Agency Costs and the Short-Run Stock Price Response to Capital Expenditures

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Abstract

We estimate the short-run stock price response to unanticipated capital expenditures. We use association study methodology to avoid the self-selection bias in event studies and to facilitate construction of a large sample of firm-years likely to exhibit agency problems. We find that the average price response to routine capital expenditures is negative, and that commonly used agency cost measures explain fully the negative response. Subsample results support the conclusion that the market is skeptical of cash flow financed spending by low-q firms and even capital spending by high-q firms when the firm is large and q is only marginally high.

1. Introduction

Event studies dominate research on the valuation impact of capital expenditures. This dominance can be attributed to the fact that event-period returns, measured over two days or less, are considered to be less noisy estimates of market response than are returns measured over longer time intervals. However, event study methodology is not without disadvantages. Titman, Wei, and Xie (2004) contend that self-selection bias is inherent in the event studies, because of a likely tendency of firms to publically announce only investments that they expect to be viewed favorably. A tendency to announce good news more often than bad news likely limits the representativeness of samples and the generality of results. Moreover, restricting study to publically announced capital expenditures limits samples to a relatively small subset of firms' capital expenditures. This limitation makes it difficult to construct representative and large, yet targeted, samples that isolate the desired effects for study from confounding influences.

We use association study methodology, a staple research tool for evaluating the value relevance of financial statement information, to estimate the impacts of agency cost measures on the relation between annual abnormal returns and unanticipated capital expenditures, i.e., on the capital spending response coefficient (CSRC). This methodology reduces self-selection bias relative to event studies, by estimating the valuation implications of capital spending reported in financial statements available on the COMPUSTAT database. The use of this method broadens the set of observations from which we can draw, facilitating the construction of a large, yet targeted, sample where the impact of agency problems can be largely isolated from confounding influences on investment. Specifically, our sample is comprised of relatively large, transparent, and financially unconstrained firms during a period when the hostile takeover market was relatively weak. By design, our sample is large and representative of firms for which agency costs are likely to play an important and identifiable role in investment decisions, but within sample variation in the degree of financial constraints, the information environment, and hostile takeover activity is limited.

In the absence of agency problems, managers act in shareholders' interests, choosing projects that are expected to be either value-increasing or, at worst, value neutral. In this case, the CSRC is expected to be greater than or equal to zero. When agency problems exist, managers acting in their own self-interests may adopt value-decreasing projects that produce a negative CSRC. Thus, the sign of the CSRC indicates whether or not agency problems play a role in the outcome of one of the most basic managerial decisions, the amount invested in capital equipment.

For a sample of 4,964 firm-year observations for 707 firms that meet our data requirements during 1993-2004, we find that the simple correlation between annual abnormal returns and unanticipated capital expenditures is negative. Our basic regression model, which controls for the impact of unanticipated changes in net income on annual abnormal returns, confirms the existence of a negative CSRC. Both the negative simple correlation and negative CSRC estimate suggest that capital expenditures are indeed associated with agency problems.

To more closely establish the link between agency costs and the CSRC, we augment our basic regression with agency cost measures interacted with unanticipated capital spending. We find that commonly used agency cost measures explain the negative CSRC. Specifically, the CSRC is significantly related to variables that substitute for the magnitude of the agency costs of free cash flow and for the scale of firms' operations. The CSRC is not significantly related to proxies for managerial entrenchment or monitoring by capital markets.

Our findings support the proposition that the market capitalizes agency costs when valuing firms' current period capital spending decisions. The market appears skeptical of cash flow financed spending by low-*q* firms and even capital spending by High-*q* firms when the firm is large and *q* is small relative to that of other high-*q* firms. We conclude that it is not unexpected capital spending per se that produces a negative market response, but unexpected capital spending that is associated with agency costs.

Prior studies of the valuation effects of capital spending include those based on event study methodology, association study methodology (estimation of the CSRC), and comparison of the relative performance of portfolios that have abnormally high and abnormally low levels of capital spending. Our evidence complements and extends these prior studies in important respects.

Putting aside the issue of selection bias, the event studies that dominate the research provide a rich set of results that inform our test design. McConnell and Muscarella (1985) find that capital expenditure announcements reveal value-relevant information. They find that announcements of unexpected spending increases by industrial firms are associated with significant positive excess stock returns, while announcements of unexpected spending decreases are associated with significant negative excess stock returns. Subsequent studies report both confirming and contradictory evidence, indicating that characteristics of the firms that comprise a sample likely influence the market response to both spending increases and decreases.[1]

Cross-sectional determinants of the price response are examined in Chung, Wright, and Charoenwong (1998), Chen and Ho (1997), Vogt (1997), Blose and Shieh (1997), Brailsford and Yeoh (2004), and Chen (2006). Across studies, the most consistently significant explanatory variable is a proxy for investment opportunities (either Tobin's *q* or a market-to-book ratio).[2] Cash flow has been shown consistently insignificant as a stand-alone variable, but shows some promise when interacted with firm size or an investment opportunity measure.[3] Other variables typically used to measure agency costs including firm size, leverage, and/or insider ownership are sometimes significant but provide mixed results. All of the aforementioned cross-sectional variables are potential agency cost measures that we incorporate in our analysis.

Our contribution relative to the event study research is greater confidence in the implications of results. By sampling firm investment behavior more broadly than is

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[1] Confirmatory evidence is provided by Vogt (1997) for spending increases but not decreases and by Blose and Shieh (1997) for decreases but not increases. Chung, Wright, and Charoenwong's (1998) results imply that mean announcement date excess returns are near zero for both spending increases and decreases, unless the samples are conditioned on Tobin's *q*. Brailsford and Yeoh (2004) find insignificant abnormal returns for their full sample of announcements of new capital expenditures by Australian firms. Chen (2006) reports a significant positive average price response to announcements of corporate capital investments. Chen and Ho (1997) find that announcements of strategic investments by Singapore firms are associated with a positive price response. Chen, Ho, and Shih (2007) find that capital investment announcements have a positive impact on the share prices of announcing firms and a negative impact on the share prices of rival firms.

[2] Chen and Ho (1997), Chung, Wright, and Charoenwong (1998), Brailsford and Yeoh (2004), and Chen (2006) provide evidence that either Tobin's *q* or market-to-book are statistically significant and positively related to announcement-period excess returns.

[3] The insignificance of cash flow as a stand-alone variable is documented by Chen and Ho (1997), Vogt (1997), Brailsford and Yeoh (2004), and Chen (2006). Vogt (1997) finds cash flow to have a significant negative impact on price response for the largest one-third of his sample firms. Brailsford and Yeoh (2004) find a significant negative impact on price response for firms that are in both the highest cash flow quartile and lowest market-to-book quartile of their sample, which they interpret as consistent with the existence of agency costs of free cash flow. Chen and Ho (1997) find a positive price response for firms with high cash flow and high *q*, but contrary to Brailsford and Yeoh (2004) find no significant price response for a sample of firms with low *q* and high cash flow.

possible with the event study approach to reduce self-selection bias, yet focusing on firms and years with particular characteristics, we can be confident that our results are representative of the investment behavior of firms likely to exhibit agency problems and unlikely to be susceptible to confounding influences. The negative CSRC that we find indicates that, on average, the short-term market response to capital expenditures by such firms is negative. Our cross-sectional results indicate that the negative market reaction is concentrated where agency problems are expected to be most severe, and that the negative response is attributable to agency problems.

