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Do Persistent Large Cash Reserves Hinder Performance?

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Abstract

Conservative financial policies are often criticized as serving the interests of managers rather than the interests of stockholders. We test this argument by examining the operating performance and other characteristics of firms that for a five-year period held more than one-fourth of their assets in cash and cash equivalents. Following the five-year period, operating performance of high cash firms is comparable to or greater than the performance of firms matched by size and industry or by a measure of proclivity to hold substantial cash. In addition, proxies for managerial incentive problems, such as ownership and board characteristics, are not unusual and do not explain differences in operating performance among high cash firms. We find that high cash holdings are accompanied by greater investment, particularly R&D expenditures, and by greater growth in assets. For firms that persistently hold large cash reserves, we conclude that such policies support investment without hindering corporate performance.

I. Introduction

Firms with large holdings of cash and cash equivalents have drawn the attention of the business press, shareholder activists, and financial economists.[1] Activist stockholders and corporate governance specialists express concern that large cash holdings reduce disciplinary pressure on managers and tempt them to spend cash even if profitable investment opportunities are unavailable. On the other hand, managers of cash-rich firms cite the benefits of having cash on hand as a reserve to fund large capital expenditures. These benefits arise because internal financing costs less than external financing.

Researchers have examined some important aspects of corporate policies on cash reserves. Kim, Mauer, and Sherman (1998) and Opler, Pinkowitz, Stulz, and Williamson (1999) examine the determinants of cash holdings at a particular

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[1]See, for example, *Business Week* (February 10, 1997) and *The Wall Street Journal* (April 20, 1995 and January 17, 1997).

point in time, and report evidence that the characteristics of firms with large cash holdings are generally consistent with motives that enhance value. Blanchard, Lopez-de-Silanes, and Shleifer (1994), who study firms that receive cash windfalls from lawsuits, and Harford (1999), who studies acquisitions by firms with unusual cash holdings at a point in time, document that managers with weaker incentives to maximize value tend to spend large holdings of cash inefficiently. The managerial behavior studied in these papers, while interesting and important, reflects a policy choice at a point in time or a response to a transitory change in corporate liquidity. Researchers have not examined policies of persistent large cash holdings.

We believe that the consequences of persistent, substantial holdings of cash are central to the debate about large cash holdings. While researchers have shown that managers tend to destroy value when they spend cash windfalls or large stockpiles of cash, it is not known whether stockholders' interests are harmed by a policy of retaining large cash reserves. Our main objective, therefore, is to determine whether policies of persistent large holdings of cash hinder a firm's performance. We also provide evidence on what types of firms tend to hold large amounts of cash over time and how they use cash.

Our sample is 89 publicly traded U.S. firms that held more than 25% of their assets in cash and cash equivalents at the end of years 1986 through 1991. We compare sample firms' operating performance from 1992 through 1996 to the performance of firms matched by size and industry. We also compare the performance of our sample firms to an alternative benchmark, firms that held high cash reserves temporarily, in 1986 and 1987, and then disgorged their cash. Our comparison is based on methods that control for the joint determination of cash holdings and operating performance. Finally, we explore factors related to possible motives for holding cash that may explain differences in performance among firms with large cash holdings.

We find that operating performance of holders of large amounts of cash is greater than the performance of firms matched on size and industry and is greater than the performance of firms that had transitory large holdings of cash. When we control for characteristics of firms that determine firms' levels of cash holdings, we find no unusual operating performance for high cash firms. In addition, operating performance among the high cash firms is unrelated to measures of governance characteristics that reflect the alignment of managers and stockholders' interests. These measures are stock ownership by insiders, stock ownership by institutional investors, the proportion of insiders on the board of directors, and the presence of a controlling founder. Based on our evidence, we conclude that persistent policies of large holdings of cash do not lead to poor performance and do not represent a conflict between managers and stockholders' interests.

The high cash firms in our sample differ from comparison firms in ways that suggest high cash holdings are optimal for these firms and support investment and growth. Sample firms are smaller, their assets grow faster, they use less debt financing, and their market-to-book values of assets are higher. Firms with large cash holdings have unusually high investment expenditures, particularly in R&D expenditures. For firms that find it optimal to retain high cash reserves,

we conclude that this policy supports growth without detracting from operating performance.

II. Motives for Large Cash Holdings

Persistent large holdings of cash are generally explained in one of two ways. One is that large holdings of cash serve managers' personal interests. Another explanation is that substantial cash reserves serve stockholders' interests by substituting for higher cost financing from external sources. In this section, we discuss these motives for large cash holdings and specify the questions we address in our research.

A. Managerial Self-Interest

A prevalent argument among scholars in corporate finance and corporate governance is that large holdings of cash represent a conflict of interest between stockholders and managers. For example, Jensen's (1986) argument that managers have incentives to increase the amount of assets under their control suggests that cash is often retained or invested unproductively rather than distributed to security holders. Incentives to retain or to overinvest cash are created by compensation schemes that are linked to firm size and thus encourage growth in assets. In addition, concerns about job tenure may lead managers to stockpile cash in order to lower the likelihood of financial distress.

Three studies directly evaluate the uses of excess cash. Harford (1999) documents the tendency of firms with unusually large holdings of cash to undertake diversifying and value-decreasing acquisitions. Blanchard, Lopez-de-Silanes, and Shleifer (1994) also find a tendency of firms that experience cash windfalls to retain or invest cash when the value of investment opportunities is estimated to be low. Harford and Haushalter (2000) find that following temporary oil price increases associated with the Persian Gulf crisis of 1991, managerial ownership stakes of oil and gas firms influenced the expenditure of cash windfalls. These studies support the argument that managers employ large, transitory holdings of cash in ways that serve managers' self-interest and harm shareholders' wealth.

Our study differs in that we examine firms with large cash reserves that persist over a period of several years, specifically 1986–1991, rather than firms that have received a temporary cash windfall. In our sample, a concern is that large cash reserves weaken the pressures on managers to create value. Substantial financial slack removes discipline provided through obtaining outside financing. This enables a firm to perform relatively poorly and yet to avoid financial distress. We investigate this issue by analyzing the operating performance of our sample of high cash firms from 1992–1996. We also examine whether operating performance of high cash firms is related to governance characteristics such as insider ownership, institutional ownership, board composition, or the presence of a controlling founder.

