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The Long-Run Behavior of Debt and Equity Underwriting Spreads

Dongcheol Kim, Darius Palia and Anthony Saunders

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by

Dongcheol Kim[a]

Darius Palia[a]

and

Anthony Saunders[b]

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Abstract

This paper is the first to look at the long-run (30-year) behavior of underwriting spreads in the markets for corporate equity and debt. Specifically, we analyze the determinants of underwriting spreads on corporate bond issues, secondary equity offerings and initial public offerings over the period 1970-2000. We explain the time-varying cross-sectional behavior of these spreads by analyzing three sets of variables or factors: macro (systematic) factors, investment banking market structure factors and issuer specific characteristics. We also analyze the relationship between the direct costs (underwriting spreads) and indirect costs (underpricing) of new issues. Among our many results we find an apparent decline in spreads over time, an increased clustering in spreads for both IPOs and SEOs, the dominance of issuer- specific characteristics in explaining spreads, and a relatively weak linkeage between the direct and indirect costs of issuance.

[a] Associate Professor of Finance and Economics, Rutgers Business School, and [b] John M. Schiff Professor of Finance, Stern School of Business at New York University, respectively. We thank Alex Ljungqvist, Eli Ofek, and Manju Puri for helpful comments and suggestions. All errors remain our responsibility.

1. Introduction

Some recent papers (for example, Fama and French 2001) have found strong support for Donaldson's (1961) pecking order theory of financing choice, wherein internally generated funds are preferred over debt to fund investment projects, and debt itself is preferred over outside equity. One quite neglected set of factors impacting the choice between debt and equity are differences in the transaction costs of issuance between the two types of securities.[1] These transaction costs can be broken into two broad categories, "direct costs" to the issuer (or the gross fees charged by an investment or commercial bank), and "indirect costs" to the issuer (any underpricing that might have occurred on the first day of issue). This paper focuses on the direct costs of issuance using a long time series for three types of securities, namely, seasoned public equity offerings (SEOs), new or initial public equity offerings (IPOs), and public corporate debt issues.

While an extensive literature has evolved regarding the indirect costs or underpricing of IPOs (see, Ritter and Welch 2002), a much smaller literature exists regarding the direct costs, or the gross fees, paid to underwriters of IPOs. In addition, while the degree of underpricing is important for IPOs, and reflects a major indirect cost borne by issuing firms, the degree of underpricing for SEOs and corporate debt offerings has generally been found to be much smaller.[2] This implies that for SEOs and debt offerings, the bulk of the transaction costs to the issuer will be reflected in the gross fees paid to the underwriter(s) as well as other expenses relating to the security's issue, such as legal and auditing costs and expenses. While data on other expenses is somewhat sketchy and not frequently available (see, for example, Altinkilic and Hansen 2000, and Lee, Lochhead, Ritter and Zhao 1996, – henceforth LLRZ), considerable information is available regarding the direct costs or gross compensation paid by issuers to the underwriters of their securities. As Ritter and Welch (2002) imply in their review of IPO underpricing, we know very little about the behavior of

[1] Many other reasons, such as asymmetric information e.g., between managers and debt and/or equity holders, have been posited in the theoretical and empirical capital structure literature (see Harris and Raviv 1991 and Smith 1986 for excellent surveys of these arguments).

underwriting spreads and in particular, about the factors that drive these spreads over relatively long periods of time.[3]

Specifically, over relatively long periods of time, in addition to issuer firm-specific characteristic, changes in systematic or macroeconomic factors and competitive conditions in the market for underwriting services (such as the entrance of commercial banks into this market) may also be reflected in spreads.[4]

Accordingly, this paper seeks to make three contributions to the existing literature on the direct transaction costs of securities issuance. First, this is one of the first to analyze the behavior of underwriting spreads over a long period of time on different types of publicly traded U.S. corporate securities. In particular, using a large number of issuing firms, for the years 1970 through 2000, we examine the cross-section time-series variation in underwriting spreads for three major types of corporate securities, SEOs, IPOs, and corporate debt issues, so as to gain insights into: (i) the general behavior of spreads over time and (ii) the relative size of spreads as a measure of the direct costs of securities issuance relative to the indirect costs of issuance (i.e., underpricing).

Second, the existing empirical literature has yet to investigate the relative impact of systematic factors or macroeconomic risk factors on spreads. For example, Gande, Puri and Saunders (1999) largely focus on competitive conditions while others, e.g., Altinkilic and Hansen (2000), and Hansen (2002) largely focus on issuer firm-specific characteristics. In this paper we examine the additional impact of a comprehensive set of systematic or macroeconomic variables on IPO, SEO, and corporate debt underwriting spreads as well. In particular, we include in our statistical tests (one-month lagged) values of: (i) the three Fama and French (1993) factors which have been shown to be correlated with stock returns (i.e., the value-weighted market portfolio, the size factor and the

[2] For example, Datta, Datta and Patel (1997) show in a small sample of 50 firms that first day (short term) returns on corporate bond issues were insignificantly different from zero.
[3] For example, previous studies that analyzed spreads have usually employed quite short time periods (see, for example LLRZ who look at 1990-94 and Altinkilic and Hansen (2000) who look at 1990-97).

book-to-market factor), (ii) the Carhart (1997) momentum factor, (iii) monthly returns on one-year, five-year and 20-year government bonds, so as to control for term structure and inflationary expectations effects,[5] (iv) the return on Ritter's value-weighted IPO index, in order to capture systematic effects in the new issue markets, not captured by the three Fama and French factors plus the momentum factor, and (v) the return on a value- weighted market index in the 15 days before the new issue (see Loughran and Ritter 2002).

Third, we also include in our tests a wide set of issuer firm-specific variables and (underwriting) market condition variables. Following Hansen (2001) who analyzes IPO spreads only, we incorporate issuer firm-specific variables that reflect profitability and leverage. We also control for the size of issuer proceeds, whether or not there was an over allotment option (see Hansen, Fuller and Janjigian 1987), the reporting of financial information by the firm and where relevant (in the case of corporate bonds) Moody's credit rating of the issue, its maturity and callability. With respect to underwriting market conditions, we control for the entry of commercial banks into the market for corporate securities underwriting (see, Gande, Puri and Saunders 1999) and the market share of lead underwriters (see, Aggarwal, Prabhala and Puri 2002, Megginson and Weiss 1991, and Carter and Manaster 1990).

Briefly, our major findings are summarized below. First, with respect to the *time-series* of underwriting spreads we find:

1. A gradual secular decline in median and (for IPO and SEOs) mean or average underwriting spreads over the last three decades. Specifically, for all three spreads (IPOs, SEOs and corporate debt) the 1970s had the highest median underwriting spreads, followed by the 1980s, with the 1990s having the lowest median spreads. The decline in

[4] Rather than talking about the absolute level of underwriting fees (in dollars), we concentrate on underwriter fees defined as the difference between the offered amount and the proceeds to the issuer as a percentage of the offered amount (issue size).

[5] Since one of the objectives of this paper is to look at the effects of systematic and macroeconomic factors on spreads, we do not explicitly deflate independent variables such as new issue proceeds for price level effects, rather we try to control for such factors by including them as components of explanatory (macroeconomic), control variables e.g., inflationary expectations being reflected in Treasury bill rates.

spreads in the 1990s was statistically significant compared to those in the 1970s and 1980s.

2. Consistent with the findings of Chen and Ritter (2000) and Hansen (2001), we find a clustering of median IPO spreads around seven percent that gets stronger with the passage of time. Indeed, the median IPO spread is exactly seven percent in the 1990s. Interestingly, we also find an increased tendency for SEO spreads to cluster around five-percent, especially after 1989.
3. Over the 30-year period, we find average IPO spreads of 7.06%, with average underpricing on day of issue of 31.37%. Thus the long-term average ratio of direct to indirect costs for IPO issuers has been of the order of 25%. For SEOs we find average underwriting spreads of 5.01%, compared to average underpricing of 2.63% (a ratio of direct to indirect costs of 190%). This supports the widely held view that the direct costs of issuance are higher for SEOs than are the indirect costs. For corporate debt, we find average spreads of 1.15%. Given the difficulty of generating one-day returns for a sufficient number of debt IPOs, we did not directly calculate one-day returns. Nevertheless, for a very small sample of 50 firms, Datta, Datta, and Patel (1997) estimate first day returns on corporate debt to be close to zero (0.15%). Moreover the consensus in the literature to date appears to be that one-day returns on corporate debt issues are extremely small.[6] Consequently, the direct costs of corporate debt issuance, as with SEOs, appear to be more important on average than the indirect (underpricing) costs.
4. The direct costs (spreads) of SEO issuance appear to be positively correlated with indirect costs (underpricing). For IPOs direct and indirect costs appear to have been largely independent.

[6] See, for example, Ritter and Welch (2002).

Second, with respect to the systematic (macroeconomic) effects on underwriting spreads we find:

1. That systematic risk factors (jointly) have a statistically significant but small economic effect on all three underwriting spreads over the 30-year period. The impact of the systematic factors also appear to differ between expansionary and recessionary periods with their effect in recessions being stronger for debt issues.
2. All three Fama-French factors have no significant individual impact on spreads while the momentum factor has a positive and statistically significant impact on debt and SEO spreads.
3. The return on the (one-month lagged) IPO index has a positive and statistically significant relationship with all three underwriting spreads. Thus, we find a "sentiment index" that is correlated not only with IPO spreads but also with SEO and debt spreads as well.
4. The three-government bond returns factors *jointly* have a statistically significant effect on all three underwriting spreads.

Finally, with respect to the effects of issuer firm-specific variables and competitive conditions in the market for underwriting services we find:

1. Higher leverage has had a positive and statistically significant impact on debt spreads but no significant impact on either IPO or SEO spreads. Accounting measures of firm profitability have no significant impact on either debt or IPO spreads.
2. Consistent with prior studies we find that issuers with an overallotment option have a higher underwriting spread for IPOs. We also find a positive relationship for both SEOs and debt offerings.
3. Consistent with Gande, Puri and Saunders (1999), we find that longer maturity debt and non-investment grade debt have higher spreads while callable debt has lower spreads.

4. With respect to the market conditions for underwriting we find: (i) the market share of lead managers of an issue, in the year of offering, to be negatively related to all three underwriting spreads, (ii) the entry of commercial banks into the market for underwriting, to have had a significantly negative effect on debt spreads (consistent with Gande, Puri and Saunders 1999) and (iii) a significantly positive effect on SEO spreads (with the impact on IPO spreads being insignificant).

