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Abstract

We examine the relationship between CEO ownership and stock market performance of S&P 500 (S&P 1500) firms from 1994-2005 (1996-2005). We find that firms in which the CEO holds a considerable share of outstanding stocks outperform the market by up to 16% p.a. after controlling for traditional risk factors like size, book-to-market and momentum. This offers an explanation why so many CEOs hold a large fraction of their own company's stocks. They do so simply because it pays. We also examine several potential explanations why the existence of an owner CEO is not fully priced but leads to abnormal returns.

JEL-Classification Codes: G12, G30

Keywords: CEO-Ownership, Asset Pricing with large shareholders

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1 Introduction

CEOs and other top managers regularly own a significant fraction of the outstanding stocks of the firms they work for. In 2000, 18% of the CEOs of S&P 1500 firms hold 5% or more of their company's stocks. These holdings of own company stocks usually constitute a dominant fraction of the CEO's personal wealth. This pronounced voluntary portfolio concentration is puzzling, as it entails costs in terms of foregone diversification (Lambert, Larcker, and Verrecchia (1991) and Kahl, Liu, and Longstaff (2003)).

We offer a simple new explanation for this puzzle: Managers invest in their own firm because it is a good (long term) investment for them. To test this explanation, we empirically examine the following question: Do stocks of firms in which the CEO holds a large fraction of the firms' outstanding shares (owner CEOs) generate positive abnormal returns?

We analyze this question by examining the returns of S&P 500 (S&P 1500) firms for the period 1994 to 2005 (1996 to 2005). We document for the first time that portfolios consisting of firms with owner CEOs significantly outperform the market. For example, a value-weighted portfolio consisting of all S&P 500 (S&P 1500) firms in which the CEO holds more than 10% of the company's stocks delivers abnormal returns of 13% p.a. (12% p.a.). This result holds after controlling for the influence of the three Fama and French (1993) factors as well as the Jegadeesh and Titman (1993) momentum factor. We find similar evidence in a stock-level multivariate analysis that takes into account other firm-specific characteristics that might drive returns. Our

findings can explain why CEOs hold their own company's stocks by showing that it simply pays off for them to do so.

While our results help to understand why managers invest in their own firm, it is far more puzzling to understand why the market does not (or cannot) price the existence of an owner manager. The share of stocks owned by top executives is public information and easily observable for market participants. So, why is this information not immediately priced? This phenomenon can be explained by recent theoretical models of the stock market that depart from Walrasian equilibrium concepts in which the existence of an owner manager would be priced (employed e.g. by Admati, Pfleiderer, and Zechner (1994), and more recently by DeMarzo and Urosevic (2006)). Von Lilienfeld-Toal (2006) and Blonski and von Lilienfeld-Toal (2006) argue that prices cannot immediately reflect expected value enhancing activities of owner managers. If that would be the case, the manager could profit from the price increase right away by selling her stocks even before carrying out the value increasing activity and bearing the effort costs associated with this. Obviously, this can not be a rational equilibrium. However, other rational equilibria can exist in which the value enhancing effect of large shareholders is not fully reflected in the stock price. Consequently, these stocks are characterized by abnormal positive returns. Our results lend some empirical support to this line of reasoning. Similar effects are present in privately negotiated block trades as shown in Gorton and He (2006).

The question why CEOs are invested in their own firm has been discussed elsewhere in the literature and several answers are suggested. The most prominent is based on private benefits of control (see e.g. Jensen and Meckling (1976), Grossman and Hart (1980), Jensen (1986) and Morck, Shleifer,

and Vishny (1988)). If managers own a large fraction of the firm they work for, they can easily become entrenched and enjoy such private benefits of control. Usually, this is not in the interest of outside shareholders and will decrease firm value. Another possible solution to the managerial ownership puzzle is based on asymmetric information. Among others, Lakonishok and Lee (2001) and Lin and Howe (1990) argue that managers can time the market, since they are better informed than outside investors. In order to profit from this knowledge, they have to trade in their own firms stock. Finally, a new strand of literature argues that top-managers become overconfident with respect to their own abilities (Malmendier and Tate (2005)). This can also explain why they hold large equity stakes in their own corporation. All of these alternative explanations have in common, that they should lead to lower firm valuation or lower returns of firms with owner CEOs as compared to firms without owner CEOs. They are not consistent with higher returns of owner CEO firms.

The structure of this paper is as follows. In Section 2 we introduce the data and detail our methodology. Section 3 presents our main results, while Section 4 contains a discussion of these results and Section 5 concludes.

2 Empirical Study

2.1 Data

Our primary data sources are the Center of Security Prices (CRSP) monthly stocks database, the Compustat database and the Standard and Poor's Execucomp Database. Security prices and stock returns are taken from CRSP and accounting data are from Compustat. Additionally, we use the Exe-

cucomp data to gather information on shareholdings of the highest paid executives in each firm.[1]

Execucomp provides information on the highest paid officers for each firm that has been in the S&P 1500 index since the end of 1994. For S&P 500 firms, history goes back to the year 1992. Execucomp backfills data of firms that enter the S&P 1500 index for the first time. As a result, using the entire Execucomp database would create a survivorship bias. To avoid this problem, we limit ourselves to those firms that were members of the historical constituency lists of the S&P 500 and the S&P 1500 for the end of each year as taken from Compustat. Compustat provides the constitutency lists for the S&P 1500 index for the end of each years starting in 1994. The last year we use is 2003. We also employ subsamples where we only examine S&P 500 firms. In these cases we can use all firms that were members of the S&P 500 at the end of the years 1992 to 2003.

Matching the Execucomp data with the CRSP and the Compustat universe gives us ownership information for 15,600 firm years (97.5% of the theoretically maximum 16,000 firm years. The remaining firm years are missing due to matching problems)[2] from a total of 2,405 different firms.

The relevant data item in the Execucomp database is *Shrownpc* which gives the percentage of the firm's shares owned by an officer. Table 6

[1]This is usually the CEO. In rare cases, the highes paid executive is not the CEO. In order to avoid confusion and complexity of expressions, we use the term owner CEO and owner manager as synonyms for the officer with the higher fraction of firm ownership.

[2]To make sure that our results are not influenced by matching problems, we also employ the dataset described in Dlugosz, Fahlenbrach, Gompers, and Metrick (2006), which provides ownership information for 7,873 firm years between 1996-2001 from the Investor Responsibility Research Center (IRRC). Our main results using this alternative data source are very similar (see Table 5, Panel E).

describes the distribution of the fraction of the company's shares owned by the largest shareholder among the officers covered by Execucomp.

