Impact Of Changes In Strategic Investments On Shareholder Returns: The Role Of Growth Opportunities

Ashay Desai, University Of Wisconsin At Oshkosh
Peter Wright, University Of Memphis
Kee H. Chung, SUNY At Buffalo
Charlie Charoenwong, Nanyang Technological University, Singapore

Abstract

We argue that a firm's growth opportunity may provide us with guidelines on whether increases or decreases in capital investments may contribute to that firm's returns to shareholders. We find consistent empirical support for "good" managerial decisions. That is, we find that increases in capital investments by firms with growth opportunities enhance their returns to shareholders. The results indicate that decreases in strategic investments increase the returns to shareholders of those firms lacking in growth opportunities. The findings, however, are not consonantally significant for "bad" managerial investment decisions - - decreases in investments by firms with growth opportunities or increases in investments by firms lacking in growth opportunities.

1. Introduction

Strategic investments, such as capital investments, "often form the long-term commitments of corporate policy that lock the corporation into particular technologies, products, and markets" (Bromiley, 1986: 1). In the related literature, because of their importance, strategic investments of firms - - such as capital or R & D investments - - have been theoretically or empirically examined in aggregate, or from an agency theoretical perspective, or in the context of the industry, irrespective of firms' growth opportunities. For example, Scherer (1984) has asserted that investments in capital intensity and R & D are generally positively associated with aggregate productivity for firms. Further, Franko (1989) has concluded that firms' R & D and capital investments are ordinarily positively related to their market shares. In a similar vein, Burgelman and Maidique (1989) have explained that businesses that continuously outspend their rivals in R & D tend to develop superior technological know-how, advancing their competitive advantage.

The notion that R & D, capital, or other strategic investments, may be generally beneficial has also been theoretically and empirically examined by other studies (Griliches, 1981; Pakes, 1985). In these studies of strategic investments in aggregate is an implicit assumption that firms normally benefit from such investments. Firms' strategic investments have additionally been explored in an agency theoretical context. In such studies while concentrated ownership, associated with a lessening of agency conflict, is presumed to result in higher strategic spending, diffused shareholdings, related to an increase in agency costs, are conjectured to detract from further investments by the firm (Hill & Snell, 1988; Hitt, Hoskisson, & Ireland, 1991). In other works, the potential impact of strategic investments on firms has been examined contingent on industry characteristics (Doukas & Switzer, 1992; Jose, Nichols, & Stevens, 1986). Further, strategic investments have been studied in the context of size, type or stage of investment projects (Kelm, Narayanan, & Pinches, 1995).

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The preceding studies have substantially advanced our understanding of effects of resource allocations to strategic investments. These studies, however, have not identified what determines the potential benefit of such investments. Thus, we are not informed as to why strategic investments may be beneficial for some firms but not for others. The conclusions of these studies, consequently, could be misleading because not all firms benefit from further inward investments.

In our work, we theoretically argue and empirically demonstrate that a firm's growth opportunity may moderate the potential benefit of its strategic investments. For firms with growth opportunities, we contend that increases in capital investments would enhance the returns to shareholders while decreases in such investments would reduce these returns. For firms lacking in growth opportunities, however, we argue that decreases in capital investments may increase the returns to shareholders while increases in these investments may lower the returns. We organize this study as follows: first, we develop our hypotheses; then we delineate our empirical analysis, describing both the sample construction procedure and our methodology; subsequently, we present the results and offer a discussion of their interpretation; finally, we provide concluding remarks.

2. Hypotheses Development

While a firm's growth opportunity has been theoretically addressed in diverse works (Barney, 1991; Grant, 1991; Leibenstein, 1966; Penrose, 1959; Wright, Ferris, Sarin, & Awasthi, 1996), so far no attempt has been made to relate the concept of growth opportunity (as a moderator) to the efficiency of a firm's strategic investment decisions. As a consequence, in financial economics and strategy works on strategic investments, which have implications for corporate performance, conclude that firms generally benefit from such investments (Franko, 1989). We focus on several conceptually distinct approaches and subsequent stream of research associated with these on strategic investments, and offer our premise within that corresponding theoretical context. In our view, whether or not strategic investments are beneficial for a firm should be reflected in the market valuation of that firm. The valuation presumably depicts the present value of expected returns from strategic investments.

