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Long-Term Performance of Seasoned Equity Offerings: Benchmark Errors and Biases in Expectations

Narasimhan Jegadeesh*

I investigate the long-term performance of firms that issue seasoned equity relative to a variety of benchmarks. I find that these firms significantly underperform all of my benchmarks over the five years following the equity issues. Across SEOs, I find similar levels of underperformance for both small firms and large firms, and both growth firms and value firms. The paper also shows that factor-model benchmarks are misspecified. Hence inferences on SEO underperformance based on such benchmarks are misleading. I also find that SEOs underperform their benchmarks by twice as much within earnings announcement windows as they do outside these windows.

Many recent studies examine the long-term performance of stocks following important corporate events, such as initial public offerings, seasoned equity offerings, stock repurchases, stock splits, dividend initiations and omissions, and privatizations.[1] These studies report that stock prices systematically drift up or down relative to their benchmarks for up to five years following the events. One interpretation of the results in these studies is that capital markets do not efficiently value the information conveyed by many important corporate announcements. Also, these results imply that traditional event studies over short windows around the events capture only a small portion of the impact of corporate actions on firm values.

I address several issues related to long-term performance of seasoned equity offerings (SEOs). First, I evaluate the sensitivity of SEO underperformance to the choice of benchmarks. There is strong and well-accepted earlier evidence that firms that issue seasoned equity have low long-term returns relative to the market index. However, the interpretation that seasoned equity issues convey new information to the market that the issuer is steeply overvalued, and that the market ignores this information, is controversial. An alternative interpretation, proposed forcefully by Fama (1998) and others, argues that low returns for these firms are not related to the act of issuing seasoned equity per se, but to cross-sectional relations between characteristics of SEOs, such as their low market-to-book ratios and high past returns, and future returns. Put differently, this interpretation implies that SEOs may appear to perform poorly only because

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[1]Examples of long-term stock performance studies are Ritter (1991) for initial public offerings, Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) for seasoned equity offerings, Ikenberry, Lakonishok, and Vermaelen (1995) for share repurchases, Ikenberry, Rankine, and Stice (1996) for stock splits, Michaely, Thaler, and Womack (1995) for dividend initiations and omissions, and Megginson, Nash, Netter, and Schwartz (2000) for share issue privatizations.

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they are not evaluated against the correct benchmark.

In this paper, I consider various benchmarks for firms that issue seasoned equity. My benchmarks include the equal- and value-weighted indexes, benchmarks constructed based on firm-specific characteristics, and factor-model benchmarks. The characteristics of the SEOs that are matched by the characteristic-matched benchmarks are firm size, market-to-book ratio, earnings-to-price ratio, lagged six-month return, and lagged 36-month return. I choose these characteristics for two reasons. First, previous studies show that these characteristics are related to future stock returns. Second, firms that issue seasoned equity do not represent a random sample, but have values of these characteristics that are systematically different from those of other publicly traded stocks.

I find that the evidence of SEO underperformance is robust, and that it survives the best candidates for benchmark returns. Across various benchmarks, I find the lowest level of SEO underperformance when the benchmark simultaneously matches on size and market-to-book ratio. The results are not sensitive to benchmarks that match SEOs on additional characteristics, such as earnings-to-price ratios and past returns. Furthermore, large-firm SEOs underperform by about the same extent as do small-firm SEOs, and growth-firm SEOs underperform by about the same extent as do value-firm SEOs. In contrast, some recent papers (e.g. Brav, Geczy, and Gompers, 2000) find larger underperformance for small-firm SEOs than for large-firm SEOs when measured against factor-model benchmarks. However, I show that these apparent differences in underperformance between large- and small-firm SEOs are due to inherent biases in the factor-model benchmarks.

To provide another perspective on SEO underperformance, I examine whether the market is unpleasantly surprised within four-day earnings announcement windows following seasoned equity offerings. I find that SEOs underperform by roughly twice as much during earnings announcement windows as they do outside these windows. This finding further reinforces my conclusion that the market is overly optimistic about the long-term prospects of SEOs at the time they issue seasoned equity.

The paper is organized as follows. Section I describes the data and presents a preliminary analysis of the performance of new issues. Section II discusses the construction of various benchmarks and presents the long-term performance of SEOs relative to these benchmarks. Section III examines SEO performance relative to three- and four-factor model benchmarks. Section IV examines returns within earnings announcement windows. Section V concludes.

I. Long-Term Performance of New Issues: A First Look

One part of the new issues underperformance literature finds that firms that issue equity either through initial public offerings (IPOs) or through SEOs earn lower returns than do non-issuing firms and concludes that these stocks are mispriced at the time of equity issues. However, several recent papers argue that SEOs appear to underperform, because the benchmark is misspecified. These studies propose that SEOs earn lower returns either because these firms are exposed to lower risks, or because they offer diversification benefits. In this section, I analyze two investment strategies and present a preliminary evaluation of these explanations. The first strategy invests in all stocks listed on all exchanges. The second strategy invests only in stocks that have been publicly traded for at least 60 months. Under the second strategy, I exclude any stock that issues seasoned equity from the portfolio for the next 60 months starting with the end of the month of SEO announcement. I consider the first date that a firm is included in the CRSP database as the first date on which the firm

trades publicly. The starting date for Nasdaq-listed firms in the CRSP database is December 1972 and hence information about when these firms originally went public is not available. Therefore, I do not consider firms traded on the Nasdaq on this date as new issues unless they subsequently issue seasoned equity. I obtain my sample of SEOs from the Securities Data Company (SDC) database for the 1970 to 1994 period.

I compute monthly returns on the equal- and value-weighted indexes of stocks with and without new issues. To be consistent with prior long-term performance studies, I exclude utilities from all indexes. I compound monthly index returns to obtain annual returns.

Table I presents the average annual index returns between 1970 and 1998. Because I do not have SEO data before January 1970 or after December 1994, firms that issued seasoned equity outside these dates are not excluded from the index without new issues. The equal-weighted index return of all stocks is 16.9% per year compared to 19.8% for the index without new issues. The difference in average annual index returns of 2.9% per year is reliably different from zero.

The difference between the value-weighted index with and without new issues is 1.04% per year, which is also significantly larger than zero. The smaller difference in value-weighted index returns is partly due to the fact that new issues constitute a smaller fraction of this index. The average weight of new issues in the value-weighted index is 22% compared to 47% for the equal-weighted index. More importantly, the average return on the value-weighted index return is lower than that on the equal-weighted index during the sample period. Hence, the value-weighted returns are not dragged down as much by new issues.

Figure I plots the number of firms included in the indexes with and without new issues. The large increase in the number of firms in January 1973 is due to the addition of Nasdaq stocks. Although CRSP indicates that December 1972 is the first month of return observation for Nasdaq stocks, these stocks do not have monthly return data until January 1973.

The fact that the index without new issues is made up of fewer stocks suggests that the new issues might provide investors with some diversification benefits. However, the annual standard deviation of the equal-weighted index of all stocks is 24.3%, compared to 22.9% for the equal-weighted index of stocks that excludes new issues. The volatility of the value-weighted index of all stocks is also marginally higher than that of the index without new issues. These results suggest that the new issues do not offer any unique diversification opportunities.

Several studies in the SEO literature use matched firms that include new issues (e.g. Eckbo, Masulis, and Norli, 2000).[2] Loughran and Ritter (2000) point out that, if new issues do underperform other stocks, then their inclusion in the benchmark will set the benchmark returns too low. To illustrate the effect of benchmark contamination in long-term tests, Figure II presents the five-year compounded returns on the equal- and value-weighted indexes with and without new issues. The five-year return on the equal-weighted index without new issues is on average 30.5% larger than that on the index with new issues. Therefore, if the objective of a study is to explain the new issues puzzle, it is important to ensure that other new issues do not weigh down the benchmark.

II. Performance of SEOs Relative to Market Indexes and Characteristic-Matched Benchmarks

In this section, I evaluate the performance of firms that issue seasoned equity relative to

[2]Eckbo, Masulis, and Norli (2000) exclude SEOs from their matched firm sample but do not exclude IPOs. IPOs have lower long-term returns that SEOs.

Table I. Market Index Returns With and Without New Issues

This table presents average annual returns of equal- and value-weighted market indexes that include and exclude new issues. I compute annual returns by compounding monthly index returns. New issues are firms that listed on the NYSE, AMEX, or Nasdaq or issued seasoned equity within the previous 60 months. I exclude utilities from all indexes. The table presents average 12-month returns over the 1970 to 1998 sample period. I exclude SEOs prior to January 1970 and after December 1993 due to lack of data. Autocorrelation-consistent t-statistics appear in parenthesis.