+ + + Please insert TABLE 6 about here + + +

Approximately one out of five S&P 500 firms have an officer who owns a positive amount of shares (Panel A). The fraction of S&P 500 firms that have a CEO who owns more than 5% of the firm's outstanding shares ranges from a low of 7% in 1992 to nearly 10% in 1999. There are substantially more owner CEOs within the S&P 1500 firm universe (Panel B). Approximately every second firm has a CEO who is invested in the firm and well above 10% of firms have a CEO who owns more than 5% of the firm in each sample year. There are only a few CEOs that own more than 50% of a S&P 1500 firm and there is only one instance in which a manager owns more than 50% of a S&P 500 firm.

2.2 Construction of Portfolios

We construct portfolios based on ownership data in order to test whether or not these portfolios would have earned abnormal returns.

Portfolios are constructed based on publicly available information about managerial ownership and are reset at the beginning of each year. For each year t, our initial full universe to choose frims from is the constituency list of the S&P 1500 (or S&P 500) at the end of year $t-2$. For example, a firm qualifies to be in a portfolio in the year 1994 if it was a member of the S&P 500 index at the end of 1992. Firms that were members of the S&P 500 at the end of 1992 filed their ownership data during 1993. By starting to invest

at the beginning of 1994, we make sure that the ownership information for the universe of investable firms is public information. Thus, all portfolios are constructed using public information only. This ensures that our results are not driven by announcements effects.

Using the methodology described above, we construct value- and equal-weighted portfolios consisting of firms in which the manager with the highest ownership owns more than a specific cutoff fraction of the company's stocks. We use 5%, 7.5%, 10%, 12.5% and 15% of managerial ownership as alternative cutoffs to define our test portfolios.

2.3 Factor Model

In estimating abnormal returns, we use the Carhart (1997) four factor model to adjust for the influence of the systematic risk factors of Fama and French (1993) and Jegadeesh and Titman (1993):

$$\begin{aligned} R_{i,t} - R_{b,t} &= \alpha_i + \beta_{i,M} \cdot (R_{M,t} - R_{F,t}) + \beta_{i,SMB} \cdot SMB_t \\ &\quad + \beta_{i,HML} \cdot HML_t + \beta_{i,WML} \cdot WML_t + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where the dependent variable is the excess return of portfolio i in month t, $R_{i,t}$, over the return of some benchmark in the same month, $R_{b,t}$. In our basic tests we will use the risk-free asset as benchmark, i.e. $R_{b,t} = R_{F,t}$. $R_{M,t} - R_{F,t}$ denotes the excess return of the market portfolio over the risk-free rate. SMB is the return difference between small and large capitalization stocks. HML is the return difference between high and low bock-to-market stocks. WML is the return difference between stocks with high past returns

and stocks with low past returns.[3]

The market portfolio and the SMB, HML and WML factors are based on the entire CRSP universe of stocks. We first want to make sure that Model (1) captures the relevant risk factors for our universe of investable stocks which consists of all S&P 500 and S&P 1500 stocks, respectively. Therefore, we analyze whether it correctly prices portfolios containing all of these stocks. If the model is correctly specified, the intercept α_i in (1) should not be statistically significant different from zero.

The S&P 1500 value-weighted returns starts at the beginning of year 1996. In contrast, the S&P 500 returns are reported for the time period starting at the beginning of 1994. Both end in December 2005. The asymmetric treatment of the two indices is due to data availability (see Section 2.1). This asymmetric treatment of S&P 500 firms and S&P 1500 firms is maintained throughout the paper. Estimation results for portfolios consisting of all S&P 500 and S&P 1500 stocks, respectively, are presented in Table 2.

+ + + Please insert TABLE 2 about here + + +

They show that regressing both, equal and value-weighted returns, on the four factors yields no abnormal returns if our entire firm universe is used. This suggests that Model (1) generally captures all relevant and priced factors for our universe and it can be used to analyze portfolios consisting

[3]The market, the size, and the value portfolio returns were taken from Kenneth French's Web site: `http://mba.tuck.dartmouth.edu/pages/faculty/ken.french`, while the momentum factor was kindly provided by Mark Carhart.

of stocks that belong to this universe.

3 Managerial Ownership and Stock Market Performance

To test for the expected positive relationship between percentage share of stocks owned by the manager and stock market performance, we employ two alternative approaches. We start by examining portfolios that only include firms in which the percentage of firms held by officers exceeds a certain threshold. We then analyze the profitability of a strategy going long in these portfolios and at the same time short in portfolios consisting of all stocks with no managerial stock ownership. Finally, we explore the robustness of our results by looking at subsamples and different methodological approaches.

3.1 Portfolio Evidence: Long Only Portfolios

Table 3 reports the estimation results for value-weighted and equal-weighted portfolios for various cutoffs of managerial ownership.

+ + + Please insert TABLE 3 about here + + +

In Panel A, the results for value-weighted portfolios of S&P 1500 firms for various cutoffs of managerial ownership over the period 1996 to 2005 are presented. For a cutoff of 5%, we find a positive estimate for α_i that is statistically significant at the 5%-level. We find abnormal monthly returns of 0.68%, which translates into an annual abnormal return of 8.52%. This

is economically significant. The result becomes even stronger if we examine portfolios with higher cutoffs for managerial ownership. It increases to abnormal returns of 12.1% p.a. for a cutoff of 10% and to over 16% for a cutoff of 15%.[4] For these higher cutoffs, abnormal returns are statistically significant at the 1%-level.

These results carry over to the S&P 500 firm universe, where we can examine the longer period from 1994 to 2005 (Panel B). In this case, we find abnormal returns of 9.73% p.a. for the 5% cutoff and abnormal returns of 13.2% p.a. for the 10% cutoff. With the exception of the 15%-cutoff, the effect is always slightly stronger than for the S&P 1500 firms in Panel A.

Results for equal-weighted managerial ownership portfolios based on the S&P 500 and S&P 1500 universe are presented in Panel C and Panel D, respectively. Again, we find similar, albeit somewhat weaker results. For S&P 1500 firms and a cutoff of 10% we find abnormal returns of 4.7% p.a. This number is smaller than for the value-weighted portfolios, but still economically and statistically highly significant. For S&P 500 firms the effect is stronger. For a cutoff of 10% abnormal returns amount to 6.9% p.a.

For equal-weighted returns, abnormal returns of the managerial ownership portfolios are always clearly higher for the S&P 500 firm universe than for the S&P 1500 firm universe.

