The Initial Listing Decisions of Firms that Go Public

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Abstract

In 1983, the New York Stock Exchange (NYSE) developed special listing procedures making it possible for some large IPOs to list directly on the NYSE. Using a sample of IPOs from 1991 to 1996 that either listed on the NYSE or met the NYSE's minimum-listing requirements and listed on the Nasdaq-NMS, we analyze the factors that affect the initial-listing decision. We examine several potential factors including issue costs, market quality, Nasdaq sponsorship, industry characteristics, follow-on offerings, continued-listing fees, the costs of delisting, and NYSE Rule 500. We find no evidence that underpricing differs across exchanges. However, direct issue costs, including underwriter spreads, listing fees and other expenses, are lower on the Nasdaq-NMS than on the NYSE, especially for smaller issues. Consistent with this difference, we find that smaller firms are more likely to list on Nasdaq than the NYSE. We also find evidence that venture-backed issues, technology firms, and firms that raise funds through follow-on offerings are more likely to list on the Nasdaq-NMS, while less risky firms and spinoffs are more likely to list on the NYSE.

Key Words: initial public offer, exchange listing, underpricing, issue costs

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Historically, publicly-held firms in the U.S. began trading on the regional or over-the-counter markets and, in many cases, eventually moved to the NYSE. In 1983, however, the NYSE changed its listing rules making it easier for initial public offerings (IPOs) to meet minimum-listing requirements. This rule change made it possible for many large IPOs to list directly on the NYSE and made the initial-listing decision an important part of the IPO process. In this article, we analyze the factors that affect the initial-listing decision and the ability of these factors to jointly explain the listing decision. In addition, we document the extent to which the NYSE rule change has resulted in the listing of IPOs directly on the NYSE.

We examine a sample of IPOs from 1991 to 1996 by firms that either listed on the NYSE or met the NYSE's minimum-listing requirements and listed on the Nasdaq National Market System (NMS). This sample allows us to examine the initial-listing decisions of firms for which NYSE listing was actually a consideration. Of the 590 IPOs meeting our sample criteria, 337 (57 percent) listed on the NYSE. The significant number of NYSE listings suggests that the NYSE rule change and increased marketing efforts by the NYSE have had a substantial effect on the competitive environment in which U.S. exchanges operate. However, the fact that many NYSE-eligible IPOs continue to list on Nasdaq suggests that the perceived costs and benefits of listing vary across firms.

We analyze several factors that may affect the initial-listing decisions of IPO firms. These factors include issue costs, market quality, Nasdaq sponsorship, industry characteristics, follow-on offerings, continued-listing fees, the costs of delisting, and NYSE Rule 500.[1] We find no evidence that underpricing, defined as the percentage change from the offer price to the first aftermarket closing price, is related to the initial-listing decision. However, direct issue costs, which include underwriter spreads, listing and registration fees, and legal and auditing fees, are significantly lower on

[1] NYSE Rule 500 restricts the ability of NYSE-listed firms to voluntarily delist from the exchange. In November 1997, the NYSE Board of Directors approved changes to Rule 500 giving listed firms more freedom to voluntarily delist. The original and revised versions of NYSE Rule 500 are discussed in more detail below.

the Nasdaq-NMS than the NYSE, especially for smaller issues. Consistent with this difference in issue costs, probit results show that smaller firms are more likely to list on the Nasdaq-NMS than the NYSE. Smaller firms may also list on Nasdaq to gain the benefits of sponsorship by Nasdaq market makers. However, we find no evidence that younger firms, which would also benefit from sponsorship, are more likely to list on Nasdaq. Technology firms, venture-backed issues and firms that raise funds through follow-on offerings are more likely to list on the Nasdaq-NMS, while less risky firms and spinoffs are more likely to list on the NYSE. Overall, the results suggest that issue costs, market quality, industry characteristics, and future financing strategies are all important factors in the initial-listing decision.

This paper is related to several previous studies that examine the price effect of exchange listing. These studies generally conclude that NYSE listing increases liquidity and may convey positive information about the firm and increase investor recognition (e.g., Sanger and McConnell (1986), Grammatikos and Papaioannou (1986) and Kadlec and McConnell (1994)).[2] Our study differs from the previous work in that we examine *initial listings*. Analysis of the initial-listing decision should provide stronger tests than analyses of exchange changes since all firms must make a listing decision at the time of the IPO. In addition, the initial-listing decision involves some factors, such as issue costs, that are not important in the decision to switch exchanges. To our knowledge, only one other study examines the initial-listing decision. Using a sample of IPOs from 1983 to 1987, Affleck-Graves, Hegde, Miller, and Reilly (1993) test for a certification effect associated with exchange listing. They find that underpricing is significantly lower for IPOs listed on the NYSE, AMEX and Nasdaq-NMS than for IPOs listed on Nasdaq, but underpricing does not differ between the NYSE, AMEX and Nasdaq-NMS.

This paper is also related to previous studies that compare measures of market quality across exchanges. These studies generally conclude that execution costs are higher for Nasdaq firms than for

[2] In a related study, Cowan, Carter, Dark, and Singh (1992) compare the characteristics of firms that move from Nasdaq to the NYSE to those that stay on Nasdaq. While their results are consistent with a liquidity motive for listing, the authors conclude that the costs and benefits of listing vary across firms.

comparable NYSE firms[3] and that execution costs decrease when firms move from Nasdaq to the NYSE.[4] While we do not address differences in market quality directly, we expect these differences to be an important factor in the initial-listing decision.

Our results suggest that the level of competition between exchanges has increased dramatically over the last decade and that listing firms consider multiple factors when choosing an exchange. Consistent with these results, several U.S. exchanges have responded to increased competition with proposals and policy changes designed to attract new listings. Nasdaq and the American Stock Exchange recently proposed a merger that would significantly increase competition between these exchanges and the NYSE. Furthermore, the NYSE recently approved changes to its Rule 500 and its allocation policy in an effort to attract new listings.[5] These types of changes should provide benefits to listing firms and investors as securities markets become more competitive.

The rest of the paper is organized as follows. Section I describes the listing process and the change in NYSE listing rules. Section II describes the data and sample characteristics. In Section III, we provide an analysis of the costs of going public and test whether these costs differ across exchanges. Section IV discusses several additional factors that may affect the initial-listing decision. Results from a probit model of the listing decision are described in Section V and Section VI concludes.

I. The Listing Process

Until 1983, U.S. firms issuing equity through IPOs had little choice in the listing venue of their shares. This lack of alternatives resulted primarily from the fact that the NYSE's listing

[3] See, for example, Huang and Stoll (1996), Keim and Madhavan (1997), LaPlante and Muscarella (1997), and Bessembinder and Kaufman (1997, 1998). In contrast, Chan and Lakonishok (1997) and Jones and Lipson (1998) provide evidence that, in some cases, trading costs are lower on Nasdaq than the NYSE.

[4] See, for example, Christie and Huang (1994) and Barclay (1997).

[5] The changes to Rule 500, approved by the NYSE Board of Directors in November of 1997, give listed firms more freedom to voluntarily change listing venues. Under the amended rule, a U.S. firm can delist its stock with the approval of the company's audit committee and a majority of the board of directors (NYSE (1997)). The changes to the Allocation Policy, approved by the Securities and Exchange Commission in January of 1998, allow listing firms to either (1) have their specialist unit selected by the NYSE's allocation committee, or (2) select from among three to five specialist units identified by the allocation committee (SEC (1998)).

requirements include restrictions on the number of publicly held shares and the number of round-lot shareholders.[6] By definition, firms issuing equity for the first time find it difficult to meet these restrictions since they have no publicly traded shares prior to the issue. Instead, these firms have typically listed on the Nasdaq or regional markets and, in some cases, moved to the NYSE later.

Figure 1 shows the frequency of U.S. domestic IPOs (excluding rights and unit offerings) between 1981 and 1996 that listed on the NYSE, AMEX or Nasdaq markets, as identified in the Securities Data Company (SDC) New Issues Database. The figure illustrates the lack of listing venue choices available to IPO firms prior to 1983. During 1981 and 1982, for example, 387 of the 399 IPOs identified by SDC (97 percent) listed on Nasdaq.

In 1983, presumably in response to increased competition from other trading facilities, the NYSE changed its listing rules to make initial listing on the Big Board a viable alternative for some large IPOs. The minimum-listing requirements for IPOs remained the same as for other firms. However, the underwriter could now certify to the exchange that the IPO would meet share ownership and distribution standards. Figure 1 shows that the number of IPOs listed on the NYSE increased after the rule change. In 1983, 14 of the IPOs identified by SDC (2.4 percent of the total) listed directly on the NYSE and after 1986 the NYSE's share of IPO listings was consistently greater than 10 percent. During the entire 16-year period, there were 6,697 IPOs listed in the SDC database of which 5,194 (77.6%) listed on Nasdaq, 1,185 (17.7%) listed on the NYSE, and 292 (4.4%) listed on the American Stock Exchange.

Although the number of IPOs listing directly on the NYSE grew steadily during the 1980s, it was not until the early 1990s that the NYSE began to aggressively target IPO firms for listing. From 1980 to 1989, the NYSE had a net gain of only 155 listed firms. From 1990 through 1996, however, the number of NYSE-listed firms increased by 1,187. This increase in listings included over 800 IPOs (NYSE (1996)). The sample in this paper covers the period from 1991 through 1996 and represents a time of both heavy activity in the IPO market and rapid growth on the NYSE.