B. Costly External Financing

In contrast to the view that large cash holdings serve the private interests of managers, substantial cash reserves can reduce the costs of external financing and therefore serve stockholders' interests. Borrowing or issuing stock entails direct expenses of underwriting and legal fees. Indirect costs include the effects of conflicts between bondholders and stockholders, identified by Jensen and Meckling (1976) and Myers (1977), and the effects of information problems with outside investors, identified by Myers and Majluf (1984). A firm can avoid these costs if cash reserves are sufficient to fund all value-increasing investment opportunities.

Overall, the evidence is quite compelling that raising funds externally is more costly than relying upon internally generated funds. Smith (1977) and Mikkelson and Partch (1986) document economically significant direct expenses associated with outside financing. Smith (1986) summarizes evidence that is consistent with substantial indirect costs as well, namely that investors discount the value of firms that attempt to sell risky securities.

One view, therefore, is that firms choose to hold ample cash reserves to avoid the costs of raising funds externally. A low level of cash flow relative to investment also creates a demand for stockpiles of cash, because cash shortfalls imply that unless a company engages in costly external financing it must forego profitable investment opportunities. In addition, demand for cash reserves is enhanced by greater variability in cash flow or in investment. Similar to the rationale for hedging developed by Froot, Scharfstein, and Stein (1993), company value is enhanced by large holdings of cash that insulate investment expenditures from variability in cash flow. Finally, as suggested by Froot's (1993) analysis of Intel Corporation, a firm with large cash reserves can deter competition in the product market.

These arguments imply that firms with persistent large cash holdings anticipate large investment requirements or high variability in investment relative to cash flow. In our empirical analysis, we investigate the investment opportunities of firms with persistent large cash holdings. For example, we examine whether firms with large cash holdings have greater investment expenditures relative to operating assets, a wider range in the amount of investment across years, and larger values of proxies for investment opportunities. Alderson and Betker's (1996) findings suggest the importance of investment opportunities is measured by the ratio of market-to-book value of operating assets and the ratio of property, plant, and equipment to operating assets. Both represent measures of the relative importance of assets with low liquidation costs.

III. Sample and Data

We study firms that appear to have an established policy of holding a large amount of cash and equivalents. From the Compustat database, we selected firms that maintained a ratio of cash and cash equivalents to assets in excess of 0.25 at the end of each of the fiscal years 1986–1991. Cash and equivalents are defined in the Compustat database as cash and all securities readily transferable to cash, and include holdings of stocks and short-term bonds. We restricted our analysis to

nonfinancial firms by excluding firms whose SIC code begins with a six. To focus on firms that maintain substantial cash holdings, we exclude any firms whose cash ratio fell by more than one-third between 1986 and 1991. For example, this requirement eliminates a firm whose cash ratio was 0.75 in 1986 and fell to 0.50 at any year-end up to 1991. We also exclude firms that are incorporated outside of the U.S. or whose assets are less than $5 million for any year from 1986 through 1991. These criteria identify a sample of 89 firms.

We end our sample selection period in 1991. The early 1990s are a period of interest because of the recession at the beginning of the decade. Arguably, the ability of large cash holdings to overcome capital market imperfections is more highly valued during a decline in general economic activity. In addition, the early 1990s are of interest because takeover activity, particularly hostile takeover activity, subsided at the end of the 1980s. As Denis and Denis (1995) and Mikkelson and Partch (1997) suggest, the decline in takeover activity diminished the disciplinary forces on managers and exacerbated incentive problems, such as those associated with large cash holdings. Thus, the early 1990s appear to be a period of potentially important benefits as well as costs of large cash holdings.

We examined the discussion of financial condition and liquidity in the annual reports of most of the 89 sample firms. These discussions typically note that holdings of cash and equivalents should be sufficient to meet expenditures in the next several years, and do not mention plans to dissipate the large reserves or provide a rationale for large cash reserves. Thus, the expectation appears to be that the high cash positions will persist beyond 1991. Later we more closely examine the uses of cash by sample firms.

We compare our sample of 89 high cash firms with two groups of firms selected from all U.S. nonfinancial firms on the Compustat database with assets and sales in excess of $5 million and with financial data reported for all of the years 1986 through 1991. Our first set of comparison firms had high cash ratios in 1986 and 1987, like our sample firms, but they experienced a significant decline in cash holdings between 1987 and 1991. In particular, each comparison firm has a ratio of cash to assets above 0.25 at the end of 1986 and 1987 that fell by more than two-thirds between the ends of years 1987 and 1991. This comparison group of 68 firms represents firms that choose not to follow a policy of persistent large cash holdings.

Our second set of comparison firms is matched to sample firms by size and industry classification. For each sample firm, we identify the comparison firms with operating assets at the end of 1991 that are within 70%–130% of the sample firm's operating assets. Among each sample firm's group of size-matched firms, we identify firms with the same four-digit SIC code as the sample firm. In the 41 cases where we could not find a match on four-digit SIC code, we search for firms with the same three-digit SIC code and if necessary we search for matches on two-digit and single-digit SIC codes. Following this procedure, we identified size and SIC code matches for 85 of our sample firms.

Rows 1 and 2 of Table 1 show that the median cash ratio for the sample firms ranges from 49% of assets in 1986 to 44% in 1991. For the firms that had high cash in 1986 and 1987 that subsequently declined, the median cash ratio is 40% in 1986 and only 6% in 1991. The median cash ratios for firms matched by size

and SIC code are 13% in 1986 and 10% in 1991. The considerably greater cash holdings of our sample firms are quite unusual for the industries in which they operate and for firms of comparable size.

TABLE 1

Medians of Cash Holdings and Sources of Cash Inflow of Firms with Sustained High Cash Holdings, of Firms with Temporary High Cash Holdings, and of Size- and Industry-Matched Comparison Firms

Sample firms had a ratio of cash to total assets above 0.25 at the end of each of the years 1986–1991 that did not fall by more than one-third between 1986 and 1991. Comparison firms in column 2 had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Comparison firms in column 3 are the sets of firms with the same SIC code whose operating assets (total assets less cash and equivalents) are within 70%–130% of the sample firm's operating assets at the end of 1991.