In the remainder of the paper, we discuss our sample in Section 2, and provide descriptive results regarding the long-run (30-year) behavior of spreads in Section 3. We describe and motivate the various independent variables used in our regression specifications in Section 4. Section 5 reports the results of statistical tests designed to determine the joint and individual effects of the different systematic factors, issuer firm-specific characteristics, and competitive factors on underwriting spreads over the last 30 years. Section 6 presents results analyzing the long-term relationship between the direct and indirect costs of underwriting SEOs and IPOs. Finally Section 7 is a conclusion

2. Data description and sample creation

The core database for our study is the US public new-issues database of the Securities Data Corporation (SDC). The SDC database is compiled from regulatory filings, news sources, company press releases and prospectuses. We examine 30 years of data 1970 through to 2000. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one- digit SIC code 4) and all firms whose gross spread data were missing from the SDC database. We obtained information on issuer firm-specific characteristics, such as the date of issuance, the size of the issue (proceeds), etc..., as well information on the underwriting market, such as the names of the lead managers of each issue and their individual annual shares of underwriting in the market under consideration. While some of these data are provided by SDC, we supplemented the SDC database with financial

variables drawn from Compstat. In the case of debt spreads, we excluded all convertible debt issues. This resulted in a final sample of 5645 issues for debt (compared to a total of 8085 issues available on SDC), 2691 issues of SEOs (compared to a total available SDC sample of 6573), and 2268 issues of IPOs (compared to a total SDC sample of 7517).

Using this sample of firms, we then obtained data for our systematic (macroeconomic) factors. The 15-day value-weighted return on the market index was obtained from CRSP, as was the one month lagged return on the market index. The Fama-French factors were obtained from Ken French, and the returns on the momentum factor were obtained from Mark Carhart. The return on the IPO index was obtained from Jay Ritter's website (http://bear.cba.ufl.edu/ritter). All three government bond return variables were obtained from the 2001 yearbook of stocks, bonds, bills and inflation published by Ibbotson Associates. We define recession quarters using NBER's Business Cycle Dating Committee Memorandum of May 2002. Accordingly, the NBER recession periods for our sample are: November to December 1970, November 1973 to March 1975, January 1980 to July 1980, July 1981 to November 1982, and July 1990 to March 1991.

3. The long-run behavior of underwriting spreads

In this section we provide preliminary evidence on the behavior of underwriting spreads over the 1970-2000 sample period. We present and discuss data for the whole-sample period, each decade, annually as well as quarterly, focusing on the time-variation shown in underwriting spreads. For each period, the 5^{th} percentile, average, median and 95^{th} percentile spreads are reported for each of the three classes of securities, publicly traded corporate debt, seasoned equity offerings (SEOs) and IPOs.

Panel A of Table 1 shows underwriting spreads for the sample of firms used in our regressions (i.e., firms for which we have data on both the dependent and independent variables). Panel B includes issues for which we have data on underwriting spreads only (i.e., firms for whom

we do not have complete data on the independent variables). Panel C presents one-day initial returns for IPOs and SEOs[7] -- where initial returns are computed as the difference between the closing price on the day issue and the offering price, expressed as a percentage of the offering price (consistent with Lee, Lochhead, Ritter, and Zhao 1996).

Table 1

As can be seen in Panels A and B of Table 1, the highest underwriting spreads occurred on average for IPOs, followed by SEOs and corporate debt offerings. Based on these data it is clear that underwriting spreads on debt are substantially lower than those on equity, and suggest that ignoring direct issuance costs, as part of the capital structure decision, may bias models of optimal capital structure towards lower debt-equity ratios than would be the case if real world frictions relating to direct transaction/issuance costs were incorporated into such models. Indeed, the mean or average underwriting spreads for our sample over the entire 1970-2000 periods were 1.149% for debt, 5.008% for SEOs, and 7.057% for IPOs.

From Table 1 Panels A and B, looking at the means and medians, there appears to be an increased tendency for IPO spreads to cluster around seven percent (Chen and Ritter 2000, Hansen 2002), and for SEOs to cluster around five-percent. While the former has been well recognized in the literature, the tendency for SEO spreads to cluster around five-percent has avoided much comment to date.

Panel C computes summary statistics on initial returns (one-day returns) for SEOs and IPOs. Since these returns reflect "money left on the table" by issuers they can be viewed as an "indirect" cost to firms of new securities issuance. Because most corporate bonds are traded OTC (and often infrequently), computing initial returns on corporate debt instruments is a difficult task. Nevertheless, Dutta, Dutta and Patel using a small sample of 50 issues over the 1976-1988 periods find average one-day returns on corporate bonds of approximately zero (0.15%). Indeed, the consensus in the

[7] Consistent with most of the extant literature, we were unable to compute the indirect costs of debt, because we do not have debt prices.

literature to date (for example, Ritter and Welch 2002, Chen and Ritter 2000, and Hansen 2002) appears to be that corporate debt underpricing is close to zero.

For SEOs and IPOs issues in our sample we computed initial one-day returns. We find that mean (median) one-day returns are 2.628% (0.926%) for SEOs, and 31.215%% (8.333%) for IPOs. This suggests that on average, the direct issuance costs of SEOs have been greater than their indirect costs, while for IPOs the reverse is clearly true. For debt, our sample's average underwriting spread of 1.149% is clearly higher than what most studies have found so far regarding the size of corporate debt underpricing.

Tables 2 through 4 breakdown spread data by decade and by year. Table 2 shows this breakdown for corporate debt offerings. While there are some atypical years, in general the mean and median debt spreads in the 1970s and 1980s appear to have been quite similar. However, as is especially clear from Panel A of Table 2, the mean and median debt underwriting spreads fell in the 1990s compared to the prior decades, e.g., mean (median) debt underwriting spreads of 1.746% (0.878%) in the 1980s, versus 0.843% (0.651%) in the 1990s. The decline and median spread differences between the 1970s versus 1990s, and 1980s versus 1990s are all statistically significant at the one-percent level. This decline in spreads is consistent with a major impact on debt spreads resulting from increased competition from commercial bank's Section 20 subsidiaries for much of the 1990's.[8] This result is also consistent with those found in Gande, Puri and Saunders (1999), who found enhanced competitive effects resulting from the entry of Section 20 subsidiaries into the market for underwriting services for debt issues over the period 1989-1994.

Table 2

Table 3 shows comparable results for SEO spreads. We find that both average and median spreads appear to have declined over the last three decades. Specifically, we find average (median)

[8] Selected section 20 subsidiaries of commercial banks were given corporate debt underwriting powers in 1989 and equity underwriting powers in 1990.

spreads of 5.637% (5.515%) in the 1970s, 5.524% (5.238%) in the 1980s and 4.709% (4.958%) in the 1990s. However, only the difference in mean and median spreads between the 1970s and 1990s, and 1980s and 1990s are significant at the one-percent level. There also appears to have been an increased clustering of spreads at the 5% level in the 1990s (see also the discussion of the quarterly results to follow).

Table 3

Table 4 shows the results for IPO spreads. As with debt and SEO spreads, both average and median spreads are lower in the 1990s compared to the 1980s and 1970s. Again, the 1990 spreads are significantly lower than those in the 1970s and 1980s. Also note the increased tendency for spreads to cluster in the 1990s at seven percent (see also Chen and Ritter 2000, and Hansen 2002). Indeed, not only is the median spread seven percent in the 1990s, but so is the 95th percentile IPO spread. Note that the number of IPOs in our 1970s sample is quite small because of the requirement that issuer firm-specific information be available so as to conduct the tests regarding the determination of spreads (see Section 5).

Table 4

Figures 1 and 2 graphically show trends in the quarterly mean and median spreads on debt, SEOs and IPOs respectively. Figure 1 shows a gradual lowering of mean quarterly spreads in the 1990s as compared to the 1980s and 1970s, confirming the results observed in Tables 2 through 4. This trend is also reflected in quarterly median spreads (Figure 2). Also apparent from Figures 1 and 2 is the tighter clustering of the quarterly mean and median spreads in the 1990s – especially of IPOs around seven percent and of SEOs around five percent.

Figures 1 and 2

4. Description of independent variables used in the regressions

In this section we describe the different independent variables used in our spread regressions. We classify these variables into three broad categories, namely macroeconomic or systematic variables, investment banking market structure variables, and issuer firm-specific variables. We describe these variables below.

4.1. Macroeconomic or systematic variables

Given that one facet of this paper is the magnitude of the impact on the costs of external capital from changes in the economic environment, we include a number of proxies that have been used in the literature to capture market risk and market timing.

Loughran and Ritter (2002) provide a prospect theory explanation for market timing of new issues and their cost. They argue that issuers bargain hard over the offer price in bad states of the world, and do not bargain as hard in good states of the world. Therefore, issuance costs might be higher in good states of the world than in bad, resulting in more money being left on the table in rising markets. As in their paper, we define a variable, *15 day*, which is the value-weighted market index in the 15-days prior to the offer date. We also include the three Fama and French (1993) factors, which have been shown to be correlated with stock returns. These are the value-weighted market portfolio (*Rmt*), the size factor (*SMB*), defined as the monthly returns on the smallest Fama-French portfolio minus the monthly returns on the largest Fama-French portfolio, and the book-to-market factor (*HML*), defined as the monthly returns on the highest book-to-market Fama-French portfolio minus the monthly returns on the lowest book-to-market Fama-French portfolio.

Jegadeesh and Titman (1993), among others, have found that momentum investing, i.e., a strategy of going long on past winners and going short on past losers tends to produce positive excess returns. In order to test if momentum investing is related to the costs of external capital, we include Carhart's (1997) momentum factor, defined as the monthly returns on an equally- weighted average of the highest 30 percent 11-month returns minus the monthly returns on an equally-weighted

average of the lowest 30 percent 11-month returns. We also include monthly returns on Ritter's value-weighted IPO index (*IPO*), in order to capture systematic effects in the new issue market, not captured by the three Fama and French factors plus the momentum factor. Finally, we include three variables to control for term structure and inflationary expectation effects. These three varaibles are the monthly returns on one-year government bills (*Tbill*), the monthly returns on five-year government bonds (*Inter*), and the monthly returns on 20-year government bonds (*Long*), respectively.

4.2. Investment banking market structure variables

Gande, Puri, and Saunders (1999) found that the entry of banks' section 20 subsidiaries into the market for underwriting debt issues in 1989, reduced debt underwriting spreads. Accordingly, we include a variable *Bank* that is set to unity if the securities issue was after 1988, and zero otherwise. Since, bank section 20 subsidiaries were only allowed to enter the SEO and IPO underwriting markets in 1990, we redefine the variable *Bank* for equity issues setting it equal to unity if the issue was after 1989, and zero otherwise.