Year	Number of Firms	SEO Returns	Matched Firm Returns	Difference	Difference Value Weighted
70	26	-7.3	13.6	-20.9	-27.2
71	75	-21.5	20.0	-41.5	-39.8
72	52	-28.2	9.5	-37.7	-17.9
73	20	-2.7	23.6	-35.3	-3.4
74	15	68.8	115.1	-46.3	-13.4
75	33	95.8	132.0	-36.2	-52.5
76	50	98.5	159.0	-60.5	-64.4
77	25	128.8	145.0	-16.2	-32.6
78	62	105.3	235.8	-130.5	-72.0
79	48	70.4	184.4	-114.0	-124.7
80	154	45.0	122.5	-77.6	-57.4
81	137	35.8	126.6	-90.8	-34.1
82	119	65.2	147.5	-82.3	-71.9
83	402	20.6	68.9	-48.3	-54.0
84	75	45.6	82.0	-36.4	6.2
85	181	26.6	48.5	-21.9	-33.2
86	201	37.6	36.3	1.3	-36.6
87	150	41.9	41.5	0.3	-4.2
88	72	59.4	69.2	-9.8	-44.7
89	117	42.0	51.7	-9.6	-9.6
90	100	47.2	86.3	-39.1	-42.1
91	288	102.5	124.4	-21.9	-16.5
92	247	116.7	126.2	-9.5	-26.3
93	343	106.6	115.2	-8.6	-18.7
70-93	2,992			-34.3	-33.5
				(-2.21)**	(-2.76)***
Average Monthly Cohort Return Difference				-37.3 (-2.85)***	

various benchmarks. I also investigate the relation between characteristics of SEOs and their stock performance.

A. Benchmarks

The choice of an appropriate model to obtain estimates of expected returns is crucial for

Figure I. Number of Firms in the Market Indexes

This figure presents the number of firms in the indexes with all stocks (indicated as "number of firms") and in the indexes that exclude new issues (indicated as "number of firms excluding SEOs/IPOs"). The sample includes all stocks traded on the NYSE, AMEX, or Nasdaq, except utilities. I define new issues as any firm that issued seasoned equity, or any firm that was first listed on the NYSE, AMEX, or Nasdaq, within 60 months prior to the month on the X-axis.

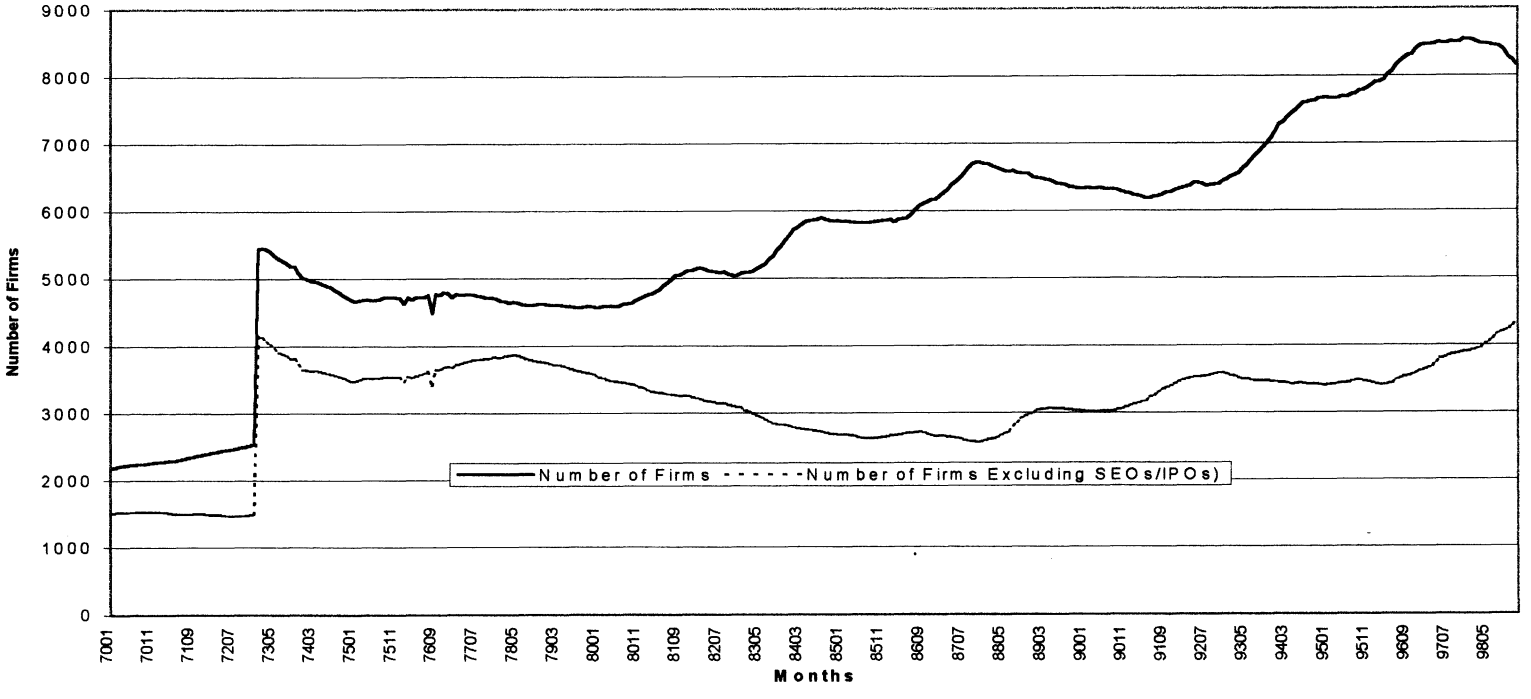
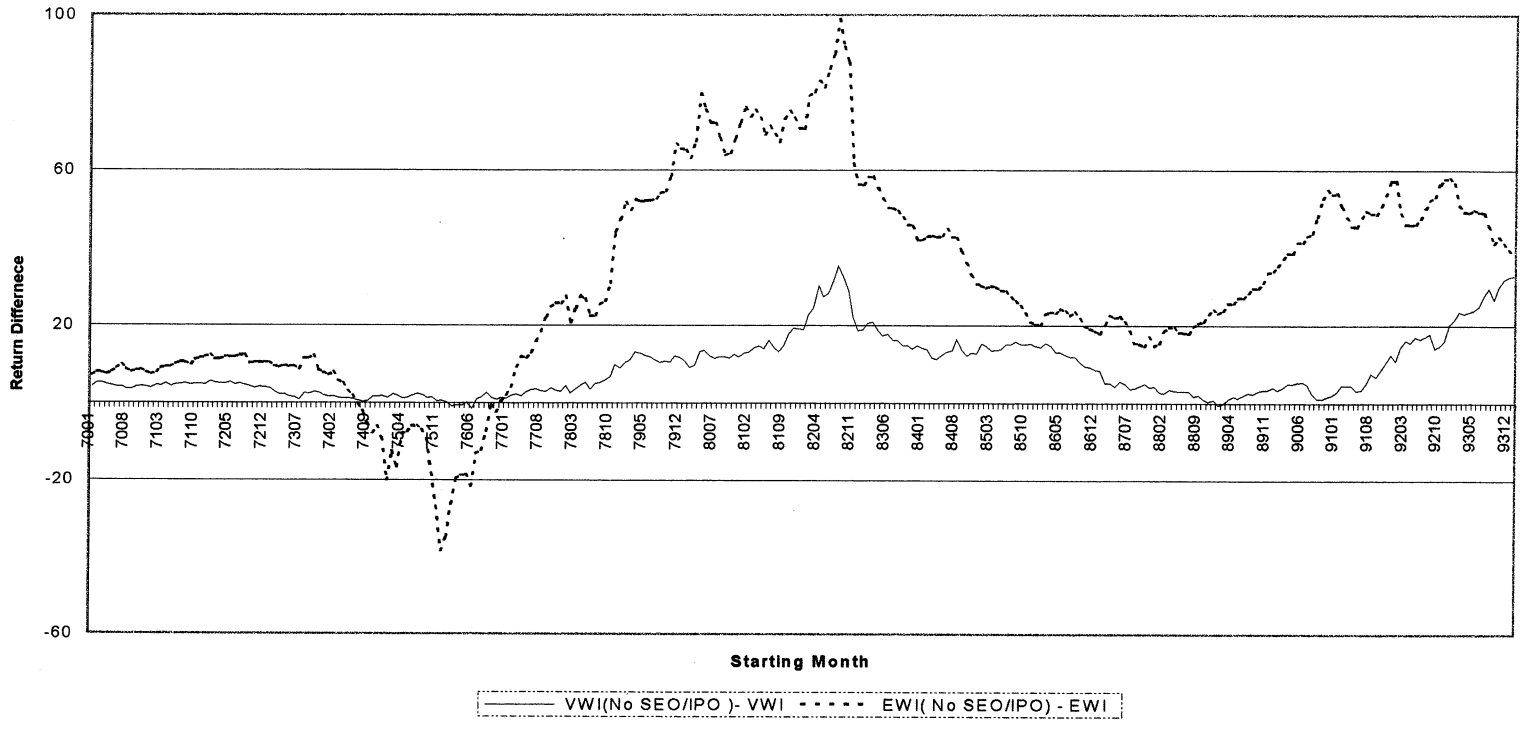


Figure II. Difference Between 60-Month Returns On Equal- and Value-Weighted Indexes Without and With SEOs /IPOs

This figure presents the difference between (1) an equal-weighted index of all stocks (EWI) and equal-weighted index of all stocks excluding new issues (EWI (No SEO/IPO)) and (2) a value-weighted index of all stocks (VWI) and value-weighted index of all stocks excluding new issues (VWI (no SEO/IPO)). I compute the time-series of 60-month returns on each index by compounding monthly index returns starting with the month on the X-axis. This figure presents the difference between 60-month returns on the indexes that include and exclude new issues I define new issues as any firm that issued seasoned equity, or was first listed on the NYSE, AMEX, or Nasdaq, within 60 months prior to the month on the x-axis. I exclude utilities from all indexes.



measuring the valuation effects of corporate actions in long-horizon event studies. To be specific, express the t-period expected return on stock i conditional on an event as follows:

$$E(r_i(t)|\text{event}) = \delta + E(r_i(t)) \quad (1)$$

where δ is the component of return attributable to the event and $E(r_i(t))$ is the unconditional t-period expected return on stock i.