In a recent paper that focuses on the long-run relation between investment and returns, Titman, Wei, and Xie (2004) report a negative relation between abnormal capital expenditures (based on financial statement data) and benchmark adjusted stock returns over the following five years. They find that the negative effect of increased capital spending on subsequent returns is stronger for firms that have greater investment discretion as evidenced by higher cash flows and lower debt ratios, and is significant only in time periods when the hostile takeover market was weak (periods before and after 1984-1989). They conclude that, during periods when the takeover market is weak, the market under-reacts to the empire building implications of increased investment.

Titman, Wei, and Xie (2004) do not examine the investment/return relation in the year in which firms invest. This fact, combined with their skepticism regarding the interpretation of event study results, raises the issue as to whether or not the market's short-run reaction reflects the empire building implications of investment. Our results extend theirs in documenting that during the year when spending occurs the market does not ignore potential agency problems.

Our methodology is most similar to that of Kerstein and Kim (1995). They estimate the capital spending response coefficient and find that unexpected capital expenditures provide value relevant information beyond that contained in unexpected earnings. Their results, using association study methodology on annual data, extend the event-study results of McConnell and Muscarella (1985), and others, by showing that excess returns are positively related to the size of the change in capital spending.[4] While their positive CSRC estimate suggests that agency problems are not pervasive in their sample, that sample includes years of both strong and weak hostile takeover markets. Our additional contributions are to show that the sign of the CSRC is negative when the sample is drawn from a period when the takeover market is weak and that commonly used measures of agency costs fully account for the negative CSRC.

An additional contribution of our study is that we focus on a later sample period than do prior studies.[5] Thus, we provide evidence on the market response to capital spending for a new sample that is representative of more recent market conditions.

The article is organized as follows. Section 2 summarizes the background research and testable implications. Section 3 discusses the construction of the sample, the empirical model, and descriptive statistics. Section 4 presents the empirical results. Section 5 concludes.

2. Background research and empirical implications

[4] In footnote 18 of their paper, McConnell and Muscarella (1985) note that excess returns in their sample are not related to the size of the spending change.

[5] We use data from the period 1993-2004. McConnel and Muscarela (1985) use data from the period 1975-1981. Vogt (1997) takes his sample from 1979-1993. Blose and Shieh (1997) examine a sample from 1985-1989. The sample period of Chen and Ho (1997) is 1983-1991. Chung, Wright, and Charoenwong (1998) use 1981-1995. Chen, Ho, and Shih (2007) take their sample from 1989-1998. Titman, Wei, and Xie (2004) take a sample from 1973-1995. Kerstein and Kim (1995) use data from 1976-1989. Brailsford and Yeoh (2004) use data from 1995-1997. Chen (2006) uses a sample from 1989-1999.

McConnell and Muscarella (1985) hypothesize that, assuming managers act in shareholders' best interests, unexpected changes in capital investment convey to the market unexpected changes in the value of the firm's investment opportunities. They posit that unexpected capital spending increases signal the availability of additional positive NPV projects, while unexpected capital spending decreases convey the opposite. The mean announcement period returns that they report for unexpected spending increases and for unexpected spending decreases during 1975-1981 are consistent with this proposition. McConnell and Muscarella also find that unexpected spending increases by oil and gas exploration firms met with a negative market response, which they interpret as consistent with the market discounting the valuation implications of such spending to reflect the agency costs of overinvestment.

The impact of agency costs on a firm's shareholders first was formally presented in Jensen and Meckling (1976). Jensen and Meckling show that, as managers' percentage ownership stake in a firm declines, it is in managers' self-interest to make investments to provide themselves with pecuniary and non-pecuniary benefits at the cost of shareholders. Their analysis suggests that the agency costs associated with the investment decision increase as the size of the firm increases. The increase in agency costs occurs due to the need for additional outside stakeholders and the inability of outsiders to efficiently monitor managers' actions. Thus, we expect the agency costs associated with unexpected capital spending changes to be increasing in firm size.

Jensen (1986) argues that the incentive to overinvest in negative NPV projects is exacerbated when the firm produces cash flow in excess of that needed to fund value creating projects. Moreover, substantial research shows a positive relation between cash flow and investment (see for example, Fazzari, Hubbard, and Peterson (1988) and the review article of Hubbard (1998)). Other things equal, managers of firms that produce high levels of cash flow are more likely to have the opportunity to overinvest and are more likely to do so than are firms with low levels of cash flow. Thus, we expect the agency costs associated with capital spending changes to be increasing in cash flow.

A widely used measure of the value of a firm's investment opportunities is Tobin's q. When accurately measured, values of q that are greater than one are an indicator that the firm either has a history of investing in positive NPV projects or the potential to make additional investments in such projects. Values less than one are an indicator of past or potential value destruction. Thus, we expect the agency costs associated with capital spending changes to be decreasing in Tobin's q.

Easterbrook (1984) points out that capital markets serve a role in the monitoring of managers. For instance, when firms raise funds through debt offerings they may be monitored by debt underwriters who require them to provide information detailed enough to set a market clearing offering price. Similarly, the processes associated with obtaining a bank loan and privately placing securities require firms to reveal information. Firms also may expose themselves to the discipline of bond rating agencies to facilitate access to credit at favorable terms. Jensen (1986) suggests that high financial leverage of itself imposes discipline on management by bonding managers to distribute cash flow that otherwise could be wasted on empire building activities. Thus, we expect the agency costs that are associated with capital spending changes to be reduced by the maintenance of bond ratings and high debt levels.

Agency costs are likely increased when decision-making power is concentrated in the hands of a powerful CEO. Indicators that a CEO is entrenched and powerful are long tenure in office and a high level of CEO holdings of the firm's common stock.[6] Thus, we expect the agency costs that are associated with capital spending changes to be increasing in both CEO tenure and CEO stock holdings.

In summary, studies predict that the market valuation of unexpected changes in capital spending reflects the market's perceptions regarding the potential agency costs associated with the spending change. The stock price response to an unexpected spending change (the CSRC) should be inversely related to variables that proxy directly for the level of agency costs. These variables include cash flow, firm size, CEO tenure and CEO stock holdings. The CRSC should be positively related to variables that substitute inversely for the level of agency costs. These variables include Tobin's *q*, a dummy variable that equals one when the firm has rated debt and zero otherwise, and the debt ratio.