Our results for the equal-weighted portfolios suggest that the abnormal returns of high managerial ownership portfolios is not solely driven by a few firms with a very high market capitalization.

[4]We do not report results for higher cutoffs, as the number of firms that enter our portfolio gets very small in these cases. For cutoffs like e.g. 25% or higher we are not able to find any statistically significant coefficients anymore.

Overall, these results are highly significant in economic as well as statistical terms. They suggest that one would have earned abnormal returns of well above 10% p.a. by investing in firms with high managerial ownership solely based on public information.

3.2 Portfolio Evidence: Difference Portfolios

We now examine a strategy of going long in managerial ownership portfolios and at the same time short in non-managerial ownership portfolios. Thus, we re-estimate Model (1), where we set $R_{b,t}$ equal to the return of the non-managerial ownership portfolio. Although the results for the long only strategy presented above are already significant, we examine difference portfolios because this a standard approach in empirical asset pricing and allows us to test the stability of our results and relate them to comparable studies also using long-short portfolios. Results are presented in Table 4.

+ + + Please insert TABLE 4 about here + + +

They confirm our results for the long-only portfolios. We find abnormal returns of up to 15.5% p.a. (value-weighted managerial ownership portfolio for 15% cutoff, S&P 1500 firms). With the exception of equal-weighted portfolios based on S&P 1500 firms (Panel C), abnormal returns are usually statistically significant at the 1% or 5% level. The extent of the abnormal returns are generally not higher than for the long-only strategy.

Thus, for an investor trying to exploit the documented effect, it makes more sense to follow a long-only strategy, because the long-only strategy incurs no short-selling costs. Furthermore, these results show that investors

who are not allowed to short-sell could also profit from abnormal returns of managerial ownership firms in the past.

3.3 Robustness Checks

We employ several robustness checks to test the stability of our results. The empirical results for all of these robustness checks can be found in Table 5.

+ + + Please insert TABLE 5 about here + + +

They are reported for the long-only strategy based on the S&P 1500 universe, but generally also hold for the S&P 500 universe.

3.3.1 Constant Portfolio Size

The incentives of a manager to work hard and increase a firm's value are primarily determined by the absolute value of her shareholdings.[5] This is the reason why we mainly focus on portfolios in which thresholds of shareholdings are used as the most important selection criterium. Nevertheless, some objections may be raised to use specific thresholds since this creates portfolios that differ over time with respect to the number of firms included. To counter these objectives, we also construct portfolios using the rank of firms with respect to the shareholdings of the officer with the highest managerial

[5]To give a precise measure of the manager's incentives, this number alternatively could also be related to the manager's overall personal wealth. Unfortunately, we do not have information on the manager's personal wealth outside the firm. However, especially for the large shares of managerial ownership of 5% or more of the whole company, it is very likely that the investment in the own firm clearly dominates the personal portfolio.

ownership.

To construct these alternative portfolios we proceed as follows. In a first step, we order the S&P 1500 firms within each year according to the shareholdings of the officer with the highest managerial ownership. We assign the rank 1 to the firm with the highest managerial ownership of an officer. The firm with the second largest managerial ownership of an officer gets the rank 2, and so forth. Each firm only enters the portfolio once. Now, we form portfolios consisting of all firms with rank 1 to 100 and with rank 1 to 250, respectively. Panel A in Table 5 shows that these portfolios also produce similar abnormal returns than the ones using percentage shareholdings as cutoff. However, the statistical significance is slightly reduced to the 5% level. With abnormal returns of 12.0% p.a. and 8.8% p.a. for the rank 1-100 and rank 1-250 value-weighted portfolios, respectively, these results are still highly economically significant. For the equal-weighted portfolios, only the rank 1-100 portfolio generates statistically significant and still economically meaningful abnormal returns of 3.9% p.a.

Overall, it appears that the abnormal returns documented above are not driven by differing portfolio size. Nevertheless, from an economic point of view, absolute values of shareholdings are a better selection criterium for portfolios if one wants to capture the incentives managers face. This might explain, why they deliver somewhat stronger results.

3.3.2 Industry Adjusted Returns

It is possible that the abnormal returns are not caused by managerial ownership but rather by an unequal industry distribution of firms with high managerial ownership and firms with low managerial ownership. As managerial

ownership indeed is not equally distributed across all industries, adjusting firm returns by industry returns will capture some of the positive effect of managerial ownership on stock returns. However, as firms with managerial ownership are not completely concentrated in a few industries, we still expect positive albeit smaller abnormal returns for our managerial ownership portfolios even after industry-adjustment.[6] Results for the industry-adjusted portfolios are presented in Panel B of Table 5.

For value-weighted portfolios with cutoffs of 5% and 10%, we still find statistically significant abnormal returns of 7.9% p.a. and 11.5% p.a., respectively. Looking at equal-weighted portfolios, results are much weaker. We still find positive coefficients, however they are economically small (1.5% p.a. abnormal returns for the 10% cutoff) and not statistically significant. This supports the idea that industries capture some of the managerial ownership effect on returns, because some industries are more heavily populated by firms with high managerial ownership than others. However, even after taking this effect into account, we can still document some significant abnormal returns at least for value-weighted portfolios.

3.3.3 No Rebalancing

The results presented so far are based on a strategy that requires annual rebalancing. Naturally, this causes some trading costs. However, managerial

[6] We carry out the industry-adjustment by subtracting the industry return from each individual firm return before constructing our portfolios. Economically, the managerial ownership portfolios then consist of the same stocks as before. Additionally, for each firm there is an industry hedge term. It essentially is a short position in a portfolio consisting of all stocks in the same industry as the firm and which is equal in size as the stock's weight in the portfolio.

ownership is relatively stable over time, so portfolios do not change completely over time. This reduces potential trading costs. Furthermore, S&P 1500 stocks are usually quite liquid (and S&P 500 stocks even more so). This suggests that the profits documented above do not vanish when taking trading costs into account. Nevertheless, as an alternative approach, we also examine the returns of a completely passive buy and hold strategy. We consider a portfolio that buys into all 1996 firms with an owner manager who owns more than 10% without any additional readjustments in the following years. The monthly (annual) abnormal return of this portfolio amounts to approximately 0.91% (11.44%) and 0.44% (5.35%) for the value-weighted and equal-weighted portfolio, respectively. Significance drops to the 5% level (Panel C). Similar results are obtained for the 5%-cutoff for managerial ownership. This shows that even a simple low-cost buy and hold strategy based on managerial ownership in 1996 would have earned abnormal returns that are significant in statistical as well as in economic terms.

