Ownership and operating performance of companies that go public

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Abstract

Going public typically leads to a separation of managerial control and stock ownership, and potentially worsens managerial incentives. We document that the median ownership stake of officers and directors declines significantly from the year before going public to ten years later. Median operating return on assets also declines from the year before the offering to the end of the first year of public trading, but performance declines no further in ten years. In general, operating performance both within one year of the offering and during the first ten years of public trading is unrelated to ownership of officers and directors.

Keywords: Initial public offerings; Going public; Separation of ownership and control; Operating performance of small companies

JEL classification: G32

1. Introduction

An initial public offering of common stock typically leads to significant changes in the ownership of a company's stock. We study the relation between the change in the ownership of common stock and the operating performance of companies that go public. In particular, we test the hypothesis in Jensen and Meckling (1976) that the interests of managers and other stockholders become less closely aligned as managers' stakes decrease and ownership becomes more disperse. In fact, perhaps more than any other corporate event, an initial public offering reflects the dilution of an owner/manager's stake as depicted in the analysis of agency costs by Jensen and Meckling. Their argument implies that a company's performance suffers after going public.

Our research is also motivated by evidence that management ownership appears to play a significant role in the performance of many companies. For example, Morck, Shleifer, and Vishny (1988) show that low ownership is associated with low measures of corporate value, as measured by the q-ratio. Walkling and Long (1984) show that the opposition to wealth-increasing takeover offers is more likely with lower target managers' ownership stakes. Holthausen and Larcker (1996) report declines in operating performance following reverse leverage buyouts, declines that are related to changes in ownership stake. In addition, Jain and Kini (1995) report that operating profitability tends to decline after going public; they suggest that the decline in performance of companies that go public is explained at least in part by worsened incentives of managers.

We document ownership characteristics and operating performance up to ten years after going public for a sample of 283 initial public offerings by U.S. companies in the years 1980–1983. We find that ownership stakes decline significantly after going public. The median ownership stake of officers and directors decreases from 67.9% before the initial public offering to 43.7% immediately afterward. Five years after going public the median stake of officers and directors is 28.6%. Ten years after going public the median stake is 17.9%, which is comparable to the median stake held by officers and directors of publicly traded firms in general.

In most cases, operating income scaled by assets or by sales exceeds the performance of matched publicly traded firms before going public and then after going public declines to a level that is below the performance of matched firms. In particular, median operating income adjusted for the performance of industry-matched firms is nine cents per dollar of assets in the year before going public, and declines to negative two cents per dollar of assets by one year after going public. However, performance does not decline appreciably further during the second through tenth years of public trading.

In general, we find that the operating performance of firms that go public is unrelated to the prior change in or the level of post-offer ownership stake of

officers and directors. We examine adjusted levels of operating performance and changes in operating performance both in the years surrounding the initial public offering and in the first ten years of public trading. These measurements of performance are unrelated to the changes in stock ownership of officers and directors from before to immediately after the offering as well as to the post-offering level of ownership. In addition, performance in the first and second five-year periods of public trading is unrelated to the change in ownership during the first five years of public trading.

Overall, our measures of management ownership are unrelated to the operating performance of companies that go public. Since going public can entail other changes that affect how companies are governed, we also investigate whether ownership by outside blockholders or board composition offsets or reinforces the effects of changes in ownership of managers. However, we find no association between operating performance and measures of blockholdings and board composition. After presenting our evidence we discuss possible reasons why the significant changes in ownership are unrelated to performance.

We find a relation between operating performance and the sale of shares in the initial public offering by current holders. Operating performance during the first five years of public trading declines more when current holders sell shares in the offering. However, we also find that the level of operating performance in the first year of public trading is higher in offerings that include a secondary sale. It appears that operating performance declines from above normal performance before going public to normal after going public when a secondary sale is included in the initial public offering. We believe this decline reflects insiders' decisions to sell shares following favorable performance, rather than the consequences of changes in ownership.

The size and age of our sample firms are related to the operating performance in the first few years after going public. At the median, small and young companies underperform industry-matched firms, while the performance of larger and more established firms is similar to the performance of industry-matched firms after going public. However, up to ten years after going public, we find that performance improves more for small and young companies.

2. Description of the offerings and the offering firms

Our sample comes from data provided to us by Chris James and represents initial public offerings of common stock reported in the *Investment Dealer's Digest* in the years 1980–1983 and made through a firm commitment underwriting arrangement. Offerings by companies in regulated industries are excluded, as are unit offerings that include warrants to buy shares. We further restrict our sample to 283 offerings by firms that have financial information in Compustat

PC Plus for the first full fiscal year following the initial public offering. Based on evidence in Schultz (1993), we believe these restrictions tilt our sample toward offerings made by larger and less speculative firms among the population of firms that went public during our sample period.

Almost one-half of the initial public offerings in our sample occurred in 1983. This pattern corresponds to the distribution of all U.S. initial public offerings during our sample period, as reported by Ibbotson, Sindelar, and Ritter (1988). The offerings in 1983 were made primarily by firms in the computer, electronics, and medical-related products industries. Offerings in 1980 were represented prominently by computer and electronic firms and by oil, gas, and mining firms. No particular concentrations by line of business are observed in 1981 and 1982.

Table 1 describes the initial public offerings and the firms in our sample. Based on information in the offering prospectus, panel A presents characteristics just prior to or at the offering. Firms of a wide range of sizes go public. The median book value of assets prior to going public is $5.8 million, the 25th percentile is $1.8 million, and the 75th percentile is $17.2 million. Firms also vary considerably in terms of their age at the time they go public. Issuing firms are required to report up to five years of financial data in the offering prospectus. We classify firms that report five years of financial performance as five years or older. For firms that report fewer than five years of performance, we examine the text of the offering prospectus to determine how many years of operations preceded the initial public offering. The number of years in these cases ranges from zero to more than five years. Row 2 shows that the median operating history is five or more years of operations. One-fourth of the firms had two or fewer years of operating history prior to going public.

The sizes of the initial public offerings of stock are substantial, given the total assets of the offering firms. Row 3 reports that the median offering size is $7.9 million, considerably larger than the median book value of assets of $5.8 million. There is considerable variation in the size of initial public offerings. The 25th and 75th percentile offering sizes are $4.1 million and $15.6 million. The median increase in shares outstanding is 37.3%, as shown in row 4. Not all of the proceeds of offerings, however, accrue to the offering firms. Row 5 reports that a median of 6.9% of offered shares were sold by current holders, and that for one-fourth of the sample at least 33.3% of the offering represents sales of shares by current holders.

We also note reasons for the offering as stated in the offering prospectus. Eighty-five percent of the sample firms intend to use the proceeds to raise working capital, 58% to retire debt, and 64% to finance capital expenditures. Firms with one year or less of operations are less likely to cite the repayment of debt as a reason for the offering. In 53% of the offers, the offering prospectus also reports plans by current holders to sell shares. These firms are predominantly firms that have five or more years of operations prior to

Table 1
Description of intial public offerings and the offering firms in the period 1980–1983.

The sample is 283 initial public offerings by unregulated firms through a firm commitment underwriting. Unit offerings are excluded. Information comes from the offering prospectus and Compustat.