[6] The NYSE's minimum-listing requirements are discussed in more detail in Section II.

To list on the NYSE, a firm must apply for listing and be approved by the exchange. Once eligibility is determined, however, firm management makes the listing decision.[7] Managers may have pre-disposed ideas about the appropriate exchange for the stock. Alternatively, management may weigh the costs and benefits of each alternative incorporating input from the underwriters, auditors, lawyers, and other parties involved with the issue. This paper examines the extent to which IPO firms list directly on the NYSE and the relative importance of several factors in the listing decision. These potential factors include the costs of going public, market quality, sponsorship by Nasdaq market makers, industry characteristics, the amount of capital raised in follow-on offerings, continued-listing fees, the expected costs of delisting, and NYSE Rule 500.

II. Data and Sample Characteristics

A. Data

Using data from the Securities Data Company (SDC) new issues database, we collected all firm-commitment initial public offerings of common stock in the U.S. from 1991 to 1996. Issues by foreign firms, investment funds and real estate investment trusts are excluded. We also exclude unit and rights offerings. Finally, the sample is restricted to issues listed on either the NYSE or the Nasdaq-NMS (SDC exchange codes *NASDQ* or *NYSE*). These restrictions result in a sample of 2,404 IPOs.

To focus on the initial-listing decision, we further restrict the sample to IPOs that either listed on the NYSE or met the NYSE's minimum-listing requirements and listed on the Nasdaq-NMS. Panel A of Table 1 lists the NYSE listing requirements in effect during our sample period. Panel B lists the SDC proxy variables and minimum values used to restrict our sample. The restrictions result in a final sample of 590 IPOs that met the NYSE's minimum-listing requirements.[8]

[7] Prior to filing a formal listing application, applicant firms generally receive a confidential preliminary review from the NYSE. As a result, nearly all firms that formally apply are approved for listing (Sanger and McConnell (1986)).

[8] Exchange listings and secondary market prices were verified using CRSP and the Standard and Poor's Daily Stock Price Record. We identified and corrected 13 incorrect exchange designations in the SDC data.

The final sample includes all firms that met the minimum-listing standards of the NYSE. However, meeting these requirements does not guarantee that a firm will be approved for listing. The NYSE evaluates each firm individually, giving consideration to factors such as the national interest in the company and the company's position and stability in its industry (NYSE (1996)). The exchange also considers other factors such as the composition of the Board of Directors and Audit Committee, and the voting rights associated with the securities. For this reason, our Nasdaq sample may include some firms that met the NYSE's quantitative listing requirements but were not approved for listing due to other considerations. It is important to note, however, that these firms are often rejected based on their unwillingness to meet NYSE requirements (e.g., requirements related to the composition of the Board of Directors or Audit Committee).

Table 2 lists the number of IPOs in the final sample by year and exchange. Of the 590 sample IPOs, 337 (57%) listed on the NYSE and 253 (43%) listed on the Nasdaq-NMS. There were at least 60 IPOs in each sample year with the largest numbers of issues occurring in 1993 and 1996. The proportion of the sample listed on the NYSE ranges from 51 percent in 1993 to 67 percent in 1992. These results, combined with the evidence in Figure 1, suggest that the change in NYSE listing rules and the increased marketing efforts of the NYSE have had a significant effect on the competitive environment in which U.S. exchanges operate.

B. Sample Characteristics

Table 3 lists summary statistics for the sample of IPO firms. For the first nine variables, the table lists mean values for the complete sample and for the NYSE and Nasdaq subsamples. For these variables, the last column lists the *p*-value from a test of the restriction that means are equal across exchanges. For the last three variables, the table lists the proportion of sample firms in the stated category (e.g., venture-backed IPOs). For these variables, the *p*-value is from a χ^2 test of the restriction that proportions are equal across exchanges. Except where noted, variables are collected directly from the SDC database.

The first four rows of Table 3 list the variables used to screen the Nasdaq sample. Even after limiting the sample to firms that met the NYSE's minimum-listing requirements, it is clear that

significant differences exist across the two exchanges. NYSE IPOs are significantly larger than Nasdaq-NMS issues. The mean value of offer proceeds is $170 million on the NYSE and $74 million on the Nasdaq-NMS. In addition, firms listing IPOs on the NYSE have significantly higher earnings in the year prior to issue and significantly larger total assets than firms listing their IPOs on the Nasdaq-NMS.

Significant differences across exchanges are also evident for other firm and offer characteristics. The average offer price for NYSE-listed IPOs is $17.31 compared to $15.16 for Nasdaq issues. In addition, NYSE IPOs tend to be brought to market by more established underwriters. The mean underwriter market share for NYSE IPOs is 7.88 percent compared to 5.36 percent for Nasdaq IPOs.[9] NYSE IPOs also appear to be less risky than Nasdaq IPOs. The mean aftermarket standard deviation is 5.86 percent on the NYSE and 7.02 percent on the Nasdaq-NMS.[10] The average time from incorporation to initial public offering is 8.73 years and does not differ significantly across exchanges.

The last three rows of Table 3 reveal that Nasdaq IPOs are more likely to be backed by venture capital and NYSE IPOs are more likely to result from spinoffs. The Nasdaq sample is comprised of 41 percent venture-backed issues and only 18 percent spinoffs, while the NYSE sample includes 22 percent venture-backed IPOs and 40 percent spinoffs. The proportion of reverse leveraged buyouts (LBOs) in the complete sample is 26 percent and does not differ across exchanges.

The results in the previous two sections provide evidence that the number of IPOs listing directly on the NYSE has increased dramatically since the NYSE changed its listing rules and increased its efforts to attract new listings. However, a large number of NYSE-eligible IPOs continue

[9] To compute underwriter market share, we first collected the complete sample of 3,935 U.S. domestic IPOs listed in the SDC new-issues database between 1991 and 1996. For each investment bank, we then calculated the proportion of offer proceeds for which that investment bank served as lead underwriter, adjusting for name changes and treating subsidiaries as the same firm.

[10] Aftermarket standard deviation is defined as the standard deviation of five-day returns over the first 100 trading days, where returns are based on closing transaction prices obtained from CRSP. We use five-day returns to reduce the effects of bid-ask bounce.

to list on Nasdaq, suggesting that the perceived costs and benefits of listing vary across firms. In the next two sections, we examine several factors that may affect the initial-listing decision.

III. The Costs of Going Public

If managers act in the best interests of shareholders, they should choose the issue characteristics (i.e., contract type, underwriter, exchange, etc.) that minimize the total costs of going public. In this section, we test whether the costs of going public differ across exchanges. If differences exist, then issue costs should be considered by firms making the initial-listing decision. Following Ritter (1987) and Lee, Lochhead, Ritter, and Zhao (1996), we examine both direct and indirect costs of going public.

The direct costs of going public consist primarily of the underwriter spread and other direct expenses. The underwriter spread is the difference between the offer price and the price received by the issuer. This spread compensates the underwriter for the risks involved in underwriting and for the costs of due diligence and marketing the issue. Other direct expenses include listing and registration fees, legal and auditing fees, and the costs of preparing registration statements.

We define underpricing as the percentage price change from the offer price to the closing price on the first day of trading. Underpricing is an indirect cost to the issuing firm, since it represents "money left on the table". Finally, we define the total costs of going public as the sum of underwriter spread, other expenses and underpricing. In the analysis to follow, all costs are stated as a percentage of offer proceeds.

The costs of going public may differ across exchanges for several reasons. One possible source of differences in issue costs is the substantial difference in initial-listing fees between the Nasdaq-NMS and the NYSE. Listing fees are included in the direct expenses paid by the issuer and typically increase with the number of shares listed. The maximum initial-listing fees on the Nasdaq-NMS and the NYSE are currently $50,000 and $504,600, respectively.[11] Figure 2 plots initial-listing

[11] Estimates are based on the Nasdaq fee schedule effective 8/7/97 and the NYSE fee schedule effective 8/4/95, and do not include annual-listing fees that must also be paid by the firm (the prorated portion of the annual listing fee may also be due upon listing). On the Nasdaq-NMS, original listing fees include a one-time fee of $5,000 plus a

fees on the NYSE and Nasdaq-NMS as a percentage of the market value of listed shares (based on the sample average offer price of $16 per share). For example, consider the initial-listing fees paid by an issuer offering 5 million shares at $16 per share.[12] On the Nasdaq-NMS, this issuer would pay initial-listing fees of $30,000 or 0.0375 percent of market value. On the NYSE, listing fees for this issuer would be $84,600 or 0.1058 percent of market value. This difference is even more substantial for smaller offers. Unless counteracted by other effects, the difference in initial-listing fees will result in higher direct expenses on the NYSE than on Nasdaq, especially for smaller issues. However, as we discuss below, listing fees are only one component of direct expenses; these expenses also include auditors' and lawyers' fees, registration and printing costs, and other expenses paid by the issuing firm.