Event studies estimate the magnitude of δ to evaluate the valuation effect of the event. In event studies in which the event window t is short, $E(r_i(t))$ is small and the estimate of δ is typically not sensitive to the choice of asset pricing model used to determine $E(r_i(t))$.

In long-horizon event studies such as the 60-month post-event window considered here, $E(r_i(t))$ is bound to be larger than δ under any plausible alternative hypothesis. Therefore, it is difficult to sharply divide average realized returns into the two components related to expected returns and to the corporate action. To overcome this problem, I could take a stand that a particular model, such as the CAPM, describes the risk-return trade off in the economy, and measure expected returns using this model. However, asset-pricing models such as the CAPM or the APT do not explain the cross-section of expected returns empirically. Many studies find deviations from the CAPM, such as the size, market-to-book, and momentum effects.[3] Therefore, any sample that differs from the population in any of these characteristics (as the SEO sample does) will exhibit abnormal performance. However, such abnormal performance could be related to stock characteristics, rather than to corporate actions, and thus would not be a good measure of the long-term valuation effects of corporate actions.

In this section, I measure SEO performance relative to several benchmarks. The first set of benchmarks is the equal- and value-weighted indexes of CRSP stocks that I constructed in Section I. The other benchmarks are based on stock characteristics that have been empirically shown to be related to the cross-section of returns. To keep the number of benchmarks manageable, I choose them to match the characteristics that are both related to future stock returns, and on which firms that issue seasoned equity are likely to systematically deviate from other publicly traded stocks.

I choose the benchmark to match each SEO on the following characteristics:

- Size: Typically, large publicly traded firms are not proportionally represented in the SEO sample. Banz (1981) finds that small firms on average outperform large firms.
- Market-to-book ratio of equity: Firms that issue seasoned equity tend to have higher-than-average growth opportunities. Because of the growth options available to them they trade at higher market-to-book ratios than the market average. Rosenberg et al. (1985), Fama and French (1992), Lakonishok, Shleifer, and Vishny (1994), and other studies find that low market-to-book firms (value stocks) outperform high market-to-book firms (growth stocks).
- Earnings-to-price ratio: Firms that issue seasoned equity tend to have low earnings-to-price ratios for the same reasons that they have high market-to-book ratios. Some previous studies (for example, Vijh, 1999) match on earnings-to-price ratios rather than on market-to-book ratios. Basu (1977) shows that high earnings-to-price ratio firms on average earn higher returns than low earnings-to-price firms.
- Lagged six-month returns and lagged 36-month returns: Seasoned equity issues are typically preceded by large stock price run ups. Jegadeesh and Titman (1993) and

[3]For example, see Banz (1981), Rosenberg, Reid, and Lanstein (1985), Fama and French (1992), Jegadeesh (1992), and Chan, Jegadeesh, and Lakonishok (1996).

Table II. Sixty-Month Buy-and-Hold Returns for SEOs and Benchmarks

This table presents the 60-month percentage buy-and-hold returns for firms that issued seasoned equity between 1970 and 1993, and firms matched on various criteria. I select matched firms in the column "No match with prior SEO/IPO" from firms that did not issue new equity in the 60 months period prior to the SEO date. The matched firms in the column "Match not constrained for prior SEO/IPO" do not screen out new issues. Equal- and value-weighted indexes comprise all CRSP stocks, excluding utilities. I compound monthly index returns to compute 60-month returns. The size-matched sample comprises ten stocks with the closest market value of equity to that of each SEO at the end of the month prior to the issue. To construct the size and market-to-book matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I also choose the "size and earnings-to-price," "size and previous six-month returns," and "size and previous 36-month returns" matches from stocks in the same size decile as the SEO. The matched stocks are ten stocks that have the closest earnings-to-price ratios, previous six-month returns and previous 36-month returns, respectively. I match all four characteristics in the "all characteristics" matched sample according to the following distance metric:

$$\text{Distance}_j = \sum_{i=1}^{4} \frac{|x_{SEO}(i) - x_j(i)|}{\sigma_i}$$

where, $x_j(i)$ is the characteristic i of the firm j, and σ_i is the cross-sectional standard deviation of characteristic i. The matched sample comprises ten firms with the smallest distance metric for each SEO. The column "obs." is the number of observations. "SEO" and "match" are the 60-month buy-and-hold returns for SEOs and matched firms, respectively. "Difference" is difference between the two. "W. R." is the wealth relative, which I define as one plus the average holding period return for the SEOs divided by the holding-period return for the benchmark. Autocorrelation-consistent t-statistics appear in parentheses.

		No Match with Prior SEO/IPO			Match Not Constrained for Prior SEO/IPO		
Obs.	SEO	Match	Difference	W.R.	Match	Difference	W.R.
Equal-Weighted Index							
2,992	59.4	114.8	-55.4 (-3.15)***	0.74	79.9	-20.5 (-1.15)	0.89
Value-Weighted Index							
2,992	59.4	95.9	-36.6 (-1.99)**	0.81	85.1	-25.7 (-1.40)	0.86
Size							
2,992	59.4	106.9	-47.5 (-2.73)***	0.77	93.1	-33.7 (-2.99)***	0.83
Size and Market-to-Book							
2,992	59.4	93.6	-34.3 (-2.21)**	0.82	83.1	-23.7 (-2.20)**	0.87
Size and Earnings-to-Price							
2,978	59.1	98.8	-39.6 (-2.89)***	0.80	83.9	-24.8 (-3.32)***	0.87
Size and Previous Six-Month Returns							
2,969	59.5	107.9	-48.5 (-3.04)***	0.77	92.1	-32.6 (-3.24)***	0.83
Size and Previous 36-Month Returns							
2,224	65.1	104.1	-38.9 (-2.27)**	0.81	91.0	-25.8 (-2.26)**	0.86
All Characteristics							
2,217	64.9	102.3	-37.3 (-2.48)**	0.82	90.7	-25.8 (-2.29)**	0.86

***Significant at the 0.01 level.

**Significant at the 0.05 level.

DeBondt and Thaler (1985) show that future stock returns are related to lagged six-month and 36-month stock returns.

B. Performance of SEOs

Table II presents the 60-month buy-and-hold returns for firms that issued seasoned equity between January 1970 and December 1993, and their benchmarks. To be included in the sample here, stocks must have market value of equity information in the CRSP files at the end of the calendar month prior to the issue. The book value of equity should also be available on the Compustat annual files for the fiscal year prior to the year of issue. Firms that I include in the characteristic-matched benchmarks also meet these criteria. For this part of the paper, I exclude firms that issued seasoned equity in 1994 from the sample, since 60-month post-issue return data were not available for these firms on CRSP files at the time this study was initiated. I also exclude SEOs with pre-issue market capitalization of equity smaller than $5 million in the month before issue. If an SEO is delisted during the 60-month holding period, then I compute returns for both that firm and its benchmarks until the SEO delisting date.

The average 60-month post-issue return for SEOs is 59.4%.[4] I first compare this performance with the return on the equal-weighted index that excludes utilities and new issues, constructed in the last section. The average 60-month compounded return on this equal-weighted index is 114.8%. The firms that issue seasoned equity underperform this benchmark by 55.4%.

Although the magnitude of SEO underperformance appears large from an economic standpoint, is it important to evaluate whether this point estimate is statistically different from zero. Statistical inference in this context is an issue of concern and deserves careful consideration. Many of the early papers in this area did not fully consider serial correlation in returns induced by overlapping observations while computing standard errors and did not obtain consistent test statistics. Recent papers by Ikenberry et al. (1995) and Lee (1997) propose a bootstrap approach to obtain the empirical distribution of test statistics. Barber and Lyon (1997) investigate this approach in more detail and find it robust under the assumptions they consider. However, the bootstrap approach is cumbersome to implement. More importantly, Lyon, Barber, and Tsai (1999) find that this approach may not yield reliable statistical inference when the sample clusters on some common factors. This will be true in the context here since SEOs tend to come predominantly from certain industries in certain years.