In a perfectly frictionless and informed economy, competition enhances the efficiency of aggregate investments, but results in no gains for any one firm over a longer time period (Barney, 1991; Wernerfelt & Montgomery, 1986). In this setting, strategic investments of firms can not be expected to significantly impact returns to shareholders since enterprises are not confronted with growth prospects. However, if there are no prospects for firm growth, there could not be incentives to make further investments in a firm (Porter, 1980; Rumelt, 1984, 1987). Alternatively, a number of mainstream economists (Harbison, 1956; Harberger, 1959) have suggested that while some firms may have zero growth opportunities, others may have substantial growth opportunities. Leibenstein (1966) likewise has argued that firms will have divergent growth opportunities because not all "individuals nor firms work as hard, nor do they search for information as effectively as they could" (1966: 407). Further, Leibenstein (1966) has more broadly asserted that a firm's growth potential is contingent on industry environment, quality of management, worker selection, and incentives within that firm. Accordingly, the efficiency of firms' further inward investments is determined by their growth prospects. Thus, with new capital investments or technological change, firms may have various changes in their level of efficiency because of differences in their growth opportunities.

Firms' strategic investments have been examined in an agency theory context. For instance, concentrated ownership is associated with a lessening of agency conflict, is postulated to result in higher corporate R & D spending. Diffused shareholdings, related to an increase in agency costs, are conjectured to detract from an emphasis on the firm's technological developments (Hill & Snell, 1988) or divert funds away from innovative projects (Hitt, Hoskisson, & Ireland, 1991). Similarly other agency theory studies conclude that leveraged buyouts hurt strategic investments that are ordinarily beneficial for shareholders (Long & Ravenscraft, 1993). However, such conclusions are misleading because not all enterprises may benefit from enhanced strategic investments.

It could be argued that in some situations higher levels of strategic investments might be reflective of agency problems. On this point, Hirshleifer (1993) and Holmstrom and Ricart i Costa (1986) have contended that managers tend to have an incentive to build their reputations in the short-run, even at the expense of long-run corporate value, by promoting further firm investments. Managers can personally benefit from myopic strategic firm investments, which can contribute to their private short-term reputation-building efforts, but these managers may not suffer the long-run costs that accrue to firms and their owners. Under these circumstances, an increase in strategic investments benefit the agent, but at a substantial cost to the owners. The limitation of these studies is that while higher levels of strategic investments may benefit some firms – in our view those with growth opportunities – they are not appropriate for all firms.

Other literature streams, however, adopt a more realistic view of the firm and its growth potential. For example, in industrial organization theory, differences in growth opportunities among firms are thought possible (Bain, 1956; Barney, 1991). In this theory, differences in growth rates have been largely attributed to industry entry (Scherer & Ross, 1990) and mobility barriers (Caves & Porter, 1977). Accordingly, these barriers tend to limit the number of rivals, enabling growth opportunities for enterprises. Axiomatically, attractive industries tend to have relatively high barriers, while unattractive industries have comparatively low barriers. Additionally, in studies associated with this stream of research on strategic investments, it has been concluded that aggregate industry characteristics may determine the effect of such investments. Industry characteristics that are presumably conducive to beneficial outcomes associated with further investments include higher technological settings (Chan et al., 1990), industry investment norms (Jose et al., 1986), or industries with a prevalence of manufacturing firms (McConnell & Muscarella, 1985). Doukas and Switzer (1992) have indicated that strategic investments have a greater positive impact in more concentrated industries. Studies of strategic investments, contingent on industry characteristics, presume that the nature of an industry could fully explain whether or not further inward investments might be beneficial to a firm. In our view, the conclusion that industry characteristics comprehensively determine the potential benefit of further investments may be ambiguous, as firms in the same industry have different prospects. In other words, we contend that within an industry, the examination of strategic investments in isolation of the moderating effect of a firm's growth opportunity is limiting.