	Sample Firms	Comparison Firms	
Characteristic of Firms (median)	Firms that Sustained High Cash Holdings from 1986–1991 ($n = 89$)	Firms with High Cash Holdings in 1986 and 1987 that Declined by More than Two-Thirds by 1991 ($n = 68$)	Groups of Firms Matched with Sample Firms by Industry and Size ($n = 85$)
1. Cash and equivalents/ operating assets in 1986	0.49	0.40	0.13***
2. Cash and equivalents/ operating assets in 1991	0.44	0.06***	0.10***
3. Proportion of cash inflows from operations in 1981–1986	0.75	0.64**	0.55***
4. Proportion of cash inflows from assets sales in 1981–1986	0.00	0.01	0.02
5. Proportion of cash inflows from financing in 1981–1986	0.23	0.34	0.37***

Sample firms and comparison firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for the years 1986 through 1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two. The median for each set of comparison firms is treated as the comparison firm median.

*, **, *** Difference from the median in column 1 is significant at the 10%, 5%, or 1% level, respectively.

Using data from Compustat, we identified the sources of cash holdings for our sample firms from 1981–1986. Table 1 shows that most of high cash firms' cash inflows prior to our sample construction period come from operations. At the median, 75% of cash inflows represent funds from operations compared to 64% and 55% for the two comparison samples. A negligible fraction of funds came from the sale of assets for sample firms, compared to 1% for the temporary high cash firms and 2% for size- and SIC-matched firms. Financing constituted 23% of funds for sample firms compared to 34% for the temporary high cash firms and 37% for size- and SIC-matched firms. Both in absolute and relative terms, sample firms' primary source of cash is internal, from operations rather than from asset sales or financing.

We also investigate the distribution of high cash firms according to lines of business, as measured by two-digit SIC codes. The percentage of high cash firms is notably higher than the percentage of other firms in the following business categories: chemicals and allied products (14.7% of high cash firms vs. 4.6% of other firms); industrial, commercial machinery, and computer equipment (11.8% vs. 8.7%); electronics (11.0% vs. 7.7%); measurement instruments, photographic goods, and watches (11.8% vs. 5.5%); and business services (15.4% vs. 5.1%).

Table 2 documents characteristics of the sample firms and comparison firms during the interval 1986 to 1991, and at the end of 1991. Row 1 indicates that the sample firms are smaller at the median than are the comparison firms whose high cash holdings dissipate between 1987 and 1991. However, row 3 shows that the high cash firms' median growth in sales is not different from the comparison samples' median growth. Thus, sales growth does not explain the sample firms' high cash holdings.

TABLE 2

Medians of Financial and Ownership Characteristics of Firms with Sustained High Cash Holdings, of Firms with Temporary High Cash Holdings, and of Size- and Industry-Matched Comparison Firms

Sample firms had a ratio of cash to total assets above 0.25 at the end of each of the years 1986 through 1991 that did not fall by more than one-third between 1986 and 1991. Comparison firms in column 2 had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Comparison firms in column 3 are the sets of firms with the same SIC code whose operating assets (total assets less cash and equivalents) are within 70%–130% of the sample firm's operating assets at the end of 1991.

	Sample Firms	Comparison Firms	
Characteristic of Firms (median)	Firms that Sustained High Cash Holdings 1986–1991 ($n = 89$)	Firms with High Cash Holdings in 1986 and 1987 that Declined by More than Two-Thirds by 1991 ($n = 68$)	Groups of Firms Matched with Sample Firms by Industry and Size ($n = 85$)
1. Operating assets in 1991 ($ millions)	38.4	59.6***	43.8
2. Average operating income/ operating assets from 1986 to 1991	0.25	0.16***	0.13***
3. Relative change in sales from 1986 to 1991	1.43	1.95	1.54
4. Market/book value of operating assets in 1991	2.12	1.21***	1.18***
5. Coefficient of variation of operating income from 1986 to 1991	0.31	0.57***	0.52***
6. Standard deviation of stock return residuals of market model from 1986 to 1991	0.12	0.13***	0.15***
7. Proportion of firms with more than one business segment	0.85	0.67	0.84
8. Long-term debt/operating assets in 1991	0.06	0.18***	0.15***
9. Insider stock ownership in 1991[a]	0.15	0.17	0.19
10. Institutional stock ownership in 1991[a]	0.34	0.20***	0.23***

Sample firms and comparison firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for the years 1986 through 1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two. The median for each set of comparison firms is treated as the comparison firm median.

[a]Ownership data were obtained from Compact Disclosure.

*, **, *** indicate difference from the median in column 1 is significant at the 10%, 5%, or 1% level, respectively.

The most prominent distinguishing characteristic of the sample is the nature of assets, as measured by median market value to book value of operating assets. In 1991, sample firms' median market-to-book ratio is 2.1 as compared to 1.2 for the two comparison samples. This is consistent with a positive relation between market-to-book and cash holdings that is observed for firms in general by Kim, Mauer, and Sherman (1998), Opler, Pinkowitz, Stulz, and Williamson (1999), and Harford (1999). In a similar vein, Minton and Wruck (2001) find high market-

to-book ratios for firms characterized as having conservatively low leverage. The high median market-to-book ratio suggests that sample firms have more opportunities to invest profitably or are expected to generate more economic profits from existing assets. If market-to-book reflects expected profitability, it is important for us to control for market-to-book ratio in our analysis of operating performance of high cash firms in 1992 and later.

During the years 1986 to 1991, the coefficient of variation of operating income is significantly lower for the high cash firms. This is contrary to our expectation that cash reserves would be greater for firms that face more variation in performance. The median standard deviation of residuals from the market model is also lower for high cash firms. We expected that financing costs, and therefore cash reserves, would be greater for firms with larger values of this proxy for firm-specific risk and greater information asymmetry. Similarly, however, Minton and Wruck (2001) find that firms with more conservative financial leverage appear to have less information asymmetry. We do not have a plausible explanation for this pattern and neither do Minton and Wruck.