The costs of going public may also differ across exchanges if listing on the NYSE provides quality certification. Certification, if credible, will reduce investor uncertainty about the value of the offer and should, in turn, result in lower underpricing.[13] Further, if exchange certification substitutes for certification provided by the underwriter, then the underwriter's costs (e.g., due diligence) may be reduced, resulting in lower underwriter spreads. Affleck-Graves et al. (1993) examine IPO underpricing and test for certification related to exchange listing. They find evidence of certification from listing on the NYSE, AMEX and Nasdaq-NMS, but no difference in certification across these three markets.

Finally, underwriter spreads may differ across exchanges if listing on a particular exchange helps promote the security to investors or provides a larger potential investor base. This type of

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variable fee ranging from $0.005 to $0.001 per share. On the NYSE, initial-listing fees include a one-time fee of $36,800 plus a variable fee that ranges from $0.01475 per share to $0.0035 per share. The variable component of the NYSE-listing fee is charged only on the first 125 million shares. The maximum is therefore equal to the $36,800 base fee, plus $14,750 per million for the first 2 million shares, plus $7,400 per million for the next 2 million shares, plus $3,500 per million for the remaining shares up to 125 million.

[12] Listing fees are based on shares outstanding. For the purpose of this discussion we assume that shares offered and shares outstanding are equal.

[13] The positive relation between investor uncertainty and IPO underpricing is well documented. For a discussion, see Ibbotson, Sindelar and Ritter (1988, 1994). See Megginson and Weiss (1991) for a more complete discussion of certification and its effect on issue costs.

promotion by the exchange should reduce the marketing costs of the underwriter and could, in turn, result in differences in underwriter spreads across exchanges.

A. Univariate Results for Issue Costs

This section provides univariate summary statistics for the direct and indirect costs of going public. Results for underwriter spreads, direct expenses and total direct costs are listed in columns one through three of Table 4. The average underwriter spread is 6.47 percent in the complete sample and is significantly lower on the NYSE (6.23 percent) than on the Nasdaq-NMS (6.79 percent). Other direct expenses average 1.58 percent for the full sample and do not differ across exchanges. The reported means are lower than those reported in previous studies because our sample is restricted to only the largest IPOs.[14] The mean value of total direct costs, defined as underwriter spread plus other direct expenses, is 8.05 percent in the full sample and is significantly lower on the NYSE (7.80 percent) than on the Nasdaq-NMS (8.39 percent).

Summary statistics for underpricing and total direct and indirect costs are provided in columns four and five of Table 4. Underpricing averages 10.28 percent for the complete sample and is marginally lower on the NYSE (9.33 percent) than on the Nasdaq-NMS (11.55 percent). The total direct and indirect costs of going public, defined as the sum of underpricing, underwriter spreads and other direct expenses, average 18.37 percent of offer proceeds in the complete sample and are lower on the NYSE (17.15 percent) than on the Nasdaq-NMS (19.97 percent).

B. Regression Results for Issue Costs

The results from Table 4 suggest that there may be some differences across exchanges in the costs of going public. In this section, we use OLS regression analysis to test for differences in issue costs after controlling for firm and offer characteristics. The regressions include several variables that have been shown by previous researchers to be associated with issue costs. These variables

[14] For example, Lee, Lochhead, Ritter and Zhao (1996) report average underwriter spreads ranging from 5.21 percent for the largest offers to 9.05 percent for the smallest offers.

include the log of offer proceeds, underwriter market share, aftermarket standard deviation, and dummy variables identifying venture-backed issues, reverse-LBOs, and spinoffs.

Offer proceeds should capture any economies of scale and may also proxy for ex-ante uncertainty about the value of the offer. Previous researchers have found this variable to be inversely related to issue costs (Beatty and Ritter (1986), Ritter (1987), and Lee, Lochhead, Ritter, and Zhao (1996)). Aftermarket standard deviation is included as an additional proxy for ex ante uncertainty and should be positively related to issue costs. We also include underwriter market share as a proxy for underwriter quality. If underwriters can certify the quality of the offer, then higher quality underwriters should be associated with reduced underpricing.[15]

Venture-backed issues are identified by a dummy variable which equals one if the IPO is backed by venture capital and zero otherwise. Reverse LBOs and spinoffs are identified similarly. Megginson and Weiss (1991) find a negative relation between venture-capital backing and underpricing. We therefore expect the venture-backed dummy variable to be negatively related to issue costs. Muscarella and Vetsuypens (1989) find that reverse leveraged buyouts are less underpriced than other IPOs. We therefore expect the LBO dummy variable to be negatively related to issue costs. Finally, we expect spinoffs to be associated with less uncertainty than other firms, also resulting in a negative relation between the spinoff dummy variable and issue costs.

To examine differences across exchanges, we include a dummy variable equal to one if the IPO listed on the NYSE and zero otherwise. We estimate the model separately for underwriter spreads, direct expenses and underpricing, as well as total direct costs and total direct and indirect costs. The regressions take the following general form:[16]

$$\begin{aligned} \textit{Issue Cost} = {} & \alpha_0 + \beta_1 \cdot \textit{Ln}(\textit{OfferProceeds}) + \beta_2 \cdot \textit{UWMarketShare} + \beta_3 \cdot \textit{StdDeviation} \\ & + \beta_4 \cdot \textit{VentureBacked} + \beta_5 \cdot \textit{LBO} + \beta_6 \cdot \textit{Spinoff} + \beta_7 \cdot \textit{NYSE} + \varepsilon \end{aligned} \tag{1}$$

[15] For discussions of underwriter certification, see Carter and Manaster (1990) and Beatty and Welch (1996).

[16] We also estimated the model including the log of firm age, where firm age is defined as the number of years from the date of incorporation to the date of the IPO. The results are similar when this variable is included in the regressions. As robustness checks, we reestimated the model excluding standard deviation and the venture, LBO and spinoff dummy variables. The conclusions regarding differences across exchanges were unchanged.

Regression results for underwriter spreads, other direct expenses, total direct costs, underpricing, and total direct and indirect costs are listed in columns one through five of Table 5, respectively.[17] Statistical tests are based on White's heteroskedasticity-consistent χ^2-test if homoskedasticity is rejected at the five percent level.

We first examine the results for the direct costs of going public shown in columns one through three of Table 5. All three regressions have good explanatory power. The adjusted R^2s for the underwriter spread, other direct expenses and total direct cost regressions are 0.77, 0.28 and 0.53, respectively. Consistent with the economies of scale reported in Ritter (1987) and Lee, Lochhead, Ritter, and Zhao (1996), underwriter spreads, other direct expenses and total direct costs are all negatively related to offer size. In addition, spinoffs are associated with lower underwriter spreads and reverse LBOs are associated with lower underwriter spreads and lower total direct costs. The coefficients on underwriter market share, aftermarket standard deviation, and the venture-backed dummy variable are not significant at the five percent level in any of the direct cost regressions.

The coefficients on the NYSE dummy variables suggest that underwriter spreads are significantly lower for NYSE-listed IPOs, while other direct expenses are significantly lower for IPOs that list on the Nasdaq-NMS. The difference in other direct expenses is consistent with the higher initial-listing fees charged by the NYSE relative to the Nasdaq-NMS. However, as we noted earlier, initial-listing fees are only a small component of other expenses. Based on the summary statistics in Tables 3 and 4, the average firm in the sample would pay approximately $2 million in other direct expenses. Even if this firm listed 20 million shares on the NYSE, it would pay only $137,100 in initial-listing fees, suggesting that the difference in direct expenses is not limited to listing fees.

Combining underwriter spreads and other direct expenses, we find that total direct costs are significantly lower on the Nasdaq-NMS than on the NYSE. On average, the difference is approximately 0.4 percent of offer proceeds. However, further investigation reveals that this

[17] SDC data on direct expenses were missing for nine of the sample IPOs. This results in only 581 observations for the direct expenses and total cost regressions.

difference is almost exclusively due to smaller firms. We reestimated the regressions including two NYSE dummy variables: one for NYSE IPOs larger than the median offer size and one for NYSE IPOs smaller than the median offer size. Based on these results, the difference in total direct costs was a statistically significant 64 basis points for smaller IPOs and was insignificant for larger IPOs.

Column four of Table 5 presents the regression results for underpricing. In contrast to previous studies, the coefficient on offer proceeds is positive and insignificant in the underpricing regression. This result suggests that the negative relationship between offer size and underpricing found in previous studies is most likely the result of large initial returns on small IPOs. These IPOs are not included in our sample, since they do not meet the NYSE's minimum-listing requirements.[18] As expected, the coefficient on aftermarket standard deviation is positive and significant, suggesting that IPOs with more uncertainty are associated with more underpricing. Consistent with Muscarella and Vetsuypens (1989), reverse LBOs are associated with reduced underpricing. The coefficients on underwriter market share and the venture-backed and spinoff dummy variables are insignificant.

The coefficient on the NYSE dummy variable suggests that underpricing does not differ across exchanges after controlling for firm and offer characteristics. This result is consistent with Affleck-Graves et al. (1993) who find no difference in underpricing between the Nasdaq-NMS and the NYSE. The adjusted R^2 for the underpricing regression is 0.088.

The last column in Table 5 reports the results of the model for total direct and indirect costs. As in the underpricing regression, the independent variables appear to have limited explanatory power. Only aftermarket standard deviation and the LBO dummy variable are significant and the adjusted R^2 for the total cost regression is 0.103. In contrast to the results for direct costs, the coefficient on the NYSE dummy variable is not significantly different from zero in the total cost regression.

