

Implications of Cash-Hoarding for Shareholders

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June 8, 2005

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Abstract

Free cash flow theory suggests that firms striving to maximize shareholder value should not hold excess amounts of cash. In the paper, we investigate firms that report high cash balances on their balance sheet. These firms report cash from operations that exceed their industry averages in the year that they are identified as cash-hoarding, and also report investment levels that are lower than industry averages. Most importantly, these firms significantly underperform over the two years following their identification as cash-hoarding. We also investigate the market response to firms that hoarded cash but subsequently reported a significant drop in their cash balance. Paying a cash dividend appears to be the best way to reduce a high-cash balance while avoiding significantly negative returns.

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1. Introduction

Over time, firms have steadily increased the level of cash and marketable securities reported on their annual balance sheets, but the implications of large cash holdings for shareholders are unclear. On the one hand, firms holding large amounts of cash are better able to respond to risks or take advantage of opportunities without having to make costly trips to external capital markets (Myers and Majluf, 1984). Large cash holdings may also be a signal of superior performance if they occur because of high cash flows from operations. On the other hand, large cash holdings reduce the ability of the market to monitor manager's decisions (Easterbrook, 1984; Jensen, 1986). Managers of firms with excess cash may be tempted to make investments that maximize their personal utility rather than shareholder value. We investigate whether the positive implications or negative implications of a high cash balance dominate for future returns. We also investigate whether investment decisions (proxied by cash outflows from the statement of cash flows) appear to be worse in periods when a firm hoards cash and in periods when a cash-hoarding firm has a significant drop in cash balance.

We show that cash hoarding firms have significantly negative abnormal returns over the two years following the public release of their financial statements. These abnormal returns persist after controlling for book-to-market, size and momentum effects, as well as controlling for sales growth and accruals. We interpret our results as being consistent with Jensen's (1986) free cash flow theory in that firms with very high cash balances are more likely to improperly invest resources; however, the market does not become fully aware of this problem until future periods. Cash hoarding firms that suffer

a subsequent, significant drop in cash level also suffer significantly negative returns, but this effect is mitigated if the drop in cash is attributable to the payment of a dividend to shareholders (i.e., if the drop in cash is because of its return to shareholders, rather than its investment in other areas such as acquisitions).

2. Prior Research and Hypothesis Development

Following Jensen's (1986) seminal paper on free cash and agency problems, a number of researchers have investigated the possible negative impacts of firms generating too much cash and failing to return it to shareholders. Richardson (2003) shows that firms generating excess cash flows tend to overinvest. Switching from flows to levels, Harford (1999) argues that excess cash levels represent an accumulation of free cash flows. He shows that firms with excess cash levels are more likely to become acquirers, and that the announcement date response to such acquisitions are decreasing in the level of excess cash held by the acquirer. Oler (2005) extends Harford's work by showing that post-acquisition returns are also significantly decreasing in acquirer cash, indicating that the market does not fully recognize the "bad news" inherent in a firm's cash level in an acquisition setting.

Although "conventional wisdom" states that high-cash firms are likely to become takeover targets, Pinkowitz (2000) and Faleye (2004) show that high-cash firms are *less* likely to be takeover targets. This is most likely because cash-rich firms are better able to mount a better defense against takeover.

The above results suggest that excess cash is an indicator of poor future performance, because high-cash firms are more likely to make poor investment decisions

(such as underperforming acquisitions) and are less subject to market discipline in the form of a takeover. However, a firm may also have a high cash balance because of superior performance in generating cash, suggesting that a high cash balance is a positive sign. Myers and Majluf (1984) argue that financial slack has value because it allows the firm to invest in positive NPV projects without having to incur the costs of visiting external capital markets. Mikkelson and Parch (2003) support this reasoning by showing that firms consistently carrying a high proportion of their total assets in the form of cash and cash equivalents do not seem to underperform; in fact, high cash holdings are associated with greater investment without hindering operating performance. Thus, it remains unclear whether high cash levels are desirable or undesirable from the viewpoint of shareholders.

We directly test whether high-cash firms underperform in terms of stock returns. Because Mikkelson and Parch (2003) show that firms *maintaining* a high cash balance do not appear to underperform, it may be that the underperformance hypothesized by Jensen occurs after the firm has accumulated a high cash level but has misinvested it, resulting in future fundamental performance that is lower than market expectations. Accordingly, although we include contemporaneous returns in our analysis, we concentrate on the two years after a firm has been identified as cash-hoarding. In addition, following Jensen (1986), we investigate whether the investment decisions of a cash-hoarding firm (measured based on cash outflows reported on the statement of cash flows) are inferior relative to those of a non-cash-hoarding firm. Because firms that have accumulated high amounts of cash may also choose to use that cash to pay dividends, repurchase shares, or

pay down long-term debt, we also investigate the market response (both contemporaneous and future) to these cash outflows.

3. Data and Variable Calculation

We use annual financial statement from Compustat, and monthly stock returns and shares outstanding from CRSP (all drawn from WRDS). Because statement of cash flow information is not available for firms before 1988, we limit our investigation to fiscal years from 1988 to 2003. We require that firms have total assets (Compustat annual item #6) of at least \$10 million, positive shareholders' equity (item #60), and have a share price above \$2 per share. We exclude financial firms (SIC code 6xxx) and utilities (49xx), using SIC codes from Compustat. Firms must have reported numbers for cash from operations (item #308), cash from investing (#311), cash from financing (#313), and net increase in cash (#274). Firms must also have sufficient information to calculate accruals $(\#123 - (\#308 - \#124)) / (\text{prior year } \#6)$, momentum (defined as market-adjusted abnormal returns for the six months' preceding the investment start date), and sales growth $(\#12 - \text{prior year } \#12) / (\text{prior year } \#12)$. After applying the above screens, we have 36,607 firm-years of observations. Table 1 provides descriptive statistics for our observations, and Table 2 shows correlation coefficients for our variables. All variable calculations are provided in the Appendix.