We also find, as reported in row 7 of Table 2, that 85% of firms with sustained high cash holdings classify themselves as having only one business segment. This is greater than the percentage of firms with temporary high cash holdings, but similar to the percentage of firms matched by SIC code and size. A higher percentage of single-segment firms among high cash firms is consistent with greater benefits of cash reserves for firms that are less diversified and without the ability to transfer funds internally among business units.

High cash firms have fewer liabilities as a proportion of operating assets. The median ratio of long-term liabilities to assets in row 8 is 0.06 for the high cash firms, which is approximately one-third the median ratios of the matched firms. This pattern is also reported in other studies of cash holdings, such as Kim, Mauer, and Sherman (1998). Similarly, Minton and Wruck (2001) document that firms with low financial leverage have unusually high levels of cash holdings. One interpretation of the relatively low financial leverage is that high cash firms have significant amounts of investment opportunities that do not represent good collateral for debt financing. Alternatively, high cash firms can use cash reserves to finance investment internally and therefore undertake little borrowing.

The low use of leverage among high cash firms may reflect the preferences of entrenched managers who stockpile cash to avoid the use of debt financing, consistent with the results of Berger, Ofek, and Yermack (1997). We collected data related to governance characteristics to assess the extent of agency problems in the high cash firms. We report ownership of common stock by insiders in row 9. The data come from Compact Disclosure, which, according to the analysis of Anderson and Lee (1997), conform well to ownership information reported in proxy statements. Among the high cash firms, insiders own a median of 15% of the common stock. This level of insider ownership is not unusual relative to comparison firms. Insider ownership in high cash firms can also be compared to evidence from other studies. For example, Mikkelson and Partch (1989) report that the median ownership of officers and directors is 13.9% in a random sample of firms listed on the New York and American Stock Exchanges. Denis and Sarin

(1999) report a median level of insider ownership of 8.08% in a random sample of publicly traded firms.

Compact Disclosure also reports levels of institutional ownership. As row 10 in Table 2 shows, the median ownership stake of institutions is 34% for high cash firms, compared to only 20% and 23% for the comparison samples. Although the significantly higher level of institutional ownership among high cash firms may reflect greater monitoring and therefore fewer agency problems, it is also consistent with the arguments of Del Guercio (1996). Firms that consistently hold large cash balances are viewed as safe or prudent investments from the standpoint of fiduciary responsibility, and therefore shares of high cash firms are in high demand by institutions.

For the high cash firms, we collected data on the proportion of insiders on the board of directors, the proportion of firms controlled by a founder, and firm age from 1991 proxy statements, but do not report these in a table. The median proportion of insiders on the board of directors of high cash firms is 0.33. Denis and Sarin (1999) provide a useful comparison. They report that the median fraction of inside directors on the board is 0.35. Fourteen percent of high cash firms are controlled by a founder, as compared to 13% of the firms described by Denis and Sarin. The median age of high cash firms in 1991 is 16 years, as compared to a median age of 24 years reported by Denis and Sarin. Thus, although high cash firms are younger than the random sample drawn by Denis and Sarin, they are not unusual in terms of the composition of the board of directors or the presence of a founder. There is no evidence of greater incentive problems among high cash firms.

We estimate regressions of cash ratio at the end of 1991 on several possible financial determinants of high cash holdings. The determinants include measures of firm size, profitability, growth prospects, and risk. The first column of regression results in Table 3 is based on the sample of high cash firms combined with the sample of firms that went from large cash holdings in 1986 and 1987 to substantially lower cash holdings in 1991. The second column of regression results is based on the high cash sample combined with the sample of size- and SIC code-matched firms. The regressions are consistent with the univariate comparisons in Table 2, and are significant. High cash holdings in 1991 are associated with a smaller amount of operating assets, greater market-to-book ratio of assets, and lower firm-specific risk as measured by standard deviation of market model residuals. Below we use these findings to estimate abnormal or unexplained cash holdings as well as to estimate the proclivity to sustain large cash holdings.

IV. Operating Performance of High Cash Firms

In Table 4, we examine the operating performance of high cash firms from 1992 through 1996, where operating performance is the ratio of operating income to operating assets. Operating income is measured before interest, taxes, depreciation, and extraordinary items. Income from holdings of cash and equivalents is excluded from the measure of operating income. Column 1 presents median operating performance for the sample firms. The second column reports the median performance of firms that had high cash holdings in 1986 and 1987 and decreased

TABLE 3

Regressions of Financial Determinants on Cash Holdings in 1991

Sample firms have a ratio of cash to total assets above 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986 and 1991. Comparison firms in column 1 had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Comparison firms in column 2 are the sets of firms with the same SIC code whose operating assets (total assets less cash and equivalents) are within 70%–130% of the sample firm's operating assets at the end of 1991.

	Firms with Sustained Cash Holdings from 1986–1991 and Firms with Temporary High Cash Holdings in 1986 and 1987	Firms with Sustained High Cash Holdings from 1986–1991 and Industry- and Size-Matched Firms
1. Constant	0.4250 (0.00)	0.406 (0.00)
2. Operating assets in 1991	−0.001 (0.00)	−0.0003 (0.03)
3. Operating income/operating assets from 1986–1991	−0.007 (0.93)	0.084 (0.24)
4. Relative change in sales from 1986–1991	−0.008 (0.15)	−0.005 (0.37)
5. Market-to-book value of assets in 1991	0.029 (0.00)	0.026 (0.00)
6. Coefficient of variation of operating income/operating assets from 1986–1991	−0.001 (0.64)	−0.001 (0.76)
7. Standard deviation of stock return residuals of market model from 1986–1991	−1.282 (0.00)	−1.085 (0.00)
F-statistic (*p*-value)	8.53 (0.00)	8.06 (0.00)
Adjusted R^2	0.23	0.20

Sample firms and comparison firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for the years 1986–1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two.

p-values of *t*-statistics are in parentheses.

their cash ratio by two-thirds or more by the end of 1991. Column 3 reports the median performance of firms that are matched by size and SIC code. We test whether the median difference between the performance of high cash firms and the performance of each set of comparison firms equals zero.

