# Do Firms Knowingly Sell Overvalued Equity?

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### ABSTRACT

This article examines the relation between top executives' trading and the long-run stock returns of seasoned equity issuing firms. Primary issuers, who sell mostly newly-issued primary shares, significantly underperform their benchmarks, regardless of the top executives' prior trading pattern. However, top executives' trading is reliably associated with the stock returns of secondary issuers, who sell mostly secondary shares previously held by existing shareholders. On average, secondary issuers do not underperform their benchmarks. The results suggest that increased free cash flow problems after issue play an important role in explaining the underperformance of issuing firms.

THERE IS WELL-DOCUMENTED evidence of a negative announcement effect for seasoned equity offerings (SEOs) following large price run-ups (e.g., Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986), Choe, Masulis, and Nanda (1993), and Bayless and Chaplinsky (1996)). For example, Asquith and Mullins (1986) report that while the average two-day announcement period return is about $-3$ percent, the average cumulative excess return (over beta-adjusted control portfolios) from 490 days before until the announcement of industrial equity offerings during 1963–1981 is 30 percent.

The most popular explanation for the negative announcement effect is based on the informational asymmetry between insiders and outside investors regarding the true value of the firm.[1] Myers and Majluf (1984) show that with asymmetric information, managers with superior information about the firm have an incentive to issue overvalued equity. Consequently, the stock price of the issuing firm drops on the announcement of a new issue.

[1] Other explanations include transaction costs, capital structure changes, downward sloping demand curves, and increasing free cash flow problems (see Asquith and Mullins (1986), and McLaughlin, Safieddine and Vasudevan (1994) for more discussion).

More recently, Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) present empirical evidence that on average, issuing firms subsequently underperform various return benchmarks in the long run (up to five years) by economically significant amounts. In particular, Loughran and Ritter report average returns on issuing firms of only 7 percent per year in the five years after issuing, compared with 15 percent per year for nonissuing firms of the same size. This long-run underperformance suggests that despite the 3 percent average announcement-day price drop, SEOs still occur when the issuing firm is substantially overvalued.

This article investigates whether or not managers of issuing firms knowingly sell overvalued equity. Previous studies (e.g., Lucas and McDonald (1990)) assume that managers of issuing firms do not have biased forecasts of their firm's future prospects, implying that if the price is not fully adjusted on the announcement date, managers know that their shares are overvalued at the time of issue. However, we cannot exclude the possibility that issuing firms' managers are unaware of the substantial overvaluation of their shares at the time of issue. It is plausible that managers of issuing firms raise capital to invest in what they think are positive net present value (NPV) projects without considering that either the market has overcapitalized prior good news before issuing, or it has underestimated a possible increase in free cash flow problems after issuing.

One way to study this issue is to examine the relation between insider trading and the long-term performance of issuing firms. If managers knowingly sell overvalued equity, we could expect managers to be net sellers, thus taking advantage of their knowledge. In addition, we could also expect a strong relation between insider trading prior to issuing and the long-run performance of issuing firms. If firms with insider purchases (buyers) do not underperform their benchmarks in the long run but firms with insider sales (sellers) do, then the sellers might knowingly be selling overvalued equity. On the other hand, if both buyers and sellers underperform, then it is very likely that the issuing firms whose insiders are buying are not intentionally selling overvalued equity. Therefore, the empirical relation between insider trading before SEOs and the long-run performance of issuing firms helps us answer the question of whether firms are knowingly selling overvalued equity. In addition, it can also tell us whether it is possible to distinguish the quality (that is, the misvaluation) of an issuing firm on the basis of the insider trading behavior around an SEO.[2] Both corporate financial managers and investors are interested in

[2] Related to this issue, Cheng (1995) shows that equity issuers that do not use the proceeds for capital investment severely underperform the market for three to five years after issue, whereas issuers that invest the proceeds do not underperform the market. However, the differences in abnormal performance between the investing and the noninvesting issuers significantly decrease when size and book-to-market ratio-adjusted benchmarks, rather than market-adjusted benchmarks, are used. Teoh, Welch, and Wong (1995) test an earnings management hypothesis and show that firms that are more aggressive in the use of discretionary accruals have the worst subsequent performance.

finding a way to distinguish the quality of an issuing firm, given the significant long-run underperformance of issuing firms.[3]

Both Karpoff and Lee (1991) and Kahle (1995) show that the number of insider sales significantly increases before SEOs and convertible bond issues, but not before straight debt issues. The evidence related to the insider trading pattern around various security issues is consistent with managers' taking advantage of informational asymmetry between insiders and outside investors (Myers and Majluf (1984)). However, without strong empirical ties between prior insider trading and the long-run performance of issuing firms, these patterns could reflect a tendency for insider selling to mechanically follow price increases.

In this article, I examine the relation between the issuing firms' three-year buy-and-hold returns after issuing and insiders' personal trading of their stock before the issue. Insider trading in this study is restricted to top executives' open-market transactions, since the focus of this article is whether or not the issuing firm's decision-makers are knowingly selling overpriced equity. The sample consists of 2,164 SEOs (both primary and secondary offerings) during 1976–1990 by operating firms (excluding utilities) listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. In contrast to previous studies, I also include pure secondary offerings in this study. I use two benchmarks in the analysis: industry-and-size-adjusted matching firms, and prior annual return, size and book-to-market equity ratio-adjusted matching firms.

The sample is divided into primary and secondary issuers. Primary issuers are those issuing firms in which 50 percent or more of the offering consists of newly-issued primary shares, whereas secondary issuers are those issuing firms in which less than 50 percent of the offering consists of primary shares. The empirical results show that primary issuers significantly underperform their matching firms in the long run, regardless of the top executives' prior trading patterns. However, only those secondary issuers with top executives who sell their shares before the issue significantly underperform their matching firms. Surprisingly, secondary issuers, on average, do not underperform their benchmarks. These results indicate that those primary and secondary issuers whose top executives sell their shares before the SEO seem to be knowingly selling overvalued equity, while those primary issuers with top executives who purchase shares before issuing do not seem to be knowingly selling overvalued equity.

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[3] Related to the efforts of corporate managers to reduce the problems of informational asymmetry around equity issues, Korajczyk, Lucas, and McDonald (1991) empirically show that equity issues tend to immediately follow credible information releases (e.g., an earnings announcement) and that the longer the time between information releases and equity offerings, the larger the price drop at the announcement of seasoned equity offerings. In contrast, Loderer and Mauer (1992) show that there is little evidence that firms "time" stock offering announcements so that they occur right after dividend declarations, and there are few, if any, benefits to be gained from linking dividend and stock offering announcements.

The noticeable differences between the primary issuers' performance and that of the secondary issuers could be due to both the market's and the top executives' underestimation of increased free cash flow problems after primary seasoned equity issues. If the market does not fully incorporate these problems into the price on the announcement date, we could observe underperformance by primary issuers, but not necessarily underperformance by secondary issuers. The observed empirical results are consistent with free cash flow problems playing an important role in explaining the underperformance of issuing firms.

The article is organized as follows. Section I describes the data and presents summary statistics. Section II presents the empirical evidence regarding announcement period returns. Section III presents empirical results, and Section IV describes simulation test procedures. Section V discusses some possible explanations for the findings, and Section VI summarizes and concludes.

## I. Data and Summary Statistics

### A. Seasoned Equity Offering Data

The sample consists of seasoned equity offerings during 1976–1990 that have been recorded by the Securities Data Company (SDC). I exclude the following firms from the original SEO sample: 1) firms that do not have price records on the University of Chicago Center for Research in Securities Prices (CRSP) daily NYSE/AMEX or Nasdaq tapes on their offering dates; 2) utility companies, Standard Industrial Classification (SIC) codes 4910–4949, since many studies have documented that utility offerings do not have typical informational asymmetry problems present in other operating companies' offerings; 3) American Depository Receipts (ADRs); 4) closed-end funds (SIC codes 6720–6739) and real estate investment trusts (REITs: SIC code 6798); 5) firms with negative postissue book equity values;[4] and 6) firms that do not have book equity value for the fiscal year before their SEOs in any of the following data sources: COMPUSTAT, Moody's various manuals, and Standard and Poor's Stock Report. I also exclude unit offerings from the sample.

Out of 2,164 SEOs in the sample, there are 1,648 SEOs with no equity issues during the previous three years. I analyze this subsample of 1,648 issues, but I do not report the results in the article since they are essentially identical to those presented for the full sample.

### B. Insider Trading Data

The insider trading data are from the Securities and Exchange Commission's (SEC) Ownership Reporting System (ORS) data file, which contains all transactions by insiders subject to disclosure according to the Securities and Exchange Act of 1934. These data start in 1975. This study analyzes only top executives' open-market transactions, since the focus of this article is to see whether or not the issuing firm's decision-makers are knowingly selling over-

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[4] 32 SEOs are excluded as a result of this criterion.

priced equity. I define top executives as chairpersons of the board of directors, persons who are both officers and directors, controlling persons, presidents, and vice presidents, as in Seyhun (1990). Since corporate insiders cannot legally trade on material, nonpublic information, they do not want to report their transparently illegal transactions to the SEC. Therefore, it is very likely that the majority of insider trading used in this article is legal trading, which by definition is not based on inside information. However, Seyhun (1992) argues that even though insiders do not often trade on legally material information, they often trade on economically material information.