	25th percentile	Median	75th percentile
Panel A: Characteristics prior to or at the offering			
1. Total assets prior to offering ($ millions)	1.8	5.8	17.2
2. Years of operating history (zero to five years)[a]	2	5	5
3. Size of offering ($ millions)	4.1	7.9	15.6
4. Shares offered as a percentage of shares outstanding	26.1	37.3	63.5
5. Shares offered by current holders as a percentage of shares offered	0.0	6.9	33.3

	Prior to offering	One year after offering	Five years after offering	Ten years after offering
Panel B: Characteristics of sample firms over time				
6. Number of firms	283	283	199	125
7. Total assets ($ millions)	5.8	19.2	23.9	33.1
8. Current assets/total assets	0.69	0.67	0.59	0.61
9. Property, plant, and equipment/ total assets	0.20	0.23	0.25	0.23
10. Total liabilities/total assets	0.64	0.40	0.49	0.51

[a]Firms are required to report up to five years of financial information in the offering prospectus. We set operating history equal to five when five or more years of financial information are reported. When fewer than five years are reported, we examine the text of the offering prospectus to determine the number of years of operating history.

going public. Offerings by young firms are more frequently intended to raise capital rather than to repay debt or to liquidate holdings of current stockholders.

In panel B of Table 1 we examine basic financial characteristics of firms prior to the offerings as well as one, five, and ten years afterwards. Information comes primarily from Compustat. For approximately one-half of our sample, financial data for the year before the offering are not available from Compustat. We collected this information from the offering prospectuses.

The numbers reported in Table 1 reflect the effects of changes in the composition of the sample as well as changes in the firms. Row 6 shows that the sample

falls from 283 to 199 by five years after the offering and to 125 by ten years after the offering. Firms most frequently leave the sample because they are taken over or they go private. According to Compustat's delisting codes, by five years after going public 24% of firms are acquired or go private, and after ten years 36% are acquired or go private.

Total assets increase substantially as the result of the initial public offerings of shares. The median book value of assets, reported in row 7, increases from $5.8 million to $19.2 million one year after the offering. After ten years the median book value of assets is $33.1 million. Despite the dramatic increase in issuing firms' assets, initial public offerings do not materially alter the composition of assets. In rows 8 and 9 current assets as well as property, plant, and equipment show little change as a fraction of total assets. Initial public offerings appear to affect the composition of financing of firms more than they affect the composition of assets. Row 10 indicates a sizable drop in the median ratio of liabilities to assets from 0.64 before to 0.40 after the offering.

3. Ownership before and after going public

We provide evidence on ownership of equity prior to going public and the changes in ownership during the first ten years of public trading. Based on information in the offering prospectus and in subsequent annual meeting proxy statements, we document ownership of various categories of stockholders at different points in time. We also report board size and composition, as well as the incidence of management turnover. In Section 5 we investigate the relation between stock ownership and the operating performance of firms.

We sought to obtain proxy statements for each sample firm both five and ten years after going public. If proxy statements at those dates are unavailable, we substituted proxy statements within one year of the desired dates. We obtain 170 proxy statements approximately five years after the offerings and 84 proxy statements approximately ten years after the offerings. The proxy statements provide data on ownership of officers, directors, and blockholders. Our measures of ownership include shares owned or controlled by the individual, family members, and by trusts. If the individual controls a corporation that owns shares of the sample firm, the corporation's ownership is assigned to the individual. We exclude options to purchase shares.

The first row of Table 2 reports the ownership of the chief executive officer (CEO), or president if there is no CEO. The median stake of the CEO is 24.8% prior to the offering, and declines to 15.9% immediately after the offering. The median CEO's stake is 9.4% five years after the offering and 5.5% ten years after.

The collective ownership stake of officers and directors also undergoes a large decline at the offering, but the post-offering stake is still substantial. The ownership of officers and directors after the offering is based on the shares held

Table 2

Median ownership stakes, board characteristics, and management turnover of companies that went public in the period 1980–1983.

The sample is 283 initial public offerings by unregulated firms through a firm commitment underwriting. Unit offerings are excluded. Data prior to and after the initial public offerings come from the offering prospectus. Data five and ten years after the initial public offerings come from annual meeting proxy statements. Median values are reported in panels A and B. Numbers in parentheses are sample sizes.

	Prior to offering ($n = 283$)	After offering[a] ($n = 283$)	Five years after offering ($n = 170$)	Ten years after offering ($n = 84$)
Panel A: Ownership				
1. CEO/president[b]	24.8% (262)	15.9%	9.4% (166)	5.5% (83)
2. Officers and directors as a group	67.9 (271)	43.7	28.6 (170)	17.9 (84)
3. All blockholders with board representation[c]	27.9 (103)	19.6	26.5 (41)	10.2 (17)
Types of blockholders:				
4. Majority blockholder[d]	95.9 (33)	54.6	81.1 (10)	66.1 (4)
5. Individuals	10.0 (55)	6.9	8.4 (38)	8.9 (19)
6. Venture capitalists	20.0 (33)	12.5	14.2 (8)	16.8 (5)
7. Financial companies	12.5 (30)	7.8	10.8 (66)	12.3 (45)
8. Nonfinancial companies	14.5 (34)	9.4	19.4 (23)	9.1 (13)

	Prior to offering	Five years after offering	Ten years after offering
Panel B: Board size and composition			
9. Board size	6 (282)	6 (170)	7 (82)
10. Proportion of insiders[e]	0.5 (282)	0.4 (170)	0.3 (82)

	Between the offering and five years after the offering	Between five years and ten years after the offering
Panel C: Management turnover		
11. CEO turnover	38.6% (66)	38.1% (32)
12. Complete turnover of top managers	28.1% (48)	21.4% (18)

[a] Ownership stakes after the offering are based on intended sales of shares as reported in the offering prospectus. The first two columns include firms for which we have ownership data for a particular category both before and after the offering.

[b] CEO/president represents the stake of the president if the position of CEO is unfilled or does not exist. Otherwise, the stake is the CEO's.

[c] Blockholders own 5% or more of outstanding common stock.

[d] A majority blockholder is an individual, institutional or corporate owner of 50% or more of the outstanding common stock. Ownership of shares by a close relative of an officer or director, or by a company majority-controlled by an officer or director, is included in our measure of officers' and directors' ownership, and is not treated as a separate blockholding position.

[e] Insiders are defined as employees of the firm.

prior to the offering minus shares sold in the offering, as reported in the offering prospectus. In row 2 we report that the median stake of officers and directors falls from 67.9% to 43.7%. In comparison, Mikkelson and Partch (1989) report a median stake of 32% held by officers and directors of firms in the smallest decile of a random sample of industrial companies traded on the New York or American Stock Exchanges.

During the first ten years as a publicly traded company, managers' ownership declines substantially. Five years after the initial public offering, the median stake of officers and directors is 28.6%. Ten years after the offering, the median stake is 17.9%. Mikkelson and Partch (1989) report that median ownership of officers and directors is 20% for industrial firms traded on the New York or American Stock Exchanges.