[Insert Tables 1 and 2 Here]

Note that because of data requirements for availability of prior year's financial statements, we show more observations in year +1 (i.e., one year after a firm is identified as cash-hoarding) than in year 0. This is because we have sufficient data to identify a

cash-hoarder as of year 0, but may not have accruals information for that firm until the following year's financial statements are available. Because we are also interested in the "big drop" firms that were once hoarding cash but have significantly reduced their cash level, we retain these firms in our dataset.

Figure 1 provides an overview of proportionate cash held by firms meeting our data requirements. Consistent with Greenwood (2004), we show a general increase in cash held by firms from 1989 to 2003 (median cash levels increase from a low of 0.069 in 1989 to high of 0.122 in 2003).

[Insert Figure 1 Here]

We define a firm as "cash-hoarding" if it is in the top decile, ranked by cash level, of firms in that year and industry and has a cash level of at least 0.1. As an exception to the above rule, we also define a firm as cash hoarding if it has a cash level of 0.8 or more, regardless of where it falls within its year/industry rank. Figures 2 and 3 track cash level and cash flows by major category (cash from operations, cash from financing, and cash from investing) for firms that we identify as hoarding cash in year 0. Figure 2 shows industry-adjusted values (we subtract the industry mean for that year, and divide by the industry standard deviation). These values reflect the number of standard deviations that the variable differs from the industry mean (for example, as of the year a firm is first identified as cash-hoarding, the median cash level is 0.437 standard deviations higher than the industry average). Both figures show that most cash-hoarding firms quickly decrease their cash level in subsequent years. Cash-hoarding firms also show a steady increase in cash from operations, from years -3 to 0, which reverses by year +1 and is followed by a continued steady increase in cash from operations in future years. Cash-

hoarders show an increase in cash from financing in year 0, although they appear to require less cash from financing than most other firms in their industry (industry-adjusted cash from financing in Figure 2 never rises above 0). Cash-hoarding firms also show cash outflows for investing activities that are lower than the industry mean (indicated by the industry-adjusted line for cash from investing in Figure 2 never falling below 0 – note that the cash outflow from investing is shown as a negative number, and therefore if a firm is paying less than the industry average, the difference will appear as a positive value in Figure 2).

[Insert Figures 2 and 3 Here]

4. Analysis and Results

We begin by determining whether firms identified as cash hoarding out-perform or underperform over the following two years. We regress market-adjusted buy-and-hold returns on the cash hoarding dummy, and add variables to control for cash level and cash flows, as well as the more standard book-to-market, size, momentum, sales growth, and accruals controls. In order to enhance comparability of our estimated coefficients, and to control for possible outliers in our data, we transform all our continuous independent variables by determining their decile rank as of each year, subtracting one, and then dividing by 9. The estimated coefficient on the transformed variable can be interpreted as the returns to moving from the bottom decile of that variable to the top decile (however, we show non-transformed variables in Table 1). Our results indicate that cash-hoarding firms significantly underperform (returns are -15%, $p < 0.01$) in the two years following their identification (about -8% per year). Subsequent returns, however, are increasing in

cash level (returns to moving from the bottom decile of firms ranked by cash level to the top decile are 10.4%, $p < 0.01$). As suggested Sloan's (1996) results, future returns are significantly increasing in cash from operations, and as suggested by Richardson and Sloan (2003), future returns are significantly decreasing in cash from financing (which includes cash from equity issues and cash from additional borrowing).

[Insert Table 3 Here]

In Table 4, we expand our list of explanatory variable to include specific cash outflow measures for both investing and financing activities, and add interaction variables to determine if investing and financing decisions made during a “cash-hoarding year” appear to be inferior to those made during other years. In order to compare the market's initial response to a cash-hoarding firm with long-run returns, we also analyse contemporaneous returns (i.e., returns over the year that the firm is first identified as cash hoarding).

Results from Table 4, Panel A, indicate that cash-hoarding firms tend to do well relative to non-hording firms in the year of cash accumulation (associated returns are 28.7%, $p = 0.009$), with a number of caveats. For instance, larger firms which hoard cash tend to underperform in the year of cash accumulation (the estimated coefficient on $\text{hoard} * \text{mcap}$, or the cash-hoarding dummy multiplied by the firm's market capitalization is -22.7%, $p = 0.02$). Returns are significantly decreasing in capital expenditures, acquisitions, stock repurchases, and cash dividends.¹ The repurchase of stock is associated with even more negative returns when the firm is hoarding cash. The market

¹ Because these are contemporaneous returns, causality is often difficult to establish. For example, a firm may respond to a significant decrease in its stock price by repurchasing some of its stock, as opposed to the market responding negatively to stock repurchases. Similarly, a firm with poor stock performance may decide to increase its dividend rather than the market responding negatively to dividend paying firms.

response is significantly increasing in the amount of cash spent to repay long-term debt, and the slope coefficient is significantly higher for cash-hoarding firms repaying long-term debt.

Long-run returns (Panel B) indicate that cash-hoarding firms significantly underperform (supporting results from Table 3). Interestingly, the only interaction variable to load with (marginal) significance for future returns is *hoarding*purchofinv* (i.e., cash outflows by cash-hoarders for long-term investments), suggesting that cash-hoarders who merely “park” their cash in long-term investments tend to suffer worse performance than cash hoarding firms who invest their cash elsewhere.