[18] The NYSE dummy variable may also capture some of the size effect. However, the coefficient on offer proceeds remains insignificant if the NYSE dummy variable is excluded from the regression.

The results in Tables 4 and 5 suggest that direct issue costs as a percentage of offer proceeds are significantly higher for IPOs listed on the NYSE than for IPOs listed on the Nasdaq-NMS. Based on the NYSE dummy-variable coefficient of 0.38, the difference in direct issue costs would amount to a approximately $500,000 for the average IPO in the sample. As we noted above, the difference in percentage direct costs is most significant for small issues, suggesting that the managers of these firms could minimize issue costs by listing on the Nasdaq-NMS rather than the NYSE.

IV. Other Listing Decision Criteria

The results in Section III suggest that some firms, particularly small firms, may be able to reduce their direct issue costs by listing on the NYSE rather than the Nasdaq-NMS. However, in addition to issue costs, several other factors may affect the initial-listing decisions of firms that go public. In this section we discuss some of these factors, including market quality, sponsorship by Nasdaq market makers, industry characteristics, follow-on offerings, and limitations on voluntary delisting from the NYSE (NYSE Rule 500). The relative importance of these factors and their ability to jointly explain the initial-listing decisions of IPO firms are addressed in Section V.

A. Differences in Market Quality

A number of academic studies examine differences in market quality across exchanges and the benefits of moving from one exchange to another. If market quality differs across exchanges, listing firms should take these differences into account when making the initial-listing decision. In this section, we provide a brief summary of the major findings in this area. While not in complete agreement, the literature on this subject provides several consistent results on which management can base its listing decision.[19]

One major branch of research related to market quality examines the price effect of moving from Nasdaq to the NYSE. In general, these studies find a positive price reaction to NYSE listing announcements (e.g., Sanger and McConnell (1986), Grammatikos and Papaioannou (1986) and Kadlec and McConnell (1994)). This positive return is generally interpreted as evidence of (i) a

signal about the future prospects of the firm, (ii) an increase in liquidity associated with exchange listing, or (iii) increased investor recognition due to exchange listing.

The second major branch of research related to market quality provides comparisons of execution costs and liquidity across exchanges. Huang and Stoll (1996) and Bessembinder and Kaufman (1997, 1998) find that several measures of bid-ask spread and post-trade variability are significantly higher for Nasdaq stocks than for comparable NYSE stocks. Christie and Huang (1994) and Barclay (1997) examine execution costs around exchange changes and find significant reductions in trading costs when firms move from Nasdaq to the NYSE.[20] For institutional trades, the evidence related to market quality is mixed. While LaPlante and Muscarella (1997) and Keim and Madhavan (1997) find that institutional trading costs are lower for exchange-listed stocks than for Nasdaq stocks, Chan and Lakonishok (1997) and Jones and Lipson (1998) provide evidence that, in some cases, institutional trading costs are lower on Nasdaq.

The main results from this literature can be summarized as follows: (1) on average, NYSE listing has a positive effect on stock prices, (2) the positive stock price reaction is consistent with increased liquidity on the NYSE, but may also result from increased investor recognition or a positive signal about firm prospects, (3) execution costs are generally lower on the NYSE, and (4) the increased liquidity and reduced execution costs on the NYSE may be limited to larger firms.

B. Nasdaq Sponsorship

An additional feature that distinguishes the Nasdaq market from the NYSE is sponsorship. Sponsorship refers to the fact that Nasdaq market makers typically promote the securities they trade to investors. According to Nasdaq (1996),

> *"…Nasdaq market makers commit to your company by taking sizable positions in their proprietary accounts, merchandising through their institutional contacts and their own or affiliated retail networks, and maintaining continuous research coverage."*

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[19] McConnell, Dybevik, Haushalter and Lie (1996) provide a complete review of the empirical literature related to domestic and international exchange listings.

[20] Clyde, Schultz, and Zaman (1997) examine a sample of firms that voluntarily move from the American Stock Exchange to Nasdaq. Interestingly, these moves are associated with significant increases in spreads, but positive stock price reactions.

Aggarwal and Angel (1997) suggest that the incentives to provide sponsorship derive from the market maker's ability to internalize order flow on Nasdaq and from the wider bid-ask spreads earned on Nasdaq trades relative to NYSE trades.

Sponsorship should be most valuable to firms that are relatively unknown among investors and for which limited publicly available information about the company exists. Since these are likely to be the smallest and youngest companies, we hypothesize that smaller and younger firms will be more likely to list on the Nasdaq-NMS than on the NYSE, all else equal. Consistent with this hypothesis, Nasdaq-listed IPOs tend to be significantly smaller than IPOs listed on the NYSE (see Table 4). However, there is no evidence that firm age differs between the two groups. The relative importance of each of these variables in the initial-listing decision will be examined further in Section V.

C. Industry

The Nasdaq market is generally considered the primary listing venue for technology companies in the U.S. In recent years, however, the NYSE has increased its efforts to draw the largest technology companies away from Nasdaq. In this section, we examine the industry characteristics of the firms in our sample to determine whether certain industries or sectors are more likely to list on one exchange versus another.

We define industries according to two classifications. First, we use Securities Data Company's technology industry definitions to identify the technology firms in the sample. Panel A of Table 6 lists the frequencies of sample IPOs in each of the SDC technology industries. Although the NYSE sample includes a lower proportion of technology firms than the Nasdaq-NMS sample, there is only weak evidence that technology IPOs are more likely to list on Nasdaq than the NYSE. Of the 89 technology firms identified in the NYSE-eligible sample, 42 listed on the NYSE and 47 listed on the Nasdaq-NMS. In Section V below, we test whether technology firms are more likely to list on the Nasdaq-NMS after controlling for other firm and offer characteristics.

As an alternative industry classification, we define eight broad industry classifications based on two-digit SIC codes. Panel B of Table 6 lists these classifications and the frequency distribution for

the sample IPOs. Relative to the NYSE sample, the Nasdaq-NMS sample includes a higher proportion of IPOs in the transportation, communication, electric and gas industry (15.8 percent versus 6.5 percent) and in the services industry (25.3 percent versus 14.2 percent), and a lower proportion of firms in the finance, insurance and real estate industry (4.3 percent versus 20.4 percent). These results suggest that there is significant industry concentration in initial-listings across exchanges.

D. Follow-on Offerings

For many firms, the initial public offering is a first step in a series of public offerings. Macklin, Adlerman and Hao (1992) refer to this as a "seasoning strategy" and suggest that it can be used to reduce the overall cost of capital. If either the NYSE or the Nasdaq-NMS provides more liquidity or increased investor recognition in the aftermarket, that exchange would likely be preferred by firms following a seasoning strategy. It could be argued that sponsorship by Nasdaq market makers results in better aftermarket conditions for future offerings. In addition, underwriters of Nasdaq IPOs generally become market makers for the stock, providing a continued relationship that may prove beneficial in future offerings. However, the NYSE argues that their market provides the aftermarket liquidity and visibility required for a successful IPO. The question of whether firms following a seasoning strategy prefer one exchange over another is therefore an empirical one.

To address this question, we first examine whether follow-on offerings are more common on one exchange versus the other. Using the Securities Data Company New Issues database, we identified all seasoned offers of equity by firms in the IPO sample within 36 months of the IPO date.[21] Table 7 provides summary data for these follow-on offers. Of the 590 firms in the IPO sample, 224 (38 percent) had at least one seasoned equity offer within 36 months of the IPO date. Relative to the NYSE, a higher proportion of the Nasdaq sample issued follow-on offerings (45.8 percent versus 32.0 percent). However, multiple offers resulted in a higher number of seasoned offers in the NYSE sample (157) than in the Nasdaq-NMS sample (141). The mean number of seasoned offers per IPO and the mean amount of capital raised through seasoned offers are 0.51 and $64.27 million,

respectively. Equality of means across exchanges cannot be rejected for either variable. Overall, there is no evidence that either Nasdaq or NYSE firms are more likely to issue follow-on offerings. In Section V, we test whether firms following a seasoning strategy are more likely to choose one exchange over another, after controlling for other factors.

E. Annual Listing Fees

In addition to initial-listing fees, firms must pay annual-listing fees to the exchange. The annual-listing fee on the Nasdaq-NMS consists of a base fee, ranging from $5,250 to 13,250, and a variable fee of $0.025 per $1,000 of market capitalization above $100 million. The maximum annual fee on the Nasdaq-NMS is $20,000. On the NYSE, the annual-listing fee ranges from a minimum of $16,170 to a maximum of $500,000.

Figure 3 shows annual listing fees on the NYSE and Nasdaq-NMS as a percentage of market capitalization (based on the sample average offer price of $16 per share). For comparison, consider the annual-listing fees on the NYSE and the Nasdaq-NMS for a firm with 5 million listed shares ($80 million market capitalization). If listed on the NYSE, this firm would pay annual listing fees of $16,170 or 0.020 percent of market capitalization. If listed on the Nasdaq-NMS, this same firm would pay annual listing fees of only $7,250 or 0.009 percent of market capitalization. Like the difference in original-listing fees, the difference in annual-listing fees is even more dramatic for smaller issues. We would therefore expect annual-listing fees to be a significant factor in the initial-listing decision, especially for smaller firms.