We document the ownership of outside blockholders, defined as holders of at least 5% of the firm's shares who are not officers or directors of the sample firm. Row 3 of Table 2 reports holdings by blockholders who sit on the board of directors or who have representation on the board. When the blockholder is a firm and a noncontrolling employee of the blockholder firm sits on the board of the sample firm, we define the blockholder as having board representation. Prior to the offering, 103 firms, or 36% of the sample, have a blockholder with a representative on the board of directors. The median stake held by these blockholders is 27.9%. The median stake declines to 19.6% immediately after the offering. By ten years after the offering, only 17 firms or 20% of the sample have a blockholder with board representation, and the median stake held by these blockholders is 10.2%.

In Table 2 we also document ownership by five mutually exclusive categories of blockholders: holders of at least a 50% stake, individuals, venture capital firms, financial corporations, and nonfinancial corporations. These groupings are based on descriptions of the blockholders reported in the offering prospectus or proxy statement. Our classification of blockholders as venture capitalists is based on listings in *Pratt's Guide to Venture Capital Sources*, a directory of venture capital firms published annually by Venture Economics.

At the time of the offering, 33 firms (12%) are controlled by an owner of 50% or more of the outstanding common stock. The median stake of these 33 majority stakeholders falls from 95.9% to 54.6% immediately after the offering. The proportion of firms with a majority blockholder declines over time. Ten firms (6%) have a majority blockholder five years after going public with a median ownership stake of 81.1%. Four firms (5%) have a majority blockholder ten years after; their median stake is 66.1%. Block-holders that own a majority of shares at the time of the offering in 24 firms that survive for five years hold a median stake of 36% five years after going public. Blockholders that own a majority of shares at the time of the offering in eight firms that survive for ten years hold a median stake of 47% ten years after going public.

Neither the size of the stake held prior to the offering by individual block-holders (row 5) or nonfinancial companies (row 8), nor the proportion of firms represented by these types of blockholdings changes dramatically over time. Prior to the offering, the median stake of venture capitalists (row 6) is 20%, and falls to 12.5% after the offering. The proportion of firms with venture capitalists as blockholders falls from 13% to 5% by five years after the offering. The size of the stake held by financial companies (row 7) varies little over time, although the proportion of firms with financial companies as blockholders increases from 10% prior to the offering to 53% ten years after the offering.

We also investigate changes in the composition of the board or of the top management during the early years of public trading. We expect the size of the board to increase and the proportion of directors who are employees of the firm to decrease as firms grow and management ownership stakes decline. However, we find that median board size remains at six directors after five years of public trading and increases to only seven directors after ten years of public trading. The median fraction of directors who are classified as employees of the company decreases from 50% to 30% by the end of ten years.

The percentages of firms with turnover of the chief executive officer are 39% and 38% during the first and second 5-year periods of public trading. Complete turnover of top management (chief executive officer, president, and chair of the board) occurs in 28% of the firms in the first five years of public trading and in 21% of firms in the second five years. These turnover rates are comparable to rates reported by Mikkelson and Partch (1997) for random samples of industrial companies publicly traded on the New York or American Stock Exchange. For the periods 1984–1988 and 1989–1993, they report that CEO turnover occurs in 39% and 34% of their samples, and complete turnover of the holders of the top three offices occurs in 23% and 16% of their samples. Changes that firms undergo as they become established as publicly traded companies do not lead to unusually high rates of management turnover.

To investigate whether changes in stock ownership over time reflect a changing composition of the sample, we replicate the analysis for the 84 companies that survived for ten years. Ownership stakes in surviving firms are similar to those for the entire sample. For example, the median ownership of officers and directors in surviving firms is 64.5% before the initial public offering and 25.4% five years after the offering. The decreases over time in ownership stakes are due mostly to the reduction in shares owned and the issuance of shares rather than to changes in the composition of the sample.

Our evidence shows that by five and ten years after going public, ownership becomes considerably less concentrated. The largest declines in median ownership stake occur for the CEO, officers and directors as a group, and majority stakeholders. Next we turn to evidence on how firms perform after going public and investigate how performance is related to the changes in ownership, the lower levels of ownership, and other characteristics of ownership.

4. Operating performance

4.1. Unadjusted measures of operating return on assets

We analyze operating performance from the fiscal year before the initial public offering to ten fiscal years after the offering. Our primary measure of operating performance is operating income before deducting depreciation, interest, taxes, and extraordinary items, divided by end-of-year assets. This scaling converts operating income into an operating return on assets and allows us to make comparisons over time and across firms. Initial public offerings typically increase assets substantially, which potentially imparts a downward bias to measures of operating income scaled by assets. Therefore, we also examine operating income scaled by sales.

Fig. 1 shows the interquartile range and median operating return on assets for 12 years beginning with the fiscal year before the offering (−1) through ten fiscal years after the offering (+10). An arrow marks the interquartile range and a small square highlights the median.
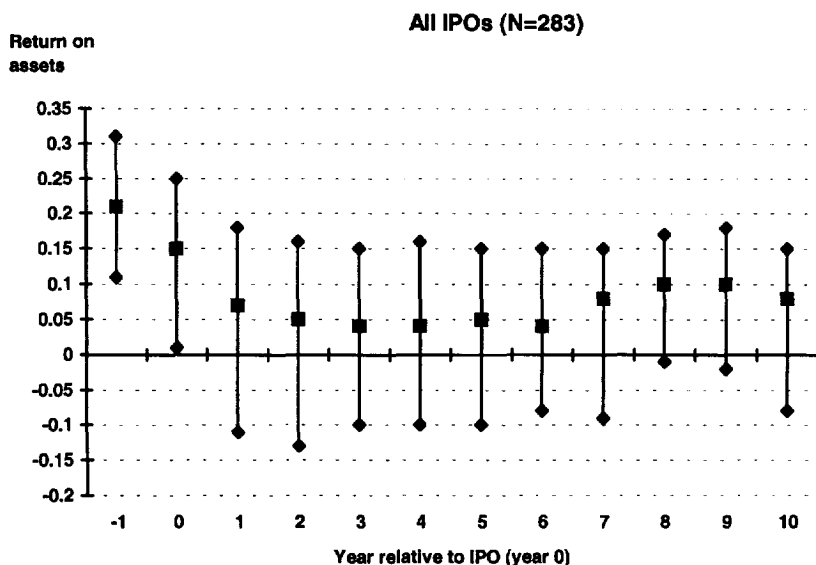
Fig. 1. Unadjusted operating return on assets of 283 firms announcing an initial public offering of common stock in the period 1980–1983. Operating return on assets is operating income before depreciation, interest, taxes, and extraordinary items divided by end-of-year assets. The median operating return on assets is depicted by a small square and interquartile range is represented by a line segment. N is the sample size in year 1, where the year of the offering is year 0.

For the entire sample, there is a shift down in the interquartile range and a decrease in the median of operating income divided by assets. The declines are most pronounced between years -1 and 0 and between years 0 and 1. The median unadjusted operating return on assets is 0.21, or 21 cents per dollar of assets, in year -1, 0.15 in year 0, and 0.07 in year 1. Median performance does not exceed 0.10 after year 0.

The median and fraction of positive performance measures for various intervals of years are also reported in row 1 of Table 3. For the five-year intervals reported in the table, we compute an average annual performance measure for each firm and report the median and percentage of positive values of these individual firm averages. The average measure for each firm is based on the number of years accounting numbers are available, so our measures include the performance of firms that do not survive to the end of an interval and therefore do not reflect a survivorship bias.