[Insert Table 4 Here]

In Table 5 we exchange our cash hoarding dummy for a “big drop” dummy set to one for cash hoarding firms that subsequently experience a significant drop in their cash level (more than 50%). Panel A shows contemporaneous returns, and Panel B shows long-run returns.

Panel A shows that the “big drop” dummy is negatively associated with contemporaneous returns. The payment of cash dividends for “big drop” firms is associated with a significantly positive market response, suggesting that the market rewards firms who reduce the agency problems of holding high amounts of cash by returning that cash to shareholders.

Panel B shows that firms that hoard cash and then subsequently pour that cash into long-term investments suffer significantly negative future returns, suggesting that such investment decisions are more likely to be inferior. With Table 4 Panel B, these

results suggest that cash-hoarding firms should not simply park cash in long-term investments.

[Insert Table 5 Here]

Overall, these results indicate that, while some degree of financial flexibility is desirable, cash-hoarding by firms is generally value-destructive. The worst culprits are larger firms that hoard cash and then reduce cash levels by making investments the stock of other firms.

5. Conclusions and Implications

This paper explores the performance implications of firms that accumulate and retain large amounts of cash. While large cash holdings provide firms with increased operational flexibility and security, holding cash above that needed as working capital provides minimal return and is subject to possible misuse by management. We find that although firms that generate and retain large amounts of cash do well in the year of cash accumulation, they experience significant negative returns in the following two years. This implies that the hoarding of non-productive cash by management has a negative impact on future firm performance that is not fully accounted for by investors at the time of the cash accumulation. This negative impact tends to outweigh any potential benefits gained from increased operational flexibility. We also show that the contemporaneous returns of hoarding firms significantly reducing their cash holdings are extremely negative, although this effect is mitigated if the cash disgorgement is in the form of dividends. This implies that investors feel that management tends to spend the excess

cash in a suboptimal manner and that managers may be better served by immediately paying out any excess cash not held for specific positive NPV investments.

This paper is in the early stages of development. In future research we hope to more firmly establish the specific market impact of various types of cash inflows and outflows. We also hope to more closely examine the impact of cash generation, retention and expenditure on firm operating performance measures, not simply returns.

Appendix

Description and Calculation of Dependent Variables

We calculate contemporaneous and future buy-and-hold-abnormal returns, calculated as follows:

$$BHAR_i = \prod_{t=s}^e (1 + R_{i,t}) - \prod_{t=s}^e (1 + R_{mk,t}) = BHR_{firm} - BHR_{mk}$$

Where:

$R_{i,t}$ = returns for firm i over the period beginning with month s and ending with month e , and

$R_{mk,t}$ = market returns (CRSP's equal weighted, with dividend returns "ewretd") over the same period.

For contemporaneous returns, s is set to 4 months after the fiscal year end of the firm's prior year, and e is 12 months later. For future returns, s is set to 4 months after the firm's fiscal year end and e is 24 months later.

Description and Calculation of Independent Variables

Variable Name	Description
Cash Level (“cashlev”)	The amount of cash and cash equivalents (Compustat annual item #1) reported by the firm in year t, divided by book value of total assets (item #6) reported for the year t-1. Cash levels calculated to be less than -1 and more than 1 are winsorised at 1.
Hoarding Dummy (“hoarding”)	Dummy variable set to 1 if the firm’s cash level is within the 10 th decile of firms within that industry and year and the firm’s cash level exceeds 0.1, or if the firm’s cash level exceeds 0.8. Any firm classified as hoarding must also have financial statement data available for the prior year, and must have been listed on CRSP for at least the last three years.
Big Drop Dummy (“big drop”)	Dummy variable set to 1 if the firm was classified as hoarding in the prior year, and the current year’s cash level is at least 50% lower than the prior year’s cash level.
Investments in Capital Assets (“capex”)	Cash outflow for the purchase of property, plant, and equipment (#128), scaled by prior year’s total assets (#6).
Purchase of long-term investments (“purchofinv”)	Cash outflow for the purchase of long-term investments (#113), scaled by prior year’s total assets (#6).
Corporate Acquisitions (“acquisitions”)	Cash outflow for acquisitions (#129), scaled by prior year’s total assets (#6).
Repurchase Stock (“repurchstock”)	Cash outflow for the repurchase of company shares (#115), scaled by prior year’s total assets (#6).
Cash Dividends (“cashdiv”)	Cash outflow for the payment of cash dividends (#127), scaled by prior year’s total assets (#6).
Repayment of Long-term Debt (“ltdrepay”)	Cash outflow for the repayment of long-term debt (#114), scaled by prior year’s total assets (#6).
Cash From Operations (“cashfromop”)	Net cash flow from operating activities (#308), scaled by prior year’s total assets (#6).
Cash from Financing (“cashfromfin”)	Net cash flow from financing activities (#314), scaled by prior year’s total assets (#6).

Description and Calculation of Independent Variables

Variable Name	Description
Cash from Investing (“cashfrominv”)	Net cash flow from investing activities (#311), scaled by prior year’s total assets (#6).
Book-to-Market (“btm”)	Book value of common equity (#60) for year t-1 scaled by total market capitalization (price x shares outstanding as of 4 months following the firm’s fiscal year-end) for year t-1.
Market Capitalization (“mcap”)	Price x shares outstanding as of 4 months following the firm’s fiscal year-end) for year t-1, scaled to 2000 dollars using the Consumer Price Index.
Momentum	Buy-and-hold abnormal returns (market adjusted, using “ewretd”) for the period 2 months before the firm’s fiscal year-end to 4 months after the firm’s fiscal year-end (i.e., 6 months before the beginning of the calculation of contemporaneous returns).
Sales Growth (“salesgrowth”)	Sales for year t-1 (#12) less sales for year t-2, divided by sales for year t-2.
Accruals	Net income before discontinued operations and extraordinary items, as reported on the statement of cash flows (#123) plus extraordinary items and discontinued operations (#124), less cash from operations (#308), scaled by prior year total assets (#6).
Interaction Variables	All interaction variables are formed by multiplying the dummy variable by the continuous variable. For example, hoarding*capex is formed by multiplying hoarding by capex. In a regression, the estimated coefficient on this variable represents the change in the slope coefficient on capex that is attributable to a firm hoarding cash.