To check the sensitivity, I repeat the analysis, using transactions by insiders, the definition of which includes officers and directors as well as top executives. The qualitative results are similar to those reported in the article. In addition, the same analysis has been performed using both open market and private transactions. However, the results are not reported here, since they are qualitatively similar except for the finding that top executives' trading is less closely related to the long-term stock returns of secondary issuers.

For this analysis, I use all top executives' trading, excluding those transactions involving less than 100 shares, during the six-month period ending on, and including, the issue date. I use different insider trading periods (i.e., three-month, nine-month, and one-year periods) to check the sensitivity of the results. However, these results are not reported here, since they are qualitatively similar to those reported in the article.

## C. Matching Firms

I use both industry-and-size-adjusted matching firms (MF1) and prior annual return, size, and book-to-market ratio-adjusted matching firms (MF2) in the analysis. Only CRSP-listed nonissuing operating firms (listed on the CRSP NYSE/AMEX or Nasdaq tapes for at least five years without any equity offerings during the prior five-year period) are used as a pool of possible matching firms. Reflecting the five-year listing requirement, these are subsequently referred to as seasoned firms. To be consistent with the SEO sample selection criteria, I exclude utilities, closed-end funds, REITs, and ADRs.

For industry-and-size-adjusted matching firms, I first select the CRSP-listed firms with the same three-digit (two- or one-digit if less than five firms are available) Standard Industrial Classification (SIC) codes as each issuing firm. I then sort those selected firms by their market capitalization. Among the sorted firms, the five firms with the market capitalization closest to that of the corresponding SEO are chosen as the matching firms. The market capitalization of issuing firms includes the proceeds raised from the issue of primary shares; the market capitalization of matching firms is calculated on the last day of the month prior to each offering.

For prior return, size, and book-to-market ratio-adjusted matching firms, I first form 25 portfolios on the basis of size and book-to-market equity ratio (BM) at the end of each month for the period from December 1975 through November 1990. I assign all the CRSP-and-COMPUSTAT-listed seasoned

operating firms on the NYSE, AMEX, and Nasdaq exchanges to their corresponding size quintiles and BM quintiles. The cutoff points for size quintiles are based on the market capitalization at the end of each month, using only NYSE and AMEX companies on the CRSP tapes. The cutoff points for BM quintiles are based on the book value of equity divided by the market value of equity at the end of each month, using all NYSE, AMEX, and Nasdaq companies available on both CRSP and COMPUSTAT. To try to guarantee that the book value is available to the market when used, I do not use the book value of a given fiscal year until at least four months after the end of the fiscal year (e.g., firms with a December 31 fiscal year begin using the new book value for calculations done on April 30).

The BM of an SEO is calculated by dividing the book equity value after issue by the market value of equity at the close of the issue day. The market capitalization of an SEO is based on the number of outstanding shares after issue and the offering date closing price. The book equity value is the sum of the preissue book equity value for the most recent fiscal year and the value of primary shares offered (i.e., the offering price times the number of primary shares offered, exclusive of any overallotment options).

At the time of issue, each SEO firm is matched with five nonissuing seasoned firms in the same size and BM portfolio, whose prior returns are closest to that of the corresponding SEO. I calculate the prior annual return of an SEO firm by compounding daily returns for the one-year period (252 trading days or the number of days between the first listed date and the day before the SEO date, whichever is smaller) before issue. I use the same holding periods to calculate the prior annual returns of firms in the same size and BM portfolio.

### D. Buy-and-Hold Returns

I use three-year buy-and-hold returns (BHRs) to measure long-term performance. Differences in BHRs are used rather than cumulative abnormal returns (CARs) to measure abnormal performance. BHRs are better because the return differences are obtainable by an implementable investment strategy, even though BHRs tend to have a highly skewed distribution. While the use of CARs has the advantage of easier statistical tests, it is hard to interpret the results in a practically meaningful way. I calculate the BHRs by compounding daily returns over either 756 trading days or the number of trading days from the offering date until the delisting date, whichever is smaller. I use the same holding periods to calculate the BHRs of matching firms. If a matching firm is delisted before the end of the three-year anniversary or the SEO firm's delisting day, whichever is earlier, CRSP value-weighted returns are spliced into the calculation of the BHR from the removal date. Throughout the article, the value-weighted NYSE/AMEX index return is used for the NYSE/AMEX-listed firms and the value-weighted Nasdaq index return is used for the Nasdaq-listed firms.

**Table I**

**Summary Statistics: Mean and Median**

The sample consists of 2,164 seasoned equity offerings (SEOs) during 1976–1990 by firms listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. Primary offerings are defined as SEOs composed of 50% or more primary shares where primary shares are those being issued by the firm. Secondary offerings are defined as SEOs composed of less than 50% primary shares. Offerings by utilities, Standard Industrial Classification (SIC) codes 4910–4949, closed-end funds, Real Estate Investment Trusts (REITs), and firms with no book value information in COMPUSTAT, Moody's manuals, or Standard and Poor's Stock Report, are excluded. American Depository Receipts (ADRs), units offerings, and firms with negative book equity values are also excluded from the sample. The market capitalization of an SEO firm is calculated by multiplying the number of shares outstanding after issue by the offering date closing price, and converted into 1993 purchasing power dollars using the U.S. consumer price index (CPI). BM ratio stands for the book-to-market equity ratio of an SEO firm and is calculated by dividing the book equity value after issue by the market value of equity at the close of the issue day. The prior 1-year return of an SEO firm is the raw buy-and-hold return of the SEO firm for the 252 trading days ending on the day before the issue date, or the number of days between the first listed date and the day before the issue date, whichever is smaller. Offering size includes both primary and secondary shares. Post 3-year return is the 3-year buy-and-hold % return (BHR) of SEO firms. If an SEO firm is delisted before its third anniversary, the buy-and-hold return from the issue date to the delisting date is used as the BHR. The 3-year buy-and-hold % returns of matching firms are calculated by compounding daily returns over the same holding periods as the corresponding SEOs' holding periods. If any of the matching firms are delisted prior to the end of the corresponding SEO firm's holding period, the CRSP value-weighted index returns are spliced into the calculation of the returns from the removal date. MF1 stands for the industry-and-size-adjusted matching firms, and MF2 stands for the prior annual return, size and book-to-market-adjusted matching firms. The mean number is reported on top and the median number is in parentheses.

|  | Primary | Secondary | Total |
| --- | --- | --- | --- |
| Number of SEOs | 1,513 (Pure: 1,160) | 651 (Pure: 552) | 2,164 |
| Market capitalization | $ 985 | $1,984 | $1,286 |
| (in millions) | ($ 307) | ($ 596) | ($ 356) |
| BM ratio | 0.60 | 0.68 | 0.62 |
|  | (0.55) | (0.55) | (0.55) |
| Prior 1-year return | 69.7% | 48.6% | 63.4% |
|  | (53.3%) | (34.7%) | (47.6%) |
| Offering size (in | $ 221 | $ 165 | $ 204 |
| millions) | ($ 42) | ($ 28) | ($ 37) |
| Post 3-year return | 31.2% | 62.9% | 40.8% |
|  | (14.2%) | (52.3%) | (23.1%) |
| MF1 Post 3-year | 50.1% | 65.2% | 54.6% |
| return | (39.5%) | (56.8%) | (43.7%) |
| MF2 Post 3-year | 51.5% | 61.5% | 54.5% |
| return | (44.8%) | (57.7%) | (48.4%) |

*E. Summary Statistics*

   Table I reports the mean and median values of market capitalization, BM ratios, one-year holding period returns before issuing, and BHRs of both SEO and the corresponding matching firms. The market capitalization is expressed in terms of 1993 purchasing power.

There are 1,513 SEOs with at least a 50 percent primary component (primary SEOs), and 651 SEOs comprised of less than 50 percent primary shares (secondary SEOs). Most of the primary SEOs are pure primary SEOs (1,160 SEOs) and most of the secondary SEOs are pure secondary issues (552 SEOs). These pure secondary issues are "registered secondaries," and are typically much larger than the more common open-market insider sales. The secondary issuers' average post-issue market capitalization of $1.98 billion is twice the average of $985 million for primary issuers. The average BM of issuing firms is only 0.62, which reflects the average one-year holding period return before issuing of 63.4 percent. The large average one-year holding period return of SEO firms before issuing is consistent with Lucas and McDonald's (1990) theory that firms strategically time their equity issues. Note that the average prior annual return of secondary issuers (48.6 percent) is smaller than the average of primary issuers (69.7 percent). This result is consistent with Asquith and Mullins (1986).