Table 3 shows that median performance in years -1, 0, and 1 is significant at the 0.01 level and more than three-fifths of the operating returns are positive. The median change in performance from year -1 to year 1 is -0.11, and nearly four out of five firms experience a decline in performance. Declines in performance after year 1 are relatively small. During years 2 through 5 the median operating return is 0.03, and during years 6 through 10 the median operating return is 0.08. The signed ranks test statistic is insignificant for the intervals of years 2 through 5, but significant for years 6 through 10. Generally, the more extreme performance measures are negative and the averages (not reported) are less than the medians.

The median measures of operating income scaled by sales display a pattern over time that is similar to measures scaled by assets. In row 5 of Table 3 the median ratio of operating income to sales declines from 0.13 to 0.08 between years -1 and 1, and the median operating income to sales is 0.02 for years 2 through 5.

4.2. Adjusted measures of operating return on assets

To control for variation in operating performance, we adjust each firm's operating return on assets by subtracting the median contemporaneous operating return of a group of matched publicly traded firms. We use three different methods for matching. Our first method matches firms according to the four-digit SIC industry classification of the company going public. This controls for variation in normal operating return on assets across different lines of business.

Our second method matches on the basis of industry and size. Firms are matched based on the book value of assets after the initial public offering, along with the four-digit SIC classification. Matching by assets accounts for the determinants of performance that are correlated with company size. We require that the matching firms' assets be within 25% of the assets of the firm going public. This reduces our sample to 219.

Table 3

Measures of operating performance of companies that went public in the period 1980–1983.

Operating performance is operating income before depreciation, interest, taxes, and extraordinary items divided by end-of-year assets (panel A) or divided by sales (panel B). Performance measures of each company are adjusted by subtracting the median performance measure for a group of matched companies. Average annual performance is reported for multiple-year periods. Year 0 is the fiscal year of the initial public offering of common stock. The sample is restricted to offerings with performance data available from Compustat for year 1. Sample sizes are the number of observations in year 1.

Performance measure	Levels						Changes			
	year -1	year 0	year 1	years 2–5	years 2–10	years 6–10	-1 to 1	1 to 5	6 to 10	1 to 10
Panel A: Median operating income divided by assets (proportion positive in parentheses)										
1. Unadjusted ($n = 282$)	0.21 (.87)[a]	0.15 (.76)[a]	0.07 (.63)[a]	0.03 (.55)	0.04 (.57)	0.08 (.66)[a]	-0.11(.21)[a]	-0.04(.40)[a]	-0.01 (.48)	-0.00 (.49)
2. Adjusted for industry ($n = 281$)[d]	0.09 (.72)[a]	0.03 (.59)	-0.02 (.44)[a]	-0.04 (.38)[a]	-0.03 (.37)[a]	-0.02 (.44)[c]	-0.09 (.26)[a]	-0.02 (.46)	0.04 (.60)	0.01 (.53)
3. Adjusted for size and industry ($n = 219$)[e]	0.07 (.66)[a]	0.02 (.54)	-0.03 (.42)[a]	-0.04 (.40)[a]	-0.03 (.42)[a]	-0.01 (.45)	-0.07 (.35)[a]	0.01 (.51)	0.05 (.61)	0.01 (.54)
4. Adjusted for industry and level of performance ($n = 115$)[f]	0.00 (.62)[a]	-0.02 (.41)[b]	-0.07 (.30)[a]	-0.06 (.27)[a]	-0.05 (.32)[a]	-0.03 (.41)	-0.08 (.30)[a]	0.01 (.55)	-0.02 (.50)	0.01 (.53)

Panel B: Median operating income divided by sales (proportion positive in parentheses)

5. Unadjusted (n = 281)	0.13 (.87)[a]	0.12 (.77)[a]	0.08 (.64)	0.02 (.54)	0.02 (.54)	0.05 (.63)	−0.03 (.36)[a]	−0.03 (.44)	−0.00 (.48)	−0.00 (.48)
6. Adjusted for industry(n = 281)[d]	0.03 (.64)[a]	0.02 (.61)[a]	−0.01 (.47)[a]	−0.04 (.35)[a]	−0.03 (.38)[a]	−0.02 (.44)[a]	−0.02 (.37)[a]	−0.00 (.49)	0.01 (.53)	−0.01 (.48)
7. Adjusted for size and industry (n = 218)[e]	0.02 (.62)[c]	0.02 (.54)	−0.01 (.48)[b]	−0.03 (.42)[a]	−0.03 (.41)[a]	−0.01 (.45)	−0.02 (.44)	0.01 (.53)	0.04 (.59)	−0.00 (.49)
8. Adjusted for industry and level of performance (n = 123)[g]	0.00 (.67)[b]	−0.00 (.48)	−0.03 (.35)[a]	−0.06 (.36)[a]	−0.05 (.36)[a]	0.00 (.53)[b]	−0.03 (.35)[a]	0.01 (.55)	−0.06 (.25)	−0.02(.50)

[a]Signed-ranks test statistic is significant at the 0.01 level.
[b]Signed-ranks test statistic is significant at the 0.05 level.
[c]Signed-ranks test statistic is significant at the 0.10 level.
[d]Matching firms have the same four-digit SIC code.
[e]Matching firms have book value of assets in year 1 within 25% of the offering firm's assets in year 1 and also have the same four-digit SIC code.
[f]Matching firms have operating return on assets in year −1 within 10% of the offering firm's operating return on assets and also have the same four-digit SIC code. If no match is found, we extend our search to firms with the same three-digit and then the same two-digit SIC code.
[g]Matching firms have operating return on sales in year −1 within 10% of the offering firm's return on sales and also have the same four-digit SIC code. If no match is found, we extend our search to firms with the same three-digit and then the same two-digit SIC code.

Our third method matches on the basis of industry and performance. Firms are matched on the level of operating return on assets or sales in the fiscal year prior to going public, along with SIC classification. This controls for the decline in performance that is expected or normal and unrelated to going public. We require that the operating return on assets of the matching firms is within 10% of the sample firm's performance in the fiscal year preceding the initial public offering. When a match cannot be found among publicly traded firms with the same four-digit SIC code, we broaden the search to firms with the same three-digit SIC code and, if necessary, to firms with the same two-digit SIC code. This procedure reduces the sample size to 115.

In rows 2, 3, 6, and 7 of Table 4 we report the median and the proportion of positive values for our first two measures of adjusted performance. Row 2 shows that operating return on assets adjusted for the median measure of firms in the same four-digit SIC classification is 0.09 in year -1 and that 72% of the measures are positive. In years 2 through 5 after going public, the median industry-adjusted average annual operating return is -0.04, and 38% of the measures are positive. Operating performance is similar in years 6 through 10. The Wilcoxon text statistic is significant at the 0.10 level, or lower, in the intervals following year 0. However, the significant changes in performance are confined to the period surrounding the offering, from years -1 to 1. When we match firms on industry classification and size (row 3) or scale by sales rather than assets (rows 6 and 7), median performance measures are similar.