Note that, in order enhance comparability of our estimated coefficients, and to control for possible outliers in our data, we transform all our continuous independent variables by determining their decile rank as of each year, subtracting one, and then dividing by 9. The estimated coefficient on the transformed variable can be interpreted as the returns to moving from the bottom decile of that variable to the top decile.

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Table 1
Descriptive Statistics

This table describes our dataset of firms, from 1988 to 2003. Financial statement information drawn from the Compustat Annual Industrial database, and share price information is drawn from the CRSP monthly dataset. We define a firm as “cash-hoarding” if its scaled cash level (cash and short-term investments, Compustat annual item #1, divided by prior year’s total assets, item #6 from the prior year) is in the top decile of firms for that industry/year and its scaled cash level is at least 0.1, or if its raw scaled cash level is above 0.8. In addition, we require that all firms defined as “cash-hoarding” be listed for at least three years on the CRSP database (to exclude the initial stages of an IPO firm’s life), and have at least the prior year’s financial statements available on Compustat. We exclude financial firms (SIC code 6xxx) and utilities (SIC code 49xx). Industry-adjusted cash level is raw scaled cash level less the industry mean for that year, divided by the industry standard deviation for that year. Market capitalization is defined as share price x shares outstanding (in millions), scaled to 2000 dollars using the Consumer Price Index, as of the end of the previous fiscal year. Book-to-market is defined as total common shareholder’s equity (item #60) divided by market capitalization, as of the end of the previous fiscal year.

	Number of firm-years	Cash Level		Industry-Adjusted Cash Level		Market Capitalization		Book-to-Market	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All Firms	36,605	0.18	0.08	-0.10	-0.13	2043	180	0.69	0.50
Firms Never Identified as Cash-Hoarders	27,926	0.11	0.05	-0.19	-0.17	2273	176	0.73	0.54
Cash-Hoarding Firms									
year -5	148	0.21	0.15	-0.10	-0.09	785	147	0.68	0.47
year -4	214	0.24	0.17	-0.09	-0.10	747	126	0.65	0.44
year -3	303	0.25	0.19	-0.04	-0.10	746	116	0.65	0.49
year -2	471	0.31	0.24	-0.04	-0.08	842	119	0.60	0.39
year -1	782	0.39	0.34	0.06	-0.04	672	132	0.54	0.34
year 0	999	0.73	0.80	0.63	0.33	860	183	0.42	0.24
year 1	1,089	0.48	0.45	0.37	0.06	1267	214	0.47	0.32
year 2	915	0.40	0.37	0.23	-0.02	1068	217	0.51	0.36
year 3	779	0.39	0.34	0.15	-0.02	991	191	0.47	0.42
year 4	602	0.35	0.28	0.15	-0.03	1077	185	0.59	0.43
year 5	496	0.33	0.27	0.11	-0.05	1593	216	0.60	0.44
year 6	400	0.31	0.23	0.08	-0.05	1826	236	0.59	0.43
year 7	310	0.30	0.26	0.07	-0.06	2644	297	0.59	0.44
year 8	248	0.28	0.21	0.03	-0.07	3769	272	0.57	0.42
year 9	197	0.27	0.17	0.11	-0.07	3385	286	0.65	0.50

(Years -14 to -6 and +10 to +13 not shown because of low observations)

Table 2
Correlation Coefficients

This table presents the correlation coefficients for the variables used in our subsequent analysis. Spearman coefficients are in the upper triangle and Pearson coefficients are in the lower triangle. All variables, except for returns, hoarding, and “big drop” dummies, are scaled by converting the value into a decile rank, subtracting one, and dividing by 9. This controls for scale differences in variables in our regressions.