In resource-based theory, differences in growth prospects have been primarily attributed to a firm's internal resources and capabilities (Barney, 1991; Grant, 1991; Penrose, 1959). Penrose (1959) has argued that although growth opportunities of firms are driven by external conditions, internal factors are the prominent determinants of growth. In a similar vein, Wright and colleagues have contended that some "firms may have growth opportunities because of valuable internal resources or locations in attractive industries" (Wright et. al. 1996: 444). In this study, we maintain that a firm's growth opportunity moderates the potential benefit of further inward investments in that firm. Consequently, we could argue that some firm have growth opportunities while others may not, contingent on whether or not their internal resources and capabilities are valuable, rare, imperfectly imitable, or imperfectly substitutable.

We propose that the concept of growth opportunity is critically relevant to investment decisions. Indeed, our theoretical expectation is that a firm's growth opportunity may moderate the impact of its strategic investments. That is because a firm could have growth opportunity not only because of its location in attractive industry niches, but also because of its valuable internal resources. Thereby, consistent with other works (e.g., Wright, et al., 1996), we contend that some firms have growth opportunities whereas others may not, contingent on their internal resources and their capability to locate their operations in attractive industry niches. We argue that a firm's growth opportunity may prominently determine whether strategic investments should be increased or decreased by that firm.

More specifically, in our study, we argue that for firms with growth opportunities, higher capital investments may enhance the returns to shareholders and, reduced inward investments lower the returns to shareholders. For enterprises, lacking in growth opportunities, however, we contend that an increase in capital spending reduces the returns to equityholders. Alternatively, a decrease in capital investments may enhance the returns to stockholders. Our discussion is reflected in the following hypotheses:

H_1: For firms lacking in growth opportunities, announcements of increases (decreases) in capital investments will have a negative (positive) impact on returns to shareholders.

H_2: For firms with growth opportunities, announcements of increases (decreases) in capital investments will have a positive (negative) impact on returns to shareholders.

3. Sample Construction And Methodology

Over a 15-year period (1981-1995), 425 capital investment decision announcements are collected from the Nexis/Lexis services. For each capital investment decision, an announcement date is identified as the earlier of the date the capital investment decision is announced in the *Wall Street Journal* or the date the announcement first appears in other major newspapers or newswires covered by the Nexis/Lexis services. Only those announcements that meet the following criteria are maintained in our sample. First, announcements must convey changes in capital investments. Second, announcements must contain definite plans rather than conjectures or speculations about future capital investments. Third, announcements must be made by firms whose complete daily return data during the study period are available from the NYSE/AMEX or NASDAQ files on the Center for Research in Security Prices (CRSP) tape. These criteria reduce our final sample to 308 announcements of changes in capital investments.

In both financial economic and management literatures it has been proposed that Tobin's *q* can represent the existence of growth opportunities for firms (Denis, 1994; Lang, Stulz, & Walkling, 1989, 1991; Lindenberg & Ross, 1981; Pilotte, 1992; Wright, et al., 1996). Tobin's *q* is defined as the market value of a firm standardized by the replacement cost of its assets. Consistent with the preceding works (Lang, Stulz, & Walkling, 1989, 1991; Lindenberg & Ross, 1981), we contend that a firm's growth opportunity, as a categorical variable, moderates the effect of its strategic investment decisions upon returns to shareholders. In this context, firms with *q*'s in excess of unity are underinvested, and their value is largely driven by the existence of growth opportunities. These growth opportunities may be due to internal firm-specific factors as well as to locational advantages in attractive industry niches.

Firms with *q*'s of less than unity can be judged as over-invested, lacking a set of profitable new investment projects. Firms lack growth opportunities because of limitations in their external environments, such as their location in declining industry niches. Enterprises may also lack growth opportunities because their internal resources are not valuable, rare, imperfectly imitable, or without equivalent substitutes, rendering them inefficient and technologically stagnant. We calculate Tobin's *q* ratio for each company using the method suggested by Lindenberg and Ross (1981). Tobin's *q* is measured as of the year ending just prior to the capital investment announcement. Using the data in the Compustat industrial files, GNP deflator, and bond yields, we first calculate the market value of firms and the replacement cost of assets (see Appendix A for a detailed explanation of the procedure). Tobin's *q* is then obtained by dividing the market value by the replacement cost.