3.3.4 Treatment of Missing Returns

Shumway (1997) argues, that some asset pricing anomalies could be caused by problems due to missing returns for some months and firms in the CRSP database. Firms with missing returns are usually excluded when constructing portfolios. To check whether the abnormal returns we find are due to these exclusions, we replace every missing return with -1 and include the respective stock in our portfolio if it qualifies. A return of -1 constitutes the worst case scenario and implies that the stock of a firm becomes worthless altogether. Results for this extreme assumption are presented in Panel D of Table 5.

The results for the value-weighted portfolios are unaffected. The portfolio return for the 10% cutoff still produces monthly alphas of 0.9% that are statistical significant at the 1% level, while a portfolio consisting of all stocks delivers no significant abnormal returns (Column 'MissRet All'). Looking at equal-weighted returns, a portfolio consisting of all stocks now delivers significantly negative abnormal results. This can be explained by the fact that return observations are more often missing for smaller, less prominent firms than for larger firms. Their influence is much stronger when analyzing equal-weighted portfolios than when looking at value-weighted portfolios. This also explains, why we find no significant positive abnormal returns for equal-weighted managerial ownership portfolios. However, it is still the case that the 10% equal-weighted portfolio delivers significantly higher returns than the equal-weighted portfolio consisting of all stocks in our universe. This shows, that the critique of Shumway (1997) does not apply in our case. Our results are not driven by the influence of missing return observations.

3.3.5 Alternative Sample

While merging our different data sources, some firms could not be matched (see Section 2.1). Although the number of non-matched firms is very small, theoretically this could create some kind of selection bias. To control for this, we alternatively use data from Dlugosz, Fahlenbrach, Gompers, and Metrick (2006) (DFGM).[7] They provide ownership information on 7,873 firm years over the time period from 1996 to 2001. Their database is drawn from the universe of firms covered by publications of the Investor Responsibility

[7]We thank Andrew Metrick for providing this data on his webpage `http://finance.wharton.upenn.edu/ metrick/data.htm`.

Research Center (IRRC). DFGM provide information on all blockholders, i.e. large shareholders of firms that own more than 5%. Apart from the name and the shareholdings, DFGM also characterize the blockholders as officers, if they were officers of the corresponding firm in the respective year. We use these two information, ownership and whether or not the blockholder is also an officer of the firm. We construct portfolios similar to the procedure employed above.[8] Since DFGM data covers a substantially shorter sample period, we consider two different time periods. The short time period are the years 1996 to 2001, that are also used by DFGM. Alternatively, we also analyze the longer time period from 1996 to 2004 by assuming that ownership levels stay constant from 2001 to 2004. Results in Panel E of Table 5 show results that are very similar to the ones presented above using our sample. They are even somewhat stronger. For example, the 10% cutoff (value-weighted) portfolio now generates abnormal returns of 15.17% p.a. for the period from 1997 to 2005. This number is even higher at 23.70% p.a. for the 1997 to 2002 period. Although statistically significant at the 1% level, this very large number has to be treated with some caution as it is based on a very short investment horizon. Nevertheless, these results suggest that the abnormal returns are not due to data problems and carry over to other data sources.

[8]There are some necessary adjustments. The data of DFGM are somewhat differently organized. Each firm of their 1996 sample issues ownership information during the year 1996. As a result, all ownership information of the 1996 firms was public information by the beginning of the year 1997. Consequently, our portfolios invest in firms of the DFGM year t at the beginning of year $t + 1$.

4 Multivariate Analysis

Brennan, Chordia, and Subrahmanyam (1998) report several firm individual characteristics that can drive returns and are not captured by the four factor model employed above. In order to explore whether such firm characteristics might drive returns of firms with high managerial ownership and thus explain our results, we also run multivariate Fama and MacBeth (1973) regressions. In these regressions we relate monthly raw and industry-adjusted returns of firms to managerial ownership and further firm-specific characteristics. We estimate the following regression separately for each month in our sample of S&P 1500 firms:

$$R_{i,t} = \alpha_i + \beta_{i,1} \cdot Shrown + \beta_{i,2} \cdot D(X\%) + \beta_{i,3} \cdot F_{i,t} + \varepsilon_{i,t}, \qquad (2)$$

where $R_{i,t}$ denotes the return (raw or industry adjusted) of firm i in month t, $Shrown$ is the maximum share of the company's stock owned by an officer, $D(X\%)$ is a dummy variable that takes on the value 1, if $Shrown$ is larger than $X\%$, and $F_{i,t}$ is a vector of firm characteristics. It includes the firm characteristics examined in Brennan, Chordia, and Subrahmanyam (1998), five-year sales growth and S&P 500 inclusion.[9] Final parameter values are given by the mean and statistical significance is determined by the

[9] These variables are also used in Gompers, Ishii, and Metrick (2003). A detailed description are given in their Appendix 2. Date on the governance index G are taken from Andrew Metrick's webpage `http://finance.wharton.upenn.edu/ metrick/data.htm`. Gompers, Ishii, and Metrick (2003) also use institutional ownership as control variable. We do not have this data item available. However, in Gompers, Ishii, and Metrick (2003), the influence of institutional ownership is never significant. Thus, we do not expect that this omission influences our results.

time series standard deviation of these monthly estimates. Table 6 summarizes the results.

+ + + Please insert TABLE 6 about here + + +

Panel A presents results for raw returns. Column (1) gives the results of an estimation where we do not include any dummy variable $D(X\%)$. The influence of managerial ownership is positive, but not statistically significant. This may be due to the large number of firms where the officer with the highest managerial ownership only owns a very small fraction of the company's stocks (see Table 6). In these instances, incentives to engage in value-enhancing efforts are too small. Including dummy variables delivers more meaningful results. In Columns (2) and (3) results including dummies for managerial ownership of at least 5% and 10%, respectively, are presented. While the influence of the 5% dummy is small and insignificant, the influence of the 10% dummy is large in economic terms. The point estimate of 0.65 indicates, that firms where one officer owns at least 10% of the company's shares deliver annual abnormal returns of 8.04%. The influence of the 10% dummy is significant at the 5% level. Panel B summarizes results using industry adjusted returns as dependent variable. Consistent with the results from the portfolios approach, abnormal returns are slightly lower now, but still economically significant. Again, while the influence of the 5% dummy is positive but not significant, the 10% dummy is statistically significant at the 5%-level. Overall, these results show, that firms with a manager that owns a large fraction of the company's stocks outperform other firms even after controlling for the influence of other firm characteristics. This confirms our results from the portfolio strategies presented in Section 3.