The extant literature has found that issues underwritten by more reputable underwriters tend to have different first day returns from those issues underwritten by less reputable underwriters, (see for example, Carter and Manaster 1990, Megginson and Weiss 1991, and Aggarwal, Prabhala, and Puri 2002). Consistent with these papers, we include a variable *Mktshr*, defined as the total percentage underwriting market share of the lead managers of the issue in the year of issue, where each "market" is defined as debt, SEOs, and IPOs separately.

4.3. Issuer firm-specific variables

We examine a number of variables that capture issuer firm profitability, leverage and size (as in Hansen 2001, who examines IPOs only). Specifically, we include two measures of firm profitability; *ROA*, defined as the ratio of the firm's net income to total assets, and *Profit*, defined as the ratio of operating profit before depreciation to total assets. We include the leverage variable *Debt*,

defined as the ratio of total debt to assets. We found that neither SDC nor Compustat provided financial statement data for a number of issuer firms. Rather than discarding these firms, we included a dummy variable *Dumfin* that is set equal to unity when these variables were unavailable, and zero otherwise. Consistent with the previous literature (see for example, Hansen, and Gande, Puri, and Saunders 1999) we include a variable *Size*, defined as the natural logarithm of the dollar value of the issue size.

Ritter (1996) and Hansen, Fuller and Janjigian (1987) suggest that many issues include an over-allotment option that may add to the flotation cost of the issuer via the spread (see Hansen, Fuller and Janjigian (1987) pp. 24/25).[9] We create a dummy variable *Overallot*, which is set equal to unity when the issue has an over-allotment option, and zero otherwise.[10]

In the case of the corporate debt regressions, we include four other variables (see also, Gande, Puri, and Saunders (1999). The first two variables deal with the maturity of debt: *Lmat* is a dummy variable for short-term debt and is set to unity if the debt issue has a maturity less than five years, *Imat* is a dummy variable for intermediate-term debt and is set to unity if the debt issue has maturity between five years and 15 years. For debt whose maturity is greater than 15 years, both *Lmat* and *Imat* are set to zero. The third variable, is a credit rating variable. We define a variable *Rating*, that is set equal to unity if the firm has a Moody's speculative debt rating of Ba1 through C, and zero otherwise. Finally, we include a dummy variable *Callable* that is set equal to unity if the debt issue is a callable bond, and zero otherwise.

5. Regressions results on the determinants of underwriting spreads

In this section we analyze the individual and joint effects of systematic (macroeconomic), investment banking market structure and issuer firm-specific variables on debt and equity spreads.

[9] Hansen, Fuller and Janjigian (1987) p. 25 argue: "One way the issuing company can compensate the syndicate for managing the over allotment problem is to pay a larger underwriter spread on the offering date."

Specifically, in Table 5, we present the results of regressing debt and equity underwriting spreads on various macroeconomic (systematic), investment banking market structure, and issuer firm-specific factors. All regressions include industry dummies (at the one-digit SIC code level),[11] and coefficient standard errors are corrected for heteroscedasticity using the White correction. For convenience, each independent variable is defined again in Appendix A. In order to examine the relative importance of each category of variables (i.e., macroeconomic, market structure, issuer firm-specific), we then present the results of two tests in Table 6 regarding the joint importance and significance of each category of variables. The first is an F-test of the null hypothesis that the joint effect of each category of variables is zero. The second test relates to estimation of a coefficient of partial determination, or partial R^2, for each category of variables. The partial R^2 between a Y-variable (i.e., underwriting spreads in our case) and a set of X-variables (X_1), given that the other X-variables (X_2) are in the regression model, is calculated as [SSE (X_2)-SSE (X_1,X_2)] / SSE(X_2), where SSE(X_2) is the residual sum of squares when only X_2 variables are in the model, and SSE(X_1,X_2) is the residual sum of squares when both X_1 and X_2 variables are in the model. It should be noted that partial R^2's, while indicating the relative explanatory power of a group of variables, will not sum to the R^2 of the full model[12]. An explanation for this, following Pindyck and Rubenfeld (1981), is presented in Appendix B.

Tables 5 and 6

5.1. Debt spreads

The first column of Table 5 presents parameter coefficients and t-statistics when the dependent variable is the underwriting spread on debt issues.

5.1.1. Systematic or Macroeconomic variables

[10] Commonly the over allotment option allows for up to 15% more shares to issued and allocated to investors.
[11] For reasons of space the industry dummy variable coefficients are not reported.

Of the nine systematic or macroeconomic variables discussed earlier, three are statistically significant in Table 5 at the five-percent level: the Carhart momentum factor (*Mom*) and the t-bill return (*Tbill*) are both positively signed and the intermediate bond return is negatively signed (*Inter*). Table 6 shows that the null hypothesis that the joint effect of the nine macroeconomic variables on debt spreads is zero is rejected at the one-percent level.

The evidence on these macroeconomic factors suggests that when secondary markets are relatively hot (as reflected in the momentum factor), underwriters tend to widen spreads. Similarly when nominal t-bill rates (returns) are high spreads also widen.[13] However, while a significant joint effect of the macro-factors on debt spreads cannot be rejected at the 1% level, the partial R^2 on the nine macroeconomic variables is only 0.012. This result suggests that while macroeconomic factors may have a statistically significant impact on debt spreads, their effect is economically very small.[14]

5.1.2. Investment banking market structure variables

The two investment banking variables, bank entry (*Bank*) and lead manager's market share (*Mktshr*) are both significantly negative in the debt regression. The negative sign on the bank entry variable supports the earlier findings of Gande, Puri and Saunders (1999), for the relatively short 1989-94 period, i.e., that the entry of commercial banks as underwriters post-1988 has had a pro-competitive effect on the market for corporate debt underwriting. Interestingly, the lead manager's market share variable also has a negative sign. This may reflect the propensity of major lead managers to "low-ball" so as to build future market share (see Saunders and Srinivasan 2002), and/or reflects the fact that ex-ante, "major" lead managers tend to underwrite higher (credit) quality issues. Table 6 shows that the null hypothesis of no joint effect of the two investment banking market structure variables on debt spreads is strongly rejected at the one-percent level in a standard F-test.

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[12] All reported R^2s and partial R^2s are adjusted for degrees of freedom.

[13] One explanation for this result is that increased inflationary expectations implicit in higher nominal short-term rates make debt securities more sensitive to systematic/macroeconomic risk such as systemic default risk.

[14] The full model R^2 is 0.605.

The partial R^2 on the investment banking market structure variables is 0.065. This result suggests that banking market structure variables also have had a relatively small joint impact on debt spreads.

5.1.3. Issuer firm-specific characteristics

As in previous studies – see Altinkilic and Hansen (2000) for example – the major determinants of spreads, statistically speaking, appear to be issuer firm-specific characteristics. Of the ten characteristics employed in the debt regressions, eight are statistically significant; the only two that are statistically insignificant (at the five-percent level) are the *ROA* and *Profit* variables. For the statistically significant variables, spreads tend to be higher, the greater the issuer's leverage (*Leverage*), the less financial information the firm discloses on SDC and Compustat (*Dumfin*), the greater the use by the underwriter of an over-allotment option (*Overallot*), the longer the maturity of the debt (*Imat*), and the lower is its Moody's credit rating (*Rating*). To some extent, all of the variables are directly or indirectly proxying for the credit quality of the borrower and hence the risk faced by the underwriter should the issue fail to be placed. There are also three variables with negative signs, S*ize*, the dummy reflecting short maturity, i.e, less than five-years maturity (*Lmat*), and callability (*Callable*). The finding of the negative sign on S*ize* is consistent with economies of scale in debt underwriting. Table 6 shows that the null hypothesis that the joint effect of the ten issuer firm-specific variables on debt spreads is zero, is strongly rejected at the one-percent level. The partial R^2 on the issuer firm-specific variables is 0.517. This result suggests that issuer firm-specific variables have a large economic and statistically significant impact on debt spreads.

5.1.4. Macroeconomic variables and recessions

Over the sample period there were five, relatively short recession periods. We broke out, as a separate sub-sample, those debt issues that came to market in the recessionary period and re-estimated our spread regression for those observations (n=429). As might be expected the macroeconomic variables individually and jointly were more significant during this period. Specifically, five out of the eight independent variables (*15 day*, *HML*, *Mom*, *Tbill*, and *Inter*) were

statistically significant at the five-percent level, and the partial R^2 for the joint effect of the macroeconomic variables was 0.10, much larger than that found for the sample as whole (.012).[15]

5. 2. SEO spreads

We next carry out a similar analysis for the determinants of SEO spreads.

5.2.1. Macroeconomic variables

In Table 5, column 2, for SEOs, four of the nine macroeconomic variables are significant at the five-percent level. Interestingly, both the momentum variable (*Mom*) and the sentiment index (*IPO*) have positive effects on SEO spreads as does short term Treasury bill returns (*Tbill*). This again suggests that in relatively hot markets, investment banks' underwriting spreads tend to widen. Table 6 shows that the null hypothesis that the joint effect of the macroeconomic variables on SEO spreads is not significant is strongly rejected at the one-percent level in a standard F-test. The partial R^2 for the macroeconomic variables is 0.033. As in the case for debt spreads, we find that jointly the macroeconomic variables have a statistically significant but very small economic impact on SEO spreads.

5.2.2. Investment banking market structure variables

With respect to the investment banking variables, the commercial bank entry dummy variable *Bank* appears to have had a significant and *positive* effect on spreads. This is not surprising given the fact that others, e.g., Gande, Puri and Saunders (1999) and Mullineaux and Roten (2002) did not find similar pro-competitive effects from bank entry into equity underwriting compared to debt underwriting. One possible reason for this is that commercial banks' customer relationship effects and their expertise in monitoring may be better suited to underwriting debt instruments, such as loans and bonds, rather than equity instruments. As was the case for debt, the higher are the market shares of lead underwriters the lower are SEO spreads. The null hypothesis that both of these market structure variables are jointly zero is strongly rejected at the 1% level. The partial R^2 on the

[15] These results are not presented in Tabular form due to space considerations. However, the results are available from the authors on request.

investment banking market structure variables is 0.026. This result suggests that banking market structure variables have a statistically significant but small impact on SEO spreads, a result that is similar to that found for corporate debt spreads.