We use the event study methodology to measure abnormal stock price movements around capital investment announcements. This methodology has been used in prior financial research (Brown &Warner, 1980; Denis, & Denis, 1995; Peterson, 1989). According to Peterson (1989), it is a post mortem analysis useful to empirically study many interesting hypotheses. The estimation period is from -150 to -31 days prior to announcements. The event period is defined as 30 days before the announcement through 10 days after the announcement. Daily stock return data during the study period (-150 days before and through 10 days after the announcement) are obtained from the CRSP files. In our method, we let R_{it} designate the stock return of firm *i* on day *t*. The abnormal return of firm *i* (AR_{it}) during the event period is derived using the following formula:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}), \tag{1}$$

where R_{mt} is the CRSP value-weighted market return on day *t*, and α_i and β_i are Scholes-Williams estimates of market model parameters during the estimation period. [(1)]

Next, the standardized abnormal return of firm *i* on day *t* (SR_{it}) during the event period is calculated using the following formula:

$$SR_{it} = \frac{AR_{it}}{\hat{\sigma}_{it}}, \tag{2}$$

$$\sigma_{it} = \sigma_i \left(1 + \frac{1}{120} + \frac{(R_{mt} - R_m)^2}{\sum_{\tau=-150}^{-31} (R_{m\tau} - R_m)^2} \right)^{1/2} \tag{3}$$

where R_m is the average market return during the estimation period, and σ_i is the standard deviation of firm *i*'s market model residuals (equation 3),. (2) The average standardized abnormal return on day *t* (SAR_t) is then obtained by averaging the standardized abnormal return over all *i*, i.e., $SAR_t = \Sigma_i SR_{it}/N$, where *N* is the number of announcements. The cumulative standardized abnormal return ($CSAR_\tau$) is measured by the intertemporal summation of the average standardized abnormal returns over a given period, i.e., $CSAR_\tau = \Sigma_\tau SAR_t/(\tau-v+1)^{1/2}$, where Σ_τ denotes the summation over $t = v$ through τ, where v and τ are, respectively, the beginning and ending day of each *CSAR* calculation. We then use the following statistics to test whether SAR_t differs from zero;

$$Z_t = SAR_t \sqrt{N}, \tag{4}$$

and to test whether $CSAR_t$ differs from zero;

$$Z_\tau = CSAR_\tau \cdot \sqrt{N}. \tag{5}$$

When corporate announcements increase the variance of returns, the above test tends to unfairly reject the null hypothesis (see Brown & Warner, 1985; Kalay & Lowenstein 1985; Rosenstein & Wyatt, 1990). To check the sensitivity of our results with respect to event-induced variance changes, we also employ the event-study method developed by Boehmer, Musumeci, and Poulsen (1991). These authors suggest the following (See following page.) statistics to test whether SAR_t and $CSAR_\tau$ are different from zero:

Here, $CSR_{i\tau}$ is the cumulative standardized abnormal return for stock *i*, T_t and T_τ are *t*-distributed random variables, and all other variables are the same as those previously defined. This study seeks to answer whether changes in capital investments have systematically different effects on the share prices of high- and low-*q* firms (those with growth opportunities and those lacking in growth potential). Hence, we calculate abnormal returns associated with announcements for the group of high-*q* firms as well as for the group of low-*q* firms.

$$T_t = SAR_t \left(\frac{N-1}{\sum_{i=1}^{N} \left(SR_{it} - SAR_t \right)^2} \right)^{1/2} \quad (6)$$

$$T_t = CSAR_t \left(\frac{N-1}{\sum_{i=1}^{N} \left(CSR_{it} - CSAR_t \right)^2} \right)^{1/2} \quad (7)$$

To examine the sensitivity of our results, abnormal share price changes are also measured using mean-adjusted returns (Brown & Warner, 1980). Excess returns are measured by subtracting the mean return during the estimation period from daily stock returns during the event period. The results are qualitatively identical to those presented here.[3] Consequently, we conclude that our results are quite robust and not sensitive to how the abnormal returns are measured.