The average BHR of 40.8 percent for issuing firms in the total sample is lower than the average benchmark returns of 54.6 percent (MF1) and 54.5 percent (MF2).[5] However, there are noticeable differences between primary and secondary issuers' BHRs. Surprisingly, secondary issuers do not seem to underperform their matching firms, while primary issuers underperform their benchmarks by economically significant amounts. These findings do not necessarily contradict previous studies. Loughran and Ritter (1995) exclude pure secondary offerings. Spiess and Affleck-Graves (1995) exclude both combination offerings and pure secondary offerings.

One interpretation of the noticeable differences between the primary and secondary issuers' performances is that the market underestimates possible increases in free cash flow problems after primary seasoned equity issues. If the market does not fully incorporate this factor into the price on the announcement date, we could expect to observe underperformance by primary issuers but not necessarily underperformance by secondary issuers.

We can derive an alternative explanation from the fact that secondary SEOs are massive insider sales. Since insider sales are bad news to outside investors, the stock price of a secondary issuer could drop more than the stock price of a primary issuer on the issue announcement date. If this is the case, secondary issuers' shares could be less overvalued than primary issuers' on the issuing date. However, as Table II shows, the magnitude of the difference in announcement effects is too small to support this possibility.

## II. Announcement Period Returns

In this section, I examine the announcement period returns of the subsample to see whether announcement period returns are different for different types of

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[5] The degree of underperformance by primary issuers is slightly lower than that reported in Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995). Brav, Géczy, and Gompers (1994) also report better relative performance of issuing firms when a size and book-to-market-adjusted benchmark is used.

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**Table II**

**Announcement Period Returns**

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Among seasoned equity offerings (SEOs) during 1980–1984, 405 SEOs whose announcements are reported in *The Wall Street Journal* are chosen. Primary offerings are defined as SEOs composed of 50% or more primary shares where primary shares are those being issued by the firm. Secondary offerings are defined as SEOs composed of less than 50% primary shares. Pure insider purchases (PP) firms are the issuers with only top executives purchasing their shares for the 6-month period before, and including, the announcement date. Pure insider sales (PS) firms are similarly defined. Firms without PP or PS are classified as mixed insider trading firms (MT). The announcement period abnormal return (AAR) is the sum of two abnormal daily percentage returns (SEO firm's return minus CRSP value-weighted index return), one on the day before the announcement date and the other on the announcement date. The reported $t$-statistics are for the test of the null hypothesis that the mean AAR equals zero.

| | PP | MT | PS | Total |
|---|---|---|---|---|
| **All** | | | | |
| No. of SEOs | 9 | 279 | 117 | 405 |
| mean AAR | −2.21% | −2.92% | −2.94% | −2.91% |
| ($t$-statistic) | (−1.63) | (−12.79) | (−7.82) | (−15.07) |
| **Primary** | | | | |
| No. of SEOs | 9 | 264 | 110 | 383 |
| mean AAR | −2.21% | −2.94% | −2.84% | −2.89% |
| ($t$-statistic) | (−1.63) | (−12.36) | (−7.42) | (−14.51) |
| **Secondary** | | | | |
| No. of SEOs | 0 | 15 | 7 | 22 |
| mean AAR | | −2.64 | −4.54 | −3.25 |
| ($t$-statistic) | NA | (−3.39) | (−2.47) | (−4.12) |

offerings. The subsample consists of 405 SEOs during 1980–1984 that were reported in *The Wall Street Journal*.[6]

The announcement period abnormal return (AAR) is calculated over a two-day period, the day before the announcement date and the announcement date itself, by subtracting the CRSP value-weighted index return from the SEO firm's return. I use the "pure insider trading criterion" to classify issuing firms into different insider trading groups. Pure insider purchasing (PP) firms are the companies in which all trades by top executives are purchases during the period beginning six months before the announcement date and ending at the announcement date.

To make sure that the insider trading information is available on the announcement date, I repeat the analysis, using insider trading only up to the end of calendar month before the announcement date, or up to the end of two calendar months before the announcement date for the SEOs that announced their issue within the first ten days of each month. According to the Securities and Exchange Act of 1934 (Section 16a), insiders are required to report their insider trading within the tenth day after the end of each month in which the

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[6] The announcement date data are from Dennis Sheehan and I thank him for allowing me to use his data. The announcement date subsample ends in 1984 because after 1984, *The Wall Street Journal* stopped reporting these announcements in all but rare instances.

transaction occurred. The unreported results are similar to those reported in this article.

Pure insider selling (PS) firms are similarly defined. Throughout the article, the issuing firms with PP and the issuing firms with PS are called buyers and sellers, respectively.

Table II reports the mean announcement effect. The average AAR of the 405 SEOs in the subsample is a statistically significant $-2.91$ percent, which is consistent with previous studies. Surprisingly, the announcement effect does not vary reliably with different trading patterns of top executives.[7] In addition, unreported multiple regression tests fail to document reliable cross-sectional differences in the announcement effects. However, it is difficult to draw a strong conclusion, due to the small number of offerings (especially those with pure purchases) in the subsample.

## III. Long-Run Performance of Issuing Firms

### A. Pure Insider Trading Criterion

In this section, I investigate the relation between top executives' personal trading and the long-run stock returns of issuing firms. Again, I use the pure insider trading criterion to classify issuing firms into different insider trading groups because a pure insider trading pattern provides outside investors with a clearer signal than does a mixed insider trading pattern.[8] However, the disadvantage of using the pure insider trading criterion is that it might not catch important signals if most top executives trade on inside information while one or two trade because of some exogenous needs. To examine the sensitivity of the results to the classification criteria, I use different criteria (i.e., intensive insider trading[9] with different degrees of intensity (three, five, and eight)). However, the results are not reported here because they are qualitatively similar. Here, I use top executives' trading during the six-month period ending on, and including, the issue date to determine the pure insider trading pattern. Again, I use different insider trading periods (three months, nine months, and one year) to check the sensitivity of the qualitative results. Since they are similar, the results are not reported in the article.

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[7] Using 374 primary SEOs during 1979–1988, Johnson, Serrano, and Thompson (1996) show that there exists a close relation between prior insider trading and the announcement period returns only for a subsample of small issuing firms that raised new capital for investments.

[8] No insider trading can also be a piece of useful information. If insiders do not increase their shares at the time of primary SEOs, the ownership fraction of insiders decreases. If insiders pay attention to the ownership, this can be equivalent to selling shares. I check this possibility by examining the performance of SEOs with no insider trading. The performance of issuing firms with no insider trading is similar to that of issuing firms with insider sales. However, I include no insider trading firms into the mixed trading category to make the pure insider trading criterion symmetric.

[9] See, for example, Jaffe (1974) and Lin and Howe (1990) for the definition of intensive insider trading criteria.

**Table III**

**Insider Trading of SEO Firms**

The sample consists of 2,164 seasoned equity offerings (SEOs) during 1976–1990 by nonutility domestic operating firms listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange /American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. Primary offerings are defined as SEOs with 50% or more of the offering composed of primary shares, with secondary offerings being the complement. Pure insider purchases firms (PP) are companies with only top executives purchasing their shares without any selling for the previous 6-month period including issue dates. Pure insider sales firms (PS) are similarly defined. Firms without PP or PS are classified as mixed insider trading firms (MT). The mean number is reported on top and the median number is in parentheses. No. of trades is the number of insider trades during the six months before issue, including the offering date, and No. of shares represents the number of shares traded during the six months before issue, including the offering date. $ volume is the dollar volume traded during the six months before issue, including the offering date (measured in 1993 purchasing power).

| | Primary SEOs | | | Secondary SEOs | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | PP | MT | PS | PP | MT | PS | PP | MT | PS |
| No. of trades | | | | | | | | | |
| Purchases | 1.55 | 0.05 | 0.00 | 1.70 | 0.05 | 0.00 | 1.59 | 0.05 | 0.00 |
| | (1.00) | (0.00) | (0.00) | (1.00) | (0.00) | (0.00) | (1.00) | (0.00) | (0.00) |
| Sales | 0.00 | 0.09 | 3.82 | 0.00 | 0.27 | 3.57 | 0.00 | 0.14 | 3.75 |
| | (0.00) | (0.00) | (2.00) | (0.00) | (0.00) | (2.00) | (0.00) | (0.00) | (2.00) |
| No. of shares | | | | | | | | | |
| Purchases | 5,137 | 1,131 | 0 | 7,054 | 32 | 0 | 5,606 | 789 | 0 |
| | (1,000) | (0) | (0) | (1,300) | (0) | (0) | (1,000) | (0) | (0) |
| Sales | 0 | 769 | 57,637 | 0 | 4,442 | 129,965 | 0 | 1,912 | 77,694 |
| | (0) | (0) | (10,850) | (0) | (0) | (20,000) | (0) | (0) | (12,237) |
| $ volume in (thousands) | | | | | | | | | |
| Purchases | 151 | 1,275 | 0 | 377 | 1 | 0 | 206 | 879 | 0 |
| | (18) | (0) | (0) | (32) | (0) | (0) | (19) | (0) | (0) |
| Sales | 0 | 31 | 1,978 | 0 | 188 | 5,340 | 0 | 80 | 2,910 |
| | (0) | (0) | (383) | (0) | (0) | (629) | (0) | (0) | (422) |
| No. of firms | 71 | 1,098 | 344 | 23 | 496 | 132 | 94 | 1,594 | 476 |

## B. Summary Statistics of Insider Trading

Table III reports the mean and median of the number of trades, the number of shares traded, and the dollar volume of top executives' personal trading for the six-month period ending on, and including, the issue date. On average, buyers (PP) typically trade less often than sellers (PS). The buyers' average number of trades is 1.59, while the sellers' is 3.75. The average total amount of purchases by buyers is $206,000 and the average total amount of sales by sellers is $2,910,000. There are no significant differences between primary and secondary issuers' insider trading patterns, except that the proportion of sales transactions among mixed traders is larger for secondary issuers than that for primary issuers.