	bhar_ew0	bhar_ew_2year	cashlev	Hoarding	Big Drop	cashfromop	cashfrominv	cashfromfin	capex	mcap	purchofinv	acquisitions	repurchstock	cashdiv	ltdrepay	btm	momentum	salesgrowth	accruals
bhar_ew0	1.00	-0.04 0.00	0.04 0.00	0.04 0.00	-0.05 0.00	0.21 0.00	-0.03 0.00	-0.10 0.00	-0.01 0.15	-0.03 0.00	-0.01 0.22	0.00 0.45	0.03 0.00	0.05 0.00	0.04 0.00	0.06 0.00	0.05 0.00	0.01 0.27	-0.07 0.00
bhar_ew_2year	-0.04 0.00	1.00	-0.03 0.00	-0.06 0.00	-0.03 0.00	0.08 0.00	0.05 0.00	-0.04 0.00	-0.04 0.00	0.00 0.46	-0.01 0.13	-0.02 0.00	0.08 0.00	0.04 0.00	0.00 0.86	0.09 0.00	-0.05 0.00	0.00 0.46	-0.03 0.00
cashlev	0.09 0.00	0.02 0.00	1.00	0.38 0.00	0.07 0.00	0.04 0.00	-0.05 0.00	0.13 0.00	-0.04 0.00	0.00 0.61	0.13 0.00	-0.10 0.00	-0.02 0.00	-0.18 0.00	-0.40 0.00	-0.26 0.00	0.05 0.00	-0.05 0.00	-0.03 0.00
Hoarding	0.08 0.00	-0.03 0.00	0.40 0.00	1.00	-0.03 0.00	0.02 0.00	-0.10 0.00	0.14 0.00	0.00 0.88	0.02 0.00	0.04 0.00	-0.07 0.00	-0.04 0.00	-0.07 0.00	-0.16 0.00	-0.16 0.00	0.08 0.00	0.01 0.03	-0.01 0.25
Big Drop	-0.03 0.00	-0.01 0.02	0.07 0.00	-0.03 0.00	1.00	-0.07 0.00	-0.01 0.23	-0.01 0.25	0.00 0.80	0.02 0.00	0.04 0.00	0.02 0.00	0.00 0.46	-0.04 0.00	-0.05 0.00	-0.04 0.00	-0.04 0.00	0.04 0.00	0.04 0.54
cashfromop	0.10 0.00	0.01 0.30	0.03 0.00	0.02 0.00	-0.07 0.00	1.00	-0.37 0.00	-0.32 0.00	0.32 0.00	0.26 0.00	0.01 0.31	0.09 0.00	0.20 0.00	0.22 0.00	0.05 0.00	-0.20 0.00	0.16 0.00	0.09 0.00	-0.15 0.00
cashfrominv	-0.01 0.02	0.04 0.00	-0.06 0.00	-0.11 0.00	-0.01 0.14	-0.36 0.00	1.00	-0.46 0.00	-0.56 0.00	-0.23 0.00	-0.07 0.00	-0.30 0.00	0.02 0.00	-0.02 0.00	-0.02 0.00	0.31 0.00	-0.15 0.00	-0.06 0.00	0.10 0.00
cashfromfin	-0.01 0.01	-0.04 0.00	0.15 0.00	0.15 0.00	-0.01 0.25	-0.33 0.00	-0.48 0.00	0.23 0.00	-0.02 0.00	0.04 0.00	0.16 0.00	-0.29 0.00	-0.25 0.00	-0.06 0.00	-0.17 0.00	0.06 0.00	-0.01 0.17	0.04 0.00	0.04 0.00
capex	-0.01 0.00	-0.02 0.00	-0.04 0.00	0.00 0.92	0.00 0.67	0.32 0.00	-0.56 0.00	0.24 0.00	0.23 1.00	0.00 0.00	-0.01 0.05	0.02 0.00	0.00 0.69	0.07 0.00	0.07 0.00	-0.24 0.00	0.10 0.00	0.07 0.00	-0.16 0.00
mcap	-0.09 0.00	-0.05 0.00	0.01 0.26	0.02 0.00	0.02 0.00	0.25 0.00	-0.22 0.00	-0.02 0.00	0.23 0.00	1.00	0.19 0.00	0.21 0.00	0.18 0.00	0.36 0.00	-0.04 0.00	-0.49 0.00	0.16 0.00	0.03 0.00	-0.02 0.00
purchofinv	-0.01 0.25	0.00 0.40	0.13 0.00	0.04 0.00	0.04 0.00	0.01 0.30	-0.07 0.00	0.04 0.00	-0.01 0.05	0.19 0.00	0.00 1.00	0.04 0.00	0.05 0.00	0.05 0.00	-0.08 0.00	-0.08 0.00	0.01 0.04	-0.02 0.00	0.00 0.78
acquisitions	-0.03 0.00	-0.03 0.00	-0.10 0.00	-0.07 0.00	0.02 0.00	0.09 0.00	-0.31 0.00	0.17 0.00	0.01 0.01	0.21 0.00	0.04 0.00	1.00	0.00	0.10 0.00	0.12 0.00	-0.10 0.00	0.06 0.00	0.01 0.13	0.06 0.00
repurchstock	-0.03 0.00	0.01 0.03	-0.02 0.00	-0.03 0.00	0.00 0.84	0.21 0.00	0.03 0.00	-0.30 0.00	0.00 0.36	0.18 0.00	0.05 0.00	0.06 0.00	1.00	0.21 0.00	-0.08 0.00	-0.01 0.09	-0.01 0.09	0.02 0.00	-0.03 0.00
cashdiv	-0.04 0.00	-0.04 0.00	-0.19 0.00	-0.07 0.00	-0.04 0.00	0.23 0.00	-0.01 0.03	-0.26 0.00	0.07 0.00	0.37 0.00	0.05 0.00	0.10 0.00	0.23 0.00	1.00	0.00	-0.05 0.00	0.06 0.00	0.05 0.00	0.00 0.93
ltdrepay	0.02 0.00	-0.02 0.00	-0.40 0.00	-0.16 0.00	-0.05 0.00	0.05 0.00	-0.02 0.00	-0.05 0.00	0.07 0.00	-0.04 0.00	-0.08 0.00	0.12 0.00	-0.09 0.00	0.95	0.00	0.08 0.00	0.04 0.00	0.05 0.00	-0.06 0.00
btm	0.02 0.00	0.05 0.00	-0.27 0.00	-0.16 0.00	-0.04 0.00	-0.19 0.00	0.31 0.00	-0.18 0.00	-0.24 0.00	-0.49 0.00	-0.08 0.00	-0.10 0.00	-0.01 0.02	0.00	0.08 1.00	0.00	-0.27 0.00	-0.07 0.00	0.02 0.00
momentum	0.03 0.00	-0.04 0.00	0.05 0.00	0.08 0.00	-0.04 0.00	0.16 0.00	-0.15 0.00	0.06 0.00	0.10 0.00	0.16 0.00	0.01 0.04	0.07 0.00	-0.01 0.19	0.06 0.00	0.04 0.00	-0.27 0.00	1.00	0.09 0.00	-0.04 0.00
salesgrowth	-0.01 0.08	-0.02 0.00	-0.06 0.00	0.01 0.03	0.04 0.00	0.09 0.00	-0.06 0.00	-0.01 0.26	0.07 0.00	0.03 0.00	-0.02 0.00	0.01 0.13	0.02 0.00	0.06 0.00	0.05 0.00	-0.07 0.00	0.09 0.00	1.00	0.01 0.01
accruals	-0.07 0.00	-0.02 0.00	-0.03 0.00	-0.01 0.25	0.00 0.53	-0.15 0.00	0.10 0.00	0.04 0.00	-0.16 0.00	-0.02 0.00	0.00 0.83	0.06 0.00	-0.02 0.00	0.00	-0.06 0.00	0.02 0.00	-0.04 0.00	0.02 0.00	0.02 1.00