F. Expected Costs of Delisting

Delistings are generally associated with a decrease in stock price. For example, Sanger and Peterson (1990) report average abnormal returns of -8.5 percent associated with announcements of delistings from the NYSE and AMEX. They also provide evidence that this negative stock price reaction may be due to a decrease in liquidity. However, as McConnell, Dybevik, Haushalter and Lie (1996) point out, this negative reaction may also suggest that the market perceives delistings as a

[21] Seasoned offer data was collected through 12/31/97. For this reason, fewer than 36 months are considered when identifying seasoned offers for IPOs issued after 1/1/95.

signal of the exchange's weakened confidence in the firm's ability to meet continued listing requirements.

To avoid the negative effects of delisting, firm managers may wait to list the firm on the NYSE until they are confident that the firm will be able to maintain its listing eligibility. Consistent with this argument, 36 of the 253 Nasdaq-listed IPOs in the sample moved to the NYSE prior to 12/31/96. Furthermore, none of the NYSE-listed IPOs were delisted prior to the end of 1996.[22]

G. NYSE Rule 500

Up to this point, we have ignored the NYSE's Rule 500, which restricts the ability of firms to voluntarily delist from the NYSE. Although the NYSE is currently considering changes to Rule 500, the original rule was in place during our entire sample period. The original rule states that, under normal circumstances, a security considered eligible for continued listing will be allowed to delist only if (1) the proposed withdrawal is approved by two-thirds of the outstanding security holders, and (2) less than 10 percent of the individual holders of the security object to the withdrawal (NYSE (1995)).

Rule 500 makes it extremely difficult to voluntarily delist from the NYSE. In fact, since the rule was implemented in the 1930s, only one firm has delisted under its provisions (NYSE (1997)). The decision to list on Nasdaq, on the other hand, is more flexible, since the firm can transfer to another exchange more freely. Given these alternatives, some firms may choose to list on Nasdaq to maintain flexibility in the listing decision. Although a complete analysis of this topic is beyond the scope of this paper, the implications of listing-decision flexibility suggest that more firms may choose to list on the NYSE and additional firms may delist if the change to NYSE Rule 500 becomes effective.

V. The Listing Decision

Sections III and IV describe several potential factors that may affect the initial-listing decisions of IPO firms. In this section, we estimate a probit model for the initial-listing decision in

[22] A list of the 36 firms that moved from the Nasdaq-NMS to the NYSE is available from the authors.

order to determine the relative importance of these factors and the ability of these factors to jointly explain the initial-listing decision. The model takes the following general form:

$$NYSE = \alpha + \beta_1 ?Ln(1 + MarketValue) + \beta_2 ?StandardDeviaion + \beta_3 ?Ln(1 + SeasonedOffers) + \beta_4 ?Ln(1 + FirmAge) + \beta_5 ?Technology + \beta_6 ?Venture + \beta_7 ?LBO + \beta_8 ?Spinoff + \varepsilon. \quad (2)$$

The dependent variable equals one if the IPO listed on the NYSE and zero otherwise. The explanatory variables include proxies for several of the factors described in Section III. *Market Value* controls for firm size and proxies for several of the factors described in Section III. For example, the results in Section III.B. suggest that smaller firms can minimize issue costs by listing on the Nasdaq-NMS rather than the NYSE. In addition, Nasdaq sponsorship should provide the greatest benefits to smaller and younger firms. If sponsorship is a significant factor in the initial-listing decision, we would expect both *Market Value* and *Firm Age* to be positively associated with NYSE listing.

Seasoned Offers is defined as the total dollar amount of seasoned offers issued by the firm during the 36 months after the IPO or prior to 12/31/97, whichever comes first. A positive (negative) coefficient on this variable would suggest that firms following a seasoning strategy are more likely to list on the NYSE (Nasdaq-NMS). *Technology* is a dummy variable equal to one if the firm is identified as a technology firm in the SDC new issues database and zero otherwise. If technology firms are more likely to list on Nasdaq than the NYSE, this variable will have a negative coefficient. *Standard Deviation* is defined as the standard deviation of five-day returns calculated over the first 100 trading days and is included to control for the risk of the firm. Finally, *Venture*, *LBO* and *Spinoff* are three dummy variables used to identify venture-backed issues, reverse leveraged buyouts, and spinoffs, respectively. The dummy variables equal one if the IPO is in the stated category and zero otherwise.

Table 8 lists the correlations between the variables used in the probit analysis. Most of the significant correlations are associated with aftermarket standard deviation. *Standard Deviation* is negatively correlated with firm size and the *Spinoff* dummy variable, consistent with the fact that larger firms and spinoffs are likely to be less risky than other firms. *Standard Deviation* is positively correlated with the *Technology* and *Venture* dummy variables, suggesting that technology firms and

venture-backed issues are associated with higher risk. The last column of Table 8 lists the correlations between the explanatory variables and the NYSE dummy variable. NYSE listings are positively associated with firm size and the *Spinoff* dummy variable and negatively associated with *Standard Deviation* and the *Technology* and *Venture* dummy variables.

Table 9 provides the results from the probit model. Columns one through eight list probit results for each of the explanatory variables individually, while columns nine through eleven list the results from multivariate probit analyses. A Pseudo-R^2 (or likelihood-ratio index) is calculated for each model, where the pseudo-R^2 equals one minus the ratio of the computed log-likelihood to the log-likelihood of a model in which all slopes equal zero.[23]

The coefficient on market value is positive and significant in all of the models. This result is consistent with smaller firms listing on Nasdaq to avoid the higher direct issue costs charged on the NYSE. This result is also consistent with the market quality literature which suggests that Nasdaq may provide liquidity benefits for smaller firms. Alternatively, the positive relation between market value and NYSE listing could be interpreted as evidence that sponsorship is an important factor in the initial-listing decision. However, if sponsorship is an important factor we would also expect younger firms to choose the Nasdaq-NMS over the NYSE. We find no such evidence; the coefficient on *Firm Age* is marginally significant in the individual variable model, but insignificant in the multivariate model.

There is some evidence that firms following a seasoning strategy are more likely to list on the Nasdaq-NMS than the NYSE. The coefficient on *Seasoned Offers* is consistently negative and significant at the ten percent level or better in all of the models. There is also evidence that technology firms are more likely to list on the Nasdaq-NMS than the NYSE. In all of the models, the coefficient on the *Technology* dummy variable is negative and significant at the ten percent level or better. Finally, the results suggest that spinoffs are more likely to list on the NYSE, while riskier

[23] For a discussion of the likelihood ratio index, see Greene (1997).

firms and venture-backed issues are more likely to list on the Nasdaq-NMS.[24] The coefficient on the *Reverse-LBO* dummy is not significant in any of the models. Overall, the results suggest that larger firms, less risky firms and spinoffs are more likely to list on the NYSE, while technology firms, venture-backed firms, and firms that raise funds through follow-on offerings are more likely to list on the Nasdaq-NMS.

VI. Conclusion

In 1983, the NYSE developed special listing procedures making it possible for some large IPOs to list directly on the NYSE. Since this rule change, the number of IPOs listing directly on the NYSE has increased dramatically. For example, according to the Securities Data Company New Issues Database, two IPOs listed on the NYSE in 1982, while over two hundred IPOs listed on the NYSE in 1993. This study analyzes the factors that explain the initial-listing decisions of IPO firms and documents the rapid growth in IPO listings on the NYSE since this rule change.

We examine a sample of 590 IPOs from 1991 to 1996 by firms that either listed on the NYSE or met the NYSE's minimum-listing requirements and listed on the Nasdaq-NMS. Of these, 337 (57 percent) listed on the NYSE. The significant number of NYSE listings suggests that the change in NYSE listing rules and increased marketing efforts by the exchange have had a significant effect on the competitive environment in which U.S. exchanges operate. However, a large number for NYSE-eligible IPOs continue to list on Nasdaq, suggesting that the costs and benefits of listing vary across firms.

Examining the factors that affect the initial-listing decision, we find that direct issue costs are substantially higher on the NYSE than on the Nasdaq-NMS, especially for smaller issues. Consistent with this difference, probit results show that smaller firms are more likely to list on the Nasdaq-NMS than the NYSE. We also find that technology firms, venture-backed issues, and firms that raise funds

[24] One possible explanation for the *spinoff* coefficient is that the spunoff companies simply list on the same exchange as the parent company. To examine this possibility, we used the parent company names provided by SDC, combined with the S&P Daily Stock Price Record, to identify those parent companies listed on the NYSE at the time of the spinoff. Only 43 percent of the 181 spinoffs in the sample had NYSE-listed parent companies. We reestimated the probit model including one dummy variable for spinoffs with NYSE-listed parents and one dummy

through follow-on offerings are more likely to list on the Nasdaq-NMS, while less risky firms and spinoffs are more likely to list on the NYSE. Overall, our results suggest that issue costs, market quality, industry characteristics, and future financing strategies are all important factors in the initial-listing decision.

variable for other spinoffs. The results suggest that spinoffs are more likely to list on the NYSE regardless of where the parent company is listed.