5 Discussion of Results

In what follows, two main questions will be discussed: Why do managers voluntarily own shares of their firm? Is there an explanation for the reported abnormal stock returns?

5.1 Compensation for Effort

Recent theories of asset pricing with a large shareholder offer a possible rationale for our empirical findings. Gorton and He (2006), von Lilienfeld-Toal (2006) and Blonski and von Lilienfeld-Toal (2006) discuss the implications of a large and value increasing shareholder for asset pricing. In their models they depart from the traditional Walrasian equilibrium concept employed in earlier studies (see, e.g., Admati, Pfleiderer, and Zechner (1994), and DeMarzo and Urosevic (2006)).

It is argued that the existence of a large and value increasing shareholder cannot be priced in equilibrium. The fundamental problem occurs because, by exerting value increasing effort, the owner manager produces a kind of public good for all investors in this firm. While all outside investors profit from the value increasing activity the owner manager may undertake, it is the owner manager alone who has to bear the (private) effort costs. Moreover, owner managers must bear additional private costs due to holding an undiversified portfolio. As a result, the owner manager has strong incentives to sell shares whenever the share price anticipates the equilibrium level of her value increasing effort. In this case, selling the shares would be optimal for the manager, because she can benefit from the risen stock price, which then would already reflect her future value-increasing effort, without really

having to bear the costs of this effort. Clearly, this situation can not be an equilibrium.

In contrast, it may constitute a Nash equilibrium if shares trade below their expected equilibrium value. In this equilibrium, outside investors fear to bid up the share price to its expected equilibrium value because bidding up the price will trigger the owner manager to sell her shares. If the owner manager sells her shares, she will not undertake the value increasing activity due to the private effort costs associated with it, the equilibrium value will not be realized, and the ex post value of the shares will be below the equilibrium value. As a result, it may be in the interest of all investors not to bid up the share price but to trade below the equilibrium value. If shares are consistently traded below the equilibrium value, long run positive abnormal returns are the consequence.

Two observations are useful to distinguish this line of arguments from other possible explanations.

1. Value increasing large shareholder

   It is necessary that the owner manager is a value increasing large shareholder. Recent empirical evidence suggest that an increase in the shareholdings of a CEO increases firm value (Aggarwal and Samwick (2003)). Interpreting CEOs as *value increasing* large shareholders is hence in line with findings of previous empirical studies.

2. Rational equilibrium behavior

   The empirical prediction of the argument is that firms with a value increasing large shareholder will be characterized by abnormal returns in a *rational equilibrium*, because her existence can not be fully priced.

Following this line of reasoning, abnormal returns should be more important in 'more rational' markets. The abnormal returns we find do not vanish for the S&P 500 subsample and even tend to be more distinct for the S&P 500 than for the S&P 1500. While both markets are generally viewed as quite efficient, S&P 500 firms are often characterized by a larger fraction of institutional investors than S&P 1500 firms. Institutional investors are usually more rational than retail investors (see, e.g., Boehmer and Kelley (2005)). Consequently, we can not reject the hypothesis that abnormal returns are more important in more rational markets.

5.2 Alternative explanations

There are other arguments that may explain why CEOs invest in their own firm or why the presence of an owner-manager is not priced. Since we do not find empirical evidence supporting these arguments, we only offer a short discussion.

5.2.1 Private benefits of control

CEOs may invest in their firm because of private benefits of control. If they own a significant fraction of their firm's shares, they can become entrenched and eventually consume private benefits of control. Thus, it may be in their self interest to invest in their firm. Following this argument, firm value should decrease if a CEO is substantially invested in a firm. The argument does not imply that this cannot be priced: the value decreasing effect of the CEO should be anticipated, the shares should be priced at a discount and long term abnormal returns for these firms should be zero. This contra-

dicts evidence from earlier studies documenting higher firm values of firms where the CEO owns a large fraction of the company's shares than of other companies (see, e.g., Aggarwal and Samwick (2003)) as well as our result of positive abnormal returns for these firms.

5.2.2 Overconfidence

Malmendier and Tate (2005) show that CEOs are often prone to overconfidence. If they are overconfident with respect to their own abilitiy to increase firm value, they may heavily invest in their own firm. However, overconfident CEOs often undertake too risky or even negative NPV projects. Consequently, this hurts firm value. Even though overconfidence may reduce firm value, the existence of owner managers should be priced. Then, it should have no influence on stock returns which is not consistent with our results.

5.2.3 Asymmetric Information

Insiders of firms are often better informed as far as firm value is concerned. Hence, it may be in the interest of the CEO to trade in her firm's stock if she has access to private information. However, our trading strategy does not make use of any private information. The ownership information is always public and should be priced. This line of argument may explain why CEOs trade in their own company's shares. However, it can not explain why CEO ownership leads to abnormal returns.

5.2.4 Liquidity and Liquidity Risk

Liquidity and liquidity risk are important factors determining asset prices. Amihud and Mendelson (1986a) show theoretically, that illiquid stocks

should deliver higher returns. There is broad empirical evidence supporting this prediction (see, e.g., Amihud and Mendelson (1986b), Brennan and Subrahmanyam (1996), Brennan, Chordia, and Subrahmanyam (1998)). Moreover, as shown by Pástor and Stambaugh (2003), not only the level of liquidity but also systematic liquidity risk is priced. While the size factor captures most of the effect of the level of liquidity on asset prices, it is likely that the four-factor model used in this paper not fully captures the influence of liquidity risk. However, Pástor and Stambaugh (2003) report that liquidity risk is more important for smaller firms. Thus, if the abnormal returns documented above would be a remuneration for low levels of liquidity or for liquidity risk, we would expect that abnormal returns are more pronounced for the smaller firms in our samples. However, the abnormal returns we find in the portfolio analysis are usually more pronounced for S&P 500 firms than for S&P 1500 firms. This suggests that the abnormal returns are not (only) caused by illiquidity or liquidity risk, because the stocks in the S&P 1500 are clearly smaller than those in the S&P 500. Furthermore, in our multivariate analysis we control for firm size and trading volume which can be interpreted as proxies for liquidity risk and the level of liquidity. While it would be preferable to add more elaborate proxies for liquidity and liquidity risk as control variables in our multivariate examinations, lack of data availability refrains us from doing so. However, the level of the abnormal returns we document seem to be too high to be possibly explained by a renumeration for liquidity or liquidity risk, especially in the case of S&P 500 stocks.