3. Sample construction, test design, and descriptive statistics

In this section we discuss the construction of the sample, empirical model, and descriptive statistics.

3.1. Sample construction

The sources of our data are the COMPUSTAT Annual Industrial and Research File, the Center for Research of Security Prices (CRSP) daily stock return database, and Standard and Poor's EXECUCOMP database. A complete set of desired data is required

[6] Evidence on the entrenchment properties of high levels of insider ownership is presented in Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990), and Hadlock (1998). All report evidence that the impact of insider holdings is nonlinear. We examine both linear and nonlinear specifications.

for a firm-year observation to be included in our sample. We exclude utility firms (SIC Code 4000s) and financial firms (SIC Code 6000s) to maintain homogeneity in our sample, as these types of firms are expected to exhibit investing, capital structure, and other characteristics that differ from other industries. We require at least five consecutive prior years of capital expenditure data for each firm, to calculate our proxy for expected capital expenditures as the difference between the current year value and the average for the prior five years. We use the average for the prior five years to substitute for expected capital spending, rather than the level of spending for the prior year, both for consistency with prior related research and because Alderson and Betker (2006) find that the year-to-year change in capital expenditures is a poor proxy for unanticipated spending.[7] Our specification checks indicate that our measure of unanticipated spending is much better specified than the year-to-year change.[8] Our data requirements produce a final sample comprised of 4,964 firm-year observations for 707 firms during the period 1993-2004. Our sample firms represent 44 two-digit SIC industries.

Because we require that sample firms are in the ExecuComp database, and that they have five prior years of capital spending data, our typical sample firm has experienced a stay of some duration in the Standard and Poor's 1,500. These firms are relatively large and likely to be more transparent than smaller firms, due to the likelihood

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[7] Our definition is consistent with McConnell and Muscarela (1985), Kerstein and Kim (1995), and Titman, Wei, and Xei (2004), in defining unexpected capital expenditures as the difference between current year spending and the average level for prior years.

[8] Alderson and Betker draw 1,000 random samples of 50 firm-year observations of the annual change in capital expenditures from Compustat data to assess its appropriateness as a measure of abnormal spending. They calculate the standard parametric *t*-statistic for each sample to test the null hypothesis of no change (no abnormal performance). They find that the *t*-statistic rejects the null at the 1%, 5%, and 10% levels in 3.7%, 15.0%, and 26.9%, respectively, of their samples. We replicate their sampling approach for our measure of unanticipated capital expenditures and find that the *t*-statistic rejects the null at the 1%, 5%, and 10% levels in 2.0%, 6.3%, and 10.9%, respectively, of our samples. The rejection rates for our measure are much closer to the desired values for a well specified measure of abnormal performance.

of higher institutional holdings, greater media following, and greater analyst coverage. The information environment that our sample firms operate in permits outsiders to better monitor and estimate the valuation implications of managerial decisions. Moreover, our sample firms are likely to have ready access to external capital and are unlikely to be financially constrained (see Hadlock and Pierce (2010)).[9] By design, our sample should be representative of firms for which agency costs are likely to play an important and identifiable role in investment decisions.

A caveat to our study is that our results and conclusions should not be generalized to smaller, less transparent, and financially constrained firms. Such firms merit separate study, as both investment behavior and the market's reaction to that behavior could differ appreciably. For instance, the fact that smaller, less transparent firms are more likely to face funding constraints implies that they are more likely to have untapped profitable growth opportunities. Thus, when small firms are able to invest, it is more likely that they will choose valuable projects that can elicit a strong positive market response. Moreover, the market is more likely to see them to benefit from the opportunity to invest unexpected cash flow. While limiting somewhat the generality of our conclusions, our sample design has the benefit of permitting us to estimate a relatively parsimonious model focused on agency cost issues. Broadening the sample would require incorporating controls for numerous additional firm characteristics.

3.2. Test design

Our empirical model is an augmented version of the association study approach employed in the accounting research to estimate the earnings response coefficient

[9] Hadlock and Pierce (2010) find that firm size and age are particularly useful predictors of financial constraints and recommend that researchers use only these two variables to identify constrained firms.

(ERC).[10] Using the association study method, the ERC is estimated by a multiple regression of annual abnormal stock returns on a measure of annual unexpected earnings and control variables. The annual abnormal return is measured over a period that reflects the fact that there is a time lag between the end of a fiscal period and the compilation and release of financial statement information for that fiscal period.[11] For instance, a firm that has a Dec. 31 fiscal year-end is typically required to file financial results with the SEC by the end of the following March. Measuring the annual abnormal return over a period beginning on April 1 prior to the fiscal year-end, and ending on March 31 following the fiscal year-end, ensures that the return measurement period includes the market responses to the public release of quarterly and annual earnings results associated with that fiscal year. Adding a measure of unanticipated capital expenditures to the standard ERC regression, enables us to test whether unexpected capital spending conveys value-relevant information beyond that conveyed by unexpected earnings.

3.2.1. Estimation of the CSRC

We first provide a baseline estimate of the capital spending response coefficient (CSRC) for the average sample firm. To do so, we augment the standard model of the ERC with a measure of unexpected capital spending. The model for firm *i* in year *t* (the subscripts are omitted for convenience) is:

$$CAR = b_1 \Delta NI + b_2 \Delta NI \cdot MB + b_3 \Delta NI \cdot LogMV + b_4 \Delta NI \cdot Beta + b_5 \Delta Capex$$
$$+ b_6 Lag\Delta NI + year\ effects + industry\ effects + \varepsilon \qquad (1)$$

where we specify the regression variables as follows:

[10] Collins and Kothari (1989) present the theoretical underpinnings for the association study approach.
[11] Typically, firms must file their form 10-K report of annual financial performance within 90 days of the fiscal year-end and must file10-Q quarterly reports within 45 days of the end of each of the three preceding quarters.

CAR = beta-adjusted abnormal daily return cumulated over the 12-month period ending three months following the fiscal year-end;

Δ*NI* = change in annual net income / market value of common equity;

MB = market value of common equity / book value of common equity;

LogMV = natural logarithm of market value of common equity;

Beta = beta from market model;

Δ*Capex* = (capital expenditures – average for five prior years' capital expenditures) / market value of Equity;

LagΔ*NI* = one-period lag of ΔNI;

Year effects = dummy variables controlling for year fixed effects;

Industry effects = dummy variables controlling for industry fixed effects; and

ε = an error term.

Balance sheet items are as reported beginning-of-period. Income statement items are as reported end-of-period. Appendix A provides additional details regarding variable definitions, including their sources and data item numbers. We winsorize the top and bottom one percent of continuous variables to reduce the influence of outliers.