5.2.3. Issuer firm-specific characteristics

Since we are examining SEOs, variables such as debt maturity (*Lmat* and *Imat),* credit ratings (*Ratings*), and whether the debt is callable (*Callable*) were all dropped from the regression specification as they pertain to debt characteristics. Of the six remaining issuer firm-specific characteristics, three were statistically significant: *Profit*, *Size*, and *Overallot*. *Size* and over-allotment (*Overallot*) have the same positive signs as in the debt regression, while P*rofit* has a negative sign, i.e., more profitable firm issues have generally been charged smaller spreads. An F-test strongly rejects the null that the joint effect of issuer firm-specific variables is zero. The partial R^2 on the issuer firm-specific variables is 0.407. This result suggests that issuer firm-specific variables have a large and statistically significant impact on SEO spreads, which is generally consistent with that found for debt spreads.

5.2.4. Macroeconomic variables and the recession

As for debt, we also conducted similar tests for SEOs during recessionary periods. Here the size of the SEO sample was again quite small (n=161). In this case the partial R^2 for the macroeconomic variables was 0.019, less than the partial R^2 (0.033) found in the full sample regression. Overall, macroeconomic variables did not appear to explain much of the variation in SEO spreads – especially in recessionary periods.[16]

5.3. IPO Spreads

5.3.1. Macroeconomic variables

For IPOs two of the nine variables are independently significant: the sentiment index (*IPO*) and the return on Treasury-bills (*Tbill*). Nevertheless, we find that the null hypothesis of a zero joint

effect of the macroeconomic variables on IPO spreads is still rejected at the one-percent level in a standard F-test. The partial R^2 on the macroeconomic variables is 0.058. As before, we find that jointly macroeconomic variables have a statistically significant but relatively small impact on (IPO) spreads.

5.3.2. Investment banking market structure variables

For IPOs the commercial bank entry dummy variable (*Bank*) is statistically insignificant, although there is a strong and significantly negative effect coming from the market share variable (*Mktshr*), which also has a negative effect on spreads in both the debt and SEO regressions. The joint effect of the investment banking market structure variables is also significantly different from zero. The partial R^2 of the investment banking market structure variables is 0.003. This result suggests that banking market structure variables have a statistically significant, but very small, impact on IPO spreads, a result similar to that found for SEO spreads and thus appears to hold for equity spreads in general.

5.3.3. Issuer firm-specific characteristics

As with both debt and SEOs, most explanatory power regarding the variation of spreads over our long panel sample period comes from issuer firm-specific characteristics. Three of the six independent variables are statistically significant with *Size* having the expected negative sign (see Ritter and Welch 2002 for example) and with the *Dumfin* and *Overallot* variables having positive signs. With respect to the *Dumfi*n variable, the less financial information regarding the new issue that is available (in our case on SDC and Compustat), the higher the gross spread demanded by the underwriter. An F-test strongly rejects the null hypothesis that the joint effect of issuer firm-specific variables is zero. The partial R^2 on the issuer firm-specific variables is 0.400. This result suggests that issuer firm-specific variables have a large and statistically significant impact on IPO spreads, which is generally consistent with that found for both debt and SEO spreads.

[16] These results are available on request from the authors, as they are not presented due to space considerations.

We repeated all specifications in Table 5 with the inclusion of three new variables for traded firms only. Altinkilic and Hansen (2000) suggest a "spectrum view" of U-shaped spreads wherein variable costs are rising for lower quality issuers. Consistent with their specification, we include a variable *Size1*, defined as the inverse of the dollar value of the issue size, and a variable *Size2* which is the interaction of the dollar value of the issue size divided by the market value of equity. Altinkilic and Hansen (2000) find a positive sign on *Size1* and a positive sign on *Size2* for SEOs and debt issues. We are unable to calculate *Size2* for firms that did not have a market value of equity on CRSP and for IPOs. Lowry and Schwert (2001) and Lowry (2002) find that IPO volume and initial returns are significantly correlated. Consistent with Lowry (2002), we calculate a variable *Volume* defined as the number of debt issues (or SEOs or IPOs respectively) divided by the number of CRSP-listed stocks. Similar to Lowry (2002), we use the compounded growth rate of 0.45% per year in the number of CRSP-listed stocks for the pre-November 1972 period. For the sub-sample of traded firms, we find a positive sign on *Size1* and *Size2* for both SEO and debt issues, a result that is consistent with those of Altinkilic and Hansen (2000). As in Lowry (2002), we also find *Volume* to be positively related to spreads. These results on the sub-sample of traded firms are available on request from the authors, as they are not presented in Tabular form here due to space considerations.

5.3.4 Macroeconomic variables and the recession

Interestingly, in the case of IPOs, running the regression over periods that just contain recession months greatly reduced both the absolute and relative explanatory power of the macroeconomic variables. Indeed, the adjusted partial R^2 for these variables, during recession periods, was –0.015. Overall, the R^2 for all variables in the IPO regression was during recessionary periods 0.718 (compared to 0.617 for the whole sample).[17]

6. Direct costs versus indirect costs

As discussed in the introduction to this paper, much of the literature to date on the cost of new issues has concerned the indirect costs of issurance, in particular, the degree to which IPOs are underpriced on the day of issue. The conventional way these "indirect" costs have been measured has been through an analysis of initial day returns on the security being issued. In this section we repeat a similar analysis, to that conducted above for direct costs, for the initial one-day returns on IPOs and SEOs. We then go on to look at the relationship between direct costs (underwriting spreads) and indirect costs (underpricing) over our 30-year panel sample to examine whether direct and indirect costs are related? For example, are indirect costs (underpricing) higher when direct costs (spreads) are higher or do the two costs, in part, offset each other? Finally, we combine the direct and indirect costs of issuance into a "total cost" measure and examine how our three groups of factors or variables have driven "total costs" of issuance over our 30-year sample period.

6.1 Indirect costs and their determinants

Figures 3 and 4, show respectively the quarterly means and medians of initial one-day returns over the 1970-2000 period. In Table 7 we show regressions for the indirect costs of issuance (one-day) returns on the same set of variables used in the spread regressions, while Table 8 reports the partial and total R^2s, and significance tests for the three groups of factors: macroeconomic, market structure and issuer firm-specific.

Figures 3 and 4, Tables 7 and 8

6.1.1. SEOs indirect costs and their determinants

We begin by examining Table 7, where one observes that no individual systematic or macro-factors are significant. Interestingly, however, both market structure variables are significant. That is, commercial bank section 20 subsidiaries have tended to underprice SEOs more than traditional investment banks, while lead managers (with larger market shares) have tended to underprice less

[17] These results are available on request from the authors, as they are not presented in Tabular form here due to space considerations.

than lead managers with smaller market shares. The greater underpricing by bank section 20 subsidiaries may reflect their tendency to concentrate more on smaller issues especially in the early 1990s when they were given equity underwriting powers (see, Gande, Puri and Saunders (1999)). For issuer firm specific characteristics, three variables are significant: the initial returns are lower for more profitable (high ROA) firms and for more highly-levered firms. Those firms issuing SEOs with an overallotment option also appear to be more underpriced.

Table 8 shows the partial R^2s and overall full model R^2 of the three groups of variables: macroeconomic (systematic), market structure and issuer-firm specific. As can be seen the overall R^2 = .038 is very small, and the largest partial R^2 (and most significant) is for the investment banking market structure variables as a group (partial R^2 = .023).[18]

6.1.2. IPOs indirect costs and their determinants

Table 7 column 2 shows for IPOs the individual coefficients and their significance for the full set of variables used in the underwriting spread regressions. Overall the fit of the full model is much better than for SEOs, with an R^2 of 0.241. For the macroeconomic group of variables, five are individually significant at the one-percent level, with the strongest (statistically speaking) effect emanating from the IPO index variable. Specifically, in relatively hot markets when the IPO index is high, so is the degree of IPO underpricing and thus indirect costs to issuers. This confirms a strong momentum effect impacting the degree of IPO underpricing (as in Lowry and Schwert 2001). As with SEOs both the commercial bank dummy and market share variables are significant. However, lead managers with large market shares tend to underprice new issues more than those lead managers with smaller market shares. This may reflect the ability of high market share managers to exploit a reputational advantage through IPO pricing. Finally, four of the six issuer specific characteristics are significant at the ten-percent level or higher, with profit, dumfin and the size variable all negatively related to the degree of underpricing.

Table 8 shows the partial R^2's and the significance of the three groups of variables. As can be seen, the systematic or macroeconomic variables (that include momentum variables) explain a significant component of the observed variability of IPO initial returns over the past 30 years. The market structure and issuer-firm specific variables while jointly significant, have a relatively small impact.

6.2 The trade-off between direct and indirect costs

So far in this paper we have analyzed the direct costs and indirect costs of new security issuance separately. In this section we examine the degree to which there is a relationship between these two costs. In Table 9 we add to our set of regressors, initial one-day returns under the "investment banking market structure variables" grouping. The dependent variables are SEO underwriting spreads (column 1), and IPO underwriting spreads (column 2), respectively. For brevity, we focus only on the coefficients of the initial return or underpricing (*Und. returns*) variable. Specifically, from Table 9, column 1, it can be seen that initial one-day returns on SEOs are positively related to SEO spreads, i.e., direct and indirect costs charged by the underwriter to the issuer appear to be "complements." By comparison the initial returns on IPOs and IPO spreads appear to be independent. For example, the sign on the IPO coefficient is very small and is insignificantly different form zero at the ten-percent level when control variables are present, and is zero otherwise. This result, found over a 30-year period, is interesting from an investment banking pricing perspective, implying that over time and across a large sample of IPOs, spreads and the degree of underpricing have largely been independent of each other. That is, empirically speaking at least, IPO spreads and underpricing do not appear to be jointly determined as suggested by Yeoman (2002).[19]

Table 9

[18] The reader is reminded (see Appendix B) that the partial R^2s will not add to the full model R^2.

6.3 The total costs of new issuance and their determinants

As a final set of tests, we added the direct and indirect costs together, and called the resulting variable "total costs." We recognize that certain underwriting costs, such as legal and auditing costs, are not included in our "total cost" variable. Table 10 presents the results for the total costs of SEO and IPO issuance using the same set of macroeconomic, market structure and issuer firm-specific variables used in our earlier spread and underpricing tests, and Table 11 presents the full model R^2 and partial R^2s.

Tables 10 and 11

6.3.1. Total costs of SEOs and their determinants

Column 1 of Table 10 shows the results for SEOs. Only two of the macroeconomic variables are significant, the IPO index or momentum factor (at the five-percent level) and the Treasury bill rate (at the ten-percent level). For the market structure variables, bank section 20 underwriting has a significantly positive effect on the total costs of underwriting, while issues underwritten by lead managers with relatively high market share have lowered the total costs of underwriting. With respect to issuer firm-specific variables, profitability, leverage and size all have negative effects on SEO total issuance costs, while the presence of an over allotment option increases total costs. The overall R^2 of the model is only .071 (see Table 11), with each of the three groups of variables jointly significant but with a small collective economic impact on spreads.