5.2.5 Market Inefficiency

The abnormal returns may be a sign of market inefficiency. This explanation is not well in line with two characteristics of our results. First of all, the results are usually most pronounced for the S&P 500. If the abnormal returns were caused by some kind of inefficiency, we would expect to observe smaller abnormal returns in more efficient markets like the S&P 500 as compared to the S&P 1500. Furthermore, our results are based on a long term investment strategy. This would imply that the market is not only inefficient on a short term notion, but that the market also does not learn from the mistakes once made.

Overall, these explanations are not supported by the data. In contrast to this, the theoretical argumentation that abnormal returns are a remuneration for effort costs and diversification costs of CEOs cannot be rejected with our empirical results.

6 Conclusion

We examine the abnormal returns of portfolios constructed based on public information about managerial ownership. We find that value-weighted portfolios consisting of S&P 500 stocks in which the respective CEO holds more than 5% or 10% of the firms outstanding share generate statistically and economically significant abnormal returns of 9.7% p.a. and 13.2% p.a., respectively. For S&P 1500 firms the effect is only slightly smaller, with abnormal returns of 8.5% p.a. and 12.1% p.a. for a 5% and 10% cutoff of managerial ownership, respectively.

These abnormal returns are achieved after controlling for factors known

to drive asset returns like size, book-to-market and momentum. Our results are robust and hold for equal-weighted as well as industry adjusted returns. They also hold after controlling for further firm specific characteristics in a multivariate setting.

Our findings provide a rational for the puzzling observation that CEOs often hold a large fraction of their own firm despite the costs of the under-diversification of their personal portfolio this often implies: It simply pays.

The results presented in this study are consistent with some recent theoretical models of the stock market deviating from the traditional Walrasian equilibrium concepts employed in earlier models. Gorton and He (2006), von Lilienfeld-Toal (2006) and Blonski and von Lilienfeld-Toal (2006)model the stock market using game-theoretic equilibrium concepts. These new models predict that managerial ownership of value enhancing managers can not be fully reflected in prices. Otherwise, managers would have no incentives to exert effort anymore but would rather sell their shares right away. Other potential explanations for abnormal returns of owner CEO firms like market inefficiencies or liquidity concerns are not able to explain our findings.

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Table 1: CEO Ownership

This table reports the number of firms, as a function of the shareholdings of the largest owner manager. The number of all firms in our dataset in the respective year are reported in the "total" rows.

Panel A: S&P 500 Index

Year shown	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
total	478	488	488	485	490	490	487	494	489	495	498	499
>0%	96	129	137	109	107	116	121	140	157	159	159	168
>5%	33	39	37	38	37	41	42	47	45	43	37	35
>10%	19	22	23	24	25	28	30	32	30	30	24	19
>15%	11	13	14	15	15	16	18	16	13	14	11	9
>20%	9	8	7	10	9	8	9	8	6	5	5	4
>25%	3	3	2	2	1	2	3	2	3	3	4	3
>30%	1	2	2	1	1	1	2	2	2	3	4	1
>50%	0	0	0	0	0	0	0	0	0	0	1	0

Panel B: S&P 1500 Index

total			1468	1462	1472	1452	1451	1452	1463	1480	1479	1455
>0%			798	760	755	748	744	801	856	825	868	864
>5%			295	279	261	254	256	270	261	232	217	195
>10%			187	177	164	159	163	174	165	143	131	117
>15%			114	109	100	101	105	113	102	87	78	69
>20%			77	81	67	64	64	71	68	57	50	43
>25%			49	47	39	41	41	51	46	36	33	27
>30%			26	26	26	27	29	32	25	22	20	18
>50%			3	3	2	2	0	1	2	0	3	3

Table 2: Results All Firms

This table describes estimation results for value-weighted portfolio returns (Panel A) and for equal-weighted portfolio returns (Panel B) of all S&P 500 and S&P 1500 firms, respectively, using the four factor Model (1) as described in the main text. Alphas are on a monthly basis. Standard errors are in parenthesis. ***, ** and * indicate significance at the one, five and ten percent level, respectively.

Panel A: Value-Weighted Portfolios

Portfolio	α	RMRF	SMB	HML	Momentum	R2	R2adj	Observations
S&P 1500	0.08	0.928***	-0.071***	0.009	-0.039***	0.965	0.963	120
	(0.083)	(0.02)	(0.021)	(0.027)	(0.012)			
S&P 500	0.132	0.903***	-0.12***	-0.029	-0.048***	0.948	0.947	144
	(0.085)	(0.022)	(0.023)	(0.029)	(0.013)			

Panel B: Equal-Weighted Portfolios

Portfolio	α	RMRF	SMB	HML	Momentum	R2	R2adj	Observations
S&P 1500	0.164	1.068***	0.426***	0.567***	-0.128***	0.935	0.933	120
	(0.127)	(0.03)	(0.032)	(0.041)	(0.018)			
S&P 500	0.177	0.983***	0.218***	0.412***	-0.149***	0.876	0.873	144
	(0.143)	(0.036)	(0.039)	(0.049)	(0.022)			

Table 3: Managerial Ownership Portfolios

This table describes estimation results of the four factor model Model (1) as described in the main text for value-weighted (Panels A and B) and equal-weighted (Panels C and D) managerial ownership portfolios. Portfolios are constructed based on the fraction of the firm's outstanding shares owned by the officer with the highest managerial ownership. The cutoff for managerial ownership of the respective portfolio is based on the Execucomp data-item *shrownpc* and is given in the first column. Stocks are selected from the S&P 1500 (Panels A and C) and from the S&P 500 (Panels B and D) universe. Alphas are on a monthly basis. Standard errors are in parenthesis. ***, ** and * indicate significance at the one, five and ten percent level, respectively.