From 1992 through 1996, the median performance of the sample firms is almost 1.5 times greater than the median performance of the comparison firms. In each year from 1992 through 1994, operating income scaled by operating assets is significantly higher for the high cash firms than the comparison samples of firms at the 1% level of significance. By 1995, the level of significance is at the 5% or 10% level and there is no difference in 1996. To control for the tendency of performance to revert to the mean, as suggested by the declining differences in performance measures over time, we also compare performance of high cash firms to firms matched on performance in 1991. We find, but do not report in a table, that when we match on prior performance, the sample firms' median-adjusted performance is not significantly different from zero. Thus, the evidence in Table 4 shows that a policy of persistent high cash balances is associated with operating performance that is comparable to or greater than the performance of various groups of comparison firms. Next we control for determinants of high cash holdings and conduct more thorough analyses of the effects of high cash on operating performance.

TABLE 4

Median Operating Income Divided by Operating Assets of Firms with Sustained High Cash Holdings, of Firms with Temporary High Cash Holdings, and of Size- and Industry-Matched Comparison Firms

Sample firms have a ratio of cash to total assets above 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986 and 1991. Comparison firms in column 1 had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Comparison firms in column 2 are the sets of firms with the same SIC code whose operating assets (total assets less cash and equivalents) are within 70%–130% of the sample firm's operating assets at the end of 1991.

	Firms that Sustained High Cash Holdings from 1986–1991 ($n = 89$)	Firms with High Cash Holdings in 1986 and 1987 that Declined by More than Two-Thirds by 1991 ($n = 68$)	Groups of Firms Matched with Sample Firms by Industry and Size ($n = 85$)
1992	0.195	0.111***	0.109***
1993	0.180	0.094***	0.107***
1994	0.192	0.122***	0.127***
1995	0.202	0.145*	0.143**
1996	0.160	0.161	0.157
1992–1996	0.169	0.112**	0.119***

Sample firms and comparison firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for the years 1986–1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two. The median for each set of comparison firms is treated as the comparison firm median.

*, **, *** indicate difference from the median in column 1 is significant at the 10%, 5%, or 1% level, respectively.

V. Estimates of the Effect of Cash Holdings on Operating Performance

A. Regression of Performance on Unexplained Cash Holdings

Our analysis involves two stages. In the first stage, we estimate normal cash holdings, using a reduced version of the regression on cash holdings in Table 3. Specifically, we estimate the relation between cash holdings in 1991 and the three variables that are related to cash holdings: operating assets in 1991, market-to-book value of assets in 1991, and standard deviation of market model residuals for the period 1986 to 1991. The estimate of normal cash holdings is

$$\begin{aligned}\text{cash}_i \quad = \quad & a + b(\text{operating assets}_i) + c(\text{market-to-book value of assets}_i) \\ & + d(\text{standard deviation of market model residuals}_i) + u_i.\end{aligned}$$

The regression is estimated on the sample of firms with high cash holdings from 1986–1991 and each of the two comparison samples described earlier. The first comparison sample is firms with high cash holdings in 1986 and 1987 that declined by two-thirds by 1991. The second comparison sample is firms matched by size and SIC code. The estimates reported in panel A of Table 5 show, as reported earlier, that operating assets and the standard deviation of market model residuals are both negatively and significantly related to the level of cash holdings, and that market-to-book value of assets is positively related to cash holdings. The degree of explained variation in cash positions, as measured by adjusted R^2, is virtually the same as reported earlier for the expanded regression.

The second stage of our test estimates the relation between average operating performance in the period 1992 through 1996 and the residual, or unexplained, value of cash holdings from the first stage regressions. In addition to the

TABLE 5
Two Stage OLS Regressions of the Relation between Operating Performance and Unexplained Cash Holdings

Sample firms have a ratio of cash to total assets above 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986–1991. Comparison firms in column 1 had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Comparison firms in column 2 are the sets of firms with the same SIC code whose operating assets (total assets less cash and equivalents) are within 70%–130% of the sample firm's operating assets at the end of 1991.

	Firms with Sustained Cash Holdings from 1986–1991 and Firms with Temporary High Cash Holdings in 1986 and 1987		Firms with Sustained High Cash Holdings from 1986–1991 and Industry- and Size-Matched Firms	
Panel A. Dependent Variable is Cash Holdings/Operating Assets in 1991 (first stage)				
Constant	0.422	(0.00)	0.431	(0.00)
Operating assets in 1991	−0.0002	(0.00)	−0.002	(0.01)
Market-to-book value of assets in 1991	0.025	(0.00)	0.026	(0.00)
Std. dev. of stock return residuals of market model 1986–1991	−1.344	(0.00)	−1.230	(0.00)
F-statistic	16.26	(0.00)	15.47	(0.00)
Adj. R^2	0.23		0.21	
Panel B. Dependent Variable is Average Operating Income/Operating Assets in 1992–1996 (second stage)				
Constant	0.020	(0.47)	0.039	(0.08)
Prediction error of cash/operating assets in 1991 from first stage regression	−0.173	(0.22)	−0.159	(0.22)
Average operating income/operating assets in 1986–1991	0.640	(0.00)	0.654	(0.00)
Insiders' ownership stake in 1991	−0.0009	(0.18)	−0.001	(0.11)
Insiders' ownership stake × dummy for positive cash prediction error	0.001	(0.46)	0.001	(0.55)
F-statistic (*p*-value)	19.68	(0.00)	31.74	(0.00)
Adj. R^2	0.37		0.46	

Sample firms and comparison firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for the years 1986 through 1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two.

p-values of *t*-statistics are in parentheses.

prediction error of cash holdings, we regress operating performance from 1992 through 1996 on operating performance from 1986 through 1991. This serves as a control for the persistence in performance of firms. We also include insiders' stock ownership stake in 1991 as a measure of managerial incentives as well as an interaction between insiders' ownership and a dummy variable for a positive prediction error for cash holdings. The interaction variable represents the effect on performance of managerial incentives for firms with positive unexplained cash holdings. The second stage regression is

$$\begin{aligned}\text{operating performance}_i \;=\; & a + b(\text{prediction error of cash}_i) \\ & + c(\text{prior operating performance}_i) + d(\text{insiders' stake}_i) \\ & + e(\text{insiders' stake} \times \text{dummy for positive prediction error of cash}_i) + v_i.\end{aligned}$$

The second stage regression estimates in panel B of Table 5 show that operating performance in 1992 through 1996 is unrelated to prediction errors in cash holdings from the first stage regression. Operating performance is significantly

related to prior performance, which reflects the persistence over time in operating performance. However, we do not find an effect of insiders' ownership by itself or interacted with a dummy for a positive prediction error for cash holdings. Overall, the two stage regression estimates indicate that performance in the period 1992 through 1996 is unrelated to unusual levels of cash holdings or to incentive effects represented by managers' ownership. These findings suggest no unfavorable effects on performance attributable to managerial incentive and high cash reserves.