6.3.2. Total costs of IPOs and their determinants

Column 2 of Table 10 shows the results for the total costs of IPO issuance. For the macroeconomic factors, five are significant at the one-percent level, with Fama-French's size and book-to-market factors having a negative effect on total costs. A similar negative relationship is found for the Treasury bill rate. Both the 15 day historical return and IPO index variables have

[19] Yeoman (2001) finds support for his theoretical joint spread setting/underpricing model over the relatively short 1988-1993 period using simulation analysis on his model.

positive effects on total IPO costs, in line with a strong momentum effect on total costs in the market for IPO underwriting. For the market structure variables, both the commercial bank underwriting dummy and the lead underwriter market share variables are significantly positive. Finally, four of the issuer-specific characteristics are significant at the ten-percent level or above. Specifically profitability, the financial information dummy variable (*Dummy fin*) and size are all significantly negatively related to total underwriting costs. From Table 11, the overall R^2 for the full model is 0.24, with the highest partial R^2 (0.11) reflecting the macroeconomic variables, which include momentum.

7. Summary and conclusions

This paper examines the long-run behavior of underwriting spreads and underpricing returns in the markets for corporate securities. Using a large panel sample covering 30 years, we analyze spreads in the corporate debt, SEO and IPO markets, respectively. This analysis is important because direct flotation costs are one element entering into corporate capital structure decisions. We find IPO spreads to be higher than SEO spreads and both spreads to be substantially higher than corporate debt spreads. We also find that median spreads appear to be trending down over time and that IPO and SEO spreads appear to be increasingly clustering (at respectively seven percent and five percent).

We also sought to analyze the cross-sectional time-series variation in these spreads. Three groups of candidate factors or variables were identified, macroeconomic (or systematic), investment banking market structure, and issuer-firm specific. While, macroeconomic and investment banking market factors were frequently jointly significant in explaining the variation in spreads, their impact was generally small. The group of factors largely driving spreads appears to be issuer-firm characteristics.

While underwriting spreads is one aspect (a direct aspect) of security issuance there are also indirect costs relating to underpricing. While it was not possible to estimate the degree of

underpricing for the corporate debt issues in our sample we did undertake an analysis of IPO and SEO underpricing over our 30-year period and the relative magnitudes of indirect costs to direct costs. For IPOs, on average, indirect costs significantly exceeded direct costs, however, the reverse appears to be true for SEOs. We also examined the relationship between the direct and indirect costs of SEOs and IPOs. While the direct and indirect costs of SEOs appear to be positively related, for IPOs the two costs appear to be largely independent. Overall, in equity markets, the degree of complementarity among direct and indirect issuance costs appears largely confined to SEOs.

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Figure 1: Quarterly Means of Underwriting Spreads ("Direct Costs")

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP.

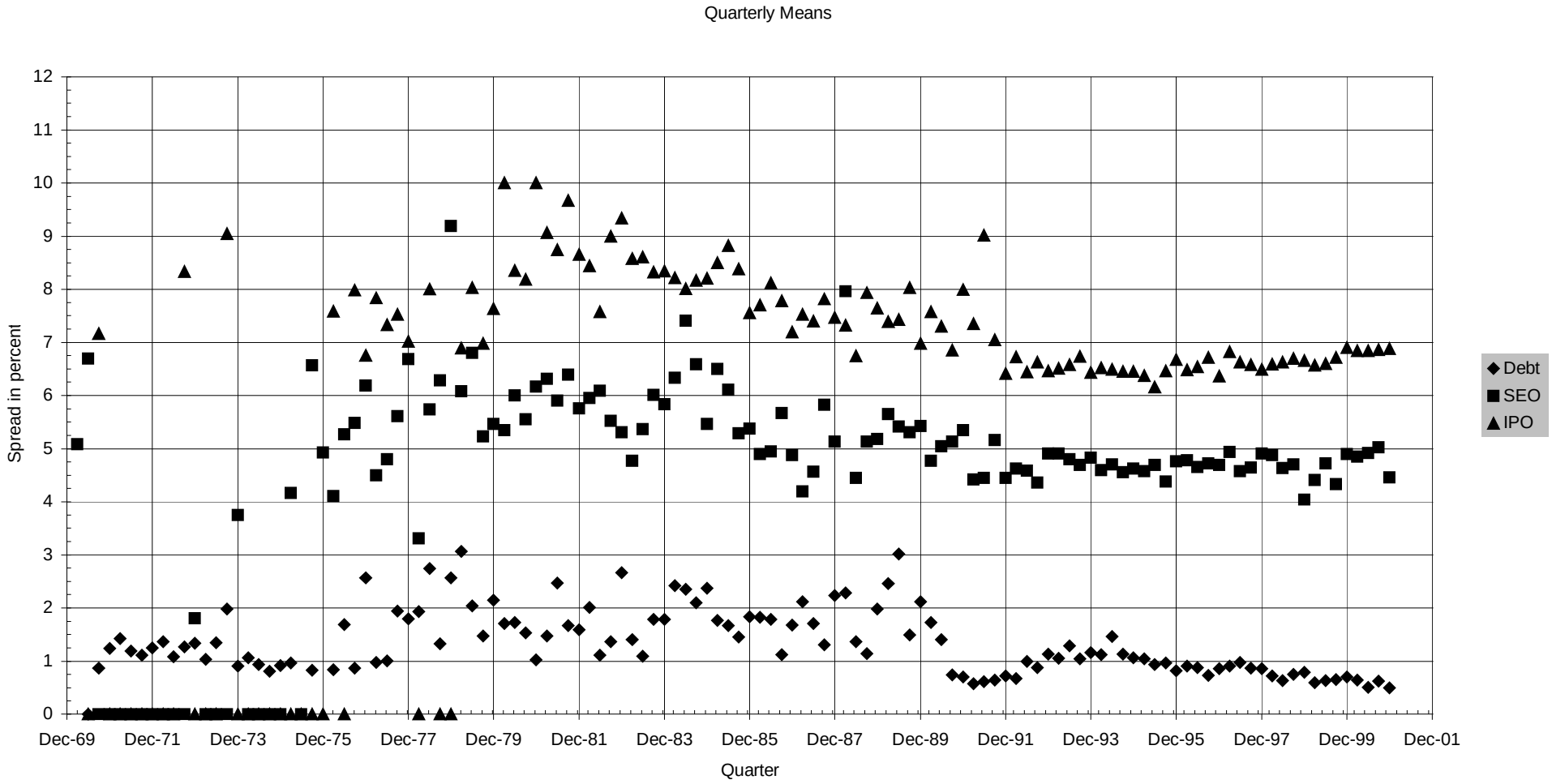

Figure 2: Quarterly Medians of Underwriting Spreads ("Direct Costs")

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP.

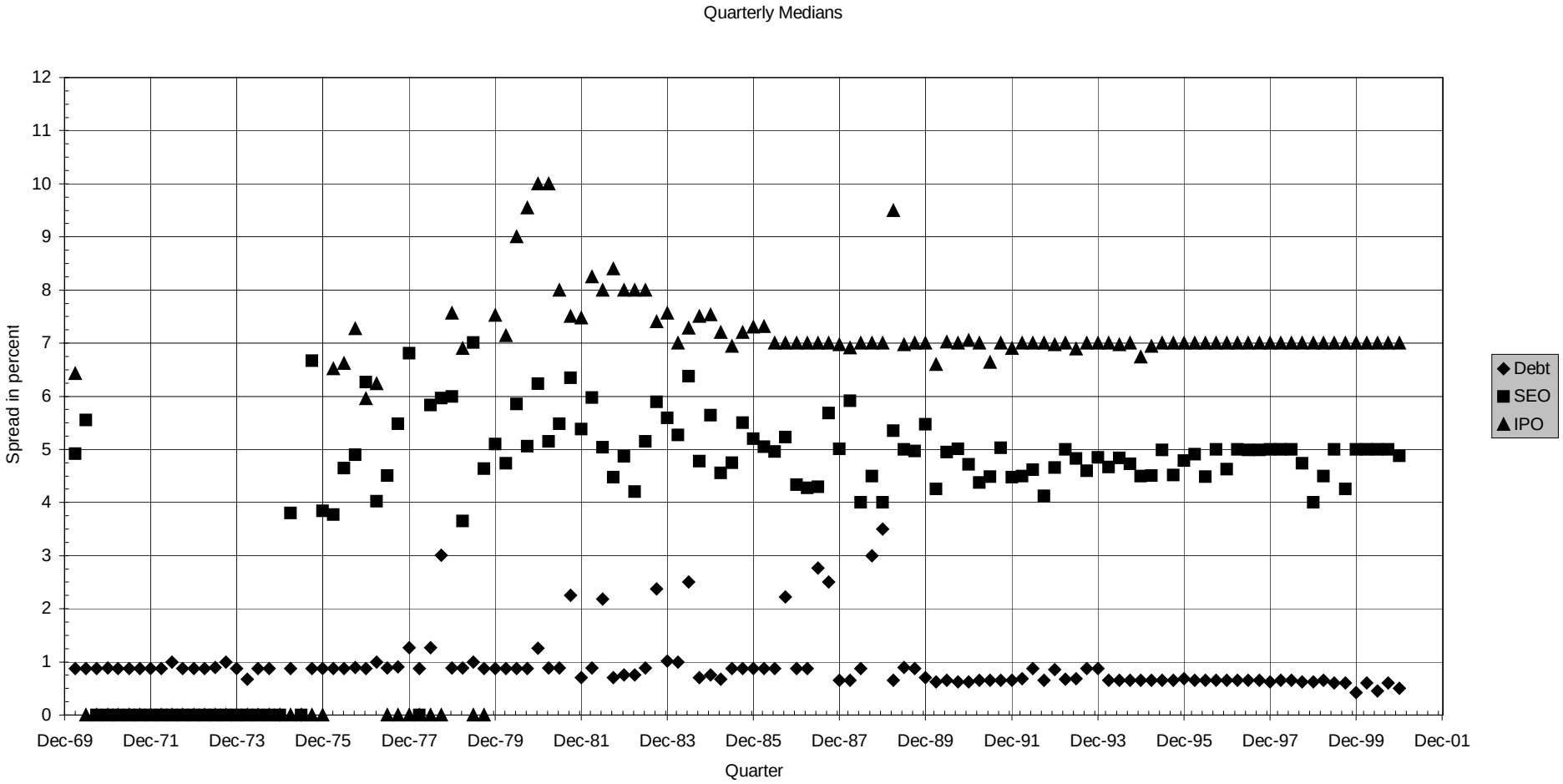

Figure 3: Quarterly Means of Underpricing Returns ("Indirect Costs")

Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP.