Recall that we have argued that the limitation of studies of strategic investments, contingent on industry characteristics, is their presumption that the nature of an industry could fully explain whether or not further inward investments may be beneficial to a firm. In such studies (e.g., Chan et al., 1990), a prominent conclusion is that strategic investments have different impacts in low-technology versus high-technology industries. To establish the extent to which any linear relationships between growth opportunities and the market reaction to announcements are widespread, we classified our sample firms into high- or low-technology firms according to the classification scheme in *Business Week*'s Annual R & D Scoreboard. This data and classification criteria has been used by several researchers (for example, Dugal, & Morbey, 1995). We run the following regression model for the group of firms in high-technology industries as well as for the group of firms in low-technology industries[4]:

$$SR_{i0} = b_0 + b_1 D_{LD} + b_2 D_{HI} + b_3 D_{HD} + e_i, \quad (8)$$

where SR_{i0} is the standardized abnormal return of stock i on the announcement date, D_{LD} is a dummy variable representing announcements by the low-q firms of decreases in capital investments, D_{HI} is a dummy variable representing announcements by the high-q firms of increases in capital investments, D_{HD} is a dummy variable representing announcements by the high-q firms of decreases in capital investments, and e_i is an error term. The intercept term (b_0) captures the market's reaction to announcements by the low-q firms of increases in capital investments. We use the market model abnormal returns and the mean-adjusted abnormal returns to estimate the regression equation.

We expect that $b_0 < 0$, $b_1 > 0$, $b_2 > 0$, and $b_3 < 0$, whether the above regression model is estimated using the sample of firms in high-technology industries or those in low-technology industries. In other words, if a firm's industry has exclusive bearings on market reactions to capital investment decisions (as previous studies have concluded), we would observe otherwise. For example, if announcements increases in capital investments by firms in low-technology industries are negatively received, similar announcements by firms in high-technology industries are favorably received by the market, one would expect a positive b_2 for high-technology firms, but negative for low-technology firms.

4. Results and Discussion

In Table 1, we present a summary description of capital investment announcements made by the group of high-q (i.e., $q \geq 1$) and low-q companies (i.e., $q < 1$) for the study period. During the study period, our sample of high-q companies made 73 announcements of capital investment increases and 33 announcements of capital investment decreases. The low-q companies made 131 announcements of capital investment increases and 71 announcements of decreases.

Table 1
Sample description of Capital Investment Announcements During the Time Period

Type of firms	Increase in capital investments	Decrease in capital investments
High-*q* firms[a,b]	131	71
Low-*q* firms[c]	73	33
Whole sample	204	104

[a]Tobin's *q* is calculated using the Lindenberg and Ross (1981) procedure.
[b]Firms with *q* ratios of greater than unity; [c]Firms with *q* ratios of less than unity.

In Tables 2a and 2b, we present the size of capital investment changes as measured by the percentage change from the previous year. Table 2a shows the summary statistics (the mean, median, minimum, and maximum values of these changes) for high-*q* firms and table2b presents these statistics for low-*q* firms. For the high-*q* firms, the mean value of increases in capital budget is 28.81%, while the mean value of decreases in capital budget is -26%. For the low-*q* firms, the corresponding figures are 36.66% and -34.77%, respectively. These results indicate that our sample of firms made significant year-to-year changes in their capital budgets, although low-*q* companies made larger yearly capital investment changes than high-*q* companies.