I propose a different approach for constructing consistent test statistics that is also quite easy to implement. This approach extends the basic intuition in Hansen and Hodrick (1980) to the case where each observation in the sample is not necessarily equally weighted. To construct this test statistic, I first group the SEOs into monthly cohorts by the calendar month of their equity issue (there is nothing special about using monthly cohorts for this approach and it could well be annual cohorts). r_t is the average five-year return for month t cohorts. R equals the vector $[r_1, r_2, ..., r_T]'$ where T is the total number of cohorts. w is a Tx 1 vector in which the t^{th} element is the fraction of the total sample that issues equity in month t. The average buy-and-hold SEO return is the weighted average of monthly cohort buy-and-hold returns. Specifically,

$$\begin{aligned} &\text{Weighted average returns} = w'R \\ &\text{Variance of average returns} = w'Vw \end{aligned} \quad (1)$$

[4]The average 60-month return for non-utility SEOs that are excluded because of nonavailability of book value data is 36%. For the firms that I exclude because of the $5m market capitalization cutoff, the average 60-month return is -12%.

where V is the variance covariance matrix of monthly cohort returns.

The diagonal elements of V are return variances and the off-diagonal elements are serial covariances. Since I consider 60-month buy-and-hold returns here, I estimate the first through 59th order serial covariances from the data and I set the higher order serial covariances equal to zero. I use this standard error estimator for statistical inference. The autocorrelation-consistent t-statistic is -3.15 under the hypothesis that the average 60-month SEO return equals the average benchmark return. Therefore, the SEOs reliably underperform this benchmark.

To examine the implications of not excluding new issues from the benchmark, I use the equal-weighted index of all stocks, including new issues but excluding utilities, as the next benchmark. The 60-month equal-weighted index returns is 79.9%. Now the SEO underperformance is only 20.5%, and this underperformance is not reliably different from zero. The average difference between 60-month index returns with and without new issues is 34.9%, which seems to be an economically important magnitude. This result suggests that studies that claim to explain SEO underperformance with benchmarks containing new issues partly use the anomaly to explain itself.

SEOs underperform the value-weighted index that includes new issues by 25.7%. When the value-weighted index excludes new issues, SEO underperformance is 36.6%. This underperformance is also reliably smaller that zero (t-statistic is -1.99).

The first characteristic-matched benchmark matches each SEO with other firms of similar size. The benchmark return is the average buy-and-hold return of the ten firms that have the closest market value of equity to that of the SEO at the end of the calendar month prior to the issue. I use ten matches for each SEO to reduce the volatility of benchmark returns. My approach increases the power of the tests relative to a test with only one match (see Lyon et al., 1999) and at the same time tailors the benchmark to each SEO so that it can provide a closer characteristic match compared to using entire size decile returns.[5] If any of the ten matching firms is delisted prior to the 60-month holding period, then I compound the investment in that firm up to the month of delisting, and reinvest the proceeds proportionally in the remaining matched firms from that month onwards.

As before, I construct two sets of benchmarks, one that does not exclude new issues and the other that excludes new issues. When the benchmark excludes new issues, I remove any matched firm that issues seasoned equity within the 60-month holding period from the benchmark, and reinvest the proceeds from that stock up to that point in the same way that I do for delisted stocks. The average buy-and-hold return for the size-matched benchmark is 106.9%. Therefore, the SEOs underperform this benchmark by 47.5%.[6]

The next benchmark matches both firm size and market-to-book ratios. I compute the market-to-book ratio for each firm as of the fiscal year end prior to the seasoned equity offering date. There is always a lag between the close of a fiscal year and the time when the market receives the accounting information for that fiscal year. To ensure that the market-to-book ratios that I use were available to the market at the time of portfolio formation, I use the balance sheet information with a five-month lag. For example, for firms that issued seasoned equity between June 1, 1989 and May 31, 1990, I use the balance sheet data for the fiscal year 1988 to compute market-to-book ratios.

To match on both size and market-to-book ratio, I first group stocks into size deciles at the end

[5]The magnitude of SEO underperformance is similar when I match five or 15 stocks with each SEO.

[6]This level of underperformance is smaller than the 58.6% underperformance reported by Loughran and Ritter (1995), largely because I exclude firms for which data on book values are not available on Compustat. As I reported earlier, SEOs that are excluded because of lack of book value data have much lower returns than the sample here.

Table III. Stock-Specific Characteristics of SEOs and Benchmarks

This table presents selected stock-specific characteristics of firms that issued seasoned equity between 1970 and 1993, and non-issuing matched firms. The size-matched sample comprises ten stocks with the closest market value of equity to that of each SEO at the end of the month prior to the issue. To construct the size and market-to-book matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I also choose the "size and earnings-to-price," "size and previous six-month returns," and "size and previous 36-month returns" matches from stocks in the same size decile as the SEO. The matched stocks are ten stocks that have the closest earnings-to-price ratios, previous six-month returns and previous 36-month returns, respectively. I match the "all characteristics" sample to all the above characteristics of SEOs. I exclude new issues from the matched sample. "Log size" is the natural logarithm of market value of equity expressed in millions of dollars at the end of the month prior to the equity issue. "M-to-B" and "E-to-P" are the ratio of the market value of equity to book value of equity and earnings-to-price (expressed in percentages) ratio at the end of the fiscal year prior to the equity issue, respectively. I truncate the extreme 2.5% of the market-to-book and earnings-to-price ratios prior to computation of the averages reported in this table.

	Log Size	M-to-B	E-to-P	Prior Six-Months Returns (%)	Prior 36-Month Returns (%)
			Size		
SEO	5.10	2.76	4.35	43.34	186.61
Match	5.10	1.93	6.47	19.30	82.65
Obs.	2,992	2,992	2,978	2,969	2,224
			Size and Market-to-Book		
SEO	5.10	2.76	4.35	43.34	186.61
Match	5.08	2.53	5.64	18.07	93.82
Obs.	2,978	2,978	2,978	2,955	2,217
			Size and Earnings-to-Price		
SEO	5.10	2.76	4.35	43.44	186.35
Match	5.08	2.24	5.20	18.65	87.06
Obs.	2,969	2,969	2,955	2,969	2,224
			Size and Previous Six-Month Returns		
SEO	5.11	2.76	4.34	43.34	186.61
Match	5.09	1.86	6.09	37.80	114.87
Obs.	2,969	2,969	2,955	2,969	2,224
			Size and Previous 36-Month Returns		
SEO	5.28	2.30	4.83	42.77	186.61
Match	5.29	2.07	8.07	27.14	151.30
Obs.	2,224	2,224	2,217	2,224	2,224
			All Characteristics		
SEO	5.29	2.30	4.83	42.89	186.35
Match	5.30	2.00	7.09	31.51	132.09
Obs.	2,217	2,217	2,217	2,217	2,217

of each calendar month, based on the decile cutoffs for NYSE firms. The ten matched firms within the same size decile that have the closest market-to-book ratio form the benchmark for that firm. The SEO underperformance relative to this benchmark is 34.3%, which is statistically significant.

The average market-to-book ratio of SEOs is 2.76, compared to 1.93 for the size-matched sample (see Table III). When the benchmark matches on the market-to-book ratio in addition to size, the average market-to-book ratio for the benchmark is 2.53. The market-to-book benchmark maintains the close size match that I obtain with the first benchmark. However, the matched sample still does not show the price run-up that the SEOs experience over the six-month and 36-month pre-issue periods. The SEO sample also has higher earnings-to-price ratios.

The next benchmark matches on size and earnings-to-price ratios. The SEO underperformance of 39.6% is larger than that with the size and market-to-book ratio benchmark. SEO underperformance relative to the benchmark that matches on size and lagged six-month returns (excluding new issues) is 48.5%, which is marginally larger than the underperformance of 47.5% for the size benchmark. The SEOs underperform the benchmark matched on size and lagged 36-month return by 38.9%. Some of the SEO underperformance relative to the size benchmark is perhaps captured by the DeBondt and Thaler (1985) long-horizon return reversal effect. The evidence that the underperformance is smaller with the size and market-to-book benchmark suggests that matching on market-to-book ratio subsumes the need to separately match on long-term past returns.

So far, the benchmarks match the size of the issuing firm and one additional characteristic at a time. The final benchmark matches all the characteristics simultaneously using the following distance metric:

$$\text{Distance}_j = \sum_{i=1}^{n} \frac{|x_{SEO}(i) - x_j(i)|}{\sigma_i}$$

where n is the number of characteristics that are matched, $x_j(i)$ is the characteristic i of the firm j, and σ_i is the cross-sectional standard deviation of characteristic i in the period when the characteristic is measured. Standardizing the distance of a particular characteristic with its cross-sectional standard deviation ensures that I give the characteristics with small cross-sectional variations, such as market-to-book ratios, more weight for the same magnitude of deviation relative to characteristics that are more variable, such as 36-month lagged returns.