Matching on industry and performance in year -1 produces lower measures of adjusted performance. In row 4, median operating income scaled by assets adjusted for industry and level of performance is -0.07 in year 1 and -0.06 in years 2 through 5. In row 8, median operating income scaled by sales is similar to the median operating income scaled by assets.

Barber and Lyon (1996) conclude that for small firms, tests on median operating performance are better specified when firms are matched by industry, level of performance in year -1, and size. When we match on the basis of these three factors, median performance measures (not reported in the table) are similar to those in row 4 and in row 8. In all cases, significant changes in operating performance are confined to the period around the initial public offering, from year -1 to year 1.

To summarize, firms that make initial public offerings in the period 1980 through 1983 experience unusually high measures of operating performance in the year before the offering. For all methods of adjusting performance, median operating income scaled by assets or by sales becomes negative after going public. However, the declines in performance are confined to the first full year of public trading and no further declines occur through ten years of public trading. Next we investigate whether operating performance is related to characteristics of stock ownership.

Table 4
Operating performance of companies that went public in the period 1980–1983 grouped by ownership and other characteristics.

Operating performance is operating income before depreciation, interest, taxes, and extraordinary items divided by end-of-year assets. Performance measures of each company are adjusted by subtracting the median performance measure for firms with the same four-digit SIC code. Average annual performance is reported for multiple-year periods. Median performance measures are followed by the fraction of positive performance measures (in parentheses). The p-values correspond to the Wilcoxon N-sample test.
Year 0 is the fiscal year of the initial public offering of common stock. The sample is restricted to offerings with performance data available from Compustat for year 1. Sample sizes are the number of observations in year 1.

	Year −1	Year 1	Years 2–5	Years 6–10	Change between years −1 and 1	Change between years 1 and 5	Change between years 5 and 10
1. Change in officers' and directors' stake from before to after the offering:							
Highest quartile ($n = 67$, median change $= -0.035$)	0.07 (.66)[c]	0.00 (5.2)	−0.03 (.36)[b]	−0.04 (.36)[b]	−0.05 (.34)[a]	−0.00 (.97)	0.07 (.54)
Lowest quartile ($n = 78$, median change $= -0.405$)	0.06 (6.7)[a]	−0.02 (.44)[c]	−0.08 (.28)[a]	−0.06 (.31)[a]	−0.09 (.16)[a]	−0.02 (.47)	0.15 (.77)[a]
p-value of test of equal medians	0.93	0.60	0.15	0.55	0.20	0.82	0.11
2. Change in officers' and directors' stake from before to five years after the offering:							
Highest quartile ($n = 58$, median change $= -0.023$)	0.11 (.76)[a]	0.01 (.52)	−0.02 (.44)	−0.03 (.35)[c]	−0.05 (.33)[a]	0.00 (.54)	0.05 (.69)
Lowest quartile ($n = 58$, median change $= -0.580$)	0.05 (.63)	−0.02 (.47)	−0.02 (.40)[a]	0.01 (.51)	−0.10 (.21)[a]	−0.02 (.46)	0.09 (.69)
p-value of test of equal medians	0.39	0.87	0.29	0.20	0.16	0.63	1.0
3. Officers' and directors' stake after the offering:							
Less than 25% ($n = 70$)	0.05 (.62)	−0.01 (.47)[b]	−0.04 (.38)[a]	−0.03 (.33)[b]	−0.05 (.32)[a]	0.01 (.53)	0.10 (.64)
Between 25% and 50% ($n = 107$)	0.07 (.68)[a]	−0.04 (.36)[a]	−0.05 (.30)[a]	−0.01 (.49)	−0.09 (.33)[a]	−0.00 (.50)	0.03 (.61)
Greater than 50% ($n = 104$)	0.11 (.79)[a]	0.01 (.52)	−0.01 (.47)[a]	−0.00 (.47)	−0.14 (.16)[a]	−0.04 (.40)	0.04 (.67)
p-value of test of equal medians	0.15	0.04	0.24	0.55	0.14	0.59	0.65
4. Majority corporate blockholder:							
Present ($n = 27$)	0.06 (.71)[b]	0.03 (.67)	−0.01 (.47)	−0.07 (.30)	−0.07 (.45)	0.01 (.59)	0.02 (.50)
Absent ($n = 254$)	0.09 (.72)[a]	−0.02 (.42)[a]	−0.04 (.37)[a]	−0.01 (.45)	−0.10 (.23)[a]	−0.02 (.45)	0.07 (.65)
p-value of test of equal medians	0.86	0.09	0.16	0.28	0.15	0.44	0.93

Table 4 (Continued)

	Year −1	Year 1	Years 2–5	Years 6–10	Change between years −1 and 1	Change between years 1 and 5	Change between years 5 and 10
5. Venture capital backing prior to offering:							
5% or greater blockholder (n = 26)	0.08 (.73)	−0.00 (.49)	−0.01 (.49)	−0.02 (.43)	−0.04 (.35)	−0.02 (.43)	−0.22 (.17)[a]
No venture capital backing (n = 244)	0.09 (.71)[a]	−0.02 (.44)[a]	−0.02 (.42)[a]	−0.02 (.44)[c]	−0.10 (.24)[a]	−0.02 (.47)	0.07 (.69)[a]
p-value of test of equal medians	0.80	0.73	0.44	0.90	0.05	0.74	0.01
6. Fraction of outside board directors at the offering:							
Fraction less than median (n = 138, median = 0.5)	0.07 (.70)[a]	−0.02 (.43)[a]	−0.04 (.39)[a]	−0.01 (.47)	−0.09 (.25)[a]	−0.02 (.48)	0.05 (.54)
Fraction greater than median (n = 145, median = 0.5)	0.09 (.74)[a]	−0.01 (.46)[a]	−0.03 (.36)[a]	−0.02 (.40)	−0.09 (.26)[a]	−0.02 (.44)	0.01 (.52)
p-value of test of equal medians	0.59	0.28	0.74	0.92	0.79	0.66	0.19
6. Secondary sale of shares:							
Secondary component (n = 141)	0.12 (.88)[a]	0.03 (.61)[a]	−0.01 (.45)	0.01 (.51)	−0.09 (.20)[a]	−0.02 (3.9)[c]	−0.02 (.46)
No secondary component (n = 118)	−0.03 (.41)	−0.10 (.26)[a]	−0.07 (.30)[a]	−0.04 (.37)[a]	−0.08 (.36)[a]	0.03 (.54)	0.15 (.79)[a]
p-value of test of medians	0.00	0.00	0.00	0.03	0.44	0.03	0.00
7. Total assets prior to offering:							
Highest quartile (n = 71, median = $30.2 million)	0.07 (.76)[a]	0.03 (.68)[a]	0.02 (.58)[b]	0.01 (.55)	−0.03 (.37)[c]	−0.04 (.34)	0.02 (.60)
Lowest quartile (n = 70, median = $0.8 million)	−0.06 (.39)	−0.19 (.16)[a]	−0.15 (.24)[a]	−0.06 (.34)[b]	−0.07 (.41)	0.10 (.61)	0.14 (.83)[a]
p-value of test of equal medians	0.01	0.00	0.00	0.02	0.46	0.01	0.00
8. Years of operating history:[d]							
Five or more years (n = 166)	0.09 (.77)[a]	0.03 (.57)	0.01 (.51)	−0.00 (.49)	−0.07 (.24)[a]	−0.02 (.39)	0.02 (.57)
Zero or one year (n = 52)	−0.37 (.40)	−0.20 (.15)[a]	−0.14 (.23)[a]	−0.02 (.47)	−0.16 (.40)	0.09 (.55)	0.16 (.87)[b]
p-value of test of equal medians	0.08	0.00	0.00	0.33	0.88	0.11	0.01

[a]Signed-ranks test statistic is significant at the 0.01 level.
[b]Signed-ranks test statistic is significant at the 0.05 level.
[c]Signed-ranks test statistic is significant at the 0.10 level.
[d]Firms are required to report up to five years of financial information in the offering prospectus. We set operating history equal to five when five or more years of financial information are reported. When fewer than five years are reported, we examined the text of the offering prospectus to determine the years of operating history.