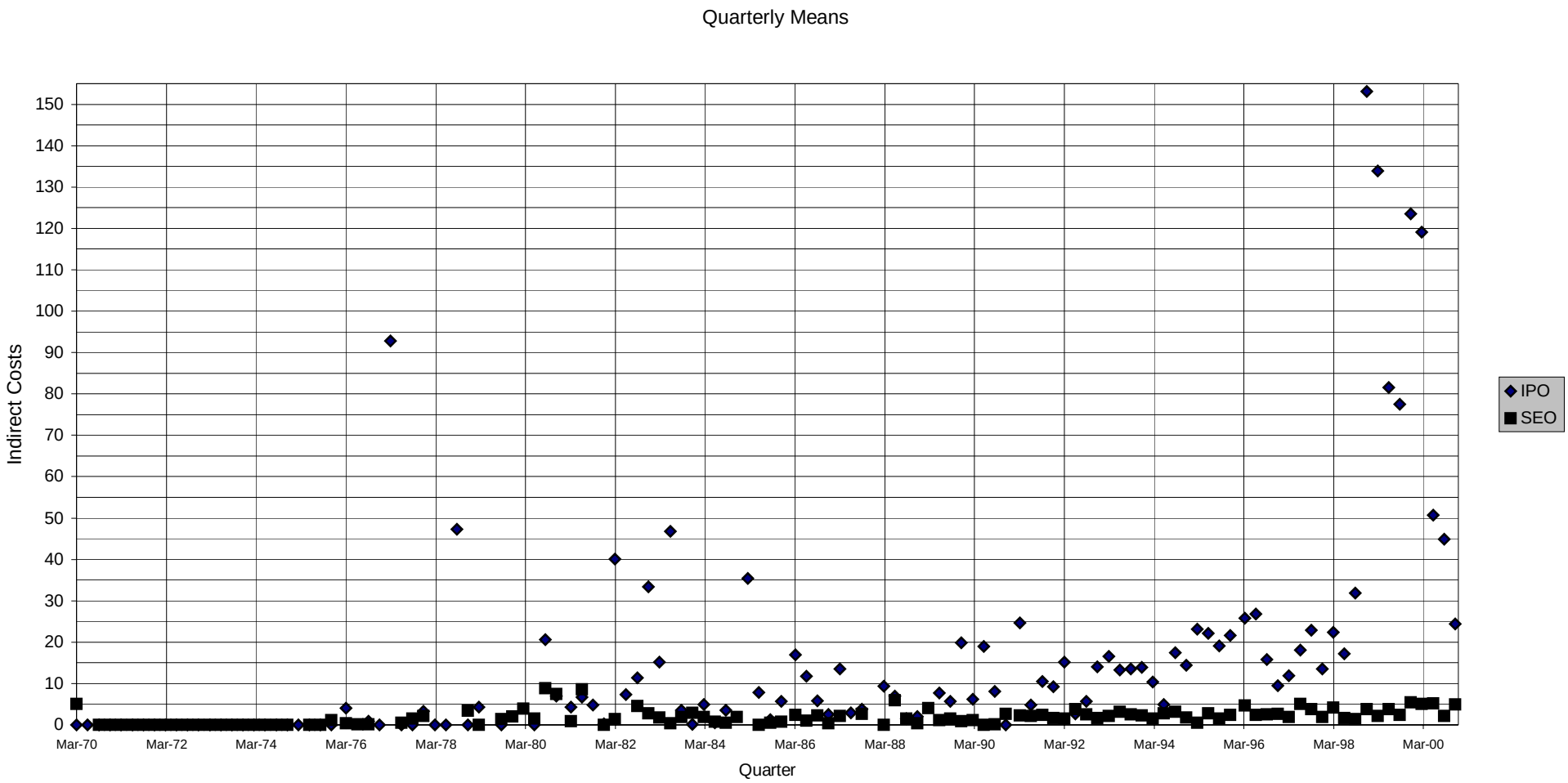

Figure 4: Quarterly Medians of Underpricing Returns ("Indirect Costs")

Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP.

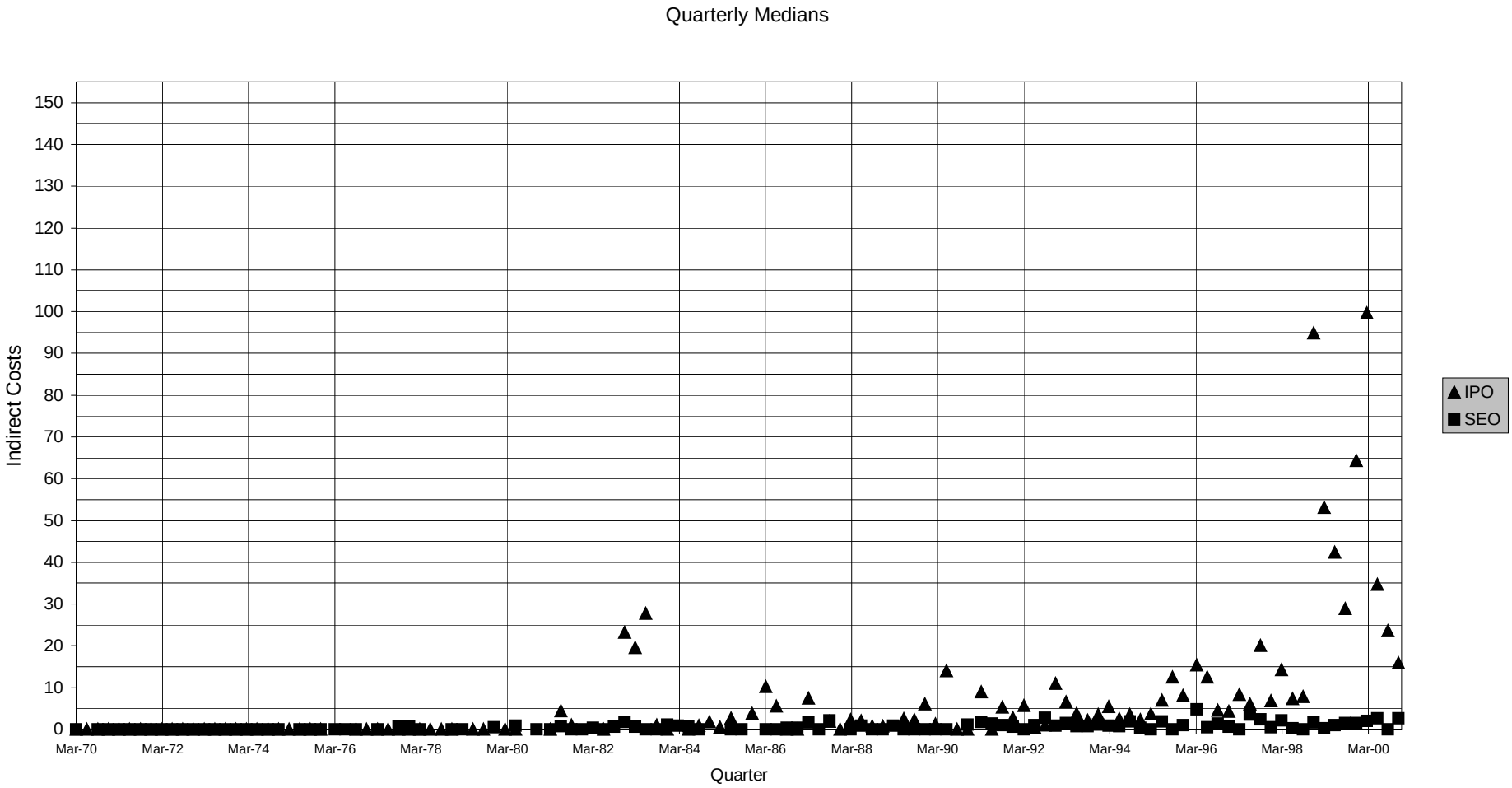

Table 1: Underwriting Spreads ("Direct Costs") and Underpricing Returns ("Indirect Costs")

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation***.** We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP.

Panel A: Spreads for sample firms used in regressions (i.e., firms for which we have data on both the independent and dependant variables)

	#	mean	median	5th %tile	95th %tile
Debt	5,645	1.149	0.678	0.230	3.530
SEOs	2,691	5.008	5.000	2.848	7.474
IPOs	2,268	7.057	7.000	5.250	10.000

Panel B: Spreads for entire sample of firms available from SDC (i.e., firms for which we have data on only the spread variable)

	#	mean	median	5th %tile	95th %tile
Debt	8,085	1.294	0.750	0.250	3.829
SEOs	6,573	5.741	5.481	3.205	10.000
IPOs	7,517	7.833	7.000	6.000	10.000

Panel C: Underpricing returns for sample firms used in regressions and for whom we have stock returns

	#	mean	median	5th %tile	95th %tile
SEOs	1,999	2.628	0.926	-4.762	13.415
IPOs	1,713	31.215	8.333	-6.034	156.25

Table 2: Distribution of Underwriting Spreads for Debt Offerings Over Time

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. *p*-values are given in parentheses and are for differences in means and medians between decades. The difference in means uses the standard *t*-test, whereas the differences in medians uses the Mann-Whitney rank sum test.

Panel A: By Decade

	1970s	1980s	1990s	'70s vs. '80s	'70s vs. '90s	'80s vs. '90s
#	563	1,465	3,617			
Mean	1.563	1.746	0.843	(0.011)[a]	(0.000)[a]	(0.000)[a]
Median	0.882	0.878	0.651	(0.002)[a]	(0.000)[a]	(0.000)[a]

Panel B: By Year

	#	Mean	Median		#	Mean	Median
1970	70	1.205	0.879	1986	273	1.647	0.880
1971	68	1.197	0.879	1987	206	1.792	0.878
1972	36	1.249	0.884	1988	187	2.020	0.879
1973	25	1.272	0.879	1989	190	1.726	0.757
1974	13	0.901	0.875	1990	154	0.658	0.628
1975	64	1.128	0.875	1991	254	0.747	0.651
1976	70	1.318	0.878	1992	352	1.073	0.678
1977	88	2.128	1.008	1993	426	1.177	0.875
1978	69	2.381	1.263	1994	261	1.061	0.652
1979	60	1.826	0.882	1995	330	0.878	0.653
1980	74	1.326	0.875	1996	329	0.867	0.651
1981	91	1.455	0.879	1997	375	0.758	0.651
1982	82	1.561	0.875	1998	527	0.712	0.629
1983	89	2.021	0.883	1999	386	0.632	0.625
1984	102	1.885	0.879	2000	223	0.559	0.554
1985	171	1.770	0.877				

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 3: Distribution of Underwriting Spreads for Seasoned Equity Offerings Over Time

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. *p*-values are given in parentheses and are for differences in means and medians between decades. Differences in means uses the standard *t*-test whereas differences in medians uses the Mann-Whitney rank sum test.