For each SEO, I choose as its benchmark ten stocks within the same size decile that are the closest to the issuing firm on this distance metric. SEO underperformance relative to this benchmark is 37.3% when new issues are excluded from the benchmark. This underperformance is larger relative to the size and market-to-book benchmarks, which is partly due to the fact that the match on market-to-book ratio is sacrificed to some extent, because the distance metric attempts to simultaneously match on all characteristics.

C. Performance Within Size and Market-to-Book Quintiles

I investigate the relation between the size and market-to-book ratios of SEOs and their underperformance in this subsection. Table IV, Panel A, presents average returns for SEOs and matched firms grouped by size and market-to-book quintiles of the SEOs. I determine the quintile cutoffs based on stocks that are listed on the NYSE. Out of the 2,992 firms that issue seasoned equity, 931 firms are in the extreme growth quintile and only 289 firms are in the extreme value quintile. That the growth firms are more likely to issue seasoned equity than the value firms is to be expected since growth firms are likely to be in businesses that are perceived as having better investment opportunities.

Table IV. Comparison of 60-month Buy-and-Hold Returns and Market-to-Book Ratios of SEOs and Size-Matched Benchmark: Size and Market-to-Book

This table presents the 60-month buy-and-hold returns and market-to-book ratios for firms that issued seasoned equity between 1970 and 1993, and non-issuing firms matched based on firm size. For each SEO, the size-matched sample comprises ten stocks with the closest market value of equity to that of the SEO at the end of the month prior to the equity issue. I exclude new issues from the matched sample. I compute market-to-book ratios at the end of the fiscal year prior to the equity issue. "W. R." is the wealth relative, which I define as one plus the average holding period return for the SEOs divided by the average holding period return for the benchmark. I base size and market-to-book quintile ranks on quintile cutoffs for stocks listed on the NYSE.

Panel A. Sixty-Month Returns

		Market-to-Book Quintile					
Size Quintile		1 (Value)	2	3	4	5 (Growth)	Row Average
(Small)	SEO	72.0	61.3	55.87	25.0	0.3	31.8
	Match	73.5	89.8	86.9	104.2	102.6	95.7
	Difference	-1.5	-28.5	-31.1	-79.2	-102.3	-63.9
	W.R.	0.99	0.85	0.83	0.61	0.49	0.67
2	SEO	92.5	66.6	69.4	38.9	62.1	61.3
	Match	114.3	112.2	115.5	104.1	129.5	116.7
	Difference	-21.7	-45.6	-46.1	-65.3	-67.5	-55.4
	W.R.	0.90	0.79	0.79	0.68	0.71	0.74
3	SEO	98.8	84.3	68.4	68.2	113.1	87.4
	Match	105.6	108.9	121.2	111.7	113.9	119.3
	Difference	-6.8	-24.6	-52.8	-43.5	-20.8	-31.9
	W.R.	0.97	0.88	0.76	0.79	0.91	0.85
4	SEO	90.1	76.1	101.9	64.3	40.4	70.6
	Match	92.7	104.3	105.2	101.2	98.2	100.7
	Difference	-9.0	-25.6	-31.6	-33.6	-41.8	-30.5
	W.R.	0.95	0.88	0.85	0.83	0.79	0.85
5 (Large)	SEO	80.4	85.1	79.3	61.0	52.9	70.8
	Match	89.5	110.7	110.9	94.7	94.8	101.3
	Difference	-9.0	-25.6	-31.6	-33.6	-41.8	-30.5
	W.R.	0.95	0.88	0.85	0.83	0.79	0.85
Column Average	SEO	85.7	72.8	71.1	45.9	47.8	59.4
	Match	93.8	103.7	106.2	104.7	114.7	106.9
	Difference	-8.2	-30.9	-35.0	-58.8	66.9	-47.5
	W.R.	0.96	0.85	0.83	0.71	0.69	0.77

The results in Table IV indicate that the small-firm quintile SEO underperformance is 63.9%, compared to 30.5% for large-firm SEOs. Extreme growth SEOs experience an average underperformance of 66.9%, compared to only 8.2% for extreme value SEOs. This evidence could suggest that poor SEO underperformance is a phenomenon concentrated among small-growth stocks. However, this comparison does not provide the complete picture. My sample period witnessed poor performance for small-growth stocks regardless of whether they issued seasoned equity. The size benchmark does not adequately account for this phenomenon.

Table IV, Panel B, presents average market-to-book ratios within size and market-to-book quintiles. The average market-to-book ratios for SEOs in the extreme quintiles are 0.66 and

Table IV. Comparison of 60-month Buy-and-Hold Returns and Market-to-Book Ratios of SEOs and Size-Matched Benchmark (Continued)

Panel B. Market-to-Book Ratios

Size Quintile		Market-to-Book Quintile 1 (Value)	2	3	4	5 (Growth)	Row Average
(Small)	SEO	0.63	1.02	1.47	22.29	5.91	3.02
	Match	2.03	1.81	1.98	1.83	1.67	1.82
	Difference	-1.40	-0.80	-0.52	0.46	4.24	1.20
	Obs.	87	134	169	234	316	940
2	SEO	0.67	0.99	1.45	2.39	5.33	2.80
	Match	1.94	1.81	1.92	1.85	1.79	1.85
	Difference	-1.27	-0.81	-0.47	0.54	3.54	0.95
	Obs.	67	98	162	185	243	755
3	SEO	0.66	1.07	1.48	2.31	5.06	2.68
	Match	1.88	2.11	1.88	1.97	1.74	1.90
	Difference	-1.22	-1.04	-0.40	0.33	3.33	0.79
	Obs.	51	94	103	161	185	594
4	SEO	0.68	1.10	1.50	2.21	5.42	2.58
	Match	2.15	2.29	2.13	2.15	2.06	2.14
	Difference	-1.47	-1.19	-0.63	0.06	3.36	0.44
	Obs.	52	67	87	10	116	422
5 (Large)	SEO	0.69	1.02	1.35	2.09	4.83	2.21
	Match	2.31	2.23	2.12	2.21	2.34	2.24
	Difference	-1.61	-1.22	-0.77	-0.12	2.49	-0.03
	Obs.	32	69	57	52	71	281
Column Average	SEO	0.66	1.03	1.46	2.30	5.44	2.76
	Match	2.04	2.00	1.98	1.94	1.81	1.93
	Difference	-1.37	-0.97	-0.52	0.36	3.63	0.83
	Obs.	289	462	578	732	931	2,992

5.44, and those for the matched firms are 2.04 and 1.81, respectively. These results show considerable divergence between the market-to-book ratios of SEOs and their benchmarks. The mismatch in market-to-book ratios indicate that the size matching procedure sets too low a benchmark for value firms that issue seasoned equity and too high a benchmark for growth firms that issue seasoned equity.

In Table V, the results for SEO underperformance show a very different picture from that in Table IV. With the size and market-to-book benchmark, there is no clear relation between firm size and SEO underperformance. More surprisingly, the SEO underperformance in the extreme value quintile is *larger* than that in the extreme value quintile. Therefore, the fact that all small-growth firms perform poorly and that small-growth firms are more likely to issue seasoned equity is only one part of the reason behind poor SEO performance. The other part is that even the large firms and value firms that issue seasoned equity fall equally short of their non-issuing counterparts with the same characteristics.

Table V. Comparison of 60-month Buy-and-Hold Returns and Market-to-Book Ratios of SEOs and Size and Market-to-Book Matched Benchmark: Size and Market-to-Book Quintiles

This table presents the 60-month buy-and-hold returns and market-to-book ratios for firms that issued seasoned equity between 1970 and 1993, and non-issuing firms matched based on firm size and market-to-book ratio. To construct the matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I exclude new issues from the matched sample. "W. R." is the wealth relative, which I define as one plus the average holding period return for the SEOs divided by the average holding period return for the benchmark. I base size and market-to-book quintile ranks on quintile cutoffs for stocks listed on the NYSE.