Panel A: Value-Weighted, S&P 1500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
>5	0.684**	1.112***	-0.136*	-0.396***	-0.043	120
	(0.283)	(0.068)	(0.072)	(0.092)	(0.039)	
>7.5	0.809***	1.118***	-0.188**	-0.47***	-0.05	120
	(0.308)	(0.074)	(0.079)	(0.1)	(0.043)	
>10	0.953***	1.115***	-0.239***	-0.547***	-0.034	120
	(0.339)	(0.081)	(0.087)	(0.11)	(0.047)	
>12.5	1.121***	1.201***	-0.211**	-0.546***	-0.039	120
	(0.385)	(0.093)	(0.099)	(0.125)	(0.054)	
>15	1.261***	1.163***	-0.185*	-0.566***	-0.04	120
	(0.42)	(0.101)	(0.107)	(0.136)	(0.059)	

Panel B: Value-Weighted, S&P 500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
>5	0.777**	1.031***	-0.277***	-0.59***	-0.085*	144
	(0.314)	(0.079)	(0.086)	(0.108)	(0.047)	
>7.5	0.893***	1.033***	-0.317***	-0.649***	-0.091*	144
	(0.335)	(0.085)	(0.092)	(0.115)	(0.051)	
>10	1.038***	1.023***	-0.356***	-0.725***	-0.073	144
	(0.362)	(0.091)	(0.1)	(0.124)	(0.055)	
>12.5	1.199***	1.11***	-0.31***	-0.728***	-0.084	144
	(0.41)	(0.104)	(0.113)	(0.141)	(0.062)	
>15	1.038***	1.023***	-0.356***	-0.725***	-0.073	144
	(0.362)	(0.091)	(0.1)	(0.124)	(0.055)	

Table 3: (continued)

Panel C: Equal-Weighted, S&P 1500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
>5	0.238	1.075***	0.521***	0.579***	-0.119***	120
	(0.159)	(0.038)	(0.041)	(0.052)	(0.022)	
>7.5	0.32*	1.065***	0.5***	0.57***	-0.119***	120
	(0.169)	(0.041)	(0.043)	(0.055)	(0.024)	
>10	0.381**	1.06***	0.469***	0.536***	-0.111***	120
	(0.166)	(0.04)	(0.043)	(0.054)	(0.023)	
>12.5	0.383**	1.054***	0.468***	0.539***	-0.11***	120
	(0.168)	(0.04)	(0.043)	(0.054)	(0.023)	
>15	0.331*	1.088***	0.462***	0.539***	-0.139***	120
	(0.176)	(0.042)	(0.045)	(0.057)	(0.025)	

Panel D: Equal-Weighted, S&P 500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
>5	0.257	1.062***	0.181***	0.343***	-0.154***	144
	(0.173)	(0.044)	(0.048)	(0.059)	(0.026)	
>7.5	0.433**	1.053***	0.12**	0.285***	-0.167***	144
	(0.178)	(0.045)	(0.049)	(0.061)	(0.027)	
>10	0.554***	1.027***	0.117**	0.193***	-0.116***	144
	(0.19)	(0.048)	(0.052)	(0.065)	(0.029)	
>12,5	0.606***	1.042***	0.146**	0.19***	-0.135***	144
	(0.206)	(0.052)	(0.057)	(0.071)	(0.031)	
>15	0.554***	1.027***	0.117**	0.193***	-0.116***	144
	(0.19)	(0.048)	(0.052)	(0.065)	(0.029)	

Table 4: Difference Portfolios

This table describes estimation results of the four factor model Model (1) as described in the main text for value-weighted (Panels A and B) and equal-weighted (Panels C and D) difference portfolios. They consist of a long position in a managerial ownership portfolio and a short position of all firms with no managerial ownership. The managerial ownership portfolios are constructed based on the fraction of the firm's outstanding shares owned by the officer with the highest managerial ownership. The cutoff for managerial ownership of the respective portfolio is based on the Execucomp data-item *shrownpc* and is given in the first column. Stocks are selected from the S&P 1500 (Panels A and C) and from the S&P 500 (Panels B and D) universe. Alphas are on a monthly basis. Standard errors are in parenthesis. ***, ** and * indicate significance at the one, five and ten percent level, respectively.

Panel A: Value-Weighted, S&P 1500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
> 5	0.629**	0.259**	-0.052	-0.438***	0.012	120
	(0.338)	(0.081)	(0.087)	(0.110)	(0.047)	
> 7.5	0.754***	0.265***	-0.104	-0.512***	0.005	120
	(0.361)	(0.087)	(0.093)	(0.117)	(0.050)	
> 10	0.897***	0.262***	-0.155	-0.589***	0.022	120
	(0.390)	(0.094)	(0.100)	(0.126)	(0.054)	
> 12.5	1.065***	0.348***	-0.127	-0.588***	0.016	120
	(0.436)	(0.105)	(0.112)	(0.141)	(0.061)	
> 15	1.206***	0.310***	-0.101	-0.608***	0.015	120
	(0.470)	(0.113)	(0.120)	(0.152)	(0.066)	

Panel B: Value-Weighted, S&P 500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
> 5	0.667*	0.177*	-0.168*	-0.611***	-0.029	144
	(0.355)	(0.090)	(0.098)	(0.122)	(0.054)	
> 7.5	0.784**	0.179*	-0.208**	-0.671***	-0.035	144
	(0.375)	(0.095)	(0.103)	(0.129)	(0.057)	
> 10	0.928**	0.169*	-0.248**	-0.747***	-0.017	144
	(0.401)	(0.101)	(0.110)	(0.137)	(0.060)	
> 12.5	1.090**	0.256**	-0.202	-0.750***	-0.028	144
	(0.450)	(0.114)	(0.124)	(0.154)	(0.068)	
> 15	0.928**	0.169*	-0.248*	-0.747***	-0.017	144
	(0.401)	(0.101)	(0.110)	(0.137)	(0.060)	

Table 4: (continued)

Panel C: Equal-Weighted, S&P 1500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
> 5	0.116	0.106**	0.199***	0.051	-0.003	120
	(0.170)	(0.041)	(0.044)	(0.055)	(0.024)	
> 7.5	0.198	0.095**	0.178***	0.041	-0.003	120
	(0.170)	(0.041)	(0.043)	(0.055)	(0.024)	
> 10	0.259	0.090**	0.147***	0.007	0.004	120
	(0.173)	(0.042)	(0.044)	(0.056)	(0.024)	
> 12.5	0.260	0.085*	0.146***	0.010	0.006	120
	(0.179)	(0.043)	(0.046)	(0.058)	(0.025)	
> 15	0.209	0.118**	0.140***	0.010	-0.023	120
	(0.194)	(0.047)	(0.050)	(0.063)	(0.027)	

Panel D: Equal-Weighted, S&P 500

Shrown	α	RMRF	SMB	HML	Mom.	Obs.
> 5	0.067	0.127***	-0.023	-0.058	-0.022	144
	(0.168)	(0.042)	(0.046)	(0.058)	(0.025)	
> 7.5	0.243	0.118***	-0.084*	-0.117*	-0.035	144
	(0.176)	(0.044)	(0.048)	(0.060)	(0.027)	
> 10	0.364*	0.092*	-0.088*	-0.209***	0.016	144
	(0.189)	(0.048)	(0.052)	(0.065)	(0.029)	
> 12.5	0.416**	0.107**	-0.059	-0.212***	-0.003	144
	(0.203)	(0.051)	(0.056)	(0.070)	(0.031)	
> 15	0.364*	0.092*	-0.088*	-0.209***	0.016	144
	(0.189)	(0.048)	(0.052)	(0.065)	(0.029)	