Panel A: By Decade

	1970s	1980s	1990s	'70s vs. '80s	'70s vs. '90s	'80s vs. '90s
#	152	814	1,725			
Mean	5.637	5.524	4.709	(0.550)	(0.000)[a]	(0.000)[a]
Median	5.515	5.238	4.958	(0.299)	(0.000)[a]	(0.000)[a]

Panel B: By Year

	#	Mean	Median		#	Mean	Median
1970	12	5.756	5.556	1986	105	5.085	5.000
1971	0	--	--	1987	88	4.938	4.747
1972	1	1.802	1.802	1988	36	5.035	4.503
1973	1	3.747	3.747	1989	47	5.406	5.231
1974	0	--	--	1990	56	5.038	4.944
1975	12	5.285	4.720	1991	136	4.593	4.532
1976	46	5.002	4.698	1992	127	4.634	4.506
1977	22	5.679	5.393	1993	177	4.810	4.871
1978	32	6.704	6.000	1994	121	4.630	4.736
1979	26	5.739	5.720	1995	161	4.603	4.809
1980	85	5.881	5.823	1996	172	4.713	4.765
1981	60	6.071	5.730	1997	192	4.794	5.000
1982	67	5.583	5.111	1998	142	4.649	5.000
1983	176	5.423	5.244	1999	194	4.617	4.877
1984	57	6.393	5.500	2000	247	4.808	5.000
1985	93	5.765	5.205				

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 4: Distribution of Underwriting Spreads for Initial Public Equity Offerings Over Time

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. *p*-values are given in parentheses and are for differences in means and medians between decades. The difference in means uses the standard *t*-test whereas the differences in medians uses the Mann-Whitney rank sum test.

Panel A: By Decade

	1970s	1980s	1990s	'70s vs. '80s	'70s vs. '90s	'80s vs. '90s
#	31	682	1,555			
Mean	7.695	7.911	6.670	(0.477)	(0.000)[a]	(0.000)[a]
Median	7.524	7.273	7.000	(0.544)	(0.000)[a]	(0.000)[a]

Panel B: By Year

	#	Mean	Median		#	Mean	Median
1970	4	7.161	6.429	1986	132	7.436	7.000
1971	0	--	--	1987	101	7.463	7.000
1972	1	8.333	8.333	1988	52	7.594	7.000
1973	1	9.048	9.048	1989	48	7.338	7.000
1974	0	--	--	1990	43	7.499	7.000
1975	1	7.576	7.576	1991	95	6.548	7.000
1976	9	7.529	6.875	1992	123	6.534	7.000
1977	5	7.519	6.347	1993	145	6.535	7.000
1978	3	7.652	6.889	1994	102	6.369	7.000
1979	7	8.090	7.520	1995	118	6.547	7.000
1980	25	8.906	9.545	1996	196	6.603	7.000
1981	54	8.719	9.959	1997	150	6.578	7.000
1982	21	8.790	8.400	1998	105	6.641	7.000
1983	116	8.181	7.750	1999	222	6.835	7.000
1984	70	8.392	7.500	2000	256	6.870	7.000
1985	63	7.912	7.200				

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 5: Regressions of Underwriting Spreads on Macroeconomic Variables, Investment Banking Market Structure Variables, and Issuer Firm-Specific Variables

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A.

Variables	Debt		SEOs		IPOs	
Intercept	0.856[a]	(5.36)	7.277[a]	(41.47)	8.930[a]	(37.23)
Macroeconomic variables:						
15 day	-4.292	(-1.11)	13.815	(1.10)	1.173	(0.14)
Rmt	-0.001	(-0.45)	-0.001	(-0.06)	0.006	(1.11)
SMB	-0.005	(-1.55)	0.004	(0.75)	0.007	(1.65)
HML	0.005	(1.06)	0.007	(0.85)	0.003	(0.42)
Mom	0.012[a]	(4.85)	0.020[a]	(3.61)	-0.007	(-1.23)
IPO	0.000	(0.40)	0.005[a]	(6.29)	0.006[a]	(10.21)
Tbill	0.328[a]	(4.36)	0.710[a]	(4.63)	0.707[a]	(4.84)
Inter	-0.024[a]	(-2.66)	-0.004	(-0.21)	-0.019	(-0.82)
Long	-0.001	(-0.45)	-0.001[c]	(-1.82)	0.012	(1.30)
Investment banking market structure variables:						
Bank	-0.452[a]	(-16.44)	0.346[a]	(4.82)	0.025	(0.43)
Mktshr	-0.014[a]	(-7.99)	-0.022[a]	(-7.51)	-0.008[a]	(-2.95)
Issuer firm-specific variables:						
ROA	0.454	(0.62)	0.032	(0.11)	-0.000	(0.00)
Profit	0.434	(0.80)	-1.022[a]	(-3.51)	-0.036	(-0.24)
Leverage	1.383[a]	(6.89)	0.184	(1.24)	0.090	(1.61)
Dummy fin	0.649[a]	(5.51)	0.097	(1.58)	0.132[a]	(3.46)
Size	-0.042[a]	(-3.28)	-0.887[a]	(-29.79)	-0.761[a]	(-30.27)
Overallot	0.760[a]	(8.45)	0.904[a]	(10.12)	0.488[a]	(2.48)
Dummy 1	-0.404[a]	(-14.02)	---		---	
Dummy 2	0.038[c]	(1.75)	---		---	
Rating	1.536[a]	(48.25)				
Callable	-0.142	(-0.28)				
# of obs	5,645		2,691		2,268	
Adj. R^2	0.605		0.527		0.617	

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 6: Coefficient of Partial Determination (Partial R^2) to Relative Importance of Each Category of Independent Variables on Underwriting Spreads

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A. The first two rows for all issues is an F-statistic and its associated p-value that a sub-category of independent variables is jointly equal to zero. We use the regressions in Table 5 in order to calculate the coefficient of partial determination. The partial R^2 between the Y-variable (i.e., underwriting spreads) and a set of X-variables (X_1), given that the other X-variables (X_2) is in the model is calculated as: $[SSE(X_2)-SSE(X_1,X_2)] / SSE(X_2)$, where $SSE(X_2)$ is the residual sum of squares when only X_2 variables are in the model, and $SSE(X_1,X_2)$ is the residual sum of squares when both X_1 and X_2 variables are in the model.

	Macroeconomic variables	Investment banking market structure variables	Issuer firm-specific variables	Full model[d] *adj* R^2
Debt				
F-statistic	7.223[a]	195.85[a]	600.12[a]	
(p-value)	(0.000)	(0.000)	(0.000)	
Partial R^2	0.012	0.065	0.517	0.605
SEOs				
F-statistic	10.03[a]	35.00[a]	304.51[a]	
(p-value)	(0.000)	(0.000)	(0.000)	
Partial R^2	0.033	0.026	0.407	0.527
IPOs				
F-statistic	15.40[a]	3.504[a]	249.06[a]	
(p-value)	(0.000)	(0.030)	(0.000)	
Partial R^2	0.058	0.003	0.400	0.617

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.
[d] The *adj* R^2 is obtained from the full regression model that is presented in Table 5.

Table 7: Regressions of Underpricing Returns on Macroeconomic Variables, Investment Banking Market Structure Variables, and Issuer Firm-Specific Variables

Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). We obtain our data from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A.

Variables	SEOs		IPOs	
Intercept	1.108	(0.91)	31.492[c]	(1.66)
Macroeconomic variables:				
15 day	176.77	(1.47)	2476.9[a]	(3.48)
Rmt	0.007	(0.11)	-0.790	(-1.53)
SMB	-0.026	(-0.46)	-1.379[a]	(-2.33)
HML	0.033	(0.50)	-2.117[a]	(-3.44)
Mom	0.033	(0.70)	0.442	(0.87)
IPO	0.015	(1.62)	0.799[a]	(8.32)
Tbill	1.900	(1.45)	-17.095[a]	(-2.46)
Inter	-0.094	(-0.68)	-2.116	(-1.50)
Long	-0.019	(-0.32)	-0.403	(-0.60)
Investment banking market structure variables:				
Bank	1.502[a]	(2.68)	9.143[b]	(2.19)
Mktshr	-0.161[a]	(-5.63)	1.626[a]	(5.47)
Issuer firm-specific variables:				
ROA	-6.035[b]	(-2.28)	54.406[a]	(2.95)
Profit	3.178	(1.11)	-68.868[a]	(-3.62)
Leverage	-1.940[a]	(-2.81)	-3.175	(-0.63)
Dummy fin	0.076	(0.16)	-6.733[c]	(-1.84)
Size	0.121	(0.76)	-6.175[b]	(-2.08)
Overallot	1.277[a]	(2.38)	-18.450	(-1.06)
#of obs	1,999		1,713	
Adj. R^2	0.038		0.241	

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 8: Coefficient of Partial Determination (Partial R^2) to Relative Importance of Each Category of Independent Variables on Underwriting Returns

Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996).We obtain data for the 30-year period, from 1970 through 2000, from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A. The first two rows for all issues is an F-statistic and its associated p-value that a sub-category of independent variables is jointly equal to zero. We use the regressions in Table 7 in order to calculate the coefficient of partial determination. The partial R^2 between the Y-variable (i.e., underwriting spreads) and a set of X-variables (X_1), given that the other X-variables (X_2) is in the model is calculated as: $[SSE(X_2)-SSE(X_1,X_2)] / SSE(X_2)$, where $SSE(X_2)$ is the residual sum of squares when only X_2 variables are in the model, and $SSE(X_1,X_2)$ is the residual sum of squares when both X_1 and X_2 variables are in the model.

	Macroeconomic variables	Investment banking market structure variables	Issuer firm-specific variables	Full model[d] *adj* R^2
SEOs				
F-statistic	1.745	22.963	3.208	
(p-value)	(0.074)	(0.000)	(0.004)	
Partial R^2	0.008	0.023	0.010	0.038
IPOs				
F-statistic	23.113	20.394	8.169	
(p-value)	(0.000)	(0.030)	(0.000)	
Partial R^2	0.110	0.024	0.028	0.241

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.
[d] The *adj* R^2 is obtained from the full regression model that is presented in Table 5.

Table 9: Regressions of Underwriting Spreads ("Direct Costs") on Underpricing Returns ("Indirect Costs") and Other Variables

Underwriting spreads or "direct costs" are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A.