## C. Characteristics of Issuing Firms with Different Insider Trading Patterns

Table IV reports the different characteristics of issuing firms according to the previous insider trading patterns. Even though the average prior annual return of buyers is high (43.7 percent), the average of sellers is even higher (76.6 percent). This is consistent with the conjecture that after a huge price runup, top executives want to sell more either to diversify their portfolios or to lock up the profits.

**Table IV**

## SEO Firms' Long-Run Performance and Insider Trading

The sample consists of 2,164 seasoned equity offerings (SEOs) during 1976–1990 by nonutility domestic operating firms listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. Primary offerings are defined as SEOs with 50% or more of the offering composed of primary shares, with secondary offerings being the complement. Pure insider purchases firms (PP) are companies with only top executives purchasing their shares without any selling for the previous 6-month period including issue dates. Pure insider sales firms (PS) are similarly defined. Firms without PP or PS are classified as mixed insider trading firms (MT). BHR stands for the mean 3-year buy-and-hold percentage return. If an SEO is delisted before its 3-year anniversary, an SEO BHR is the buy-and-hold return from the issue date to the delisting date. BHRs of matching firms are calculated by compounding daily returns over the same holding periods as the corresponding SEOs' holding periods. If any of matching firms are delisted prior to the end of the corresponding SEO firm's holding period, the CRSP value-weighted index returns are spliced into the calculation of the returns from the removal date. MF1 stands for the industry-and-size-adjusted matching firms and MF2 stands for the prior annual return, size and book-to-market-adjusted matching firms. WR represents the wealth relatives and is defined as ((1+ average SEO firms' BHR)/(1+ average matching firms' BHR)). SEO PR is the raw buy-and-hold return of the SEO firm for the 252 trading days ending on the day before the issue date, or the number of days between the first listed date and the day before the issue date, whichever is smaller. The prior return of matching firms is the average of the raw buy-and-hold returns of 5 matching firms for the same holding period as the corresponding SEO firm's. The market capitalization of an SEO firm is calculated by multiplying the number of shares outstanding after issue by the offering date closing price, and converted into dollars of 1993 purchasing power using the U.S. consumer's price index (CPI).

| | Primary SEOs | | | Secondary SEOs | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | PP | MT | PS | PP | MT | PS | PP | MT | PS |
| SEO BHR | 31.3 | 31.2 | 31.2 | 77.4 | 66.8 | 45.8 | 42.6 | 42.3 | 35.2 |
| MF1 BHR | 53.1 | 49.4 | 51.5 | 50.9 | 63.3 | 74.7 | 52.6 | 53.8 | 58.0 |
| WR1 | 0.86 | 0.88 | 0.87 | 1.18 | 1.02 | 0.83 | 0.93 | 0.93 | 0.86 |
| MF2 BHR | 46.2 | 52.4 | 49.7 | 63.8 | 63.7 | 52.9 | 50.5 | 55.9 | 50.6 |
| WR2 | 0.90 | 0.86 | 0.88 | 1.08 | 1.02 | 0.95 | 0.95 | 0.91 | 0.90 |
| SEO PR | 47.1 | 67.3 | 82.1 | 33.2 | 45.6 | 62.5 | 43.7 | 60.6 | 76.6 |
| MF1 PR | 33.6 | 43.5 | 46.5 | 24.7 | 33.2 | 40.1 | 31.4 | 40.3 | 44.7 |
| MF2 PR | 44.2 | 59.9 | 70.0 | 30.3 | 41.3 | 55.1 | 40.8 | 54.1 | 65.9 |
| Market cap (millions) | $1,376 | $ 930 | $1,082 | $3,413 | $1,944 | $1,884 | $1,875 | $1,245 | $1,304 |
| No. of SEOs | 71 | 1,098 | 344 | 23 | 496 | 132 | 94 | 1,594 | 476 |

Consistent with Karpoff and Lee (1991) and Kahle (1995), the number of buyers is much smaller than the number of sellers. The ratio of the number of buyers to that of sellers is lower than the ratio reported in previous studies that do not focus on SEOs.[10] This could reflect that issuing firms tend to have high returns in the year before issuing, resulting in more sales than usual (Jaffe (1974), Seyhun (1986), and Rozeff and Zaman (1988)); shares purchased through the exercise of stock options are not counted as purchases, although the sale of those shares is counted; and insiders of issuing firms might believe that their shares are overvalued. However, the results seem to be most consistent with managers knowingly selling overvalued equity. Both Kahle (1995) and Lee (1995) show that even after controlling for the huge prior returns of issuing firms, insider sales show a significant increase before the issue.

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[10] Seyhun (1986) reports that the ratio of insiders' purchases to sales for a sample of 769 randomly selected firms on the CRSP NYSE/AMEX tape is 0.7 over the 1975–1981 period. In Lin and Howe (1990), the ratio of intensive purchases months to intensive sales months (for the firms listed on the CRSP Nasdaq tape during 1975–1985) is 0.85.

Primary issuers significantly underperform their benchmarks regardless of their top executives' personal trading patterns. Secondary issuers, except for those secondary issuers with top executives selling their shares prior to issuing, do not underperform their benchmarks. The qualitative results are not sensitive to the use of different benchmarks.[11] These results indicate that primary and secondary issuers whose top executives sell their shares before the issue seem to be knowingly selling overvalued equity, but those primary issuers whose top executives buy their shares before the issue do not.

It is striking that while top executives' personal trading prior to seasoned equity issues is closely related to the long-run performance of secondary issuers, it is not closely related to the long-run performance of primary issuers. Moreover, most secondary issuers, except for those whose top executives engage in open-market sales prior to issuing, do not underperform their matching firms even though many insiders sell large amounts of their shares in the secondary offerings. This evidence suggests that an increase in free cash flow problems after primary issues is a crucial factor in explaining the underperformance of SEOs, and that this is not predicted by either the market or top executives of primary issuers.

Figure 1 shows the average annual returns of both SEO firms and their industry-and-size-adjusted matching firms during the four-year period, one year before and three years after issue. The offering date is the beginning of year 1. The average annual return during the three years following the offering of buyers among primary issuers is 10.8 percent per year, compared to 15.8 percent for their matching firms, and 20.7 percent and 14.9 percent, respectively, for buyers among secondary issuers and their matching firms. For sellers among primary issuers, the average annual return is 10.5 percent per year, compared to 16 percent for their matching firms, whereas for sellers among secondary issuers and their matching firms, the average annual returns are 15.2 percent and 21.4 percent, respectively.

## D. Factors Related to the Long-Run Stock Return Performance of Issuing Firms

To see what factors affect post-issue stock returns, the following ordinary least squares (OLS) regression model is used in Table V.

$$R_i = \alpha + \beta_1 \, \text{ARPR}_I + \beta_2 \, \text{LBM}_i + \beta_3 \, \text{LSIZE}_i + \beta_4 \, \text{INS1}_i + \beta_5 \, \text{INS2}_i$$
$$+ \, \beta_6 \, \text{PRIM}_i + \beta_7 \, \text{INS1}_i \cdot \text{PRIM}_i + \beta_8 \, \text{INS2}_i \cdot \text{PRIM}_i + \beta_9 \, \text{EX}_i + \epsilon_i, \qquad (1)$$

where $\text{ARPR}_i$ is the SEO firm's prior annual return minus the corresponding industry-and-size-adjusted matching firms' average prior return, $\text{LBM}_i$ is the log book-to-market ratio (Ln(1 + book-to-market equity ratio)), $\text{LSIZE}_i$ is the log market capitalization (Ln(market capitalization in millions of 1993 $)),
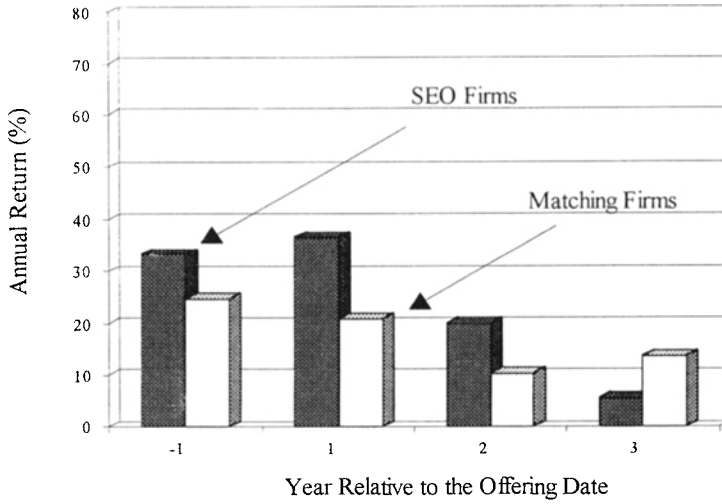
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[11] The returns in Table IV are equally weighted average returns; that is, each firm is given equal weight in the reported average returns. Even when the returns are value-weighted (after placing the market values into 1993 dollars), the qualitative results are similar.