Table 5: Robustness Checks

This table describes reports monthly α estimates in % from Model (1) as described in the main text. In all panels, we report results from value- as well as equal weighted portfolios based on the original universe of all S&P 1500 firms. In Panel A, portfolios are constructed based on the rank of the managerial ownership of that officer with who owns the highest fraction of the firm's outstanding shares. We examine portfolios consisting of the 100 and 200 firms with the highest managerial ownership, respectively. In Panel B, results for industry adjusted managerial ownership portfolios with a cutoff of 5% managerial ownership and 10% managerial ownership are presented. Panel C presents the results from buy-and-hold strategies, where the portfolio was set up in 1996 and not readjusted. We examine a buy-and-hold strategy with a 5% and with a 10% cutoff for managerial ownership. In Panel D, we present results for the full universe of S&P 1500 firms as well as for managerial ownership portfolios with cutoffs of 5% and 10% managerial ownership where all missing returns are replaced by -1. While firms were allowed to have multiple missing returns in the value-weighted portfolio, we allowed firms to go bankrupt (have a missing return replaced with -1) only once in the equal-weighted portfolio. Only the first missing return was replaced with a -1, all other missing returns were dropped. In Panel E, instead of using our Execucomp data, we use ownership data provided by Dlugosz, Fahlenbrach, Gompers, and Metrick (2006) (DFGM). We examine managerial ownership portfolios with a cutoff of 5% and 10% managerial ownership, respectively. In addition to the time period 1997 to 2002, for which the alternative data is available, we also examine the period 1997 to 2005, assuming that managerial ownership remains constant from 2002 to 2005. Alphas are on a monthly basis. Standard errors are in parenthesis. ***, ** and * indicate significance at the one, five and ten percent level, respectively.

Table 5: (continued)

Panel A: Constant Portfolio Size

	Value-Weighted Returns		Equal-Weighted Returns		
Portfolio	α	t-stat	α	t-stat	Observ.
Rank 1-100	0.951** (0.414)	2.299	0.318* (0.175)	1.818	120
Rank 1-250	0.707** (0.284)	2.490	0.208 (0.155)	1.341	120

Panel B: Industry Adjusted Returns

	Value-Weighted Returns		Equal-Weighted Returns		
Portfolio	α	t-stat	α	t-stat	Observ.
Indadj. >5	0.639* (0.382)	1.673	0.029 (0.161)	0.179	120
Indadj. >10	0.911** (0.439)	2.074	0.123 (0.158)	0.775	120

Panel C: Buy-and-Hold Returns

	Value-Weighted Returns		Equal-Weighted Returns		
Portfolio	α	t-stat	α	t-stat	Observ.
1996: >5	0.712** (0.311)	2.293	0.391** (0.175)	2.236	120
1996: >10	0.907** (0.379)	2.393	0.435** (0.187)	2.324	120

Table 5: (continued)

Panel D: Setting Missing Returns to -100%

	Value-Weighted Returns		Equal-Weighted Returns		
Portfolio	α	t-stat	α	t-stat	Observ.
MissRet All	-0.115 (0.089)	-1.297	-0.283** (0.127)	-2.233	120
MissRet >5	0.513* (0.276)	1.857	-0.158 (0.165)	-0.954	120
Miss Ret >10	0.901*** (0.342)	2.634	0.027 (0.177)	0.150	120

Panel E: Alternative Sample

	Value-Weighted Returns		Equal-Weighted Returns		
Portfolio	α	t-stat	α	t-stat	Observ.
DFGM '97-'05 >5	0.885** (0.389)	2.275	0.368** (0.182)	2.024	108
DFGM '97-'05 >10	1.184** (0.478)	2.478	0.468** (0.215)	2.174	108
DFGM '97-'02 >5	1.366** (0.549)	2.488	0.506** (0.233)	2.175	72
DFGM '97-'02 >10	1.788*** (0.669)	2.671	0.566** (0.268)	2.113	72

Table 6: Multivariate Evidence

This table contains the results of Fama and MacBeth (1973) regressions of Model (2) as described in the main text. The dependent variable is the individual firm's monthly raw return (Panel A) and industry adjusted return (Panel B). Standard errors are in parenthesis. ***, ** and * indicate significance at the one, five and ten percent level, respectively.

Panel A: Raw Returns

	(1)	(2)	(3)
Shrown	0.0048	-0.0013	-0.0200
$D(5\%)$		-0.0506	
$D(10\%)$			0.6465**
G	0.0064	0.0061	0.0061
NASDUM	1.3986	1.4268	1.4559
SP500	0.1054	0.1018	0.1087
LOGBM	0.1786*	0.1774*	0.1825*
LOGSIZE	-0.2683	-0.2685	-0.2728
Price	-0.0011	-0.0013	-0.012
NYDVOL	0.2279	0.2296	0.2292
NADVOL	0.1446	0.1440	0.1418
Yield	-48.65254	-48.19744	-50.04607
Ret2-3	-0.4805	-0.4798	-0.5071
Ret4-6	0.0378	0.0415	0.0398
Ret7-12	0.3611	0.3596	0.3841
SGROWTH	0.0177	0.0172	0.0188
Constant	0.02833238	0.028097*	0.029219*

Table 6: (continued)

Panel B: Industry-Adjusted Returns

	(1)	(2)	(3)
Shrown	0.0122	0.0066	-0.0110
$D(5\%)$		0.1259	
$D(10\%)$			0.6003**
G	0.0066	0.0067	0.0064
NASDUM	1.8224	1.8560	0.1265
SP500	0.1244	0.1197	1.8924
LOGBM	0.2197*	0.2190*	0.2221*
LOGSIZE	-0.3086	-0.3072	-0.3130
Price	-0.0042	-0.0044	-0.0043
NYDVOL	0.3591*	0.3611*	0.3604*
NADVOL	0.2456	0.2449	0.2419
Yield	-45.14949	-44.17939	-45.87704
Ret2-3	-0.5592	-0.5465	-0.5864
Ret4-6	-0.2070	-0.1999	-0.1953
Ret7-12	0.0419	0.0388	0.0712
SGROWTH	0.0337	0.0317	0.0346
Constant	0.010759	0.010232	0.011461

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