TABLE 2A
Descriptive Statistics on Investment Changes in High-q firms

	Firms in high-technology industries		[a]Firms in low-technology industries		Whole sample	
	Increase	Decrease	Increase	Decrease	Increase[b]	Decrease
Average	24.21	-19.73	32.82	-31.22	28.81	-26.00
Median	20.00	-16.00	29.00	-28.50	25.00	-25.00
Minimum	3.00	-50.00	2.00	-70.00	2.00	-70.00
Maximum	79.00	-4.00	100.00	-1.00	100.00	-1.00
Sample Size	34	15	39	18	73	33

TABLE 2B
Descriptive Statistics on Investment Changes in Low-q firms

	Firms in high-technology industries		[a]Firms in low-technology industries		Whole sample	
	Increase	Decrease	Increase	Decrease	Increase[b]	Decrease
Average	30.64	-25.81	38.94	-38.54	36.66	-34.77
Median	19.50	-29.00	25.00	-25.50	20.00	-26.00
Minimum	2.00	-50.00	2.00	-500.00	2.00	-500.00
Maximum	174.00	-4.00	900.00	-3.00	900.00	-3.00
Sample Size	36	21	95	50	131	71

[a]Sample firms are classified into high- or low-technology firms according to the classification scheme in *Business Week*'s Annual R & D Scoreboard.
[b]The change in capital investment is measured in terms of the percentage change from the previous year's figure.

In Tables 3a and 3b on the following pages, we report both the average abnormal returns ($AAR_t = \Sigma_i AR_{it}/N$) and the average standardized abnormal returns ($SAR_t = \Sigma_i SR_{it}/N$) for each day during the time period -5 through +5 days. We also report the cumulative average abnormal returns ($CSAR_\tau$) and the cumulative standardized abnormal returns ($CSAR_\tau$) for days -30 through –6 and for days 6 through 10, in four sub-periods and one sub-period respectively.[(5)] The results in Table 3a show that the market on average reacts favorably to announcements of increases in capital investments by high-*q* firms. Both *Z* and *T* statistics indicate that excess returns on the announcement day are positive and significant. Moreover, the number of positive standardized abnormal returns (*SR*) is significantly greater than the number of negative *SR* on the announcement day, suggesting that the results are not due to a few large outliers. Succinctly put, the market reacts unfavorably to decreases in capital investments by these firms.

In Table 3b, the results show that the share price changes associated with announcements of increases in capital investments by low-*q* companies are quite different than those associated with the same announcements by high-*q* firms. The findings indicate that firms lacking in growth opportunities experience significant share price decreases around such announcements. Both *T* and *Z* statistics indicate that abnormal returns on select days are significantly negative for firms lacking in growth opportunities. The abnormal returns associated with corporate announcements of decreases in capital investments are also systematically different between the groups of high- and low-*q* companies. Our results indicate that such announcements made by low-*q* companies are received favorably by the market. These results support of hypotheses H_1 and H_2.

The results in Table 4 show that the market reacts favorably to the announcements of increases in capital investments by the group of high-*q* firms in both high- and low-technology industries. Regardless of their industry affiliations, the market reacts favorably to the announcements of decreases in capital investments by the group of low-*q* firms. Note, however, that market reactions to announcements of increases in capital investments by low-*q* firms (in low-technology or high-technology industries) are in the hypothesized direction but not consistently statistically significant. Also, impacts of announcements of decreases in capital investments for the high-*q* firms, although in hypothesized direction, are not consistently significant.

Table 4
Regression results of Standardized Abnormal Returns

	Firms in low-technology Industries		Firms in high-technology Industries	
	Market model abnormal return	Mean-adjusted abnormal return	Market model abnormal return	Mean-adjusted abnormal return
Intercept[a]	-0.1698 (-1.32)[e]	-0.1326 (-1.01)	-0.3721 (-2.15*)	-0.2119 (-1.30)
Low *q* / decrease in capital investment dummy[b]	0.6300 (2.88**)	0.6299 (2.81**)	0.7953 (2.79**)	0.7507 (2.80**)
High *q* / increase in capital investment dummy[c]	0.6024 (2.53**)	0.4578 (1.88*)	0.7438 (2.99**)	0.5130 (2.20*)
High *q* / decrease in capital investment dummy[d]	-0.6650 (-2.07*)	-0.8227 (-2.49*)	-0.0495 (-0.16)	0.2132 (-0.71)
F statistic	6.980**	6.943**	4.969**	4.534**
Adjusted R^2	0.0819	0.0815	0.1019	0.0917

a The intercept term captures the abnormal return associated with announcements of increases in capital investment made by low-*q* companies (firms with $q < 1$).

b Dummy variable representing announcements of decreases in capital investments made by low-*q* companies (firms with $q < 1$).

c Dummy variable representing announcements of increases in capital investments made by high-*q* companies (firms with $q > 1$).

d Dummy variable representing announcements of decreases in capital investments made by high-*q* companies (firms with $q > 1$).

e Figures in parentheses are t-statistics.