The independent variables that are standard in estimating the earnings response coefficient are *ΔNI*, *MB*, *LogMV*, and *Beta*. The variables *MB*, *LogMV*, and *Beta* are interacted with *ΔNI* in order to capture differences in the ERC due to differences across firms in growth opportunities, firm size, and firm risk. That earnings follow a process close to a random walk is well established in accounting research; thus, the coefficients b_1, b_2, b_3, and b_4 combine to explain the impact of unexpected changes in annual net income on annual abnormal stock returns.[12] The focus of this study is on the coefficient

[12] See Ball and Watts (1972) and Bernard and Thomas (1990) for evidence on the time series properties of earnings.

b_5, which is an estimate of the relation between the unexpected change in annual capital expenditures (Δ*Capex*) and annual abnormal stock returns. In the absence of agency problems, b_5 is predicted to be non-negative. A significant negative relation is consistent with the existence of agency problems. Note that we include *Lag*Δ*NI,* as an additional control variable in the CSRC regression, to account for the possibility that unexpected changes in net income affect capital spending, but with a lagged effect. To the extent that unexpected changes in income predict subsequent changes in spending, the coefficient b_6 absorbs the impact of measurement error in the proxy for unanticipated spending, reducing bias in and increasing efficiency of the estimate b_5. Year and industry fixed effects are included to control for differences in cumulative abnormal returns, across years and industries, that are not captured by other independent variables.

3.2.1. Estimation of the impact of agency costs on the CSRC

To estimate the impact of agency costs on the CSRC, we expand regression (1) by adding agency cost measures, interacted with unexpected capital spending. The fully expanded model for firm *i* in year *t* is:

$$\begin{aligned} CAR = {} & b_1 \Delta NI + b_2 \Delta NI \cdot MB + b_3 \Delta NI \cdot LogMV + b_4 \Delta NI \cdot Beta + b_5 \Delta Capex \\ & + b_6 Lag\Delta NI + b_7 \Delta Capex \cdot CF + b_8 \Delta Capex \cdot q + b_9 \Delta Capex \cdot LogMV \\ & + b_{10} \Delta Capex \cdot Bdum + b_{11} \Delta Capex \cdot LogTenure + year\ effects \\ & + industry\ effects + \varepsilon \end{aligned} \qquad (2)$$

The agency cost measures that mitigate b_5 through their interaction with Δ*Capex* are:

CF = cash flow from operations / market value of equity;

q = Chung and Pruitt's (1994) approximation for Tobin's *q*;

LogMV = natural logarithm of market value of common equity;

Bdum = a dummy variable equal to one if the firm has rated debt, zero otherwise;

LogTenure = the natural log of CEO tenure in years.

The focus of our analysis of the impact of agency costs on the CSRC is on the estimated coefficients associated with the unexpected change in capital spending (Δ*Capex*) and with the agency cost proxies that mitigate the direct impact of Δ*Capex* on *CAR*. The coefficient b_5 and the coefficients b_7-b_{11} combine to explain the impact of unanticipated changes in capital spending on annual abnormal stock returns. If the mitigating variables account fully for the valuation impact of agency problems, the relation between *CAR* and Δ*Capex* is predicted to be non-negative. The empirical predictions of the previously summarized agency research are that *CAR* is negatively related to Δ*Capex ·CF*, Δ*Capex ·LogMV*, and Δ*Capex ·LogTenure*, because *CF*, *LogMV*, and *Tenure* are direct proxies for agency costs. The *CAR* is predicted to be positively related to Δ*Capex ·q* and Δ*Capex ·Bdum*, because *q* and *Bdum* are inverse proxies for agency costs.

3.3. Descriptive statistics

Table 1 provides details of the sample distribution. Panel A reports the annual frequency of firm-year observations. The annual frequency increases over time, but no more than 14% of observations occur in any sample year. Panel B provides details of the distribution of observations across industries. Not unexpected is that about 63% of observations fall in the SIC codes associated with manufacturing firms (2000s and 3000s).

Table 2 reports descriptive statistics. The proxies for unanticipated earnings and unanticipated capital spending, *ΔNI* and *ΔCapex*, have both means and medians that are close to zero. These are desirable properties for variables that act as a proxy for random shocks. The medians for *Beta* and *q* are close to one, which indicates that the sample is fairly evenly divided between high risk and low risk firms and between growth and mature firms. The mean and median cash flow are both near 10% of the market value of equity. The mean and median firm market values associated with our observations are $4,339 million and $1,221 million, respectively. The mean value of *Bdum* indicates that about 49% of the observations are associated with firms that have rated debt. The mean CEO tenure is 8.8 years. All variables exhibit a reasonable amount of dispersion.

4. Empirical results

In this section we report the results of our estimation of correlations and multivariate regressions. Our regression *t*-statistics are based on White standard errors, as an examination of our regression variables indicates that none exhibit the high persistence that necessitates estimation of clustered standard errors. It is when one persistent firm characteristic is regressed on another that White standard errors may be biased in finance panel data sets (see Petersen (2009)). It is not surprising that none of our regression variables exhibit high persistence, given that all are either a random shock or a random shock multiplied by another firm characteristic.

4.1. Correlations

Table 3 reports correlations between the variables used in the analysis. Consistent with prior findings, the cumulative abnormal return is significantly (0.01 level) and positively related to our measure of unexpected earnings, ΔNI, which confirms that the market responds positively to good earnings news. A significant (0.01 level) positive correlation between *CAR* and cash flow, *CF*, likely reflects the significant positive correlation between net income and cash flow. The *CAR* also is significantly (0.01 level) positively related to the market-to-book ratio and Tobin's *q*, which is consistent with a positive impact of growth opportunities on firm value.

Regarding the primary variable of interest, *ΔCapex*, its correlation with *CAR* is significantly negative (0.01 level). This negative relation between unexpected capital spending and contemporaneous abnormal returns is of the same sign as the negative relation between unexpected investment and subsequent years' abnormal returns reported by Titman, Wei, and Xie (2004). Our sample indicates that the negative abnormal investment/return relation also exists in the year of spending and for a later time period than the one examined by Titman, Wei, and Xie.

Titman, Wei, and Xie (2004) express concern that a positive investment/return relation in the year of spending could exist simply because strong stock price performance makes it easier for firms to increase investment. Our finding of a negative relation indicates that their concern does not drive the investment/return relation in our sample. Rather, it is firms with relatively poor stock price performance that tend to increase spending more.

CAR is negatively related to *Bdum* (significant at 0.01 level). The negative correlation with *Bdum* indicates that firms with rated debt earn lower abnormal returns. *Beta* and *Tenure* are positively correlated with *CAR*.

Additionally, there are many significant correlations between the independent variables used in our analysis. In particular, firm size exhibits strong correlations with other variables. Thus, care must be exercised in drawing conclusions from correlations alone, due to the potential omitted variables problem. The section that follows presents results of multivariate regressions in order to address the omitted variables problem.