B. Comparison of Performance Measures Controlling for Propensity to Hold Cash

Another approach we take is to match sample and comparison firms on the basis of characteristics that determine the propensity to hold large amounts of cash, and then to compare performance of groups with similar proclivities to hold cash. We adopt this procedure to address concerns about the joint determination of cash holdings and operating performance. Furthermore, Lalonde (1986) finds that biases in estimation can result when observations are not allocated randomly between the treatment and non-treatment groups, the high cash and comparison samples in our study. Problems of bias are less, the greater is the similarity between the two samples of firms in terms of the characteristics that determine a firm's likelihood of being in the high cash group.

Our sample firms had a ratio of cash to assets in excess of 0.25 from 1986 through 1991. The comparison firms had similarly large cash holdings from the end of 1986 through 1987, and then experienced a decline in cash to assets of more than two-thirds by 1991. Following Dehejia and Wahba (1999), we estimate sample and comparison firms' propensity, as of the end of 1987, to retain their high cash through 1991. Our computation of this estimate, referred to as a propensity score, is described below. We remove any comparison firm whose propensity score is below the minimum or above the maximum propensity score of the sample firms. We group the sample firms into quartiles based on their propensity scores and place comparison firms with similar propensity scores into corresponding groups. For example, in row 1 of Table 6 there are 21 sample firms in the quartile with the lowest propensity scores. In row 2, there are 26 comparison firms whose propensity score falls within the same range. We compare the operating performance from 1992–1996 of these two groups that by construction have a similar estimated tendency to hold cash. We repeat this procedure for the other three quartiles of sample firms.

To estimate propensity scores, we estimate a logit model of whether firms retained high cash holdings through 1991, using the combined sample of 155 firms, which is 87 sample firms and 68 comparison firms, with high cash holdings in 1986 and 1987. The independent variables in the model are the variables in the regression of cash holdings in Table 3 plus the cash to sales ratio. Independent variables that represent stock measures are defined as of the end of 1987. The flow and variability variables are measured from 1986 to 1991. The logit model is

$$\begin{aligned}\text{retain high cash after 1987}_i \quad = \quad & a + b(\text{operating assets}_i) \\ & + c(\text{market-to-book value of assets}_i) + d(\text{operating performance}_i) \\ & + e(\text{coefficient of variation of operating performance}_i) \\ & + f(\text{standard deviation of residuals}_i) + g(\text{cash/sales}_i) + u_i.\end{aligned}$$

We use the estimated coefficients of the logit model to compute a predicted value, or propensity score, that lies between 0.0 and 1.0 for each firm. The propensity scores, which represent the likelihood of retaining cash through 1991, range from 0.25 to 0.96 for the sample firms. We discard 13 comparison firms with a propensity value that falls outside this range of values for the sample firms.

Table 6 shows the grouping of sample firms into quartiles by propensity score. The comparison firms are also placed into the four groups based on their propensity scores. Row 2 shows that most comparison firms, 26 of 55, are in the quartile with the lowest propensity to retain high cash through 1991, while only four comparison firms are in the highest quartile of propensity to retain high cash. Rows 3 and 4 show the similarity (by construction) of the propensity scores of the two samples within quartiles. Thus, in each of the four subsamples we have sample firms and matched firms that are estimated as of 1987 to have had a similar likelihood of retaining high cash holdings through 1991. Rows 5 through 8 show the different behavior of cash holdings between the two samples despite their similar estimated propensities to retain cash.

Rows 9 and 10 of Table 6 present the median return on operating assets for the quartiles of firms grouped by propensity to hold cash through 1991. In the first quartile, firms with the lowest likelihood of retaining a large amount of cash had a median operating return on assets in 1992 through 1996 of 7.2% compared to 8.9% for the firms that did not retain large cash holdings. In quartile 2, the returns are 12.2% and 13.5%. These differences are not statistically significant at the 0.10 level. For the other two quartiles, which represent higher propensities to retain cash, the median operating performance of comparison firms increases somewhat, while the median operating performance increases substantially for the firms that retained large cash positions. However, the small sample sizes for quartiles 3 and 4 do not allow us to infer that differences in median performance measures between samples are significant. We conclude that controlling for the propensity to hold cash does not reveal subsequent underperformance by firms that retain substantial cash reserves.

C. Cross-Sectional Analysis of the Operating Performance of High Cash Firms

Our third test on operating performance examines the cross-sectional variation in performance among the sample of high cash firms. As a test of the idea that conservative financial policies serve managers' self-interest, we examine whether proxies for managerial incentives explain variation in performance among the sample firms. If large cash holdings represent self-serving behavior by managers, we predict that performance is negatively related to insider ownership and to the

TABLE 6

Comparisons of Operating Performance in 1992–1996 of Firms Matched by Estimated Propensity in 1987 to Retain High Cash Holdings

Sample firms, labeled retain high cash, have a ratio of cash to total assets above 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986 and 1991. Comparison firms, labeled decrease cash, had a ratio of cash to total assets above 0.25 in 1986 and 1987, and the cash ratio fell by at least two-thirds between 1986 and 1991. Quartiles of sample firms are formed according to a logit model that estimates the likelihood of retaining high cash from the end of 1987 through 1991. Comparison firms, labeled decrease cash, are placed into corresponding quartiles according to their estimated probability of retaining high cash from the end of 1987 through 1991.