* $p < .05$, ** $p < .01$

TABLE 3A

Abnormal Returns for announcements of Capital Investment Changes of high-q firms

Event day	Increases in capital investments				Decreases in capital investments			
	$CAAR_{\tau}$[a] or AAR_t	$CSAR_{\tau}$[b] or SAR_t	*Z* Statistic	*T* statistic	$CAAR_{\tau}$[a] or AAR_t	$CSAR_{\tau}$[b] or SAR_t	*Z* statistic	*T* statistic
-30 to -21	-0.0066	-0.1358	-1.160	-1.366	0.0023	-0.0291	-0.167	-0.134
-20 to -16	-0.0023	-0.0590	-0.504	-0.480	-0.0013	-0.0361	-0.207	-0.209
-15 to -11	0.0065	0.1520	1.299	1.255	-0.0016	0.0206	0.118	0.126
-10 to -6	-0.0016	0.0007	0.006	0.005	-0.0098	-0.2040	-1.172	-1.1270
-5	0.0013	0.0790	0.675	0.712	-0.0009	0.0428	0.246	0.179
-4	0.0005	0.0834	0.712	0.593	0.0028	0.2447	1.406	1.133
-3	-0.0036	-0.1486	-1.270	-1.355	0.0016	0.1756	1.009	0.786
-2	0.0023	0.1445	1.235	1.227	0.0026	0.0578	0.332	0.247
-1	0.0004	0.0294	0.251	0.301	-0.0002	-0.0689	-0.396	-0.354
0	0.0075	0.4043	3.454**	3.371**	-0.0115	-0.6470	-3.716**	-2.588**
1	-0.0015	-0.1073	-0.917	-0.840	-0.0004	-0.0921	-0.529	-0.355
2	-0.0036	-0.2000	1.705	-1.940	-0.0030	-0.1249	-0.718	-0.577
3	0.0027	0.0762	0.651	0.622	0.0061	0.3999	1.787	1.861
4	0.0020	-0.0010	-0.008	-0.008	0.0021	0.0831	0.477	0.495
5	-0.0007	-0.0311	-0.266	-0.314	0.0022	0.1101	0.632	0.544
6 to 10	0.0008	-0.0023	-0.020	-0.020	-0.0013	-0.0877	-0.504	-0.502

[a] The average abnormal return ($AAR_t = \Sigma_i AR_{it}/N$), where AR_{it} is calculated using the market model corrected for non-synchronous trading. The cumulative average abnormal return ($CAAR_{\tau}$) is measured by the intertemporal summation of the average abnormal returns over a given period, i.e., $CAAR_{\tau} = \Sigma_{\tau} AAR_t$, where Σ_{τ} denotes the summation over $t = v$ through τ.

[b] The average standardized abnormal return ($SAR_t = \Sigma_i SR_{it}/N$). The cumulative standardized abnormal return ($CSAR_{\tau}$) is measured by the intertemporal summation of the average standardized abnormal returns over a given period, $CSAR_{\tau} = \Sigma_{\tau} SAR_t/(\tau-v+1)^{1/2}$, where Σ_{τ} denotes the summation over $t = v$ through τ.

[c] No:+/No:- denote the numbers of positive and negative standardized abnormal returns.