4.2. Mulitvariate regressions for full sample

Table 4 reports the results of our estimation of four pooled cross-sectional multivariate regressions. Each regression contains variables that control for the influence of unexpected earnings changes on the annual cumulative abnormal return. Each regression is designed to test whether unexpected capital expenditures provide value-relevant information beyond that conveyed by unexpected earnings. Model 1 tests for the value-relevance of unexpected capital expenditures alone. Model 2 adds the interaction of unexpected capital expenditures with the two variables most often associated with the agency costs of free cash flow, cash flow (*CF*) and Tobin's *q* (*q*). Model 3 adds to model 2 a variable often associated with the magnitude of agency costs, firm size (*LogMV*). Model 4 adds our proxies for monitoring by capital markets (*Bdum*) and managerial entrenchment (*Tenure*). We report significance levels for two-tailed tests.

The coefficient estimates and *t*-statistics on the variables that are intended to capture the effect of unexpected earnings on abnormal returns are consistent across the four models. The coefficients on *ΔNI* and *ΔNI·MB* always are positive and significant at the 0.01 level. The coefficients on *ΔNI·LogMV* and *ΔNI·Beta* are not statistically significant. These results indicate that the earnings response coefficient is generally positive and increasing in growth opportunities, but unrelated to firm size and systematic risk.

Regression 1 tests for the value-relevance of the unanticipated change in capital expenditures beyond that provided by the unanticipated earnings change. The coefficient on *ΔCapex* is negative and statistically significant at the 0.01 level. This coefficient is consistent with the simple correlation coefficient reported in Table 3. Even after controlling for the valuation impact of unanticipated earnings changes, the CRSC is negative, indicating that for the average firm unanticipated increases in capital spending have a negative impact on firm value.

Regression 2 includes the variables most often chosen to test for the agency costs of free cash flow (*CF* and *q*). The results of our estimation of model 2 indicate that the CSRC is significantly negatively related to cash flow (0.01 level), but is not significantly related to Tobin's *q*. The fact that the market responds more negatively to capital spending by firms with high levels of cash flow is consistent with the existence of agency costs of free cash flow. In model 2, both the coefficient on *ΔCapex* and the statistical significance of that coefficient are reduced slightly relative to model 1. However, *ΔCapex* remains negative and significant at the 0.05 level. The results of regression 2 indicate that the CSRC is generally negative and decreasing with cash flow.

Regression 3 adds firm size, a variable often used in empirical studies to proxy directly for the magnitude of agency costs. The results of our estimation of regression 3 indicate that the CSRC is significantly (0.05 level) inversely related to firm size. This finding is consistent with the prediction that agency costs are increasing with firm size. Interestingly, when size is added to the regression the coefficient on the level of unexpected capital expenditures is no longer statistically significantly different from zero. Apparently, the significant negative coefficient on *ΔCapex* in regressions 1 and 2 is attributable to spending by larger sample firms. The inclusion of size does not eliminate the significance of the impact of cash flow on the CSRC. Thus, the results of regression 3 indicate that the CSRC is decreasing with cash flow and decreasing in firm size. These results support the conclusion that it is not unexpected capital spending per se that produces a negative market response, but unexpected capital spending that is associated with higher agency costs.

Regression 4 adds our proxies for capital market monitoring (the bond rating dummy variable) and managerial entrenchment (CEO tenure). Neither variable is statistically significantly different from zero. Except for firm size, which exhibits a decrease in statistical significance from the 0.05 to the 0.10 level, the inclusion of *Bdum* and *Tenure* affects neither the sign nor the statistical significance of other regression variables. Thus, the results of regression 4 are largely consistent with those of regression 3. The regression 4 results and related robustness checks (results not shown) lead us to conclude that neither capital market monitoring nor managerial entrenchment have impacts on the market response to unexpected capital spending in our sample.[13]

The statistical insignificance of measures of capital market monitoring and managerial entrenchment may reflect the fact that our sample is comprised of relatively large, long-lived, and transparent firms. While our focus on such firms proves beneficial in documenting the roles of cash flow and firm size, there may not be sufficient within-sample diversity to uncover the roles of entrenchment and monitoring. This is especially likely for proxies for capital market monitoring. Due to the likelihood of relatively high levels of institutional holdings, media following, and analyst coverage for our sample

[13] We perform a number of robustness checks. We replace *Bdum* with measures of the firm's debt ratio. Like *Bdum*, the debt ratio should be positively related to the extent of capital market monitoring. This change has no material effect on our results. We also replace *Tenure* with the percent of stock owned by the CEO. We estimate both linear and nonlinear specifications of the impact of ownership on the CSRC. These alternative proxies for managerial entrenchment have no material impact on our results. Additional robustness checks center on the calculation of *CAR*. Results are qualitatively the same using market-adjusted and size-adjusted returns.

firms, the marginal impact of additional monitoring activities on the agency costs of incremental investment could be small.

In summary, the results of our multivariate regressions indicate that the stock market response to unexpected capital spending is decreasing with cash flow and decreasing in firm size. These results are consistent with the hypothesis that the market capitalizes agency costs when valuing firms' current period capital spending decisions. The empirical evidence supports the conclusion that it is not unexpected capital spending per se that produces a negative market response, but unexpected capital spending that is associated with higher agency costs.

4.3. Mulitvariate regressions for low-q and high-q firms

It is likely that cash flow and Tobin's *q* interact in determining the market reaction to unanticipated capital spending. Specifically, we expect the negative impact of cash flow on the capital spending response coefficient to be stronger for low-*q* than for high-*q* firms. The market is likely to associate the combination of low *q* (poor investment opportunities) and high cash flow with high agency costs of free cash flow, producing a strong negative market reaction to unanticipated capital spending. To the contrary, we expect a zero or positive impact of cash flow on the CSRC for high-*q* firms. High-*q* firms, having better investment opportunities, are less likely to be viewed by the market as overinvesting available cash flow. The market may even consider high-*q* firms that are financially constrained to benefit from an investment of additional cash flow. However, our sample selection criteria make it unlikely that financially constrained firms play a predominate role in determining the CSRC for our sample.

To test for an interaction effect between cash flow and Tobin's *q*, we subdivide our sample based on the average (mean) value of Tobin's *q* for each firm during the sample period. Because Tobin's *q* is measured with error and over a protracted time period, we employ two methods of subdividing the sample. The first method defines low-*q* firms as those with average Tobin's *q* less than 1 and high-*q* firms as those having average Tobin's *q* greater than 1. The second method defines low-*q* (high-*q*) firms as those with average Tobin's *q* less than (greater than) the median value. The low-*q* subsamples should represent firms that experienced a prolonged period of mostly poor investment opportunities. High-*q* subsamples should represent firms that faced predominately good investment opportunities.

Table 5 reports the results of our estimation of cross-sectional multivariate regressions for the subsamples. In the regressions we replace Δ*Capex*•*q* with Δ*Capex*•*qdiff*, where *qdiff* is defined as *q*-1 for the first sample division and *q* minus the median value for the second sample division. The variable *qdiff* is intended to capture any impact of Tobin's *q* that is not captured by the sample division.