Table 3
OLS Regression on Cash Level and Cash Hoarding Dummy

This table presents the results for regressing market-adjusted (using CRSP equal-weighted, with dividend, returns) buy-and-hold abnormal returns on cash level and a dummy set to one for firms defined as “cash-hoarding.” We control for cash from operations, financing, and investing, as well as book-to-market, size, momentum, sales growth, and accruals. Additional dummy variables to control for fixed effects for year and industry are not shown. T-values and probability scores are adjusted for heteroscedasticity. All independent variables, except for the hoarding dummy, are transformed by dividing the decile rank (less one) by nine, so that estimated coefficients can be interpreted as the returns from moving from the bottom decile of that variable to the top decile. We begin accumulating buy-and-hold returns starting four months after the financial statement date, and close our positions 24 months later. When the firm is delisted, we include delisting returns and assume returns of -100% for missing delisting values.

Number of Observations	36,605		
F-Score	16.54		0.000
Adjusted R-Square	1.4%		
Dependent Variable:	2-year ahead buy-and-hold, market adjusted returns		
Independent Variable:	Parameter Estimate	t-score	Pr > t
hoarding	-0.154	-5.69	0.000
cashlev	0.104	3.77	0.000
cashfromop	0.140	4.18	0.000
cashfromfin	-0.142	-3.17	0.002
cashfrominv	0.049	0.93	0.350
btm	0.237	6.32	0.000
mcap	-0.141	-4.27	0.000
momentum	-0.127	-3.24	0.001
salesgrowth	-0.042	-1.57	0.117
accruals	-0.078	-2.87	0.004
Intercept	-0.024	-0.37	0.712

Table 4
Cash Outflow when Hoarding – Contemporaneous and Future Returns

This table presents the results of OLS regressions of contemporaneous (Panel A) and future (Panel B) returns on six major cash outflow measures taken from the statement of cash flows. We show interaction variables to determine if the market response is significantly different for outflow measures when the firm is defined as hoarding cash. We control for cash from operations, financing, and investing, as well as book-to-market, size, momentum, sales growth, and accruals. Additional dummy variables to control for fixed effects for year and industry are not shown. T-values and probability scores are adjusted for heteroscedasticity. All independent variables, except for the hoarding dummy, are transformed by dividing the decile rank (less one) by nine, so that estimated coefficients can be interpreted as the returns from moving from the bottom decile of that variable to the top decile. Contemporaneous returns reflect buy-and-hold returns from four months after the prior year's financial statement date to four months after the current year's f/s date. Future returns reflect buy-and-hold returns from four months after the current year's f/s date to 24 months later.

Panel A: Contemporaneous Returns				Panel B: Future Returns			
Number of Observations	36,605			Number of Observations	36,605		
F-Score, p-value	46.24	0.000		F-Score, p-value	12.81	0.000	
Adj R-Sq	5.1%			Adj R-Sq	1.4%		
Dependent Variable:	1-year contemporaneous buy-and-hold, market adjusted returns			Dependent Variable:	2-year ahead buy-and-hold, market adjusted returns		
Independent Variable:	Parameter Estimate	t Value	Pr > t 	Parameter Estimate	t Value	Pr > t 	
hoarding	0.287	2.61	0.009	-0.201	-2.18	0.029	
capex	-0.099	-5.94	0.000	-0.059	-2.05	0.040	
hoarding*capex	0.090	1.14	0.254	0.078	1.10	0.270	
mcap	-0.236	-13.76	0.000	-0.090	-2.16	0.031	
hoarding*mcap	-0.227	-2.32	0.020	-0.036	-0.42	0.671	
purchofinv	-0.001	0.00	0.953	0.008	0.14	0.881	
hoarding*purchofinv	0.318	2.84	0.005	-0.170	-1.76	0.078	
acquisitions	-0.037	-2.39	0.017	-0.112	-4.54	0.000	
hoarding*acquisitions	-0.095	-0.92	0.359	0.052	0.56	0.579	
repurchstock	-0.059	-4.09	0.000	0.082	2.65	0.008	
hoarding*repurchstock	-0.205	-2.18	0.029	0.117	1.46	0.144	
cashdiv	-0.030	-1.93	0.054	-0.153	-5.72	0.000	
hoarding*cashdiv	-0.128	-1.44	0.151	0.092	1.28	0.200	
ltdrepay	0.064	4.56	0.000	-0.043	-1.58	0.115	
hoarding*ltdrepay	0.228	2.10	0.036	-0.034	-0.45	0.657	
cashfromop	0.423	21.06	0.000	0.204	5.26	0.000	
btm	0.079	4.03	0.000	0.261	7.47	0.000	
momentum	0.057	3.61	0.000	-0.126	-3.14	0.002	
salesgrowth	-0.038	-2.56	0.010	-0.042	-1.57	0.117	
accruals	-0.123	-7.59	0.000	-0.079	-2.74	0.006	
Intercept	-0.115	-2.91	0.004	0.071	1.23	0.218	

Table 5
Cash Outflow “Dropping Out” from Hoarding – Contemporaneous and Future Returns