## A. Primary SEOs

### Pure Purchases



Year Relative to the Offering Date

### Pure Sales



Year Relative to the Offering Date
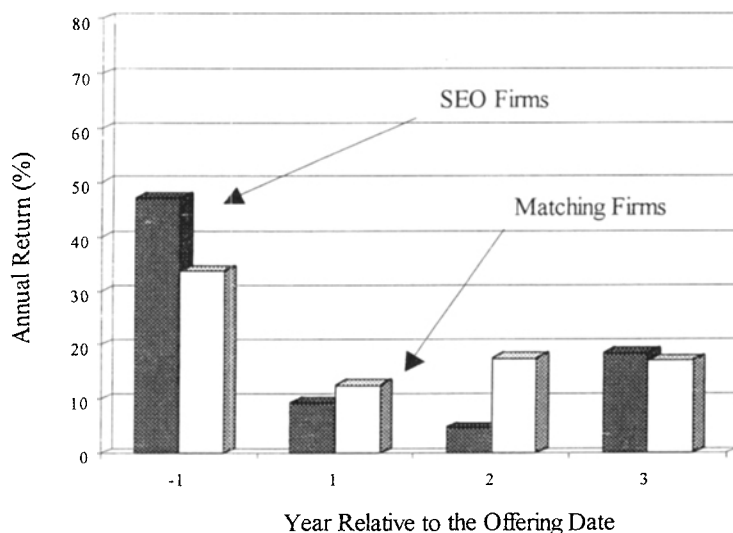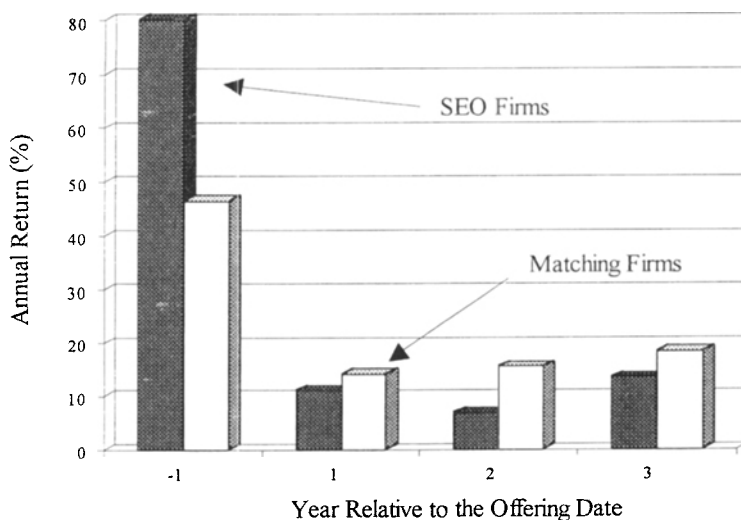
**Figure 1. Annual returns for SEO firms and industry-and-size-adjusted matching firms.**
The sample consists of 2,164 seasoned equity offerings (SEOs) during 1976–1990 by firms listed
on the CRSP NYSE/AMEX and Nasdaq tapes. Primary offerings (Panel *A*) are defined as SEOs
composed of 50 percent or more primary shares, where primary shares are those being issued by
the firm. Secondary offerings (Panel *B*) are defined as SEOs composed of less than 50 percent
primary shares. Offerings by utilities (SIC codes 4910–4949), closed-end funds, REITs, and firms

## B. Secondary SEOs

### Pure Purchases
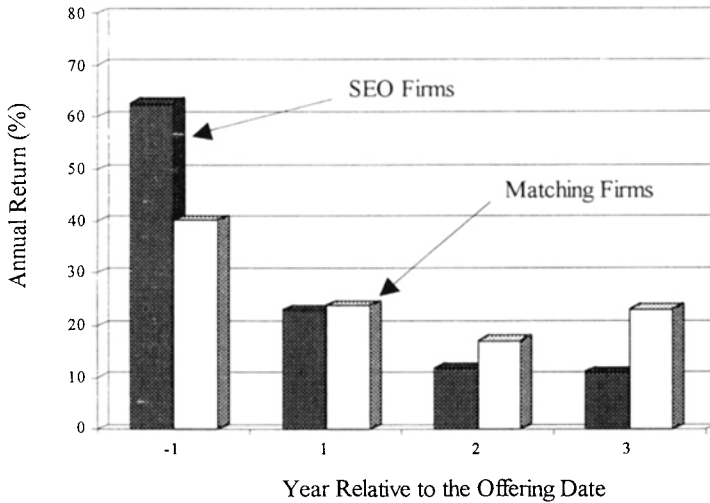
Annual Return (%) — Year Relative to the Offering Date

SEO Firms

Matching Firms

### Pure Sales

Annual Return (%) — Year Relative to the Offering Date

SEO Firms

Matching Firms

with no book value information in COMPUSTAT, Moody's manuals, or Standard and Poor's Stock Report, are excluded. ADRs, units offerings, and firms with negative book equity values are also excluded from the sample. Each SEO is matched with 5 size-and-industry-matched nonissuing firms. Pure insider purchasing firms are companies with only top executives purchasing their shares without any selling for the previous 6-month period including issue dates. Pure insider selling firms are similarly defined. There are 71 pure purchasing SEOs among primary issuers (23 among secondary issuers) and 344 pure selling SEOs among primary issuers (132 among secondary issuers). The offering date is the beginning of year 1.

**Table V**

## OLS Regressions of 3-Year Performance Measures

The sample consists of 2,164 seasoned equity offerings (SEOs) during 1976–1990 by nonutility domestic operating firms listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. Primary offerings are defined as SEOs with 50% or more of the offering composed of primary shares, with secondary offerings being the complement. The independent variables are as follows: $ARPR_i$ is the SEO firm's prior annual return minus the respective industry-and-size-adjusted matching firms' average prior return; $LBM_i$ is the log book-to-market ratio ($= Ln(1 + book\text{-}to\text{-}market\ ratio)$); $LSIZE_i$ is the log market capitalization ($= Ln(market\ capitalization\ in\ millions\ of\ 1993\ \$)$); $INS1_i$ is the dummy variable for pure insider purchases ($=1$ if PP, and $=0$ otherwise); $INS2_i$ is the dummy variable for pure insider sales ($=1$ if PS, and $=0$ otherwise); $PRIM_i$ is the dummy variable for primary offerings ($=1$ if the proportion of primary shares is greater than or equal to 50%, $=0$ otherwise); and $EX_i$ is the dummy for exchange ($=1$ for Nasdaq). The dependent variables are LBHR ($Ln(1+SEO$ firm's 3-year buy-and-hold return (BHR))), and LAR ($LBHR - Ln(1+industry\text{-}and\text{-}size\text{-}adjusted$ matching firms' BHR)). The 3-year BHR starts at the close of the day of issue and ends either on the end of the 3-year anniversary or on the delisting day of the issuing firm, whichever is earlier. A return of 50% is measured as 0.5. The $t$-statistics are in parentheses, and are calculated using heteroskedasticity-consistent variances.

| | Dependent Variables | |
| Coefficient Estimates | LBHR | LAR |
|---|---|---|
| Intercept | −0.014 | −0.347 |
| | (−0.13) | (−3.43) |
| ARPR | −0.034 | −0.043 |
| | (−1.05) | (−1.38) |
| LBM | 0.532 | 0.281 |
| | (6.73) | (3.68) |
| LSIZE | 0.021 | 0.023 |
| | (1.71) | (1.96) |
| INS1 | 0.001 | 0.060 |
| | (0.01) | (0.47) |
| INS2 | −0.134 | −0.191 |
| | (−2.00) | (−3.07) |
| PRIM | −0.265 | −0.172 |
| | (−7.10) | (−4.77) |
| INS1 · PRIM | 0.001 | −0.021 |
| | (0.01) | (−0.13) |
| INS2 · PRIM | 0.139 | 0.166 |
| | (1.65) | (2.07) |
| EX | −0.142 | −0.092 |
| | (−3.43) | (−2.27) |
| $R^2_{adjusted}$ | 6.9% | 3.2% |

$INS1_i$ is a dummy variable for PP ($= 1$ if PP, and $= 0$ otherwise), $INS2_i$ is a dummy variable for PS ($= 1$ if PS, and $= 0$ otherwise), $PRIM_i$ is a dummy variable for primary offerings ($= 1$ if the proportion of primary shares is greater than or equal to 50%, and $= 0$ otherwise), and $EX_i$ is a dummy variable for Nasdaq-listed firms ($= 1$ for Nasdaq). The dependent variables are LBHR ($Ln(1 + SEO$ firm's 3-year buy and hold return (BHR))), and LAR (SEO's LBHR minus industry-and-size-adjusted matching firms' LBHR). The $t$-statis-

tics are in parentheses and are calculated using White's (1980) heteroskedasticity-consistent variances.