The results for both definitions of low-*q* firms are reported in Panel A of Table 5, the results for both definitions of high-*q* firms in Panel B. To save space, we report only the results for the basic CSRC model and the full model that incorporates all agency cost measures. The results are consistent with the conclusion that both low-*q* and high-*q* firms experience agency problems, but that the nature of those problems differs for low-*q* versus high-*q* firms.

The results reported in Panel A are consistent for the alternative definitions of low-*q* firms. The coefficient on Δ*Capex* is negative and statistically significant at the

0.05 level in the basic CSRC model (regressions 1 and 3) indicating that the average Low-*q* firm has a negative CSRC. For the full model (regressions 2 and 4) the coefficient on Δ*Capex* is no longer statistically significant, but the coefficient on Δ*Capex•CF* is negative and significant at the 0.01 level. Overall, the results for low-*q* firms are consistent with the conclusion that the negative CSRC for those firms is attributable to cash flow financed spending.

In Panel B, the results differ somewhat based on the method used to subdivide the sample. Considering first the subdivision based on a Tobin's *q* value of one, the coefficient on Δ*Capex* is negative and statistically significant at the 0.05 level for the basic CSRC model, regression 5. For the full model, regression 6, the significance of Δ*Capex* is reduced to the 0.10 level, as Δ*Capex•qdiff* is significant at the 0.05 level. Thus variation in the CSRC is captured largely, but not completely, by the extent to which a firm's Tobin's *q* exceeds one. The findings that the coefficient on Δ*Capex* remains marginally significant and that the magnitude of the negative CSRC increases as *q* approaches one, combined with the fact that q is measured with error, suggest that a division based on the median may be more successful at isolating firms that truly have superior investment opportunities.

We now turn to the Panel B subdivision based on a greater than median value of Tobin's *q*. For the basic CSRC model, regression 7, the coefficient on Δ*Capex* remains negative and statistically significant as in regression 5. However, the results for the full model differ from those for the $q > 1$ definition of high-*q* firms. In regression 8, the coefficient on Δ*Capex* is no longer statistically significant, as variation in the CSRC is explained by the combined effects of a significant positive coefficient on Δ*Capex•qdiff* and a significant negative coefficient on $\Delta Capex \cdot LogMV$. Thus, the results for this sample division suggest that even capital spending by high-*q* firms may be associated with agency costs when the firm is large and its Tobin's *q* is small relative to that of other high-*q* firms.

4.4. Discussion

Our results differ fundamentally from those of Kerstein and Kim (1995), who also use association study methodology. Their finding, that the capital spending response coefficient is positive, suggests that factors other than agency costs drive their results. Our comparable regression produces a negative CSRC, indicating that agency costs play a predominant role. We offer a twofold explanation for the change in sign. First, our sample period excludes years when the hostile takeover market was strong, but Kerstein and Kim include years of both weak and strong takeover markets. The discipline of a strong takeover market is expected to reduce agency costs and have a positive impact on the CSRC. The lack of such discipline, during our sample period, should have a negative impact. Second, our sample is drawn to focus on firms for which agency issues are relatively important influences on investment behavior, but Kerstein and Kim sample more broadly. The impact of agency costs on their CSRC estimate is likely masked by other influences on investment behavior. Thus, our use of targeted, rather than disparate, firms and years is the likely explanation for the change in sign of the CSRC.

Our results extend those of Kerstein and Kim, by providing evidence of cross-sectional variation in the CSRC. Where they assume that the CSRC is constant across firm-years, we estimate the impact of agency costs on the CSRC and find that the CSRC is a function of firm specific measures of agency costs.

Our results extend those of Titman, Wei, and Xie (2004), who find that the market reacts to the agency cost implications of capital expenditures over a period of one to five years after the spending occurs. Their long-run results raise the issue of whether the market reaction to the empire building implications of investment is in any sense timely. Our results extend theirs in documenting that during the short-run (the year when spending occurs) the market does make valuation adjustments for potential agency costs.

Our results complement the extant event-study research, which provides some, though mixed, evidence that the short-term market response to capital spending changes is related to agency costs. Using an alternative methodology that reduces self-selection ("good news") bias, and facilitates the construction of a large sample of firms for which agency problems are likely to play a role, we find that the short-run market reaction to unexpected capital spending is significantly related to variables that stand proxy for the magnitude of the agency costs of free cash flow and for the scale of firms' operations.

The major difference between our results and the results of any event study that finds evidence that the market response to capital expenditures is related to agency cost variables is that we find stronger statistical evidence of the negative impact of cash flow. Contrary to any event study, we find such evidence in both our full sample and subsample results. We attribute our stronger statistical support for the role of free cash flow to our methodology. By sampling firm investment behavior more broadly than is possible with the event study approach to reduce self-selection bias, yet focusing on firms (and years) with particular characteristics, we increase the likelihood that our results are representative of the investment behavior of firms more likely to exhibit agency problems and less susceptible to confounding influences.

5. Conclusions

We estimate the impacts of agency cost measures on the relation between annual abnormal returns and unanticipated capital expenditures, i.e., on the CSRC. By design, our sample is one where agency costs are likely to play an important and identifiable role in investment decisions. Our empirical finding of a negative CSRC suggests that one of the most basic firm decisions, the amount that the firm chooses to invest in capital equipment, is associated with agency problems. Further evidence of this association is the fact that commonly used agency cost measures account fully for the negative CSRC. Notably, the CSRC is related to variables that proxy for the magnitude of the agency costs of free cash flow and for the scale of firms' operations. Specifically, our full sample results indicate that the CSRC is negatively related to cash flow and firm size. Our subsample results indicate that both low-*q* and high-*q* firms experience agency problems, but that the nature of those problems differs. The negative CSRC for low-*q* firms is attributable to cash flow financed spending by those firms. Even capital spending by high-*q* firms appears to be associated with agency costs when the firm is large and its Tobin's *q* is small relative to that of other high-*q* firms. Our findings support the proposition that the market capitalizes agency costs when valuing firms' current period capital spending decisions. We conclude that it is not unexpected capital spending per se that produces a negative market response, but unexpected spending that is associated with higher agency costs.

Appendix A

Variable Definitions

Returns are from CRSP. Financial statement data are from COMPUSTAT.

CAR = Beta-adjusted returns are computed as the difference between the return for a firm and the return for the firm's beta decile portfolio (assigned by CRSP based on all NYSE, AMEX and NASDAQ firms).