This table presents the results of OLS regressions of contemporaneous (Panel A) and future (Panel B) returns on six major cash outflow measures taken from the statement of cash flows. We show interaction variables to determine if the market response is significantly different for outflow measures when the firm that was hoarding cash in the prior year has a significant decrease in cash level (i.e., more than a 50% decrease in raw cash level from prior year). We control for cash from operations, financing, and investing, as well as book-to-market, size, momentum, sales growth, and accruals. Additional dummy variables to control for fixed effects for year and industry are not shown. T-values and probability scores are adjusted for heteroscedasticity. All independent variables, except for the hoarding dummy, are transformed by dividing the decile rank (less one) by nine, so that estimated coefficients can be interpreted as the returns from moving from the bottom decile of that variable to the top decile. Contemporaneous returns reflect buy-and-hold returns from four months after the prior year’s financial statement date to four months after the current year’s f/s date. Future returns reflect buy-and-hold returns from four months after the current year’s f/s date to 24 months later.

Panel A: Contemporaneous Returns				Panel B: Future Returns			
Number of Observations	36,605			Number of Observations	36,605		
F-Score, p-value	40.07	0.000		F-Score, p-value	12.43	0.000	
Adj R-Sq	4.4%			Adj R-Sq	1.3%		
Dependent Variable:	1-year contemporaneous buy-and-hold, market adjusted returns			Dependent Variable:	2-year ahead buy-and-hold, market adjusted returns		
Independent Variable:	Parameter Estimate	t Value	Pr > t 	Parameter Estimate	t Value	Pr > t 	
big drop	-0.250	-2.24	0.025	0.159	0.74	0.459	
capex	-0.097	-5.75	0.000	-0.051	-1.80	0.072	
big drop*capex	0.136	1.66	0.098	-0.005	0.00	0.976	
mcap	-0.252	-14.08	0.000	-0.086	-2.16	0.031	
big drop*mcap	-0.168	-1.25	0.211	-0.050	-0.28	0.779	
purchofinv	0.037	2.04	0.041	0.002	0.00	0.964	
big drop*purchofinv	-0.034	-0.37	0.707	-0.513	-3.33	0.001	
acquisitions	-0.052	-3.26	0.001	-0.103	-4.29	0.000	
big drop*acquisitions	0.167	1.34	0.180	0.163	0.91	0.362	
repurchstock	-0.078	-5.04	0.000	0.094	3.16	0.002	
big drop*repurchstock	0.037	0.39	0.703	0.014	0.10	0.930	
cashdiv	-0.058	-3.52	0.000	-0.139	-5.45	0.000	
big drop*cashdiv	0.244	2.22	0.027	-0.092	-0.55	0.587	
ltdrepay	0.049	3.40	0.001	-0.028	-1.08	0.279	
big drop*ltdrepay	-0.051	-0.52	0.604	-0.046	-0.26	0.791	
cashfromop	0.420	20.86	0.000	0.196	5.06	0.000	
btm	0.045	2.28	0.023	0.280	7.90	0.000	
momentum	0.068	4.27	0.000	-0.136	-3.43	0.001	
salesgrowth	-0.032	-2.16	0.031	-0.041	-1.54	0.125	
accruals	-0.128	-7.86	0.000	-0.077	-2.69	0.007	
Intercept	-0.049	-1.25	0.211	0.029	0.50	0.620	