Panel A. Sixty-Month Returns

Size Quintile		Market-to-Book Quintile 1 (Value)	2	3	4	5 (Growth)	Row Average
(Small)	SEO	72.0	61.3	55.8	25.0	0.3	31.8
	Match	141.5	96.8	93.8	63.2	33.6	70.8
	Difference	-69.5	-35.5	-38.1	-38.1	-33.4	-39.1
	W.R.	0.71	0.82	0.80	0.77	0.75	0.77
2	SEO	92.5	66.6	69.4	38.9	62.1	61.3
	Match	135.9	123.1	102.7	75.2	91.5	98.0
	Difference	-43.4	-56.4	-33.3	-36.4	-29.4	-36.7
	W.R.	0.82	0.75	0.84	0.79	0.85	0.81
3	SEO	98.8	84.3	68.4	68.2	113.1	87.4
	Match	139.3	134.2	125.4	97.0	108.1	114.9
	Difference	-40.5	-49.9	-56.9	-28.8	5.0	-27.5
	W.R.	0.83	0.79	0.75	0.85	1.02	0.87
4	SEO	90.1	76.1	101.9	64.3	40.4	70.6
	Match	135.9	120.2	116.3	87.7	71.3	100.2
	Difference	-45.9	-44.0	-14.4	-23.4	-30.8	-29.6
	W.R.	0.81	0.80	0.93	0.88	0.82	0.85
5 (Large)	SEO	80.4	85.1	79.3	61.0	52.9	70.8
	Match	125.4	114.7	117.6	100.9	74.4	103.8
	Difference	-45.0	-29.7	-38.3	-39.8	-21.5	-33.0
	W.R.	0.80	0.86	0.82	0.80	0.88	0.84
Column Average	SEO	85.7	72.8	71.1	45.9	47.8	59.4
	Match	137.0	116.1	107.7	79.7	71.3	93.6
	Difference	-51.4	-43.2	-36.6	-33.7	-23.5	-34.3
	W.R.	0.78	0.80	0.82	0.81	0.86	0.82

D. Equal-, Value- and Calendar Month-Weighting of SEOs

Table VI presents 60-month buy-and-hold returns for yearly SEO cohorts, and size and market-to-book ratio matched firms. During this period, 21 of the 23 yearly SEO cohorts underperform their benchmarks. As has been noted in earlier studies, SEO underperformance is more severe in the hot-issue market of the early 1980s when relatively more new issues

Table V. Comparison of 60-Month Buy-and-Hold Returns and Market-to-Book Ratios of SEOs and Size and Market-to-Book Matched Benchmark: Size and Market-to-Book Quintiles (Continued)

Panel B. Market-to-Book Ratios

Size Quintile		Market-to-Book Quintile 1 (Value)	2	3	4	5 (Growth)	Row Average
(Small)	SEO	0.63	1.02	1.47	22.29	5.91	3.02
	Match	0.64	1.02	1.46	2.28	5.58	2.91
	Difference	0.00	0.00	0.00	0.01	0.33	0.11
	Obs.	87	134	169	234	316	940
2	SEO	0.67	0.99	1.45	2.39	5.33	2.80
	Match	0.69	0.99	1.44	2.36	4.44	2.51
	Difference	-0.02	0.00	0.01	0.04	0.88	0.29
	Obs.	67	98	162	185	243	755
3	SEO	0.66	1.07	1.48	2.31	5.06	2.68
	Match	0.70	1.07	1.47	2.28	3.95	2.33
	Difference	-0.04	0.00	0.01	0.03	1.12	0.35
	Obs.	51	94	103	161	185	594
4	SEO	0.68	1.10	1.50	2.21	5.42	2.58
	Match	0.76	1.10	1.49	2.18	4.37	2.29
	Difference	-0.08	0.00	0.00	0.02	1.05	0.29
	Obs.	52	67	87	100	116	422
5 (Large)	SEO	0.69	1.02	1.35	2.09	4.83	2.21
	Match	0.81	1.02	1.34	2.07	4.30	2.09
	Difference	-0.11	0.00	0.00	0.01	0.52	0.12
	Obs.	32	69	57	52	71	281
Column Average	SEO	0.66	1.03	1.46	2.30	5.44	2.76
	Match	0.70	1.03	1.45	2.27	4.71	2.53
	Difference	-0.04	0.00	0.01	0.02	0.74	0.23
	Obs.	289	462	578	732	.931	2,992

came to the market (see Loughran and Ritter, 1995, and Speiss and Affleck-Graves, 1995). The sample period in these studies ends in 1990. However, the results in the expanded sample period in this paper indicate that the relation between the number of new issues and SEO underperformance is somewhat tenuous. There are more new issues annually in the 1991 to 1993 subperiod than in any other year except 1983, but the average SEO underperformance in this subperiod is only 13.3%, which is below the sample average.

The marginally negative relation between the number of issues and SEO underperformance is also evident in the average return for SEOs when I equally weight each cohort month. The calendar-month-weighted SEO underperformance is 37.3% (t-statistic is -2.85), which is larger than the observation-weighted SEO underperformance.

To examine whether the smaller firms in the sample drive the results, I examine the value-weighted SEO performance. When the observations are value-weighted, SEO underperformance is 33.5%, which is about the same as the underperformance when each SEO is equally weighted. However, the variability of SEO underperformance across years is

Table VI. Sixty-Month Buy-and-Hold Returns of SEOs and Size and Market-to-Book Matched Firms by Cohort Years

This table presents the 60-month buy-and-hold returns and market-to-book ratios for firms that issued seasoned equity between 1970 and 1993, and non-issuing firms matched based on firm size and market-to-book ratio. To construct the matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I exclude new issues from the matched sample. The column "difference value-weighted" weights each observation by market capitalization of the issuing firm at the end of the month prior to issue. The row "average monthly cohort return difference" presents average 60-month buy-and-hold returns where each monthly cohort is weighted equally. Autocorrelation-consistent t-statistics appear in parentheses.

Year	Number of Firms	SEO Returns	Matched Firm Returns	Difference	Difference Value Weighted
70	26	-7.3	13.6	-20.9	-27.2
71	75	-21.5	20.0	-41.5	-39.8
72	52	-28.2	9.5	-37.7	-17.9
73	20	-2.7	23.6	-35.3	-3.4
74	15	68.8	115.1	-46.3	-13.4
75	33	95.8	132.0	-36.2	-52.5
76	50	98.5	159.0	-60.5	-64.4
77	25	128.8	145.0	-16.2	-32.6
78	62	105.3	235.8	-130.5	-72.0
79	48	70.4	184.4	-114.0	-124.7
80	154	45.0	122.5	-77.6	-57.4
81	137	35.8	126.6	-90.8	-34.1
82	119	65.2	147.5	-82.3	-71.9
83	402	20.6	68.9	-48.3	-54.0
84	75	45.6	82.0	-36.4	6.2
85	181	26.6	48.5	-21.9	-33.2
86	201	37.6	36.3	1.3	-36.6
87	150	41.9	41.5	0.3	-4.2
88	72	59.4	69.2	-9.8	-44.7
89	117	42.0	51.7	-9.6	-9.6
90	100	47.2	86.3	-39.1	-42.1
91	288	102.5	124.4	-21.9	-16.5
92	247	116.7	126.2	-9.5	-26.3
93	343	106.6	115.2	-8.6	-18.7
70-93	2,992			-34.3	-33.5
				(-2.21)**	(-2.76)***
Average Monthly Cohort Return Difference				-37.3 (-2.85)***	

***Significant at the 0.01 level.
**Significant at the 0.05 level.

lower with value weighting. As a result, the t-statistic now is farther from zero at -2.76. These results, and the results in Table V, clearly indicate that the SEO underperformance is not a small-firm phenomenon and that it is pervasive.

The findings in this section clearly indicate that firms that issue seasoned equity underperform any reasonable benchmark. Across various benchmarks in this section, I find the lowest level of underperformance when the benchmark matches on size and market-to-book ratio. My results are not sensitive to benchmarks that match on additional characteristics such as earnings-to-price ratios and past returns. My results also show that benchmarks that do not account for differences in market-to-book ratios, such as the size-matched benchmark, lead to mistaken inferences, particularly when the goal is to examine the relative performances of SEOs of large firms versus small firms, or SEOs of growth firms versus value firms.

III. Factor-Model Benchmarks

Recently, Brav et al. (2000) find that only the smallest size tercile of SEOs underperform the Fama-French three-factor model and the Carhart (1997) four-factor model benchmarks. This evidence based on factor-model benchmarks is contrary to my results in the last section. One possible reason for this difference is that the characteristic-matched benchmark is misspecified. Alternatively, perhaps the factor-model benchmark is misspecified.

There has been some debate in the literature regarding the appropriateness of using factor-model benchmarks versus characteristic-matched benchmarks. The results in Daniel and Titman (1997) suggest that the cross-section of stock returns is more closely related to stock characteristics than to Fama-French factor sensitivities. However, Davis, Fama, and French (2000) examine the cross-section of stock returns over a longer sample period and dispute these conclusions.

The conflicting evidence in these papers suggests that it is probably difficult to determine whether one approach to establishing benchmark returns is better than another. However, in specific contexts, such as that in this paper, we can assess whether the factor-model benchmark is superior to the characteristic-matched benchmark. If the factor model is the appropriate benchmark for SEO expected returns, then it should also be the appropriate benchmark for the matched firms that are similar to the SEOs in all the important characteristics except that the matched firms do not issue seasoned equity.

I examine the performance of SEOs and matched firms relative to the Fama-French three-factor model and the Carhart (1997) four-factor model. The three factors in the Fama-French model are:

- RMRF: Return on the value-weighted market index (RM) minus the risk-free rate (RF)
- HML: Return on a portfolio of firms in the bottom 30% market-to-book ratio minus return on a portfolio of firms in the top 30% market-to-book ratio
- SMB: Return on small firms (firms that are smaller than the median NYSE firm) minus the return on large firms (firms larger than the median NYSE firm)

Motivated by the evidence in Jegadeesh and Titman (1993), Carhart (1997) constructs a four-factor model that includes the following momentum factor in addition to the three factors listed above:

- PR12: Return on winner minus loser portfolio, where winners and losers are classified based on returns over the previous year, excluding the previous month.