MB = Market to Book Ratio= Market Value of Common Equity/Book Value of Common Equity = (Item 199 x Item 25)/Item 60,

LogMV = Natural Logarithm of Market Value of Equity = log(Item 199 x Item 25),

Beta = Beta from Market Model estimated for the fiscal year,

ΔNI = Change in Net Income scaled by the Beginning Market Value of Equity = (Net Income – Lagged Net Income)/Beginning-of-year Market Value of Equity = (Item 172 – Lagged Item 172)/(Lagged Item 199 x Lagged Item 25),

$\Delta Capex$ = Changes in Capital Expenditures scaled by the Beginning Market Value of Equity = (Capital Expenditures – Average of five prior years' Capital Expenditures)/Beginning-of-year Market Value of Equity = (Item 128 – Average of five prior years' Item 128)/(Lagged Item 199 x Lagged Item 25),

CF = Cash Flows scaled by the Beginning Market Value of Equity = (Income Before Extraordinary Items + Depreciation and Amortization – Preferred Dividends – Common Dividends)/Beginning Market Value of Equity = (Item 18 + Item 14 – Item 19 – Item 21)/(Lagged Item 199 x Lagged Item 25),

q = Chung and Pruitt's (1994) approximation of Tobin's *q* = (Market Value of Equity + Liquidating Value of Preferred Stock + Total Long-Term Debt + Net Short-Term Debt)/Total Assets = (Item 199 x Item 25 + Item 10 + Item 9 + (Item 5 – Item 4))/Item 6,

Bdum = Bond Rating Dummy = Dummy variable which takes a value of 1 if a firm's bond is rated (Item 280), else 0,

LogTenure = CEO Tenure in office= Natural Logarithm of CEO Tenure in Years from S&P's *Execucomp* database.

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Table 1

Sample Distribution

There are a total of 4,964 firm-year observations for 707 firms that have required data drawn from the COMPUSTAT Industrial and Research and S&P's EXEUCOMP files from 1994 to 2004. We omit utility firms (SIC codes 4000's) and firms in the financing industries (SIC code 6000's) to maintain sample homogeneity.

Panel A: *Yearly Distribution of Firm-Year Observations*

Year	Frequency	Percent	Cum. Freq	Cum. Pct
1994	195	3.93	195	3.93
1995	271	5.46	466	9.39
1996	312	6.29	778	15.67
1997	345	6.95	1,123	22.62
1998	404	8.14	1,527	30.76
1999	459	9.25	1,986	40.01
2000	503	10.13	2,489	50.14
2001	541	10.90	3,030	61.04
2002	619	12.47	3,649	73.51
2003	638	12.85	4,287	86.36
2004	677	13.64	4,964	100.00

Panel B: Industry Distribution of Sample Firms

two-digit SIC('000)	Frequency (# of firms)	Percent	Cum. Freq	Cum. Pct
10	5	0.71	5	0.71
13	17	2.40	22	3.11
14	4	0.57	26	3.68
16	8	1.13	34	4.81
17	2	0.28	36	5.09
20	23	3.25	59	8.35
22	5	0.71	64	9.05
23	10	1.41	74	10.47
24	6	0.85	80	11.32
25	6	0.85	86	12.16
26	15	2.12	101	14.29
27	21	2.97	122	17.26
28	68	9.62	190	26.87
29	4	0.57	194	27.44
30	9	1.27	203	28.71
31	5	0.71	208	29.42
32	5	0.71	213	30.13
33	19	2.69	232	32.81
34	19	2.69	251	35.50
35	57	8.06	308	43.56
36	86	12.16	394	55.73
37	24	3.39	418	59.12
38	51	7.21	469	66.34
39	11	1.56	480	67.89
50	18	2.55	498	70.44
51	6	0.85	504	71.29
52	4	0.57	508	71.85
53	10	1.41	518	73.27
54	6	0.85	524	74.12
55	6	0.85	530	74.96
56	18	2.55	548	77.51
57	5	0.71	553	78.22
58	16	2.26	569	80.48
59	17	2.40	586	82.89
70	2	0.28	588	83.17
72	7	0.99	595	84.16
73	74	10.47	669	94.63
75	2	0.28	671	94.91
78	2	0.28	673	95.19
79	5	0.71	678	95.90
80	10	1.41	688	97.31
82	4	0.57	692	97.88
87	12	1.70	704	99.58
99	3	0.42	707	100.00

Table 2

Descriptive Statistics for Sample

This table presents summary statistics on the sample attributes for 4,964 firm-year observations from the COMPUSTAT Industrial and Research and S&P's EXECUCOMP files from 1994 to 2004. We omit utility firms (SIC codes 4000's) and financial firms (SIC code 6000's) to maintain sample homogeneity. CAR is the beta-adjusted abnormal daily return cumulated over the 12-month period ending three months following the fiscal year-end. ΔNI is the change in annual net income scaled by dividing by the beginning-of-period market value of equity. MB is the ratio of market to book value of equity. Beta is the common stock beta, estimated using daily data to estimate the market model for each year. ΔCapex is the difference between the current year capital expenditures and the average for the prior five years. ΔCapex is scaled by dividing by the beginning-of-period market value of equity. CF is cash flow scaled by dividing by the beginning-of-period market value of equity. Tobin's *q* is denoted by *q*. MV is the market value of equity in millions of dollars and LogMV is its natural log. Bdum is a dummy variable that is equal to one if a firm has rated debt and 0 otherwise. Tenure is CEO tenure in years from Standard and Poor's *ExecComp* database and LogTenure is its natural log. Appendix A provides details of variable definitions and *Compustat* item numbers used.

Variable	Mean	Median	Std. Dev	Q1	Q3
CAR	0.038	-0.035	0.512	-0.269	0.224
ΔNI	0.008	0.007	0.059	-0.013	0.024
MB	3.153	2.443	2.249	1.600	3.934
Beta	1.260	1.125	0.666	0.760	1.634
ΔCapex	0.002	0.002	0.033	-0.011	0.016
CF	0.098	0.085	0.116	0.047	0.137
q	1.546	1.177	1.161	0.745	1.931
MV ($millions)	4,339.427	1,221.488	15,579.000	493.842	3,527.840
LogMV	7.196	7.108	1.453	6.202	8.168
Bdum	0.493	0.000	0.500	0.000	1.000
Tenure (years)	8.828	6.000	8.166	3.000	12.000
LogTenure	1.749	1.792	0.934	1.099	2.485

Table 3

Pearson Correlation Coefficients

This table reports the Pearson correlation coefficients. There are a total of 4,964 firm-year observations from the COMPUSTAT Industrial and Research and S&P's EXECUCOMP files from 1994 to 2004. We omit utility firms (SIC codes 4000's) and firms in the financing industries (SIC code 6000's) to maintain sample homogeneity. See table 2 and Appendix A for variable definitions.

	CAR	*ΔNI*	*MB*	*Beta*	*ΔCapex*	*LagΔNI*	*CF*	*q*	*LogMV*	*Bdum*
ΔNI	0.205***									
MB	0.220***	0.070***								
Beta	0.088***	0.071***	0.055***							
ΔCapex	-0.056***	-0.054***	0.094***	-0.086***						
LagΔNI	0.002	-0.219***	0.054***	0.005	0.144***					
CF	0.141***	0.147***	-0.147***	-0.205***	-0.017	0.004				
Q	0.247***	0.059***	0.810***	0.130***	0.138***	0.063***	-0.185***			
LogMV	0.076***	0.043***	0.524***	-0.033**	0.168***	0.047***	-0.013	0.487***		
Bdum	-0.085***	-0.001	0.025*	-0.153***	0.002	-0.008	0.137***	-0.114***	0.435***	
LogTenure	0.027*	-0.025*	0.014	0.057***	0.105***	0.042***	-0.040***	0.087***	-0.005	-0.059***

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; two-tailed test.