	Quartiles of Firms Grouped by Propensity to Retain High Cash			
	(lowest propensity to retain cash) 1	2	3	(highest propensity to retain cash) 4
No. of Firms				
1. Retain high cash	21	22	22	22
2. Decrease cash	26	16	9	4
Median Propensity Score to Retain High Cash				
3. Retain high cash	0.412	0.576	0.727	0.859
4. Decrease cash	0.394	0.584	0.699*	0.842
Median Cash Ratio in 1987				
5. Retain high cash	0.446	0.480	0.498	0.538
6. Decrease cash	0.415	0.383**	0.470	0.500
Median Cash Ratio in 1991				
7. Retain high cash	0.456	0.493	0.496	0.476
8. Decrease cash	0.074***	0.072***	0.089***	0.067***
Median Operating Income/Operating Assets from 1992–1996				
9. Retain high cash	0.072	0.122	0.256	0.307
10. Decrease cash	0.089	0.135	0.143	0.104

*, **, *** Indicate denote that the medians between the retain high cash and the decrease cash sample differ at the 10%, 5%, or 1% level of significance, respectively.

presence of a controlling founder. We also expect operating performance of high cash firms to be positively related to greater outside representation on the board, assuming outside directors provide more effective oversight of managers.

In addition, we include variables to represent the motive to hold substantial cash as a reserve to meet large investment expenditures. Assuming that such a precautionary motive serves stockholders' interests, we expect operating performance to be greater for firms that undertake larger amounts of investment and for firms with a smaller spread between cash flow and investment expenditures. That is, cash reserves are more beneficial to firms with investment that is more likely to exceed cash flows.

The dependent variable in Table 7 is average annual operating performance from 1992 through 1996. Variation in operating performance is not explained by the proxies for managerial incentives. Insider ownership, institutional ownership, board composition, and founder status are all unrelated to performance. Our variables representing potential for agency conflicts do not appear to explain variation in performance among high cash firms.

Operating performance is unrelated to scaled investment expenditures. This does not support the idea that high cash firms with greater investment subsequently perform better. The minimum difference between cash flow and investment is positively related to performance. However, we expected a negative coefficient. The direction of the relation does not support the idea that high cash holdings lead to benefits when shortfalls in cash flow are more likely. One possible

TABLE 7

Regression of Operating Performance on Characteristics of High Cash Firms ($n = 85$)

Independent Variables	Estimates of Coefficients (p-value)
1. Constant	−0.14 (0.51)
2. Average ratio of cash and equivalents to assets for 1987–1991	0.29 (0.42)
3. Average annual operating income to operating assets for 1987–1991	0.37 (0.05)
4. Total operating assets in 1991	0.00 (0.65)
5. Market value to book value of operating assets in 1991	0.02 (0.05)
6. All investment scaled by operating assets for 1987–1991	0.39 (0.28)
7. Minimum difference between cash flow and investment scaled by operating assets for 1987–1991	0.37 (0.01)
8. Proportion of insider ownership	−0.00 (0.82)
9. Board composition	−0.15 (0.57)
10. Founder status	0.06 (0.63)
11. Age of company in years	0.00 (0.87)
F-statistic (p-value)	4.16 (0.00)
Adj. R^2	0.27

The dependent variable is the average annual unadjusted operating income divided by operating assets for the years 1992–1996. High cash firms have a ratio of cash to total assets in excess of 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986 and 1991.

Data on board composition and ownership were available for 85 firms.

interpretation is that a higher level of cash flow, and therefore a higher minimum difference between cash flow and investment, is positively related to future cash flow. However, as we discuss next, the regression controls for prior operating performance so this interpretation is not fully satisfactory.

As we found earlier, operating performance is related positively to prior operating performance. Prior operating performance essentially serves as a control for expected or sustained performance of high cash firms. Market-to-book ratio is also related positively to performance among high cash firms. One interpretation is that high cash combined with valuable investment opportunities leads to better performance. That is, companies benefit from high cash holdings when their assets are constituted more by investment opportunities. However, high market-to-book can also reflect investors' higher expected levels of performance rather than differences in the nature of assets or investment opportunities.

Our three tests on operating performance do not uncover evidence of underperformance by firms that retain high cash reserves. We conclude that firms that chose to hold substantial cash did so without hindering their performance. We next extend our analysis by trying to gain more insight into the apparent motives for persistent large cash reserves.

VI. Uses of Cash

We document how sample and comparison firms used cash in the period 1992 through 1996. In particular, we examine expenditures on investment and payouts to security holders. We also compare subsequent rates of growth. We are interested in whether high cash firms stand out in terms of either their investment or financing behavior.

Row 1 of Table 8 reports that the median ratio of all investment expenditures to operating assets is 0.17 for the high cash firms. This rate of expenditures is significantly greater than the median ratios for high cash comparison firms that

reduced their cash holdings after 1997 but not for comparison firms matched on size and SIC code.

TABLE 8

Median Measures (1992–1996) of Average Annual Cash Outflows and Growth of High Cash Firms and Firms Matched by Size Only and by Size and Four-Digit SIC Code

High cash firms have a ratio of cash to total assets in excess of 0.25 at the end of each of the years 1986–1991 and did not fall by more than one-third between 1986 and 1991. Size matching is against the median of firms with operating assets (total assets less cash and equivalents) within 70%–130% of the sample firm's operating assets at the end of 1991.