5. The relation between stock ownership and operating performance

We believe that there is no clearly superior specification of the relation between operating performance and stock ownership. As we elaborate below, there are plausible arguments why incentive effects are related to the change in ownership stake as well as to the level of ownership stake. In addition, both changes in and levels of operating performance are meaningful metrics. Therefore, we test for the possibility that levels of and/or changes in operating performance and ownership are related.

5.1. Univariate comparisons between subsamples

Officers and directors' ownership: The response of performance to changes in ownership stakes is suggested by the argument in Jensen and Meckling (1976) that incentives of an owner/manager change when shares are issued to another party. Mikkelson and Partch (1985) provide evidence that decreases in ownership concentration of publicly traded firms lower share value, and Wruck (1989) finds that increases in ownership concentration increase share value, on average. Holthausen and Larcker (1996) find that declines in operating performance following reverse leveraged buyouts are positively related to the changes in insiders' ownership stake.

We do not find differences in the level of performance following offerings grouped by quartiles of the change in the stake of officers and directors. Row 1 of Table 4 shows similar median measures of performance for the lowest and highest quartiles of changes in ownership from before to after the offering. When changes in ownership are measured from before the offering to five years later, row 2 also shows no differences between quartiles. Changes in ownership stake do not appear to explain levels of operating performance after going public. Nor do changes in ownership stake appear to explain changes in operating performance, as shown in the last three entries in rows 1 and 2.

Variation among firms in the level of ownership stakes after the offerings is also potentially important because firms can have similar changes in ownership but quite different levels of ownership. For example, the analysis of Jensen and Meckling (1976) focuses on incentives as shaped by the owner/manager's post-offering level of ownership.

Jain and Kini (1994) report a positive relation between operating performance after initial public offerings and a proxy for managers' ownership of common stock. They document that declines in operating performance from year -1 up to year 3 are larger when their measure of ownership is greater than the median, 73% in their sample. However, Jain and Kini do not directly measure share ownership before and after the offerings. Their proxy for management ownership is the percentage of shares retained by pre-offering shareholders. In our sample, the simple correlation coefficient between our direct measure of the

ownership of officers and directors after the offering and Jain and Kini's imputed measure of ownership retention is only 0.17.

In row 3 of Table 4, we report performance following initial public offerings for three groups defined by the ownership stakes of officers and directors after the offering. In year 1, firms with the greatest ownership stake (more than 50%) have the highest median operating performance, and performance of groups with ownership stakes of less than 50% is significant and negative. However, there are no statistically significant differences among performance measures in the three groups in years 2 through 5 and years 6 through 10. Changes in performance also do not differ among the groups.

In general, the univariate analysis indicates that changes in or levels of the ownership stakes of officers and directors in firms that go public explain little, if any, variation in performance among firms.

Blockholders: We also examine other features of stock ownership. In our sample, 27 firms were controlled by a corporation prior to going public. Firms that become public through an equity carve-out can display unusual performance relative to other firms that go public. These offerings can have special motives, as discussed by Schipper and Smith (1986), and in many cases the firms going public were already part of a publicly traded company. Therefore, we test whether operating performance is unusual following initial public offerings of companies that had a majority corporate stockholder.

We compare initial public offerings with and without a corporate majority stockholder in row 4 of Table 4. Majority corporate stockholders control more than 50% of the company's pre-offering shares. In general, operating performance following initial public offerings of firms with a majority corporate stockholders is not unusual. Only in year 1 is median operating performance higher (the p-value of the difference is 0.09) for firms that had a majority corporate stockholder.

Another potentially important type of blockholder in companies that go public is a venture capitalist. Barry et al. (1990) provide evidence that the presence of venture capital backing influences investors' valuation of companies. We examine whether the operating performance of firms that go public with the backing of a venture capitalist with a 5% or greater ownership stake exceeds the performance of firms without 5% ownership stakes held by venture capitalists.

In row 5 we report that offerings with venture capital backing experience a smaller decline in performance from year -1 to year 1. However, the longer intervals provide no evidence of superior operating performance for firms that go public with the backing of a venture capitalist. It is possible that differences in performance are not observed because monitoring by other types of blockholders substitutes for the benefits of venture capital backing.

Outside directors: In addition to ownership by blockholders, managers' incentives are potentially influenced by the composition of the board of

directors. Several studies suggest that board composition influences the value of companies.[1]

We group firms by whether the fraction of outside directors is above or below the median of 0.50. We define outside directors as those who are not employees of the firm. Row 6 of Table 4 shows that performance is quite similar between the two groups.

Secondary sales: As shown earlier in Table 1, many initial public offerings include sales of shares by current holders. Offerings that include secondary sales are of interest because they may be timed to follow favorable performance and to precede a decline in performance. Secondary sales are also of interest because they often reduce the ownership stakes of current holders, including management in some cases.

Row 6 of Table 4 shows that offerings with secondary sales follow favorable operating performance and are followed by normal levels of operating performance. Offerings without secondary sales are preceded by normal performance and are followed by unfavorable levels of performance. Both groups of offerings experience similarly large median declines in operating performance from year −1 to year 1. However, among the firms that remain publicly traded through year 10, operating performance improves from year 1 to year 5 and from year 5 to year 10 only for the firms that do not have a secondary sale. Below we discuss these findings in connection with our regression analysis.

Size and age: The final two rows of Table 4 examine operating performance around offerings grouped by two attributes of the offering firms that vary greatly in our sample: the sizes and ages of the offering companies. We suspect that small and relatively young companies report lower performance measures in their early years due to low volume of sales, high initial operating costs, or an aggressive pricing strategy. It is plausible that startup firms have low sales or they incur higher production and selling costs due to inexperience, a small scale of operations, or one-time startup costs. These firms may also price their product at a smaller margin over costs in order to attract customers. In addition, Fama and French (1995) provide evidence that smaller firms generally had lower earnings in the 1980s.