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Table 1 - NYSE Listing Requirements and Sample Restrictions

Panel A lists the NYSE minimum listing requirements for domestic firms. These listing requirements are reproduced from the NYSE Fact Book (NYSE 1996) and have been in effect since October of 1988. Panel B lists the data restrictions used in the analysis to identify NYSE-eligible IPOs. The variables in panel B are taken directly from the Securities Data Company's New Issues database. EBIT is defined as earnings before interest and taxes for the latest 12-month period. Total Assets is measured prior to the offer. Offered Shares excludes overallotment options. Offer Proceeds is defined as offered shares multiplied by the offer price.

Panel A - NYSE Listing Requirements	
Pre-tax income latest year	\$2.5 m[a]
Pre-tax income preceding 2 years	\$2.0 m[a]
Net tangible assets	\$40.0 m
Aggregate market value of publicly held shares	\$40.0 m[b]
Shares not concentrated (publicly held)	1.1 m
Number of holders of round lots (>100 shares)	2,000
Panel B - Sample Data Restrictions	
EBIT most recent fiscal year prior to the issue	\$2.5 m
Total assets prior to the issue	\$40.0 m
Offer proceeds (offered shares * offer price)	\$40.0 m
Offered shares	1.1 m

[a] Or \$6.5 million aggregate for prior three years and \$4.5 million in the most recent year.

[b] Was \$18.0 million prior to January 2, 1996.

Table 2 - Frequency of Initial Public Offerings by Exchange and Year

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial-listing requirements and listed on the Nasdaq-NMS. All data are from the Securities Data Company's New Issues database.

Year	NYSE	Nasdaq-NMS	Total
1991	40 (59.7%)	27 (40.3%)	67 (100%)
1992	65 (67.0%)	32 (33.0%)	97 (100%)
1993	64 (50.8%)	62 (49.2%)	126 (100%)
1994	46 (57.5%)	34 (42.5%)	80 (100%)
1995	45 (56.3%)	35 (43.8%)	80 (100%)
1996	77 (55.0%)	63 (45.0%)	140 (100%)
Total	337 (57.1%)	253 (42.9%)	590 (100%)

Table 3 – Summary Statistics for Firm and Offer Characteristics

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. In rows one through nine, the table lists the mean values of each variable for the full sample, the NYSE subsample, and the Nasdaq-NMS subsample. For these variables, the *p*-value is from a test for equality of means across exchanges based on analysis of variance. In rows 10-12, the table lists the proportion of sample firms that are in the listed category. For these variables, the *p*-value is from a test for equality of proportions across exchanges based on a χ^2. *Offered Shares* excludes overallotment options. *Offer Proceeds* is defined as offered shares multiplied by the offer price. *Total Assets* is measured prior to the offer. *EBIT* is defined as earnings before interest and taxes for the latest 12-month period. *Firm Age* equals the number of years from the incorporation date to the date of the IPO. *Aftermarket Standard Deviation* equals the standard deviation of five-day returns over the first 100 trading days, where returns are based on closing transaction prices. *Underwriter Market Share* equals the proportion of all IPO proceeds from 1991 through 1996 for which the underwriter served as lead underwriter. *Market Value after Issue* equals shares outstanding after the issue multiplied by the offer price. All variables except *Firm Age*, *Standard Deviation*, and *Underwriter Market Share* are taken directly for the Securities Data Company's New Issues database.

Variable	N	All IPOs	NYSE IPOs	Nasdaq IPOs	*p*-value for difference in means [proportions]
Offer Proceeds ($m)	590	128.69	169.96	73.73	0.000
Offered Shares (m)	590	7.37	9.27	4.84	0.000
Total Assets prior to Issue ($m)	564	1,124.66	1,866.78	212.39	0.000
EBIT ($m)	580	46.13	66.27	20.09	0.000
Offer Price	590	16.39	17.31	15.16	0.000
Firm Age	552	8.73	8.59	8.93	0.794
Aftermarket Standard Deviation (%)	590	6.36	5.86	7.02	0.000
Underwriter Market Share (%)	590	6.80	7.88	5.36	0.000
Market Value after Issue ($m)	590	639.07	925.81	257.13	0.001
Venture-Backed (% in sample)	590	30.00	21.96	40.71	[0.000]
LBO (% in sample)	590	26.10	26.71	25.30	[0.700]
Spinoff (% in sample)	590	30.68	40.06	18.18	[0.000]

Table 4 – Summary Statistics for Issue Costs

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. The table lists the mean values of each variable for the full sample, the NYSE subsample, and the Nasdaq-NMS subsample. The *p*-value is from a test for equality of means across exchanges based on analysis of variance. *Underpricing* is defined as (first aftermarket price - offer price)/offer price. *Underwriter Spread* is the difference between the offer price and the price paid to the issuing firm as a percentage of offer proceeds. *Other Expenses* include costs (excluding the underwriter spread) paid by the issuer, such as legal and auditing expenses and listing and registration fees. Other expenses is defined as a percentage of offer proceeds. *Total Direct Costs* is defined as the sum of underwriter spreads and other expenses stated as a percentage of offer proceeds. *Total Direct and Indirect Costs* is defined as the sum of underpricing, underwriter spreads and expenses stated as a percentage of offer proceeds.

Variable	N	All IPOs	NYSE IPOs	Nasdaq IPOs	*p*-value for difference in means
Direct Issue Costs:					
Underwriter Spread (%)	590	6.47	6.23	6.79	0.000
Other Expenses (%)	581	1.58	1.56	1.59	0.758
Total Direct Costs (%)	581	8.05	7.80	8.39	0.000
Indirect Issue Costs:					
Underpricing (%)	590	10.28	9.33	11.55	0.049
Total Direct and Indirect Costs (%)	581	18.37	17.15	19.97	0.014

Table 5 – Issue Cost Regressions

The table lists the coefficients (*p*-values) from OLS regressions of issue costs on firm and offer characteristics. The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. *Underpricing* is defined as (first aftermarket price - offer price)/offer price. *Underwriter Spread* is the difference between the offer price and the price paid to the issuing firm as a percentage of offer proceeds. *Other Expenses* include costs (excluding the underwriter spread) paid by the issuer, such as legal and auditing expenses and listing and registration fees. Other expenses is defined as a percentage of offer proceeds. *Total Direct Costs* is defined as the sum of underwriter spreads and other expenses stated as a percentage of offer proceeds. *Total Direct and Indirect Costs* is defined as the sum of underpricing, underwriter spreads and expenses stated as a percentage of offer proceeds. *NYSE* is a dummy variable equal to one if the IPO listed on the NYSE and zero otherwise. *Offer Proceeds* is defined as offered shares (excluding overallotment options) multiplied by the offer price. *Aftermarket Standard Deviation* equals the standard deviation of five-day returns over the first 100 trading days, where returns are based on closing transaction prices. *Underwriter Market Share* equals the proportion of all IPO proceeds from 1991 through 1996 for which the underwriter served as lead underwriter. *Venture-Backed* is a dummy variable which equals one if the IPO was backed by venture capital and zero otherwise. *LBO* and *Spinoff* are defined similarly for reverse leveraged buyouts and spinoffs. Statistical tests are based on White's heteroskedasticity-consistent χ^2-test if homoskedasticity is rejected at the five percent level.

	Direct Issue Costs				
	Underwriter Spread	Other Expenses	Total Direct Costs	Underpricing	Total Direct and Indirect Costs
Intercept	9.588 (0.000)	5.776 (0.000)	15.366 (0.000)	-1.908 (0.642)	13.934 (0.000)
Ln(Offer Proceeds)	-0.672 (0.000)	-1.006 (0.000)	-1.680 (0.000)	0.840 (0.330)	-0.955 (0.276)
UW Market Share	0.002 (0.518)	-0.001 (0.908)	0.001 (0.936)	0.115 (0.293)	0.127 (0.257)
Aftermarket Standard Deviation	0.006 (0.269)	0.013 (0.515)	0.019 (0.353)	1.494 (0.000)	1.509 (0.000)
Venture-Backed	0.047 (0.091)	-0.005 (0.963)	0.045 (0.673)	0.834 (0.502)	0.969 (0.443)
Reverse LBO	-0.116 (0.000)	-0.205 (0.051)	-0.326 (0.002)	-4.663 (0.000)	-5.047 (0.000)
Spinoff	-0.119 (0.000)	0.015 (0.884)	-0.098 (0.369)	-1.820 (0.149)	-1.92 (0.132)
NYSE	-0.146 (0.000)	0.535 (0.000)	0.388 (0.000)	-0.609 (0.616)	-0.193 (0.875)
N	590	581	581	590	581
Adj. R^2	0.7793	0.2886	0.5366	0.0880	0.1031

Table 6 – IPO Firms by Industry

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. Panel A lists the number of IPOs in each technology industry, where technology industries are identified using the Securities Data Company's technology industry classifications. Panel B lists the number of IPOs (and proportion of the sample) in each industry, where industries are classified according to two-digit SIC codes. In panel B, * and ** indicate a significant difference in proportions across exchanges at the 5 and 1 percent levels, respectively (based on a chi-square test).