Firm Characteristic	Median of High Cash Firms (25th and 75th percentiles) ($n = 89$)	Median of Firms with High Cash in 1986 and 1987 that Fell by More than Two-Thirds by 1991 ($n = 68$)	Median of Firms Matched by Industry and Size ($n = 85$)
Investment Expenditures:			
1. All investment expenditures/ operating assets	0.17 (0.08, 0.34)	0.11**	0.13
2. Capital expenditures/operating assets	0.07 (0.04, 0.10)	0.05**	0.05
3. R&D expenditures/operating assets	0.17 (0.05, 0.27)	0.07***	0.09***
4. Acquisition expenditures/operating assets	0.00 (0.00, 0.03)	0.00	0.00
5. Maximum annual capital, R&D, acquisition and other expenditures/ cash flow	0.28 (0.13, 0.49)	0.19**	0.22
6. Difference between maximum and minimum investment expenditures/ operating assets	0.13 (0.09, 0.33)	0.11**	0.12*
Financing Expenditures:			
7. All financing payouts/operating assets	0.08 (0.05, 0.18)	0.08	0.08
8. Debt payments/operating assets	0.01 (0.00, 0.03)	0.07***	0.06***
9. Equity payments/operating assets	0.05 (0.01, 0.12)	0.01***	0.01
Measures of Growth:			
10. Relative change in operating assets	1.69 (1.13, 3.25)	1.29***	1.38***
11. Relative change in sales	1.41 (1.11, 2.24)	1.73*	1.29

Sample firms and matching firms come from the population of Compustat firms with assets in excess of $5 million, whose SIC code does not begin with a six, and that have Compustat data for 1986–1991. Fifty-eight sample firms had at least one match with a firm of comparable size and the same four-digit SIC code. Fifteen sample firms had at least one match based on size and three-digit SIC codes; nine firms had matches based on size and two-digit SIC codes; and three firms had matches based on single-digit SIC codes. Four firms had no matches. The median number of comparison firms per sample firm is two.

*,**,*** denotes significance at 10%, 5%, or 1% level, respectively.

In rows 2, 3, and 4, the total investment expenditures from row 1 are disaggregated. High cash firms have greater R&D expenditures than do either set of comparison firms. Median R&D expenditures are 17% of operating assets for high cash firms and 7% and 9% for the two comparison firm samples. Similarly, Maher (1998), for high cash firms, and Minton and Wruck (2001), for low leverage firms, find unusually high R&D expenditures. The high level of R&D expenditures among sample firms is consistent with the argument that high cash firms have substantial growth opportunities and the assets of these firms do not support high levels of debt financing. Therefore, firms rely on internally generated cash and cash reserves to support investment and avoid debt financing, because outside financing is relatively costly for the high cash firms.

Finally, median acquisition expenditures, scaled by operating assets, are zero for both the sample firms and comparison firms, as shown in row 4. Only 34% of high cash firms have any acquisition expenditures from 1987 through 1991, while 51% of the median comparison firms have positive acquisition expenditures.

Thus, unlike Harford's (1999) evidence that excess cash reserves measured within a one-year window lead to value-decreasing acquisitions, there is not an unusual propensity to make acquisitions among firms that have had a persistent policy of holding cash reserves. Consistent with our findings, as well as Harford's (1999), Maher (1998) finds that firms defined as having high cash holdings at a point in time, similar to our definition, do not exhibit unusual acquisition expenditures, but firms that display increases in cash over time make unusually high levels of acquisition expenditures. Thus, it is important to distinguish between changes in and levels of cash holdings when characterizing the proclivity to spend large cash reserves on acquisitions.

One possible benefit of large cash balances is to insulate investment expenditures from variability of cash flows and external financing requirements. We investigate whether the high cash firms use their cash reserves to make a large capital expenditure. In particular, we examine the maximum ratio of total investment expenditures to cash flow from 1992 through 1996. As row 5 of Table 8 shows, sample firms' maximum annual scaled investment expenditures are greater than in the comparison firms with temporary cash holdings, but not significantly greater than in the size- and SIC-matched sample. Row 6 indicates that high cash firms have a wider range of scaled investment expenditures. Some evidence, therefore, indicates that high cash firms face unusually high peaks in investment requirements.

Row 7 in Table 8 shows that combined cash outflows to equity and debt are not unusual for high cash firms in the period 1992 through 1996. The combination of different types of payouts masks the relatively high equity payouts and relatively low debt payouts of high cash firms shown in rows 8 and 9. High cash firms, despite their ample reserves, do not make unusually high total payouts to security holders.

We conclude, as row 10 shows, that high cash firms appear to use their cash to support faster growth in assets. However, row 11 shows that this growth is not accompanied by unusual growth in sales and our earlier results show that this growth is not accompanied by unusual operating returns on assets.

VII. Summary and Conclusions

We investigate firms that held more than one-fourth of their assets as cash and cash equivalents at the end of each of the years 1986 through 1991. We find that in the ensuing five years, firms with large cash holdings have median operating performance that is greater than the performance of firms matched by size and industry and greater than or comparable to the performance of firms matched by propensity to retain high cash reserves. In addition, high cash firms grow faster, undertake higher levels of investment, and have higher ratios of market-to-book value of assets. We conclude that these asset characteristics lead our sample firms to follow a policy of persistent large cash holdings. There is no evidence that high cash firms have characteristics consistent with weak incentives or oversight of managers. In addition, there is no unusual performance for firms with lower insider stock ownership, higher inside board composition, or control by a founder.

Governance characteristics do not explain variation in performance among firms with large cash holdings.

Much of our evidence complements the findings of Kim, Mauer, and Sherman (1998) and Opler, Pinkowitz, Stulz, and Williamson (1999), who study the cash holdings of firms in general. They find, as we do, that holdings of excess cash appear to support growth and reduce the use of external financing. Further, these studies indicate that a policy of holding excess cash reflects a precautionary financial policy.

Most of the prior research on the consequences of large cash holdings focuses on firms that have large cash balances at a particular point in time. These studies tend to find uses of cash that conflict with stockholders' interests. However, the inference does not necessarily apply directly to firms that have adopted a policy of persistent large cash balances over time, the focus of our study. We find no evidence that the operating performance of firms with persistent large cash reserves suffers from a conservative financial policy. In fact, the characteristics of our sample firms suggest that large cash holdings facilitate growth and investment.

Our research on cash holdings highlights the extreme to which some firms go to insulate themselves from the occurrence of cash shortfalls. Conservative financial policies can also take the form of little or no financial leverage and extensive financial hedging. Berger, Ofek, and Yermack (1997) and Graham (2000) indicate that firms tend to underutilize financial leverage, and Minton and Wruck (2001) describe in detail firms with low financial leverage. It will be interesting to see whether there is a similar tendency toward conservatism in firms' use of hedging instruments. Future research could explore cash holdings, financial leverage, and risk management in combination to more fully understand the motives for and consequences of conservative financial policies. At this point, there is no clear evidence that such polices harm stockholders.

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