The results for raw log returns (LBHRs) are similar to those for the abnormal log returns (LARs). For both LBHR and LAR, the coefficients of LBM are significantly positive, consistent with the performance of value versus growth stocks during the sample period that others have documented. The coefficients of LSIZE are marginally significantly positive, possibly because the asymmetric information problems around SEOs are less severe for larger firms. Loughran and Ritter (1996) also report a positive relation between size and the future long-run performance of issuing firms.

The coefficients of INS1, INS2, INS1 · PRIM, and INS2 · PRIM indicate that holding everything else constant, among secondary issuers, the sellers perform significantly worse than the secondary issuers with either mixed-trading or pure-selling top executives. In addition, the coefficients suggest that for primary issuers, top executives' trading does not have any significant explanatory power.[12] This supports the hypothesis that both primary and secondary issuers whose top executives engage in open-market *selling* prior to the issue are intentionally selling overvalued equity, while those primary issuers with top executives engaging in open-market *purchasing* before issuing are not. The significantly negative coefficients of PRIM confirm the previous summary statistics results, indicating that primary issuers have lower returns than secondary issuers, even after controlling for other factors. The coefficients on EX imply that holding all else constant, the Nasdaq-listed firms' performance is significantly worse than the NYSE/AMEX firms' performance.

I use multiple logit tests to examine whether the motivations for top executives' trading prior to issuing can be deduced from some explanatory variables, ex post. The unreported results indicate that the post-issue long-run performance of issuing firms has no reliable association with top executives' prior trading. However, top executives of issuing firms with higher prior annual returns, lower book-to-market ratios, or larger market capitalization are more likely to sell their shares before an issue.

In summary, secondary issuers, except for those whose top executives sell their shares before the issue, do not underperform their matching firms in the long run. In contrast, primary issuers significantly underperform their matching firms regardless of top executives' personal trading patterns prior to issuing.

## IV. Statistical Tests Using a Simulation Methodology

Both Kothari and Warner (1997) and Barber and Lyon (1997) show that biased inferences can be drawn by using standard parametric tests in studies of long-horizon abnormal stock returns around firm-specific events. This is

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[12] Instead of dummy variables, the net dollar purchases as a fraction of the total dollar amount of insider transaction (($purchases − $sales)/($purchases + $sales)) are also used to check the sensitivity of the results. Since the results are similar, those results are not reported here.

because the skewed distribution of long-horizon returns and the clustering of observations in time, as well as industry and size effects, pose problems for standard parametric significance tests.

To tackle this problem, I develop a nonparametric simulation test procedure. This method is similar to the Bootstrap method (see Noreen (1989)), but is closer to the Monte Carlo simulation method. In each trial, for each SEO firm, a firm is randomly selected from all risk-adjusted firms in the population (i.e., all the companies in the same BM and size portfolio as the corresponding SEO firm), rather than from the original SEO firms. Ikenberry, Lakonishok, and Vermaelen (1995) use a similar method.

The basic idea underlying the null hypothesis of this test is that the post-offering abnormal returns of SEO firms are just pure compensation for risk. Therefore, the abnormal returns of companies in a similar risk category should be comparable to those of SEO companies. However, defining "risk" is not a simple task. Historically, beta from the CAPM was a dominant risk measure among academics. Recently, however, there has been a great deal of controversy over the usefulness of beta. Fama and French (1992) show that book-to-market ratio and size are the two most important factors of those that they examine for explaining the cross-section of stock returns during my sample period. Consequently, I control for size and BM. I test whether the abnormal performance of SEO firms (measured relative to industry-and-size-adjusted matching firms) is close to the abnormal performance of other companies with similar size and BM.[13] The different characteristics of SEO firms in different BM and size portfolios are summarized in Table VI and described in more detail in the Appendix.

First, at the end of each month from December 1975 to November 1990, I assign all the CRSP-and-COMPUSTAT-listed nonissuing seasoned (i.e., listed more than five years without issuing any equity for the previous five years) nonutility domestic operating firms (i.e., excluding closed-end funds, ADRs, and REITs) on the NYSE, AMEX, and Nasdaq exchanges to their corresponding size and BM quintiles. I use the same cut-off points as those used to choose prior return, size, and BM-adjusted matching firms for the formation of size and BM quintiles.

Second, at the time of issue, I figure out which portfolio each SEO firm belongs to and purge this portfolio of the SEOs and its five matching firms (using the MF1 definition). I then calculate the three-year holding period returns (BHRs) of the nonexcluded firms in the portfolio. I calculate the three-year BHRs over the identical time period as the corresponding SEO firms' BHRs. If a company is delisted before the end of the third year or the issuer's delisting day, whichever is earlier, I splice the CRSP value-weighted return into the calculation of the BHR from the day after the delisting date.

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[13] To check the sensitivity of the results, I also test whether the abnormal performance of SEO firms (measured relative to prior return, size, and book-to-market ratio-adjusted matching firms) is close to the abnormal performance of other similarly sized companies in the same industry. The qualitative results are very similar to those reported here.

**Table VI**

## Summary Statistics for Size and BM Portfolios

In each cell, 5 numbers are listed. From top to bottom, these are (i) number of seasoned equity offering (SEO) firms, (ii) abnormal prior annual return (average prior annual % return of SEO firms minus average prior annual percent return of industry-and-size-adjusted matching firms), (iii) average 3-year buy and hold percent return of SEO firms (BHR), (iv) average abnormal return of SEO firms (SEO firm's BHR–average of 5 industry-and-size-adjusted matching firms' BHR), and (v) percentage of pure insider purchasing SEO firms. The sample consists of 2,164 SEOs during 1976–1990 by nonutility domestic operating firms listed on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and Nasdaq tapes. Primary offerings are defined as SEOs with 50% or more of the offering composed of primary shares, with secondary offerings being the complement. The cut-off points for the size quintiles are based on the last day of the previous calendar month market capitalization of all CRSP-listed NYSE/AMEX firms and the cut-off points for BM quintiles are based on the last day of the previous month BM of all CRSP-listed NYSE/AMEX and Nasdaq firms.

| SIZE/BM | Lowest | 2 | 3 | 4 | Highest | Total |
|---|---|---|---|---|---|---|
| Smallest | 8 | 10 | 3 | 14 | 6 | 41 |
| | −27.8% | 26.9% | 13.1% | 23.2% | −23.7% | 6.5% |
| | −49.0% | −43.3% | −6.5% | 127.3% | 46.2% | 29.6% |
| | −57.4% | −85.6% | −7.8% | 67.0% | 20.6% | −6.8% |
| | 0% | 10% | 0% | 21% | 0% | 10% |
| 2 | 16 | 64 | 102 | 75 | 22 | 279 |
| | 60.2% | 34.9% | 29.4% | 12.2% | −4.4% | 25.2% |
| | 28.6% | 14.4% | 42.0% | 31.3% | 18.7% | 30.2% |
| | −13.0% | −24.3% | −16.1% | −16.3% | −23.0% | −18.4% |
| | 6% | 5% | 6% | 7% | 14% | 6% |
| 3 | 125 | 265 | 134 | 87 | 30 | 641 |
| | 44.0% | 29.4% | 29.5% | 4.8% | −8.0% | 27.2% |
| | 49.1% | 37.6% | 50.4% | 28.4% | 35.1% | 41.2% |
| | −14.9% | −13.7% | 1.3% | −4.6% | −15.7% | −9.7% |
| | 6% | 3% | 6% | 7% | 7% | 5% |
| 4 | 202 | 165 | 129 | 105 | 39 | 640 |
| | 50.4% | 29.0% | 15.7% | 10.3% | −24.5% | 26.8% |
| | 35.6% | 42.5% | 38.2% | 39.6% | 51.3% | 39.5% |
| | −21.9% | −25.6% | −16.5% | −11.2% | −12.2% | −19.4% |
| | 2% | 4% | 2% | 8% | 5% | 4% |
| Largest | 91 | 134 | 136 | 155 | 47 | 563 |
| | 34.3% | 14.7% | 5.2% | 9.4% | −8.0% | 12.2% |
| | 36.2% | 42.5% | 48.7% | 50.9% | 71.9% | 47.7% |
| | −9.0% | −23.3% | −8.6% | −9.6% | 13.4% | −10.6% |
| | 1% | 3% | 2% | 6% | 0% | 3% |
| Total | 442 | 638 | 504 | 436 | 144 | 2,164 |
| | 44.2% | 26.7% | 19.3% | 9.6% | −12.6% | 22.5% |
| | 37.8% | 36.3% | 44.8% | 42.8% | 49.4% | 40.8% |
| | −17.6% | −21.0% | −9.5% | −7.7% | −4.9% | −13.9% |
| | 3% | 3% | 4% | 7% | 5% | 4% |

Third, for each SEO firm, I randomly select one company from those com-
panies in the same size and BM portfolio, the three-year holding period returns
of which are calculated in the second step described above. I treat this ran-
domly selected firm as if it had issued seasoned equity on the same day as the
corresponding SEO, and calculate its abnormal return by subtracting the
average BHR of the corresponding SEO's industry-and-size-adjusted matching
firms from the BHR of the randomly selected firm. This process continues until
each firm in the sample is represented by a randomly selected firm with
similar size and book-to-market ratio. I then calculate the average abnormal
return of a trial (TAR) over these randomly matched pairs. I repeat this
procedure 10,000 times, producing an empirical distribution of TARs.