Table 4

Pooled Cross-sectional Regression Results

The dependent variable is the beta-adjusted abnormal daily return cumulated over the 12-month period ending three months following the fiscal year-end. Results are for pooled cross-sectional regressions. There are a total of 4,964 firm-year observations from the COMPUSTAT Industrial and Research and S&P's EXECUCOMP files from 1994 to 2004. We omit utility firms (SIC codes 4000's) and firms in the financing industries (SIC code 6000's) to maintain sample homogeneity. The *t*-values in parentheses are White's (1980) heteroskedasticity-consistent *t*-statistics. See table 2 and Appendix A for variable definitions.

	Regression 1	Regression 2	Regression 3	Regression 4
ΔNI	2.246	2.045	2.091	2.077
	(2.69)***	(2.41)**	(2.46)**	(2.44)***
$\Delta NI \cdot MB$	0.444	0.454	0.453	0.453
	(3.76)***	(3.81)***	(3.78)***	(3.77)***
$\Delta NI \cdot LogMV$	-0.172	-0.144	-0.145	-0.144
	(-1.37)	(-1.14)	(-1.14)	(-1.13)
$\Delta NI \cdot Beta$	-0.228	-0.251	-0.278	-0.277
	(-0.98)	(-1.09)	(-1.20)	(-1.20)
$\Delta Capex$	-0.963	-0.858	-0.224	-0.376
	(-3.60)***	(-2.18)**	(-0.48)	(-0.75)
$Lag\Delta NI$	0.404	0.401	0.409	0.407
	(2.65)***	(2.62)**	(2.67)***	(2.66)***
$\Delta Capex \cdot CF$		-1.494	-1.410	-1.398
		(-4.46)***	(-3.87)***	(-3.68)***
$\Delta Capex \cdot q$		0.130	0.477	0.499
		(0.54)	(1.44)	(1.51)
$\Delta Capex \cdot LogMV$			-0.121	-0.143
			(-2.01)**	(-1.87)*
$\Delta Capex \cdot Bdum$				0.369
				(0.73)
$\Delta Capex \cdot Tenure$				0.048
				(0.26)
$\sum$ *year dummies*	Yes	Yes	Yes	Yes
$\sum$ *industry dummies*	Yes	Yes	Yes	Yes
(Adj.) R^2	9.90	10.52	10.70	10.67

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; two-tailed test.

Table 5

Regression Results for Low-*q* and High-*q* Firms

The dependent variable is the beta-adjusted abnormal daily return cumulated over the 12-month period ending three months following the fiscal year-end. The sample divisions are based on the average value of Tobin's *q* for each firm over the sample period. Results are for pooled cross-sectional regressions. There are a total of 4,964 firm-year observations from the COMPUSTAT Industrial and Research and S&P's EXECUCOMP files from 1994 to 2004. We omit utility firms (SIC codes 4000's) and firms in the financing industries (SIC code 6000's) to maintain sample homogeneity. The *t*-values in parentheses are White's (1980) heteroskedasticity-consistent *t*-statistics. See table II and Appendix A for variable definitions.

Panel A: Regression results for two definitions of low-q Firms

	Tobin's *q* below 1 (n=1,687)		Tobin's *q* below sample median (n=2,482)	
	Regression 1	Regression 2	Regression 3	Regression 4
ΔNI	3.432 (3.53)***	3.704 (3.89)***	3.438 (3.86)***	3.136 (3.58)***
ΔNI·MB	0.322 (2.19)**	0.394 (2.61)**	0.347 (2.42)**	0.377 (2.59)**
ΔNI· LogMV	-0.325 (-2.10)**	-0.353 (-2.43)**	-0.315 (-2.34)**	-0.288 (-2.18)**
ΔNI · Beta	-0.419 (-1.28)	-0.605 (-1.94)*	-0.336 (-1.22)	-0.375 (-1.39)
ΔCapex	-0.676 (-2.05)**	1.095 (1.34)	-0.698 (-2.46)**	0.426 (0.55)
LagΔNI	0.122 (0.66)	0.160 (0.88)	0.302 (1.84)*	0.303 (1.84)*
ΔCapex·CF		-2.230 (-5.60)***		-1.412 (-3.44)***
ΔCapex·qdis		2.556 (1.60)		1.638 (1.51)
ΔCapex·LogMV		-0.089 (-1.00)		-0.003 (-0.00)
ΔCapex·Bdum		0.578 (0.86)		0.300 (0.53)
ΔCapex·Tenure		-0.039 (-0.17)		-0.068 (-0.33)
∑ *year dummies*	Yes	Yes	Yes	Yes
∑ *industry dummies*	Yes	Yes	Yes	Yes
(Adj.) R^2	12.20	14.98	10.92	11.99

Panel B: Regression results for two definitions of high-q Firms

	Tobin's *q* above 1 (n=3,277)		Tobin's *q* above sample median (n=2,482)	
	Regression 5	Regression 6	Regression 7	Regression 8
ΔNI	1.476	1.288	1.631	1.522
	(1.29)	(0.89)	(0.93)	(0.84)
$\Delta NI \cdot MB$	0.416	0.391	0.362	0.331
	(2.62)**	(2.43)**	(2.08)**	(1.88)*
$\Delta NI \cdot LogMV$	-0.066	-0.028	-0.050	-0.015
	(-0.35)	(-0.14)	(-0.20)	(-0.00)
$\Delta NI \cdot Beta$	-0.077	-0.099	-0.116	-0.166
	(-0.24)	(-0.30)	(-0.28)	(-0.41)
$\Delta Capex$	-1.627	-1.862	-1.929	-0.773
	(-3.78)***	(-1.86)*	(-3.23)***	(-0.53)
$Lag\Delta NI$	0.577	0.581	0..465	0.584
	(2.40)**	(2.40)**	(1.49)	(1.87)*
$\Delta Capex \cdot CF$		0.178		0.832
		(0.26)		(0.67)
$\Delta Capex \cdot qdis$		1.844		2.563
		(2.63)**		(2.99)***
$\Delta Capex \cdot LogMV$		-0.169		-0.402
		(-1.55)		(-2.30)**
$\Delta Capex \cdot Bdum$		0.242		0.466
		(0.32)		(0.44)
$\Delta Capex \cdot Tenure$		0.269		0.347
		(1.03)		(0.97)
∑ *year dummies*	Yes	Yes	Yes	Yes
∑ *industry dummies*	Yes	Yes	Yes	Yes
(Adj.) R^2	11.14	11.62	11.81	13.02

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; two-tailed test.