Industry	Full Sample	NYSE	Nasdaq
Panel A – SDC Technology Industries			
Biotechnology	17	12	5
Communications	16	6	10
Computer Equipment	34	12	22
Electronics	16	10	6
General Technology	6	2	4
Total Technology Firms	89	42	47
Panel B – SIC Industries			
Agriculture, Fishing and Forestry: SIC 01-09	1 (0.17)	0 (0.00)	1 (0.40)
Mining: SIC 10-14	21 (3.56)	17 (5.04)	4 (1.58)*
Construction: SIC 15-17	8 (1.36)	6 (1.78)	2 (0.79)
Manufacturing: SIC 20-39	218 (36.95)	129 (38.28)	89 (35.18)
Transportation, Communication, Electric, Gas: SIC 40-49	62 (10.51)	22 (6.53)	40 (15.81)**
Wholesale and Retail Trade: SIC 50-59	88 (14.92)	46 (13.65)	42 (16.60)
Finance, Insurance and Real Estate: SIC 60-67	80 (13.56)	69 (20.47)	11 (4.35)**
Services: SIC 70-89	112 (18.98)	48 (14.24)	64 (25.30)**
Total Firms	590 (100.0)	337 (100.0)	253 (100.0)

Table 7 – Seasoned Offers by IPO Firms

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. Seasoned offers by firms in the IPO sample are identified using the Securities Data Company's Corporate New Issues Database. The table includes all seasoned offers of common stock within 36 months of the IPO or prior to 12/31/1997 whichever comes first.

	Full IPO Sample	NYSE	Nasdaq	*p*-value for difference in means
Number of firms making seasoned offers during first 36 months of trading[a]	224	108	116	-
Total number of seasoned issues during first 36 months of trading	298	157	141	-
Total amount raised through seasoned issues during first 36 months of trading ($m)	37,919	23,634	14,285	-
Mean number of seasoned issues during first 36 months of trading	0.51	0.47	0.56	0.1478
Mean amount raised through seasoned issues during first 36 months of trading ($m)	64.27	70.13	56.46	0.2318

[a] Seasoned offer data were collected through 12/31/97. For this reason, fewer than 36 months are considered when identifying seasoned offers for IPOs issued after 1/1/1995.

Table 8 – Correlations for Probit Model Variables

The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. *Market Value* is defined as offered shares after the offer multiplied by the offer price. *Standard Deviation* equals the standard deviation of five-day returns over the first 100 trading days, where returns are based on closing transaction prices. *Seasoned Offers* is the total dollar amount of seasoned offers (in millions) within 36 months of the issue or prior to 12/31/97, whichever comes first. *Technology Firm* is a dummy variable equal to one if the firm is in one of the Securities Data Company's technology industries. *Venture-Backed* is a dummy variable which equals one if the IPO was backed by venture capital and zero otherwise. *LBO* and *Spinoff* are defined similarly for reverse leveraged buyouts and spinoffs. *Firm Age* is the number of years from the incorporation date to the IPO. ***, ** and * indicate significance at the 1, 5 and 10 percent levels.

	Standard Deviation	*Seasoned Offers*	*Technology Firm*	*Venture-Backed IPO*	*Reverse LBO*	*Spinoff*	*Firm Age*	*NYSE*
Market Value	-0.135***	-0.012	0.029	-0.068*	-0.054	0.164***	0.028	0.133***
Standard Deviation	-	-0.017	0.199***	0.088**	-0.074*	-0.143***	-0.035	-0.249***
Seasoned Offers	-	-	-0.031	0.094**	0.100**	-0.023	-0.069	0.049
Technology Firm	-	-	-	0.075*	-0.056	-0.034	0.008	-0.085**
Venture-Backed IPO	-	-	-	-	0.234***	-0.211***	-0.067	-0.203***
Reverse LBO	-	-	-	-	-	-0.077*	-0.045	0.016
Spinoff	-	-	-	-	-	-	-0.052	0.235***
Firm Age	-	-	-	-	-	-	-	-0.011

Table 9 – Probit Model for Exchange Listing

The table lists the coefficients (*p*-values) from a probit model of the initial-listing decision. The dependent variable equals one if the IPO listed on the NYSE and zero if the IPO listed on the Nasdaq-NMS. The sample includes all domestic, firm-commitment initial public offerings of equity between 1991 and 1996, excluding closed-end funds, REITs, units, and rights offerings. In addition, an IPO is only included if it (i) listed on the NYSE or (ii) met the NYSE's initial listing requirements and listed on the Nasdaq-NMS. These restrictions result in a sample of 590 IPOs of which 337 listed on the NYSE. *Market Value* is defined as offered shares after the offer multiplied by the offer price. *Standard Deviation* equals the standard deviation of five-day returns over the first 100 trading days, where returns are based on closing transaction prices. *Seasoned Offers* is the total dollar amount of seasoned offers (in millions) within 36 months of the issue or prior to 12/31/97, whichever comes first. *Technology Firm* is a dummy variable equal to one if the firm is in one of the Securities Data Company's technology industries. *Venture-Backed* is a dummy variable which equals one if the IPO was backed by venture capital and zero otherwise. *LBO* and *Spinoff* are defined similarly for reverse leveraged buyouts and spinoffs. *Firm Age* is the number of years from the incorporation date to the IPO.

	1	2	3	4	5	6	7	8	9	10	11
Intercept	-3.805 (0.000)	1.072 (0.000)	0.280 (0.000)	0.225 (0.000)	0.350 (0.000)	0.168 (0.005)	-0.015 (0.804)	0.387 (0.000)	-3.005 (0.000)	-2.856 (0.000)	-2.263 (0.000)
Ln(1+Market Value)	0.706 (0.000)	-	-	-	-	-	-	-	0.729 (0.000)	0.687 (0.000)	0.632 (0.000)
Standard Deviation	-	-0.140 (0.000)	-	-	-	-	-	-	-0.119 (0.000)	-0.112 (0.000)	-0.137 (0.000)
Ln(1+Seasoned Offers)	-	-	-0.055 (0.012)	-	-	-	-	-	-0.057 (0.016)	-0.044 (0.072)	-0.050 (0.047)
Technology Firm	-	-	-	-0.295 (0.041)	-	-	-	-	-0.373 (0.022)	-0.322 (0.054)	-0.324 (0.053)
Venture-Backed IPO	-	-	-	-	-0.557 (0.000)	-	-	-	-	-0.371 (0.004)	-0.326 (0.017)
Reverse LBO	-	-	-	-	-	0.046 (0.699)	-	-	-	0.116 (0.389)	0.178 (0.211)
Spinoff	-	-	-	-	-	-	0.677 (0.000)	-	-	0.368 (0.005)	0.382 (0.006)
Ln(1+Firm Age)	-	-	-	-	-	-	-	-0.086 (0.065)	-	-	-0.057 (0.278)
N	590	590	590	590	590	590	590	552	590	590	552
Pseudo-R^2	0.1386	0.0460	0.0066	0.0051	0.0298	0.0001	0.0419	0.0045	0.1877	0.2106	0.2098

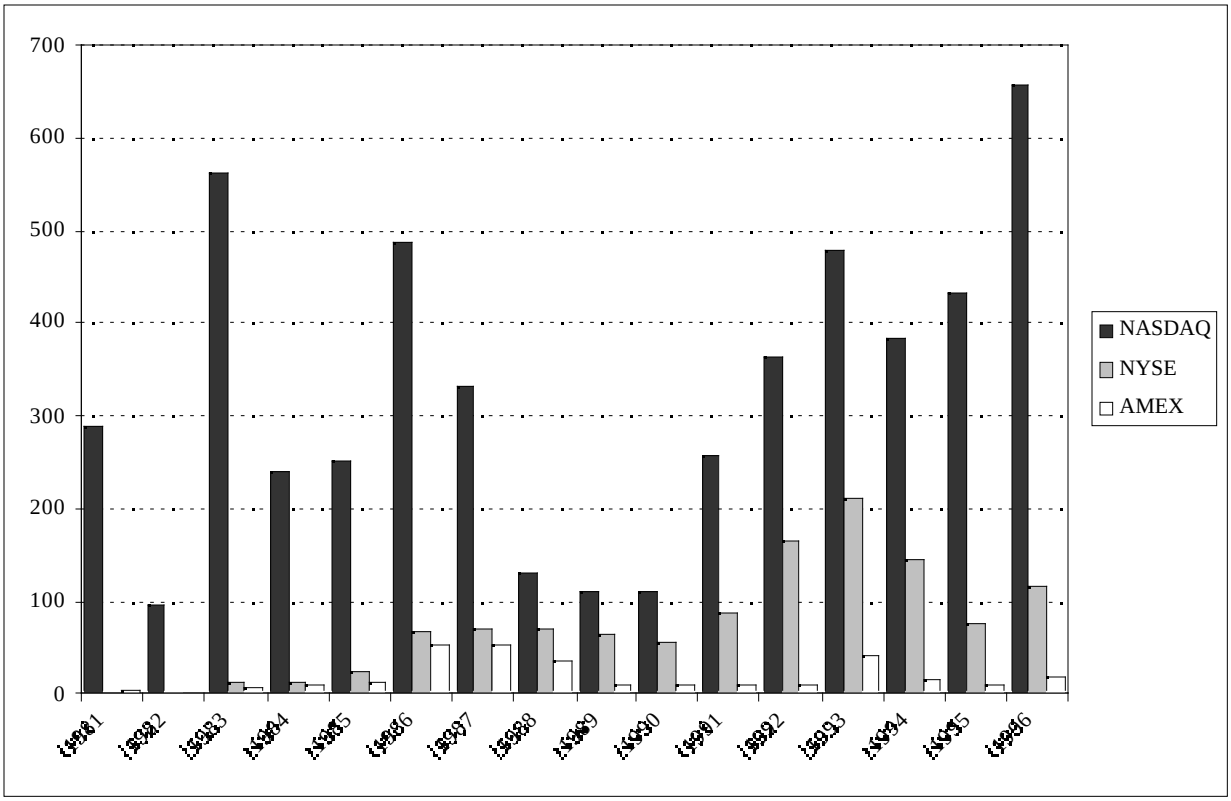

Figure 1 – Frequency of IPOs by Year and Exchange

The figure shows all domestic, firm-commitment IPOs (excluding units and rights offerings) that listed on Nasdaq, AMEX, or the NYSE from 1981 to 1996.[a] Data are from the Securities Data Company New Issues database. Nasdaq initial public offers include SDC exchange codes *OTC*, *NASDQ*, and *SMCAP*.