Finally, I test whether the average SEO's abnormal return is significantly
different from the mean TAR from 10,000 trials, using the *p*-value from the
resulting empirical distribution:

$$p\text{-value} = \frac{\text{Number of trials with TAR being less than or equal to SEO's average AR}}{10,000}$$

where AR represents abnormal returns and TAR is the average AR of each
trial.

Panel A of Table VII reports the results of the test examining whether the
three-year holding period ARs of SEO firms are significantly different from
those of other companies in the same size and BM portfolio. Out of 10,000
trials, there were no cases in which the average AR of each trial (TAR) was as
low as the average AR of the total sample of SEO firms. This suggests that the
issuing firms, on average, significantly underperform the firms in the same
size and BM portfolio. This result applies to the primary SEO subsample.
Among primary issuers, both buyers and sellers significantly underperform
those firms in the same size and BM portfolio. In contrast, on average second-
ary issuers do not underperform their matching firms. However, the sellers
among secondary issuers significantly underperform their matching firms; the
buyers among secondary issuers outperform their benchmarks, but not by
statistically significant amounts.

The results of the test for different abnormal performances among different
insider trading groups are reported in Panel B of Table VII. DAR is the
difference between the average ARs of buyers and sellers. DAR measures how
the relative performance (relative to their industry-and-size-adjusted match-
ing firms' performance) of buyers is different from that of sellers. SEO firms'
DAR is reported in Column 3, Panel B.

To estimate the average DAR of those firms in the same size and BM
portfolios as SEO firms, I follow a procedure similar to that used above. For
each buyer, I randomly select one company from the same size and BM
portfolio and calculate the AR of that company by subtracting the average
BHR of the SEO's industry-and-size-adjusted matching firms from its BHR. I
then calculate the average AR over the randomly selected firms in the buyers

## Table VII
## Simulation Results: Short-Run Performance Comparison

This table reports the results of the following simulation statistical test. For each seasoned equity offering (SEO), one company is randomly selected from those companies in the same size and book-to-market ratio quintiles. The abnormal return of that randomly selected company is calculated by computing its 3-year buy-and-hold return (BHR) and then subtracting the average BHR of the corresponding SEO firm's industry-and-size-adjusted matching firms. This is done for each SEO, and the mean abnormal return is then calculated over randomly matched pairs in each trial. This procedure is repeated 10,000 times. Pure insider purchases firms (PP) are the ones with only top executives purchasing their shares without any selling for the previous 6-month period including issue dates. Pure insider sales (PS) is similarly defined. In Panel A, mean SEO abnormal return represents SEO's average abnormal return (AR) (i.e., SEO firm's BHR minus average of 5 industry-and-size-adjusted matching firms' BHR). In Panel B, mean SEO abnormal return represents DAR, the average difference of ARs between firms with PP and firms with PS. Mean of trial means is the mean of average AR (or DAR) out of 10,000 trials. The *p*-value from empirical distribution is defined as (the number of trials with mean abnormal return less than or equal to SEO's mean/10,000). All includes all firms in each category, PP includes only pure insider trading firms, and PS includes only pure selling firms.

| | | No. of SEOs | Mean SEO Abnormal Return (%) | Mean of Trial Means (%) | *p*-Value |
|---|---|---|---|---|---|
| | | Panel A: SEO vs. Matching Firms (AR) | | | |
| Total | All | 2,164 | −13.9 | 0.8 | 0.000 |
| | PP | 94 | −10.0 | 2.9 | 0.066 |
| | PS | 476 | −22.8 | −6.7 | 0.000 |
| Primary SEOs | All | 1,513 | −18.9 | 2.1 | 0.000 |
| | PP | 71 | −21.8 | 0.0 | 0.011 |
| | PS | 344 | −20.4 | −2.1 | 0.000 |
| Secondary SEOs | All | 651 | −2.3 | −2.3 | 0.508 |
| | PP | 23 | 26.5 | 12.6 | 0.802 |
| | PS | 132 | −28.9 | −18.6 | 0.066 |
| | | Panel B: Purchase Group vs. Sales Group (DAR) | | | |
| Total | | 2,164 | 12.7 | 9.6 | 0.640 |
| Primary SEOs | | 1,513 | −1.5 | 2.1 | 0.388 |
| Secondary SEOs | | 651 | 55.5 | 31.5 | 0.904 |

group for each trial. The average AR of the sellers group is similarly calculated. The difference between these two average ARs is the DAR of each trial. The mean DAR out of 10,000 trials is reported in Column 4 (mean of trials).

For the total sample, the difference (between the SEO DAR and the mean of trials) is not significantly different from zero, implying that on average, after controlling for size and BM effects, the relative performance of SEO purchasing groups is not significantly better than that of SEO selling groups. Neither is there a significant difference for primary issuers. However, the result for secondary issuers indicates that the buyers among secondary issuers perform marginally significantly better than the sellers, even after I control for size and

BM effects. These results imply that there is a reliable relation between top executives' trading prior to secondary SEOs and the long-run stock price performance of secondary issuers. However, the close relation does not hold for primary issuers.

## V. Discussion

There are several possible factors that could explain the lack of a close relation between top executives' trading and the long-run stock price performance of primary seasoned equity issuing firms.

### A. Cognitive Biases

Top executives' trading is a useful signal of future performance if top executives are unbiased. However, we cannot ignore the possibility that top executives have biased forecasts of their future prospects. The very high preissue stock returns, especially those of primary issuers, suggest that primary issuers' top managers might increase their estimation of the firms' fundamental value too much, and that they might expect to receive a higher return when they purchase their shares. In addition, managers could pay too little attention to the possible worst-case scenario when they consider a new project. Loughran and Ritter (1996) show that issuing firms with rapid increases in capital expenditures subsequently underperform by more than issuing firms with slower increases in capital expenditures. Ali (1995) shows that during the five-year period after issuing equity, analysts' earnings forecasts have greater optimistic bias for issuers than do nonissuers. These results suggest that managers, as well as analysts, are overoptimistic about issuing firms' future profitability.

In addition, it is also possible that managers raise capital to invest in what they think are positive NPV projects, but do not realize that the market has overcapitalized prior good news. Managers might follow a mechanical rule of thumb in financing decisions, i.e., they issue equity rather than debt after a huge increase in their stock price, irrespective of the future prospects. Nevertheless, firms would appear to be successful in timing SEOs because there is a tendency in the equity market towards long-term mean reversion.

### B. Underestimation of Increases in Free Cash Flow Problems After Primary Equity Issues

Loughran and Ritter (1995, Table VII) find that if companies with high returns do not issue, they do not subsequently underperform their benchmarks. This evidence seems to be inconsistent with the possibility of mechanical financing decisions by managers. However, this evidence is not necessarily inconsistent with managers making mechanical financing decisions.

An increase in free cash flow problems after primary seasoned equity issues and the underestimation of these increased free cash flow problems by both the market and top executives of primary issuers might explain the poor perfor-

mance of primary issuers. This explanation is supported by the evidence that, on average, secondary issuers except for those with top executives selling their shares before issuing do not underperform their benchmarks, while primary issuers underperform, regardless of the prior top executives' trading pattern. This is also supported by Loughran and Ritter's (1996) results that issuers with rapidly growing capital expenditures subsequently underperform by more than those with slower growth in capital expenditures. Moreover, Jung, Kim, and Stulz (1996) and McLaughlin, Safieddine, and Vasudevan (1994) present empirical results that support the hypothesis that the negative stock price reaction to SEO announcements is due to the increase in free cash flow problems from equity issues.

## C. Insiders' Short-Term Investment Horizon

If top executives' investment horizon is short, then even when they trade to take advantage of the inside information on the firm's short-term prospects, we would not observe a strong relation between insider trading and issuing firms' *long-term* performance.[14] However, we should be able to observe a close relation for the *short-term* stock returns.