The factor returns are value-weighted returns of stocks in the factor portfolios. The factor portfolios here exclude all new issues.

The SEO sample in month t comprises all stocks that issued seasoned equity in the previous 60 months. The matched sample comprises the size and market-to-book ratio matched stocks that I selected in the last section. Let $R_{SEO,t}$ and $R_{Match,t}$ denote the equal-weighted month t returns of SEOs and matched firms, respectively. The abnormal returns for the SEO and matched samples are the intercepts from the following regressions:

$$\text{Fama-French Model: } Exret_{p,t} = a_{p,0} + a_{p,1}RMRF_t + a_{p,2}HMB_t + a_{p,3}SML_t + u_{p,t}$$

$$\text{Four-Factor Model: } Exret_{p,t} = b_{p,0} + b_{p,1}RMRF_t + b_{p,2}HMB_t + b_{p,3}SML_t + b_{p,4}PR12_t + e_{p,t}$$

for p=SEO, Match, and SEO-Match

where

$$Exret_{SEO,t} = R_{SEO,t} - RF_t$$
$$Exret_{Match,t} = R_{Match,t} - RF_t$$
$$Exret_{SEO\text{-}Match,t} = R_{SEO,t} - R_{Match,t}$$

I fit these regressions over the January 1975 to December 1995 sample period, which is the same sample period as that in Brav et al. (2000).[7] The SEO sample includes firms that issued seasoned equity prior to 1975 and their matches, if the issue occurred within 60 months prior to month t. However, since my SEO sample ends in December 1994, I do not include SEOs after this date.

Table VII presents the regression intercepts for the full sample and for size-based subsamples. The "large firm" subsample comprises firms in the largest three size deciles, the "medium firm" subsample comprises firms in size deciles four through seven, and the "small firm" subsample comprises firms in the bottom three size deciles. All size decile cutoffs are based on NYSE firms.

The abnormal returns are significant for all subsamples under the Fama-French model. Consistent with Brav et al. (2000), there is a monotonic relation between SEO underperformance and firm size. I also find a similar relation between SEO underperformance and firm size under the Carhart (1997) model. However, now the abnormal return for the large-firm SEOs is not significantly different from zero.

The abnormal return for the matched firms also exhibits a similar monotonic relation with firm size. In fact, with the four-factor model, the abnormal returns are significantly positive for the large- and medium-firm subsamples of matched firms. Since there is no reason to expect these matched firms to earn any abnormal returns, I can only attribute these differences in the intercepts across matched firm subsamples to model misspecification.

To put these results into perspective, I consider the intercepts when the dependent variable is the difference between the SEO returns and matched-firm returns.[8] With the Fama-French model, abnormal return is not monotonically related to firm size. In fact, the abnormal return for the medium firms is larger than that for small firms.

This pattern of abnormal returns also obtains with the Carhart (1997) four-factor model. With the four-factor model, however, the point estimate of the regression intercept for the large firms appears closer to zero than the intercepts for the other subsamples.

To statistically test the hypothesis that the abnormal returns in the three size-based

[7] I would like to thank Alan Brav for providing me with the factor returns.

[8] Eckbo et al. (2000) also examine the differences between the intercepts for the SEOs and matched firms for their factor model. However, they allow recent IPOs in their matched firm sample.

Table VII. Factor-Model Benchmarks

This table presents the abnormal returns for SEOs, size and market-to-book matched firms, and for SEOs minus matched firms. SEOs are firms that issued seasoned equity in the previous 60 months. To construct the matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I exclude new issues from the matched sample. Panel A presents the intercepts from the following two sets of regressions:

Fama-French Model: $Exret_{p,t} = a_{p,0} + a_{p,1}RMRF_t + a_{p,2}HMB_t + a_{p,3}\ SML_t + u_{p,t}$

Four-Factor Model: $Exret_{p,t} = b_{p,0} + b_{p,1}RMRF_t + b_{p,2}HMB_t + b_{p,3}SML_t + b_{p,4}PR12_t + e_{p,t}$

where RMRF is the return on the value-weighted index return (RM) minus the risk-free rate (RF). HML is the return on the low market-to-book ratio portfolio minus the high market-to-book ratio portfolio. SMB is the return on small firms minus large firms. PR12 is the returns on the winner-minus-loser portfolio, where winners and losers are classified based on returns over the previous year, excluding the previous month. All factor portfolios exclude new issues. The rows "SEO," "match," and "SEO - match" present the regression intercepts when the dependent variable Exret is equal-weighted SEO returns minus RF; equal-weighted matched firm returns minus RF, and equal-weighted SEO returns minus matched firm returns, respectively. I fit the regressions with monthly returns over the January 1975 to December 1995 sample period. I do not include 1995 SEOs because of lack of data. The unit for intercepts is percent per month. t-statistics appear in parentheses. The sample of firms in various columns are as follows: "All firms" comprises all stocks in the sample; "large firms" comprises firms the top three size deciles, "medium firms" comprise firms in size deciles four through seven, and "small firms" comprises firms in the bottom three size deciles. I based size decile cutoffs on NYSE firms. Panel B presents the F-statistics under the hypothesis that the intercepts for the three size-based subsamples are jointly equal.

Panel A. Intercepts

	Fama-French Model				Four-Factor Model			
Sample	All Firms	Large Firms	Medium Firms	Small Firms	All Firms	Large Firms	Medium Firms	Small Firms
SEO	-0.45	-0.33	-0.40	-0.48	-0.31	-0.12	-0.29	-0.42
	(-5.07)***	(-2.84)***	(-3.78)***	(-3.53)***	(-3.68)***	(-1.09)	(-2.73)***	(-2.99)***
Match	-0.07	0.01	0.03	-0.11	0.02	0.11	0.11	-0.06
	(-1.20)	(0.18)	(0.62)	(-1.10)	(0.36)	(1.90)*	(2.06)**	(-0.57)
SEO-Match	-0.38	-0.34	-0.43	-0.37	-0.33	-0.23	-0.39	-0.36
	(-4.79***)	(-3.32)***	(-4.49)***	(-2.86)***	(-4.08)***	(-2.24)**	(-4.01)***	(-2.69)***

Panel B. F-Statistics

	Fama-French Model	Four-Factor Model
F-Statistic	0.33	0.92
(p-Value)	(0.72)	(0.40)

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

subsamples are jointly equal, I compute the F-statistic below:

$$\frac{T-k-2}{2}\,\alpha'(k)\,\hat{\Omega}^{-1}(k)\alpha(k) \sim F(2, T-k-2) \text{ for } k = 3 \text{ and } 4$$

where

T ≡ Number of months in the sample period

$$\alpha(3) \equiv \begin{bmatrix} a_{\text{SEO-Match,0}}(\text{large firm}) - a_{\text{SEO-Match,0}}(\text{small firm}) \\ a_{\text{SEO-Match,0}}(\text{medium firm}) - a_{\text{SEO-Match,0}}(\text{small firm}) \end{bmatrix}$$

$$\alpha(4) \equiv \begin{bmatrix} b_{\text{SEO-Match,0}}(\text{medium firm}) - a_{\text{SEO-Match,0}}(\text{small firm}) \\ b_{\text{SEO-Match,0}}(\text{medium firm}) - a_{\text{SEO-Match,0}}(\text{small firm}) \end{bmatrix}$$

$\hat{\Omega}(k) \equiv$ Sample variance-covariance matrix of $\alpha(k)$

and $a_{.,0}$ and $b_{.,0}$ are the intercepts in the three- and four-factor model regressions.

The F-statistics for the three- and four-factor models are 0.33 and 0.92, respectively. Both statistics are not significant at any conventional level, and they indicate that any differences in abnormal returns across the size-based subsamples are due to sampling errors. Therefore, after accounting for the effect of model misspecification, the results are consistent with the findings in the last section. My results do not support the conclusion of Brav et al. (2000) that SEO underperformance is primarily a small-firm phenomenon.

The tests in this section show reliable evidence of SEO underperformance in all three size-based subsamples. Additionally, the three- and four-factor models used in the literature are misspecified, at least in this context. Therefore, the results based on these factor models benchmarks lead to misleading inferences, particularly when examining cross-sectional differences in stock performances.

IV. Performance Around Earnings Announcements

To address the issue of biased expectations more directly, I examine stock returns within a short window around earnings announcements. This window comprises a period when a concentrated dose of firm-specific information reaches the market and thus allows for sharper tests of potential biases.[9]

If the market is systematically over-optimistic about the long-term prospects of SEOs, a gradual correction of this over-optimism would lead to poor SEO performance. This over-optimism hypothesis implies that the market will be unpleasantly surprised at the time of earnings announcements. Therefore, earnings announcement window returns for SEOs should be negative relative to their benchmarks. But, if low returns for these firms are not due to biased expectations, then the market will not be surprised at the time of their earnings announcements.