[a] Twenty-six (0.4 percent) of the 6,697 IPOs identified in the Securities Data Company database for this period listed on exchanges other than the NYSE, Nasdaq, or AMEX. These IPOs are not included in the figure.

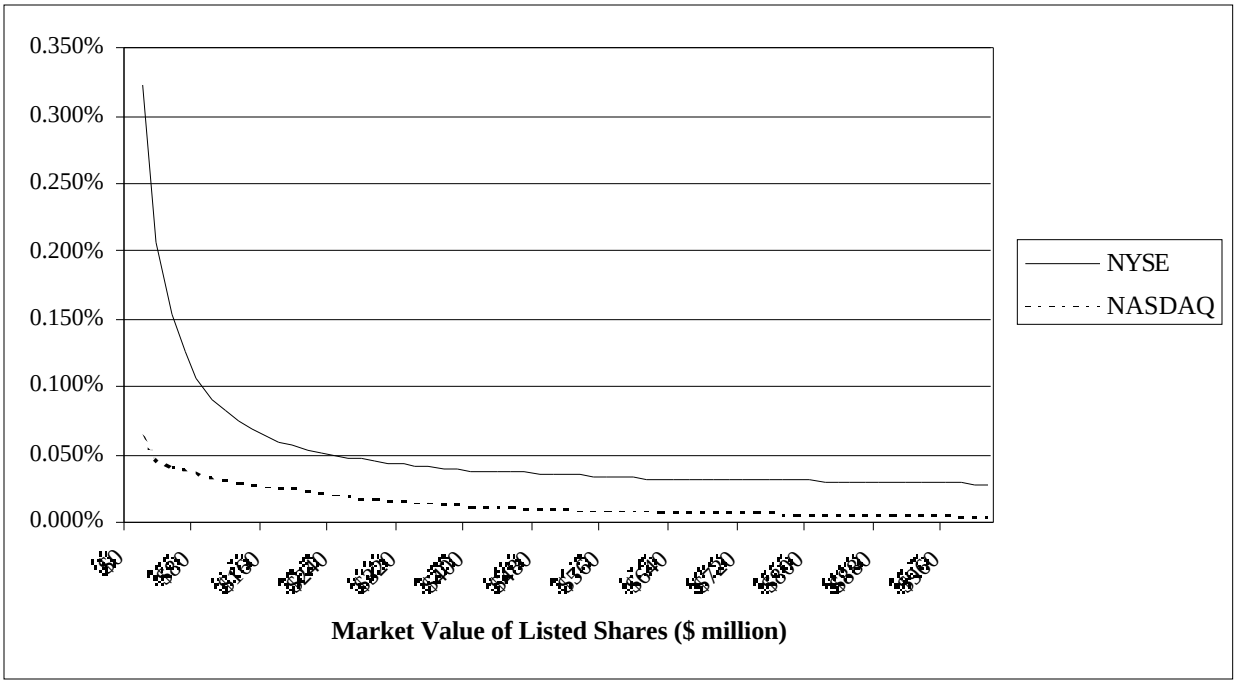

Figure 2 – Original Listing Fees as a Percentage of Market Capitalization

The figure shows original listing fees as a percentage of the market value of listed shares based on a price of $16 per share. Original listing fees on the NYSE include a one-time charge of $36,800 and an initial fee equal to $14,750 per million shares for the first and second million, plus $7,400 per million shares for the third and fourth million, plus $3,500 per million shares for the fifth up to 300th million, plus $1,900 per million shares in excess of 300 million. However, the exchange currently charges the initial fee only on the first 125 million shares resulting in a maximum original list fee of $504,600. NYSE listing fee information is based on the fee schedule effective 8/4/95. Original listing fees on the Nasdaq-NMS include a one-time fee of $5,000 plus a variable fee of $0.005 per share for the first 5 million shares, plus $0.0025 per share for shares greater then 5 million and up to 15 million, plus $0.001 per share for shares over 15 million. The maximum original listing fee on the Nasdaq-NMS is $50,000. Nasdaq listing fee information is based on the fee schedule effective 8/7/97.

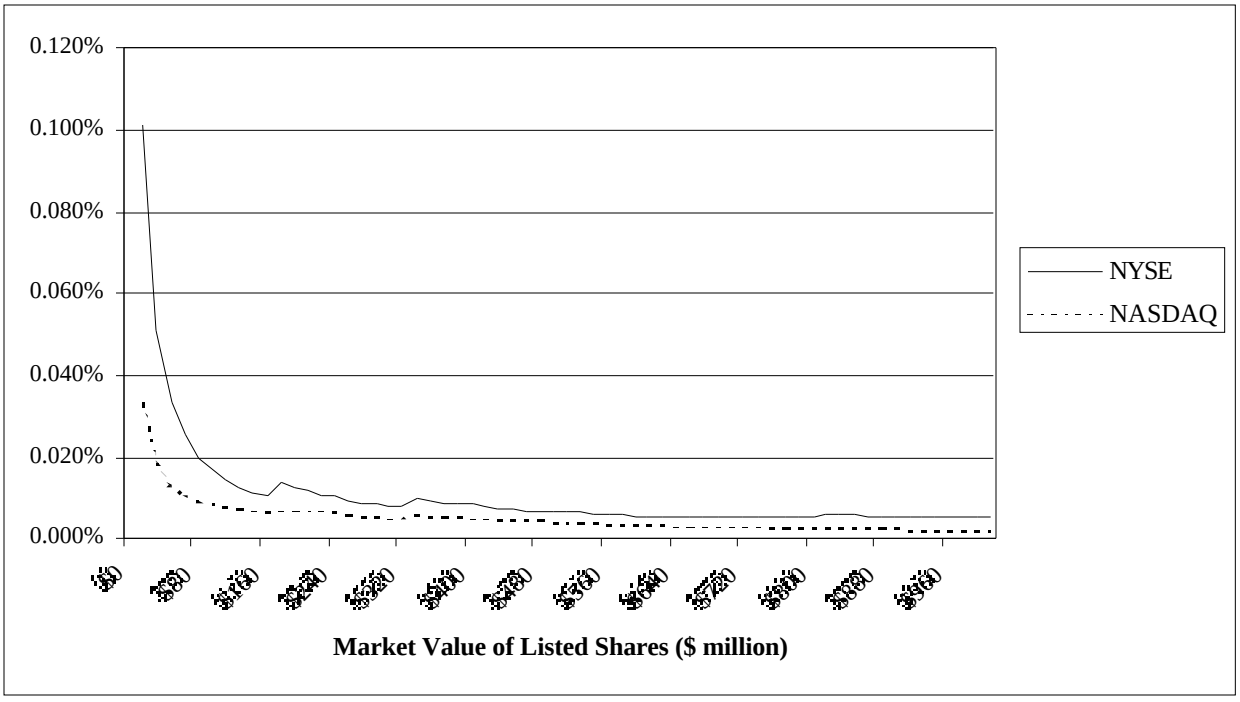

Figure 3 – Annual Listing Fees as a Percentage of Market Capitalization

The figure shows annual listing fees on the NYSE and Nasdaq as a percentage of the market value of listed shares based on a price of $16 per share. Annual listing fees on the NYSE equal $1,650 per million shares for the first and second million, plus $830 per million shares for shares in excess of two million. The exchange maintains minimum fee levels of $16,170 for up to 10 million shares, $24,260 for 11 to 20 million shares, $32,340 for 21 to 50 million shares, $48,410 for 51 to 100 million shares, $64,580 for 100 to 200 million shares, and $80,440 for over 200 million shares. The maximum annual listing fee on the NYSE is $500,000. NYSE listing fee information is based on the fee schedule effective 8/4/95. Annual listing fees on the Nasdaq-NMS include a base fee and a variable fee. The base fee ranges from $5,250 for up to one million shares to $13,250 for over 16 million shares (the fee increases by $500 per million shares up to 17 million). The variable fee equals $0.025 per $1,000 of market capitalization above $100 million. However, the total annual fee paid on the Nasdaq-NMS is capped at $10,000 for up to 10 million shares, $15,000 for up to 20 million shares, and $20,000 for over 20 million shares. Nasdaq listing fee information is based on the fee schedule effective 8/7/97.