To check this possibility, I repeat the simulations discussed in Section IV. I use one-year holding period returns because top managers are almost always permitted to sell their shares within a year of the SEO.[15] Table VIII reports the results. On average, there is no significant abnormal short-term performance. However, primary issuers significantly underperform their benchmarks, while secondary issuers outperform their benchmarks. We do not observe significant differences in the short-term performance between sellers and buyers, implying that insiders' short-term investment horizon is not the main reason for the poor relation between prior insider trading and postissue abnormal returns measured over a three-year horizon.

## D. Mismeasurement of Common Factors

Even though I have used different benchmarks in the article, it is still possible that I have not appropriately controlled for common factors. There has been a great deal of controversy over what the appropriate factors are. Therefore, we cannot exclude the possibility that the relevant factors are not suitably captured by the benchmarks used in this article.

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[14] Seyhun (1986) shows that most of the abnormal stock price movement occurs during the 100 trading-day period following the insider trading day. Other studies (e.g., Jaffe (1974) and Finnerty (1976)) also show that insider trading has predictive power of six months up to one year.

[15] Most SEOs have lockup provisions, under which managers agree not to sell any shares without the prior consent of the underwriters during the lockup period. SDC started to report lockup provision information for SEOs in 1988. Among 496 seasoned common stock issues during the 1988–1990 period (247 SEOs in my sample), 201 offerings did not have any lockup provisions, and 295 offerings did. The most popular lockup provision period was 90 calendar days (127 SEOs), followed by 120 days (77 SEOs) and 180 days (56 SEOs). The maximum was 730 days and the minimum was 30 days.

Table VIII

## Simulation Results: Short-Run Performance Comparison

This table reports the results of the following simulation statistical test. For each seasoned equity offering (SEO), one company is randomly selected from those companies in the same size and book-to-market ratio quintiles. The abnormal return of that randomly selected company is calculated by computing its 1-year buy-and-hold return and then subtracting the average 1-year buy-and-hold return of the corresponding SEO firm's industry-and-size-adjusted matching firms. This is done for each SEO, and the mean abnormal return is then calculated over randomly matched pairs in each trial. This procedure is repeated 10,000 times. Pure insider purchases firms (PP) are the ones with only top executives purchasing their shares without any selling for the previous 6-month period including issue dates. Pure insider sales (PS) is similarly defined. In Panel A, mean SEO abnormal return represents SEO's average abnormal return (AR) (i.e., SEO firm's 1-year holding period return minus average of 5 industry-and-size-adjusted matching firms' 1-year holding period return). In Panel B, mean SEO abnormal return represents DAR, the average difference of ARs between firms with PP and firms with PS. Mean of trial means is the mean of average AR (or DAR) out of 10,000 trials. The $p$-value from empirical distribution is defined as (the number of trials with mean abnormal return less than or equal to SEO's mean/10,000). All includes all firms in each category, PP includes only pure insider purchasing firms, and PS includes only pure insider selling firms.

| | | No. of SEOs | Mean SEO Abnormal Return (%) | Mean of Trial Means (%) | $p$-Value |
|---|---|---|---|---|---|
| | | Panel A: SEO vs. Matching Firms (AR) | | | |
| Total | All | 2,164 | −1.9 | −1.3 | 0.221 |
| | PP | 94 | 1.3 | 2.4 | 0.403 |
| | PS | 476 | −2.4 | −4.7 | 0.923 |
| Primary SEOs | All | 1,513 | −3.8 | −0.8 | 0.001 |
| | PP | 71 | −3.3 | 0.1 | 0.232 |
| | PS | 344 | −3.0 | −2.9 | 0.491 |
| Secondary SEOs | All | 651 | 2.5 | −2.5 | 1.000 |
| | PP | 23 | 15.7 | 9.7 | 0.772 |
| | PS | 132 | −0.9 | −9.5 | 0.997 |
| | | Panel B: Purchase Group vs. Sales Group (DAR) | | | |
| Total | | 2,164 | 3.8 | 7.2 | 0.218 |
| Primary SEOs | | 1,513 | −0.3 | 3.1 | 0.248 |
| Secondary SEOs | | 651 | 16.6 | 18.9 | 0.402 |

### E. No Control of Noise Related to Insider Trading

The results could be driven by the fact that I do not control for top executives' exogenous trading needs, which by definition are not related to the inside information about the firm's future performance. However, unless there exists a systematic difference between primary and secondary issuers in top executives' exogenous trading needs, it is very unlikely that this omission affects only primary issuers' results. In addition, Lee (1995) shows that primary-issue buyers significantly underperform their matching firms even after he indirectly controls for exogenous trading needs. To control for unobserved insiders'

exogenous trading needs in his statistical test, Lee uses an inequality test with instrumental variable methodology that has been used in other studies to control for unobserved factors in a statistical hypothesis test. For example, Boudoukh, Richardson, and Smith (1993) test the positivity of the ex ante risk premium by employing an instrumental variables approach to take into account the unobservability of expected returns.

## F. Use of Self-Reported Insider Trading Data

The use of mostly legal insider trading could have driven the poor relation. The SEC's ORS data are likely to contain mostly legal trading, since the data are self-reported by insiders. Meulbroek (1992) shows that illegal insider trading is more closely related to the abnormal performance around takeovers than is legal insider trading. However, Seyhun (1992) argues that even though insiders rarely trade on *legally* material information, they often trade on *economically* material information. Moreover, the close relation between top executives' trading and the long-run performance of secondary issuers suggests that the poor relation for primary issuers is unlikely to be driven mostly by the use of self-reported insider trading data.

## G. Efficient Market

In a semi-strong-form efficient market, the market price reflects the information content of insider trading when it becomes public (i.e., before the issue date). Thus, even when insider trading truthfully signals the quality of issuing firms, in an efficient market we cannot observe a close relation between preissue insider trading and the postissue long-term stock price performance. However, the previous evidence of market inefficiency related to insider trading (e.g., Jaffe (1974)) and the negative announcement period abnormal returns of buyers (average 2.2 percent) indicate that the poor relation between insider trading and the long-run performance of primary issuers cannot be totally attributed to market efficiency.[16]

## VI. Summary and Conclusion

The previously reported insider trading patterns around SEOs (i.e., a significant increase in insider sales before issuing) are consistent with insiders intentionally selling overvalued equity (Karpoff and Lee (1991) and Kahle (1995)). However, Lee (1995) reports a small (albeit significant) increase in insider sales before issuing *and* a decrease of insider sales after issuing, before the long-run price adjustments have occurred. This suggests that insiders do

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[16] To see whether the returns during the period between the announcement date and the issue date significantly affect the results, I examine the average daily abnormal return during this period. The mean daily abnormal return is −0.06 percent, which is not significantly different from zero. This also indicates that the postissue long-term stock return underperformance of primary issuers with PP cannot be explained by the market efficiency (i.e., by the argument that the price has already incorporated the insider trading information before issuing).

not seem to know the degree of overvaluation. Moreover, the article shows that there is no close relation between top executives' trading and the long-run stock returns of primary issuers, even though there is a close relation for secondary issuers. While primary-issue decision makers seem to be able to strategically time the issue of primary seasoned equity, it appears that quite a few top managers of primary issuers (e.g., who have purchased shares before issuing) are not successful in timing their personal trades.

Most secondary issuers, except for those with top executives engaging in open-market selling prior to issuing, do not underperform their benchmarks. However, primary issuers significantly underperform even when top executives purchase shares before issuing. This evidence is consistent with the notion that an increase in free cash flow problems plays an important role in explaining the underperformance of SEOs.

In conclusion, the results suggest that it is not desirable to invest in firms issuing primary seasoned equity (i.e., firms with offerings that have most of the shares being issued by the firm) no matter what the previous pattern of insider trading is. However, the examination of top executives' trading before issuing seems to be a useful way to distinguish the quality of firms issuing secondary seasoned equity (i.e., firms with offerings that have most of the shares being sold by existing shareholders).

## Appendix

To show how SEO firms in different BM and size portfolios have performed, Table VI reports the number of SEO firms in each portfolio, the SEO firm's prior annual excess return (i.e., SEO prior annual return minus average industry-and-size-adjusted matching firms' prior annual return), the SEO firm's three-year buy-and-hold return (BHR), the SEO firm's three-year abnormal return (SEO BHR minus average industry-and-size-adjusted matching firms' BHR), and the percentage of buyers. It is clear that the firms with low BMs are those that have performed well for the year before issue. The firms in the high BM portfolios are those with lower prior stock returns. There is also a weak pattern showing that the low BM firms' top executives have purchased less than the top executives in the high BM firms during the previous six months. Overall, the postissue raw returns of SEO firms in the higher BM quintiles are larger, albeit smaller than those of industry-and-size-adjusted matching firms. Size portfolios do not show any systematic pattern, except that the percentage of buyers is higher for smaller-size portfolios and the raw returns of larger firms are larger than those of smaller firms.

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