity						0.0012
						(0.0006)
Constant	0.1024***	0.1155***	0.1024***	0.1155***	0.1109***	0.1059***
	(0.0046)	(0.0040)	(0.0046)	(0.0040)	(0.0043)	(0.0059)
N	855	853	855	853	855	853
adj. R^2	0.640	0.647	0.640	0.647	0.640	0.648

Table 13. Change in Price and Marketing Effort

The sample is described in Table 1. The table reports regression results for price improvement, which is regressed on the residual gross spreads derived from the regressions in Table 12. The dependent variable "price improvement" is defined using excess returned adjusted for Fama-French factors. The excess returns are calculated for the window beginning eleven days prior to the offering and ending one day prior to the offering. That window covers the interval of time subsequent to the announcement date (which, for fully marketed offerings, occurs more than two weeks prior to the offering) and prior to the offering date, at which point underwriting costs are disclosed. Robust standard errors are reported in parentheses. *** and ** indicate significance at the 1% and 5% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
GS residuals	1.3379*	1.3827**	1.3379*	1.3827**	1.3381*	1.4727**
	(0.5204)	(0.5258)	(0.5204)	(0.5258)	(0.5205)	(0.5276)
_cons	-0.0198***	-0.0199***	-0.0198***	-0.0199***	-0.0198***	-0.0199***
	(0.0041)	(0.0042)	(0.0041)	(0.0042)	(0.0041)	(0.0042)
N	782	780	782	780	782	780
adj. R^2	0.007	0.008	0.007	0.008	0.007	0.009