Rows 7 and 8 show that in the years around an initial public offering, the level of operating performance differs greatly between firms of different size and between firms of different lengths of operating history. Larger firms and older

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[1] For example, Rosenstein and Wyatt (1990) investigate the stock price effects of appointments of outside directors, Weisbach (1988) studies the role of outside directors in CEO turnover, Byrd and Hickman (1992) and Cotter et al. (1996) analyze the relation between outside directors on bidder and target firm boards of directors and the valuation consequences of takeovers, and Brickley et al. (1994) analyze the relation between outside directors and the stock price effects of adoptions of poison pill plans.

firms have substantially higher median operating performance both before and for five years after going public. However, performance measures of groups defined by age do not differ over years 6 through 10. The last two columns show that small and young companies that survive for five or ten years as publicly traded companies experience improvements in performance.

Overall, Table 4 shows that differences in median measures of operating performance are not associated closely with various measures of ownership stakes. Variation in operating performance is explained mostly by the presence of secondary sales and by the size and age of the offering company. Poor operating performance after going public is associated with the samples of smallest and youngest companies. The largest and oldest companies display high levels of performance before going public and lower, but nonnegative, performance measures after.

5.2. Regression analysis

In Table 5 we jointly test the association between operating performance and ownership characteristics by estimating multivariate regressions. The dependent variable is either the adjusted level of operating performance or the change in performance, and the independent variables correspond to the characteristics examined in Table 4. We include a variable for the squared level of ownership stake to detect a nonlinear association.

To remove the potential influence of extreme measures of performance, the data are winsorized by setting the top and bottom 5% of values of the dependent variable equal to the 5th and 95th percentile values. If the hypothesis of constant variance of the residuals is rejected, the standard errors of the coefficient estimates in Table 5 are corrected using the method described in White (1980).

In the first two regressions the dependent variable is the level of industry-adjusted operating performance for year 1 (column 1) and for years 2 through 5 (column 2). Consistent with Table 4, the size and the age of the firm are positively related to industry-adjusted performance after the offering. None of the measures of ownership are related to operating performance. The fraction of outside directors is positively related to performance in year 1.

The fraction of shares sold in the offering by current holders is positively related to performance in year 1 and in years 2 through 5. An increase from zero to 0.33 in the fraction of the offering that is a secondary offering increases average annual performance in years 2 through 5 by two cents per dollar of assets. We suspect that in order to successfully place an initial public offering of shares that includes a secondary sale, the offering firm must have favorable prospects. Thus, secondary sales and the level of post-offering performance are positively related.

The coefficients on size and age are statistically significant and economically important. A shift in pre-offering assets from $1.8 million to $17.2 million, the interquartile range, implies an increase in industry-adjusted operating income

Table 5
Ordinary least-squares regressions of adjusted operating income divided by assets on characteristics of offering firms and initial public offerings.

The sample is initial public offerings by unregulated firms through a firm commitment underwriting in the period 1980–1983. Unit offerings are excluded. Operating income is measured before depreciation, interest, taxes, and extraordinary items and is adjusted for the median performance measure of firms with the same four-digit SIC code. Year 0 is the year of the offering of stock. The numbers in parentheses following the coefficient estimates are p-values. The sample is winsorized at the 5th and 95th percentile values of the dependent variable.

Variable (average value)	Industry-adjusted operating return for year 1 (-0.09)	Average industry-adjusted operating return for years 2 through 5 (-0.08)[a]	Industry-adjusted change in operating return from year -1 to year 1 (-0.13)	Industry-adjusted change in operating return from year 1 to year 5 (-0.00)
1. Intercept (1.0)	−0.41 (0.00)	−0.18 (0.01)	−0.20 (0.06)	0.11 (0.35)
2. Change in ownership stake of officers and directors from before to after the offering (−0.21)	−0.03 (0.77)	0.04 (0.70)	0.02 (0.88)	−0.18 (0.40)
3. Ownership stake of officers and directors following the offering (0.42)	−0.14 (0.62)	−0.10 (0.68)	0.08 (0.82)	0.05 (0.91)
4. Square of the ownership stake of officers and directors following the offering	0.35 (0.25)	0.08 (0.75)	−0.57 (0.57)	−0.18 (0.73)
5. Index variable for offering firm controlled by a majority blockholder prior to the offering (0.13)	0.09 (0.20)	−0.02 (0.73)	0.01 (0.93)	−0.02 (0.90)
6. Index variable for backing by a venture capitalist with a 5% or larger ownership stake prior to the offering (0.13)	0.01 (0.85)	0.03 (0.52)	0.08 (0.09)	0.04 (0.61)

Table 5 (Continued)

Variable (average value)	Industry-adjusted operating return for year 1 (−0.09)	Average industry-adjusted operating return for years 2 through 5 (−0.08)[a]	Industry-adjusted change in operating return from year −1 to year 1 (−0.13)	Industry-adjusted change in operating return from year 1 to year 5 (−0.00)
7. Fraction of outside board directors at the time of the offering (0.44)	0.26 (0.00)	0.04 (0.47)	0.05 (0.51)	−0.22 (0.05)
8. Fraction of shares sold by existing shareholders in the offering (0.18)	0.15 (0.00)	0.19 (0.00)	−0.03 (0.44)	−0.24 (0.05)
9. Assets prior to offering in millions of dollars (22.1)	0.001 (0.03)	0.001 (0.07)	0.001 (0.00)	0.00 (0.85)
10. Years of operating history measured from 0.0 to 5.0 (3.7)	0.02 (0.02)	0.02 (0.03)	0.01 (0.60)	−0.00 (0.88)
p-value of F-statistic	0.00	0.00	0.05	0.29
Adjusted R^2	0.23	0.09	0.06	0.01
Sample size	267	248	146	155

[a]This is computed by averaging the industry-adjusted operating return for years 2 through 5. If a sample firm did not survive until year 5, the average reflects the years with performance measures available.

scaled by assets of 0.015. A three-year increase in years of operating history, the interquartile range, implies an increase of about 0.06 in scaled operating income. Age, or years of operating history, appears to have the largest effect on the level of post-offering performance.

The regression in column 3, on changes in operating performance from year −1 to year 1, indicates that size is the most reliable determinant of performance during the first five years of public trading. Firms with venture capital backing have a smaller decrease, or larger increase, in performance immediately around the initial public offering. The regression in column 4, on changes in operating performance from year 1 to year 5, is statistically insignificant.

Earlier we reported that the ownership stakes of officers and directors decline substantially during the first five and ten years of public trading. Therefore, operating performance in years 6 through 10 may be related to measures of ownership as of year 5. We investigate this possibility and find that neither the declines in ownership stakes during the first five years of public trading nor the levels of ownership in year 5 explain subsequent operating performance.

6. Discussion of determinants of performance

We find that the median operating performance exceeds the performance of industry-matched firms in the year before going public and that median performance falls below the performance of matched firms in the first ten years after going public. Despite the large variation in ownership stakes in our sample, our analysis uncovers no association between performance and various measures of equity ownership by officers and directors.

We suspect that the sizable declines in ownership stakes do not materially affect managers' incentives, given the substantial level of managers' holdings after the offerings. The median change in the stake of officers and directors from before to after the offerings is −19%; however, the median stake following the offerings is 43.7%. Even though ownership declines, the size of ownership stakes held by officers and directors just after going public appears sufficient to align the incentives of managers with the interests of other stockholders. In addition, lower ownership stakes can diminish managers' incentives to avoid risky investments that increase managers' personal risk exposure but also increase the value of the firm.