I obtain earnings announcement dates from Compustat files for SEOs and their size and market-to-book matched benchmarks for the 60 months following the equity issue. Table VIII

[9]Bernard and Thomas (1990) and Jegadeesh and Titman (1993) also examine returns around earnings announcements. Their studies test whether the SUE and momentum effects are attributable to biases in market expectations.

Table VIII. Earnings Announcement Returns

This table presents mean percentage returns around a four-day window (day -2 to day +1) surrounding earnings announcement dates for firms that issued seasoned equity between 1970 and 1993, and matched firms. To construct the matched sample, I match each SEO with ten stocks from the same size decile. The matched stocks have the closest market-to-book value of equity ratio to that of the SEO at the end of the previous fiscal year. I exclude new issues from the matched sample. I compute four-day returns by compounding daily returns within the announcement window. The unit for returns is percent per four trading days. Quarter 1 contains all earnings announcements within the first 91 days of the SEO. Quarter 2 contains all earnings announcement between 92 days and 182 days of the SEO and so on. The row "all" presents average announcement window returns for all quarters within the first 60 months after the seasoned equity offering. t-statistics appear in parentheses.

Quarter	SEO Returns	Matched Returns	Difference
1	0.467	0.178	0.288
2	-0.058	0.197	-0.255
3	-0.187	0.332	-0.519
4	-0.318	0.206	-0.524
5	-0.156	0.283	-0.439
6	-0.106	0.199	-0.305
7	0.310	0.410	-0.099
8	0.163	0.396	-0.230
9	0.087	0.341	-0.254
10	0.020	0.320	-0.300
11	0.246	0.463	-0.217
12	0.077	0.424	-0.348
13	-0.233	0.372	-0.605
14	0.247	0.446	-0.199
15	0.446	0.534	-0.087
16	0.453	0.551	-0.098
17	0.320	0.405	-0.085
18	0.513	0.450	0.063
19	0.139	0.341	-0.202
20	0.548	0.554	-0.006
All	0.140	0.355	-0.215
	(1.69)*	(5.29)***	(-3.65)***

***Significant at the 0.01 level.

*Significant at the 0.10 level.

presents average returns within the four-day window (day -2 to day +1) surrounding earnings announcement dates. Day 0 is the earnings announcement date recorded on Compustat. Quarter 1 comprises all earnings announcements within the first 91 days of the equity issue, Quarter 2 contains all earnings announcement between 92 days and 182 days of the equity issue, and so on.

The average earnings announcement window return for SEOs is 0.140% over the 20 quarters following the issue. The marginally positive announcement window return could give the impression that the earnings of these firms pleasantly surprise the market. However, the appropriate benchmark for evaluating returns around earnings announcements is not zero. For instance, Chari, Jagannathan, and Ofer (1988) find significantly positive average returns within four-day earnings announcement windows for all stocks. Therefore, I use the earnings announcement returns for matched firms as the benchmark.

In 18 out of 20 quarters, matched firm earnings announcement window returns are larger than those for the SEOs. The average four-day compounded return for matched firms over the 20 quarters after the equity issue is 0.355%. The difference between the earnings announcement returns for SEOs and matched firms is -0.215%. The t-statistic[10] for this difference is -3.55, which indicates that the difference is reliably negative.

In a recent paper, Brous, Datar, and Kini (2000) also examine SEO returns around earnings announcements. Brous et al. (2000) reports that the earnings announcement window return for SEOs is 0.16% smaller than the earnings announcement returns for firms matched on size and market-to-book ratios. However, Brous et al. (2000) fails to find statistically significant differences between earnings announcement returns for SEOs and size-matched firms. Brous et al. retain firms in the matched sample even after some of them issue seasoned equity during the holding period, but I remove the firms from the benchmark the month after they issue seasoned equity. Since the results here indicate that SEO firms typically have lower post-issue earnings announcement returns than non-issuing firms, retaining them in the benchmark will result in a smaller return difference.

The total SEO underperformance within the earnings announcement windows is 4.3% (=20 x 0.215), which is 12.5% of the total underperformance of 34.3% in the 60-month period following the equity issue. However, the number of trading days within the earnings announcement windows is only 6.4% of the total number of trading days during that period. The SEO underperformance within earnings announcement windows is about twice the underperformance outside these windows. Therefore, it appears that much of the SEO underperformance can be linked directly to unpleasant earning surprises for these firms.[11] In fact, since firms often pre-announce earnings disappointments, the four-day earnings announcement window returns here might understate the true level of market disappointment with SEO earnings. Overall, the results in this section lead to the conclusion that the long-term underperformance of SEOs is attributable, at least in part, to market over-optimism about their prospects.

V. Conclusion

Firms that issue seasoned equity earn low returns in the years following equity offerings. One interpretation of this result is that the corporate act of issuing seasoned equity signals

[10]The Appendix describes the consistent standard error estimator used for computing t-statistics in Table VIII.

[11]McLaughlin, Safieddine, and Vasudevan (1996, 1998) find that SEO operating performance deteriorates after the equity issue.

overvaluation. Another is that announcements of new equity issues are non-events after the announcement dates, and low returns following equity issues are attributable to certain other firm-specific characteristics. A suitable benchmark for evaluating long-term performance is essential to understanding the relative importance of these two explanations.

I consider several benchmarks in this paper. Across various benchmarks, I find the lowest level of underperformance when the benchmark matches on size and market-to-book ratio. My results are not sensitive to benchmarks that match on additional characteristics such as earnings-to-price ratios and past returns. Overall, my findings indicate that SEOs significantly underperform the best candidates for benchmark returns.

The results here also resolve some of controversy surrounding the question of whether SEOs indeed underperform a well-specified benchmark. For example, Eckbo et al. (2000) report smaller and insignificant levels of SEO underperformance. However, their matched firms do not exclude IPOs. I find here that inclusion of new issues in the benchmark significantly understates the level of underperformance because this benchmark partly uses the new issue anomaly to explain itself.

Some recent papers (e.g. Brav, Geczy, and Gompers, 2000) find larger underperformance for small-firm SEOs than for large-firm SEOs when performance is measured against factor-model benchmarks, and suggest that SEO underperformance is not a pervasive phenomenon. However, I show that such apparent differences in SEO underperformance are attributable to the inherent biases in the factor-model benchmarks. For instance, I show that even in the case of the matched firms that do not issue seasoned equity, the factor models imply that large firms earn significantly higher returns than do small firms. My findings indicate that the factor models set too low a benchmark for the large-firm SEOs and too high a benchmark for small-firm SEOs. With the correct benchmarks, I find similar levels of underperformance for both large-firm SEOs and small-firm SEOs, and value-firm SEOs and growth-firm SEOs.

To provide a different perspective on whether the underperformance of SEOs is indeed related to market over-optimism about their future prospects, I examine returns around their earnings announcement dates. I find that SEOs underperform the benchmark by 4.3% around earnings announcements in the 20 quarters after the equity issues. This estimate implies that the SEOs underperform twice as much within earnings announcement windows as they do outside these windows. This evidence reinforces my conclusion that SEO underperformance is attributable to biased market expectations. ■

Appendix

This appendix describes the standard error estimator for earnings announcement date returns used in Table VIII.

Let $r_{SEO(i),t}$ and $r_{match(i),t}$ denote the return on security i on date t in the SEO and matched samples, respectively, where t is within the four-day announcement window. Let $N_{SEO,t}$ and $N_{match,t}$ be the total numbers of SEOs and matched firms that have announcement-date returns on t . Let T be the total number of days in the sample period. The difference between average SEO returns and matched-firm returns around their earnings announcement dates, AR , is given by:

$$AR = \frac{1}{N_s}\left(\sum_{t=1}^{T}\sum_{i=1}^{N_{SEO,t}} r_{SEO(i),t}\right) - \frac{1}{N_m}\left(\sum_{t=1}^{T}\sum_{i=1}^{N_{match,t}} r_{match(i),t}\right)$$
$$= \sum_{t=1}^{T}\left(\frac{1}{N_s}\sum_{i=1}^{N_{SEO,t}} r_{SEO(i),t} - \frac{1}{N_m}\sum_{i=1}^{N_{match,t}} r_{match(i),t}\right) \quad (A.1)$$

where $N_s = \sum_{t=1}^{T} N_{SEO,t}$ and $N_m = \sum_{t=1}^{T} N_{match,t}$.

The second equation each term within the summation across t represents returns on different dates. Therefore, under the efficient market hypothesis, each term is uncorrelated with other terms within the summation and under the null hypothesis the expectation is zero. Therefore, the variance of AR is given by:

$$Var(AR) = \sum_{t=1}^{T}\left(\frac{1}{N_s}\sum_{i=1}^{N_{SEO,t}} r_{SEO(i),t} - \frac{1}{N_m}\sum_{i=1}^{N_{match,t}} r_{match(i),t}\right)^2 \quad (A.2)$$

The standard deviation of one-day returns is given by the square root of Equation (A.2). I compute standard deviations of announcement window returns for the SEO sample and for the matched sample in the same way. Table VIII reports the average four-day returns within earnings announcement windows. Its standard deviation is given by four times the standard deviation of one-day returns.

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