Figure 1
Cash Holdings by Year

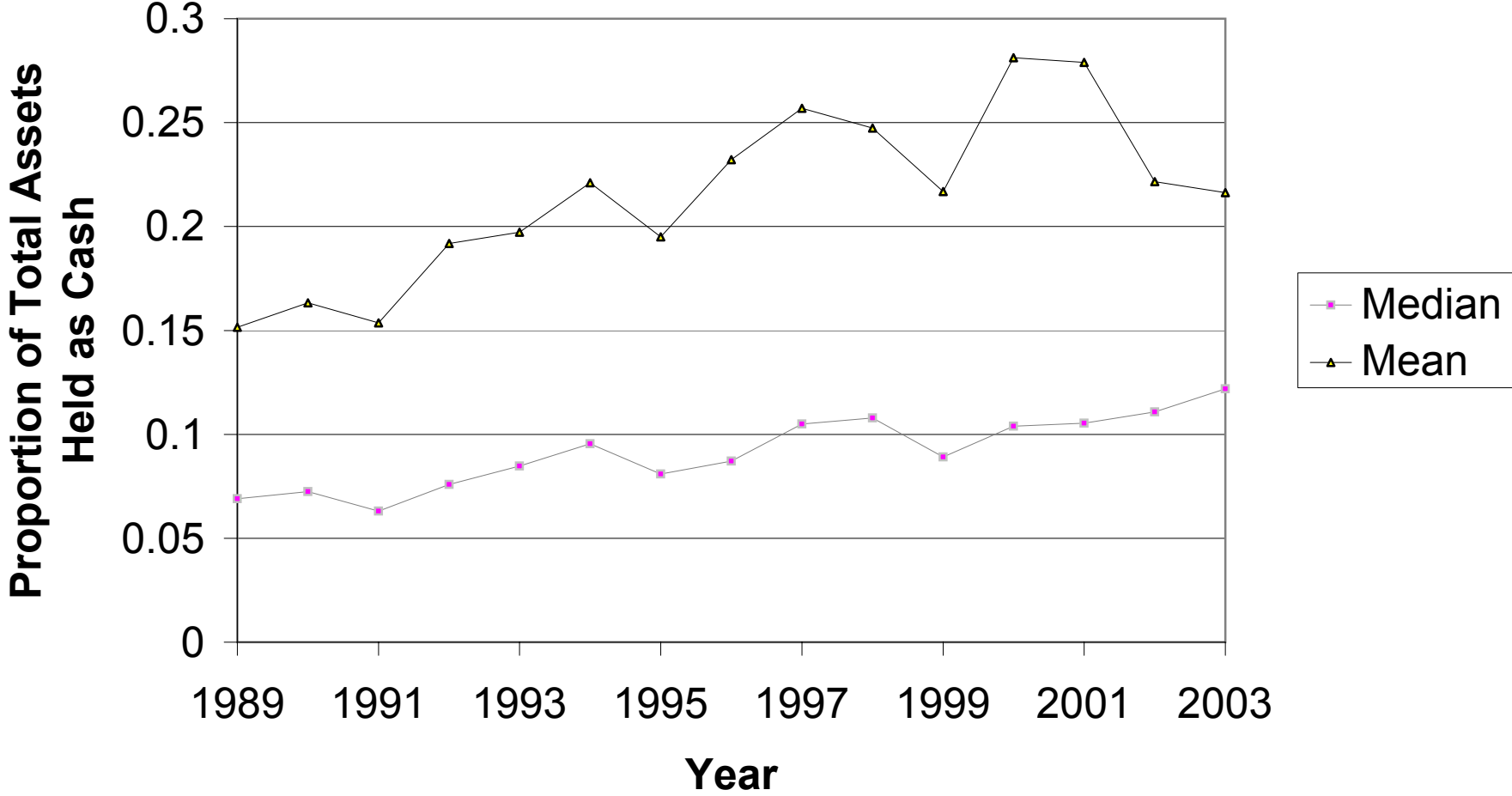


Figure 2
Industry-Adjusted Cash Level and Flows - Cash Hoarding Firms

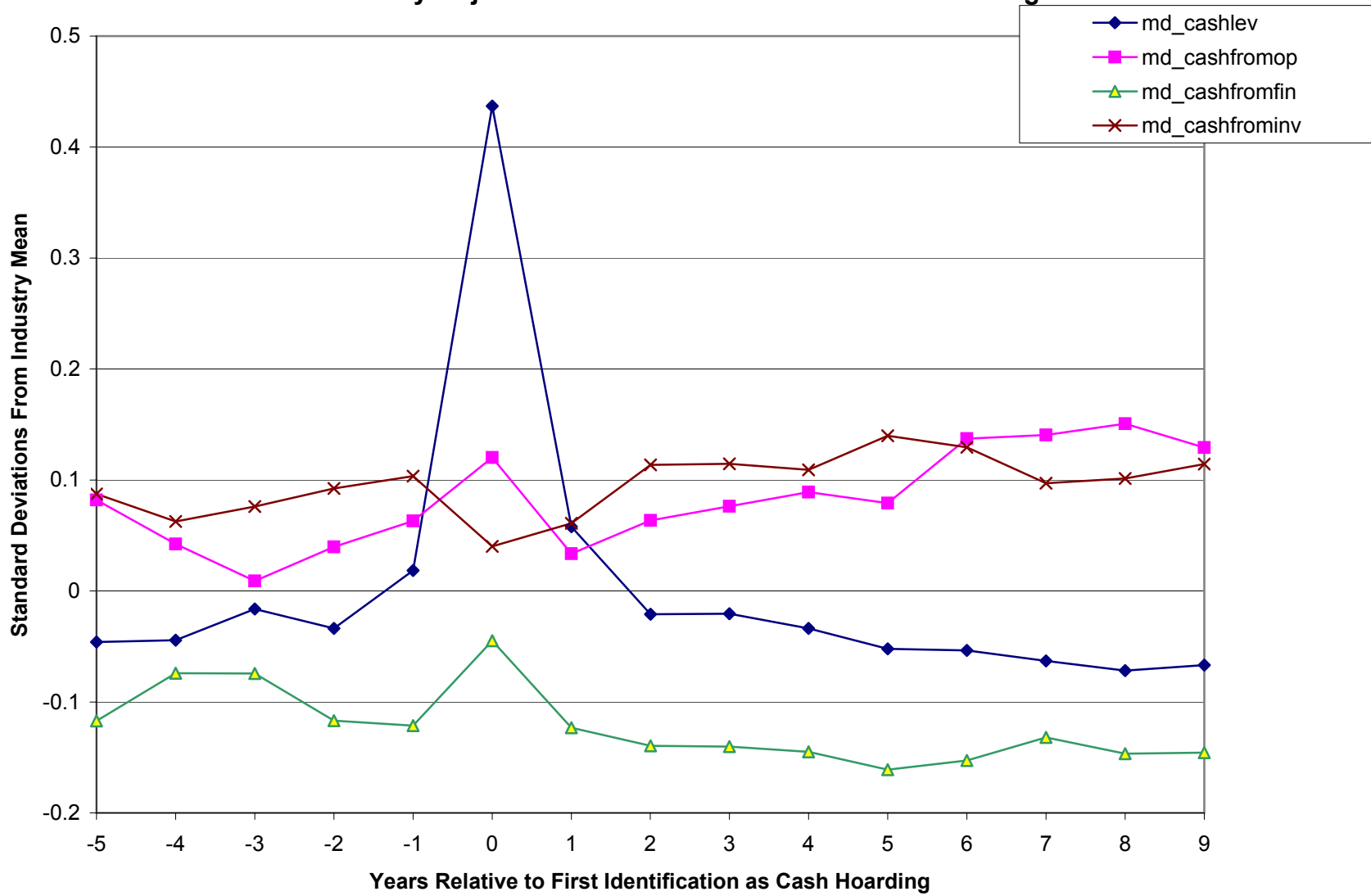


Figure 3
Raw Cash Level and Flows - Cash Hoarding Firms