Variables	SEOs		IPOs	
Intercept	4.796[a] (144.26)	6.867[a] (37.32)	6.870[a] (248.25)	8.806[a] (42.31)
Macroeconomic variables:				
15 day	---	7.806 (0.78)	---	-7.418 (-1.05)
Rmt	---	0.008 (1.16)	---	0.012[b] (2.33)
SMB	---	0.010[c] (1.90)	---	0.011[a] (2.94)
HML	---	0.012 (1.54)	---	0.017[a] (2.78)
Mom	---	0.017[a] (3.22)	---	-0.000 (-0.05)
IPO	---	0.005[a] (6.25)	---	0.005[a] (7.24)
Tbill	---	0.666[a] (4.04)	---	0.738[a] (4.60)
Inter	---	-0.001 (-0.06)	---	-0.021 (-0.87)
Long	---	-0.001[c] (-1.69)	---	0.008 (0.72)
Investment banking market structure variables:				
Bank	---	0.322[a] (3.85)	---	0.067 (1.17)
Mkt shr	---	-0.017[a] (-5.47)	---	-0.005[c] (1.76)
Und. returns	0.022[a] (3.75)	0.012[a] (2.46)	0.000[a] (2.59)	0.001 (1.64)
Issuer firm-specific variables:				
ROA	---	0.003 (0.01)	---	-0.043 (-0.35)
Profit	---	-0.806[a] (-3.29)	---	0.005 (0.04)
Leverage	---	7.806 (0.78)	---	0.065 (1.36)
Dummy fin	---	0.114 (1.04)	---	0.137[a] (3.65)
Size	---	-0.816[a] (-26.26)	---	-0.657[a] (-28.01)
Overallot	---	0.942[a] (8.88)	---	0.138 (0.86)
# of obs	1,999	1,999	1,713	1,713
Adj. R^2	0.013	0.536	0.002	0.604

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 10: Regressions of Total Costs ("Direct" plus "Indirect") on Macroeconomic Variables, Investment Banking Market Structure Variables, and Issuer Firm-Specific Variables

Total costs are the sum of underwriting spreads (or "direct costs") and underpricing returns (or "indirect costs"). Underwriting spreads are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). Spreads are for the 30-year period, from 1970 through 2000, and are obtained from US Public New Issues Database from *Securities and Data Corporation*. We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns data obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A.

Variables	SEOs		IPOs	
Intercept	7.988[a]	(6.48)	40.333[b]	(2.11)
Macroeconomic variables:				
15 day	186.63	(1.54)	247.28[a]	(3.47)
Rmt	0.014	(0.23)	-0.778	(-1.51)
SMB	-0.017	(-0.29)	-1.370[a]	(-2.31)
HML	0.046	(0.68)	-2.103[a]	(-3.41)
Mom	0.050	(1.06)	0.442	(0.87)
IPO	0.020[b]	(2.21)	0.805[a]	(8.37)
Tbill	3.599[c]	(1.79)	-16.377[a]	(-2.36)
Inter	-0.096	(-0.68)	-2.140	(-1.51)
Long	-0.031	(-0.50)	-0.396	(-0.59)
Investment banking market structure variables:				
Bank	1.841[a]	(3.24)	9.220[b]	(2.21)
Mktshr	-0.179[a]	(-6.15)	1.623[a]	(5.45)
Issuer firm-specific variables:				
ROA	-6.102[b]	(-2.27)	54.424[a]	(2.95)
Profit	2.299	(0.79)	-68.941[a]	(-3.62)
Leverage	-1.849[a]	(-2.55)	-3.114	(-0.62)
Dummy fin	0.118	(0.24)	-6.604[c]	(-1.80)
Size	-0.693[a]	(-4.12)	-6.839[b]	(-2.30)
Overallot	2.234[a]	(4.00)	-18.333	(-1.05)
#of obs	1,999		1,713	
Adj. R^2	0.071		0.240	

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.

Table 11: Coefficient of Partial Determination (Partial R^2) to Relative Importance of Each Category of Independent Variables on Total Costs ("Direct" plus "Indirect")

Total costs are the sum of underwriting spreads (or "direct costs") and underpricing returns (or "indirect costs"). Underwriting spreads are gross spreads defined as the difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (or issue size), see Gande, Puri, and Saunders (1999). Underpricing returns or "indirect costs" are defined as the difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, see Lee, Lochhead, Ritter, and Zhao (1996). We obtain data for the 30-year period, from 1970 through 2000, from US Public New Issues Database from *Securities and Data Corporation***.** We exclude all financial firms (one-digit SIC code 6) and all firms in regulated industries (one-digit SIC code 4) and all firms whose gross spread data was missing from the SDC database. Equity returns are obtained from CRSP. For each regression, the first number is the parameter coefficient and the number in parentheses is the associated *t*-statistic. All standard errors are corrected for heteroscedasticity using the White correction. All regressions include industry dummies (at the one-digit SIC code level), the results of which are not reported. Detailed descriptions for each independent variable are given in Appendix A. The first two rows for all issues is an F-statistic and its associated p-value that a sub-category of independent variables is jointly equal to zero. We use the regressions in Table 7 in order to calculate the coefficient of partial determination. The partial R^2 between the Y-variable (i.e., total costs spreads) and a set of X-variables (X_1), given that the other X-variables (X_2) is in the model is calculated as: $[SSE(X_2)-SSE(X_1,X_2)] / SSE(X_2)$, where $SSE(X_2)$ is the residual sum of squares when only X_2 variables are in the model, and $SSE(X_1,X_2)$ is the residual sum of squares when both X_1 and X_2 variables are in the model.

	Macroeconomic variables	Investment banking market structure variables	Issuer firm-specific variables	Full model[d] *adj* R^2
SEOs				
F-statistic	2.665	28.415	8.453	
(p-value)	(0.005)	(0.000)	(0.000)	
Partial R^2	0.012	0.028	0.025	0.071
IPOs				
F-statistic	23.305	20.300	8.639	
(p-value)	(0.000)	(0.000)	(0.000)	
Partial R^2	0.110	0.023	0.030	0.240

[a] statistically significant at the 1% level, [b] statistically significant at the 5% level, and [c] statistically significant at the 10% level, respectively.
[d] The *adj* R^2 is obtained from the full regression model that is presented in Table 10.

Appendix A: Variable Definitions

Variables	Definitions
Dependent variables:	
Gross spread	Difference between the offered amount and the proceeds to the issuer, expressed as the percentage of the offered amount (for example, see Gande, Puri, and Saunders 1999)
Underpricing returns	Difference between the closing price on the day after the issue and the offering price expressed as the percentage of the offering price, (for example, see Lee, Lochhead, Ritter, and Zhao 1996).
Independent variables:	
15 day	The value-weighted market index in the 15-days prior to the offer date (Loughran and Ritter 2002)
Rmt	One-month lagged data of the value-weighted market portfolio (Fama and French 1993)
SMB	One-month lagged values of the monthly returns on the smallest size portfolio minus the monthly returns on the largest size portfolio (Fama and French 1993)
HML	One-month lagged values of the monthly returns on the highest book-to-market portfolio minus the monthly returns on the lowest book-to-market portfolio (Fama and French 1993)
Mom	One-month lagged values of the momentum factor, defined as the monthly returns on an equally weighted average of the highest 30% 11-month returns minus the monthly returns on an equally weighted average of the lowest 30% 11-month returns (Carhart 1997)
IPO	One-month lagged values on the returns of Ritter's IPO index
Tbill	One-month lagged values of the monthly returns on one-year government bonds
Inter	One-month lagged values of the monthly returns on five-year government bonds
Long	One-month lagged values of the monthly returns on twenty-year government bonds
Bank	Set to unity if the issue date was after 1998 (after 1999) for debt offerings (for equity offerings), and zero otherwise (Gande, Puri, and Saunders 1999)
Mktshr	Total percentage market share ownership of the lead managers in the year of the issue
ROA	Issuer firm's ratio of net income to total assets
Profit	Issuer firm's ratio of operating income before depreciation to total assets

Appendix A (continued)

Appendix A (continued):

Variables	Definitions
Debt	Issuer firm's ratio of total leverage to total assets
Dumfin	Set to unity if the above three financial statement variables are unavailable for issuer firms, and zero otherwise
Size	Natural logarithm of the dollar value of issue size
Overallot	Set to unity if the syndicate has an over-allotment or green-shoe option to purchase additional amounts of the issue (Ritter 1996, Hansen, Fuller, and Janjigian 1987)
Lmat	Set to unity if debt issue has maturity less than five years, and zero otherwise
Imat	Set to unity if debt issue has maturity between five and fifteen years, and zero otherwise
Rating	Set to unity if issuer firm has Moody's speculative rating of Ba1 to C, and zero otherwise
Callable	Set to unity if debt issue is callable, and zero otherwise

Appendix B: The Relationship Between Partial R^2 and the Full Model R^2

Initially lets take the case where we have two sets of independent variables, X_1, X_2.

Let ρ_1^2 be the R^2 between Y-variable and X_1,

ρ_2^2 be the R^2 between Y-variable and X_2, and

R^2 be the full model R^2 between Y-variable and (X_1, X_2).

Then, the partial R^2 between Y-variable and X_1, given X_2 in the model, is $(R^2 - \rho_2^2)/(1-\rho_2^2)$ and the partial R^2 between Y-variable and X_2, given X_1 in the model, is $(R^2 - \rho_1^2)/(1-\rho_1^2)$. The sum of these two partial R^2s equals $R^2 + D$, where $D = [R^2(1-\rho_1^2\rho_2^2) - \rho_1^2(1-\rho_2^2) - \rho_2^2(1-\rho_1^2)] / [(1-\rho_1^2)(1-\rho_2^2)]$. If D is negative, the sum of the partial R^2s is less than the full model R^2 and vice versa. Except for the extreme case where ρ_1^2 and ρ_2^2 equal to zero (which we see is not our result), D does <u>not</u> equal zero. Therefore, sum of all partial R^2s from each set of X-variables does not equal the R^2 of the full model (for more explanation of this see Pindyck and Rubenfeld 1981).

For a general case, if all X-variables are (non-overlapped) partitioned into K-subsets, then $D = \left(R^2 \{ \sum_{i=1}^{K} [\prod_{j \neq i}^{K} (1-\rho_j^2)] - \prod_{i=1}^{K} (1-\rho_i^2) \} - \sum_{i=1}^{K} \rho_i^2 [\prod_{j \neq i}^{K} (1-\rho_j^2)] \right) \; / \; \prod_{i=1}^{K} (1-\rho_i^2)$.