In the years after going public, the median ownership stake of officers and directors declines further. By five years after going public, the median ownership stake of officers and directors is 28.6%. Although still high, this level of ownership may not be sufficient to closely align the interests of managers and stockholders. The lack of association between operating performance and the ownership stakes five years after going public is potentially explained by new pressure on managers that arises from being a publicly traded firm. For

example, the threat of a takeover, monitoring by outside investors, or the effects of stock based compensation possibly compensate for undesirable incentive effects of lower ownership stakes of managers.

If changes in incentives do not explain operating performance around initial public offerings, we are left with the question of why firms that go public experience a deterioration in performance. Our cross-sectional analysis shows that poor performance after going public is associated with small and young companies. As mentioned earlier, we suspect that the poor performance of startup firms is explained by effects of higher initial operating costs or a more aggressive pricing strategy that diminish over time. Our measures of operating performance are consistent with these explanations in that performance in years 6 through 10 is markedly better than performance in years 1 through 5. For the firms that survive at least five years after going public, median industry-adjusted operating return on assets improves from −14% in years 1 through 5 to −2% in years 6 through 10. However, these improvements in performance potentially reflect the survivorship bias in Compustat's coverage of startup firms rather than a pattern of performance that applies to startup firms in general.[2]

There remains the question of why the operating performance of larger and more established companies erodes from a high to a normal level as measured against industry matched firms. Based on the offering prospectuses issued by firms in our sample, there are two important motivations for going public. One motivation is to finance investment. Firms that have had strong performance may be more likely to invest. Consequently, the increase in assets leads to declines in operating income scaled by assets after going public. Another motivation for going public is to facilitate the sale of current stockholders' holdings. Insiders may attempt to time their sales of equity to follow favorable performance or to precede a decline in performance.

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[2] It appears that Compustat backfills data of firms added to the database. We suspect that data that are backfilled by Compustat are for firms that have had favorable performance after going public. To investigate the importance of selection bias, we compare the survival rates of companies in our sample to 1111 companies in Ritter's (1991) sample of initial public offerings that occurred in the years 1980 through 1983. Our sample is a subset of Ritter's sample. Ritter uses CRSP-listed firms and therefore his sample is free of a survivorship bias. If our sample has a bias because some poor-performing firms do not enter the Compustat database, we should observe that a smaller fraction of firms in our sample than in Ritter's sample leave the CRSP file over time.

We find that no firms in our sample departed the CRSP database in the first year after going public, while 2% of Ritter's firms did. During the first 36 months after going public, the rates of departure in our sample and in Ritter's sample are also close: 16% of our firms depart the CRSP file and 19% of Ritter's firms depart. Among firms that go public within one year of incorporation, only 14% of our firms depart the CRSP file during the first 36 months and 27% of Ritter's firms depart. Among companies five years and older, the rates of departure within the initial 36 months of public trading are 14% for our sample and 13% for Ritter's sample. Thus, our analysis indicates that Compustat's criteria primarily affects the composition of our sample of startup companies that go public.

We examine these two motivations by comparing the operating performance of two groups of established companies. We exclude firms with fewer than five years of operating history to reduce the effects of size and age of firms in this analysis. The first group is 33 offerings in which at least 50% of the shares offered were sold by current holders. The other group of 25 offerings has no secondary sales, but has substantial capital expenditures after going public. We define capital expenditures as substantial if cumulative expenditures in the first three years after the offering exceed one-half the size of the initial public offering.

The two groups experience quite different patterns of industry-adjusted operating performance. Offerings with a large secondary component have a median operating return that declines from 0.16 in the year before going public to 0.07 in the first full year after going public, and to an average of 0.05 in the first five years after going public. Median industry-adjusted operating performance is positive and statistically significant both before and after going public. In contrast, offerings with no secondary component and large capital expenditures are preceded and followed by median industry-adjusted operating returns that are not different from zero. There is no decline in median performance measures.

For the older companies the decline in operating performance around initial public offerings is associated with secondary sales rather than with capital expenditures. In fact, median capital expenditures in the two groups we examine are not statistically different. Thus, the difference in performance seems attributable to factors related to the sales of shares of current holders.

Offerings that include secondary sales appear to be timed to follow favorable operating performance that is not sustained after going public. It is also possible that earnings are managed prior to these offerings. Teoh et al. (1994), for example, provide evidence that suggests accounting numbers are manipulated upward before an initial public offering. An issue we do not address is whether the timing of initial public offerings actually benefits the selling shareholders and the other pre-offering shareholders of the issuing firm.[3]

7. Summary and conclusions

We investigate whether the operating performance of firms that go public is explained by changes in stock ownership by managers. Median operating income falls from 21 cents per dollar of assets in the year before going public to four cents per dollar of assets during the first five years of public trading. However, neither the level of performance after going public nor the change in

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[3] There is some provocative evidence on whether initial public offerings tend to be mispriced. Ritter (1991) and Loughran and Ritter (1995) report poor stock price performance following initial public offerings, and Jain and Kini (1994) report that shares of issuing firms are priced at high multiples that are not sustained after initial public offerings.

performance from before to after going public is related systematically to various measures of ownership by officers and directors and other blockholders, such as venture capitalists or parent corporations. We conclude that the changes in equity ownership that result from going public do not lead to changes in incentives that affect operating performance.

Our findings and conclusions contrast with those of Jain and Kini (1994) and Holthausen and Larcker (1996). Both sets of authors conclude that ownership is related to operating performance around initial public offerings. However, as we noted earlier, Jain and Kini (1994) do not directly measure management ownership. Their measure of management ownership is imputed from estimates of the post-offering stakes retained by pre-offering stockholders. In addition, their analysis consists only of a comparison of the average change in operating performance of firms grouped by whether post-offering stakes are above or below the sample median. We question whether their conclusions are robust to a more thorough investigation of the relation between performance and ownership.

Holthausen and Larcker (1996) study initial public offerings by companies that were formerly publicly traded and went private. Firms that undergo a reverse leveraged buyout tend to be larger and more mature than the firms in our sample. However, the pre-offering and post-offering ownership stakes of insiders are similar for their sample of reverse leveraged buyouts and our sample of initial public offerings. We do not know why the findings of the two studies differ, but the differences suggest that changes in ownership and incentive effects are more important for firms that have previously converted from public to private ownership than for firms that are going public for the first time.

Our evidence raises the question of why large declines in ownership stakes of officers and directors of firms that go public for the first time are unrelated to operating performance. One explanation is that managers' and other stockholders' interests are closely aligned because officers and directors continue to hold substantial ownership stakes in the first years of public trading. In addition, after becoming publicly traded, alternative forces, such as compensation linked to stock price, potentially substitute for the incentive benefits of large ownership stakes of managers.

Variation in operating performance after going public is explained mostly by the size and age of the companies and by the presence of secondary sales. The median performance of small and startup companies is significantly below the performance of industry-matched firms after going public, while larger and more established companies' median performance is not different from the performance of industry-matched firms. However, large and established companies experience significant declines in performance from before to after going public. The declines in performance appear to be associated primarily with offerings that include a large proportion of shares sold by current holders. We suspect that these declines in performance reflect the decision to go public following favorable performance rather than the consequences of changes in ownership.

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