* $p < .05$

** $p < .01$

TABLE 3B
Abnormal Returns for announcements of Capital Investment Changes of low-q firms

Event day	Increases in capital investments				Decreases in capital investments			
	$CAAR_{\tau}$[a] or AAR_t	$CSAR_{\tau}$[b] or SAR_t	Z Statistic	T Statistic	$CAAR_{\tau}$[a] or AAR_t	$CSAR_{\tau}$[b] or SAR_t	Z statistic	T statistic
-30 to -21	-0.0063	-0.0650	-0.744	-0.694	-0.0044	-0.0947	-0.798	-0.635
-20 to -16	0.0008	0.0088	0.1004	0.099	0.0032	-0.0222	-0.187	-0.168
-15 to -11	-0.0042	-0.1443	-1.652	-1.370	-0.0010	0.0149	0.126	0.114
-10 to -6	0.0013	0.0141	0.162	0.167	-0.0053	-0.1002	-0.844	-0.947
-5	-0.0006	-0.0662	-0.758	-0.757	-0.0008	-0.1370	-1.154	-1.213
-4	0.0005	0.0765	0.875	0.816	0.0005	0.0172	0.145	0.109
-3	-0.0025	-0.1848	-2.115*	-2.278*	0.0024	0.1764	1.486	1.122
-2	0.0010	0.0592	0.678	0.643	0.0017	0.1182	0.996	0.881
-1	-0.0002	-0.0225	-0.257	-0.261	0.0029	0.1338	1.127	1.141
0	-0.0038	-0.2254	-2.578**	-2.483**	0.0066	0.4493	3.786**	2.669**
1	0.0004	0.0332	0.381	0.388	0.0005	0.0762	0.642	0.597
2	0.0016	0.0603	0.670	0.806	0.0015	0.0626	0.528	0.524
3	-0.0004	-0.0309	-0.354	-0.366	0.0017	0.1405	1.184	1.066
4	0.0009	0.0667	0.764	0.762	0.0004	0.0130	0.109	0.100
5	-0.0023	-0.2371	-2.714*	-2.069*	0.0016	0.1482	1.249	1.202
6 to 10	-0.0025	-0.0050	-0.058	-0.057	0.0031	0.0729	0.614	0.468

[a] The average abnormal return ($AAR_t = \Sigma_i AR_{it}/N$), where AR_{it} is calculated using the market model corrected for non-synchronous trading. The cumulative average abnormal return ($CAAR_{\tau}$) is measured by the intertemporal summation of the average abnormal returns over a given period, i.e., $CAAR_\tau = \Sigma_\tau AAR_t$, where Σ_τ denotes the summation over $t = v$ through τ

[b] The average standardized abnormal return ($SAR_t = \Sigma_i SR_{it}/N$). The cumulative standardized abnormal return ($CSAR_\tau$) is measured by the intertemporal summation of the average standardized abnormal returns over a given period, $CSAR_\tau = \Sigma_\tau SAR_t/(\tau - v+1)^{1/2}$, where Σ_τ denotes the summation over $t = v$ through τ

[c] No:+/No:- denote the numbers of positive and negative standardized abnormal returns.

* $p < .05$

** $p < .01$

More specifically, announcements of increases in capital investments by firms lacking in growth opportunities are negatively but insignificantly associated with abnormal returns in low-technology industries. Further, such announcements significantly and negatively impact abnormal returns in high-technology industries, but only when the market model is utilized (not when the mean-adjusted method is employed). Announcements of decreases in capital spending by firms with growth opportunities are significantly negative in low-technology industries but not in high-technology industries.

Evidently, in settings of low- versus high-technology industry environments, the market's response to corporate announcements is asymmetric between good and bad decisions. That is, the market tends to respond consistently and strongly to good decisions (e.g., increases in capital investments by high-*q* firms or decreases in capital spending by low-*q* firms). But the market's reaction is less consistent or prominent for bad decisions (e.g., decreases in capital investments by high-*q* firms or increases in capital investments by low-*q* firms). These findings are puzzling and, reverting to our hypotheses, represent only partial support for them. Why should the market's ability to recognize value-increasing decisions differ from its ability to recognize value-decreasing decisions when we focus our analyses on firms in low- and high-technology industry environments?

We offer a speculative response to the preceding question. Perhaps agency conflict has become evident at this level of analysis due to information asymmetry. It has been argued that self-serving senior executives may be able to cultivate information asymmetry (between insiders and outsiders) in the short-term in order to personally benefit, but at a significant cost to the shareholders. Accordingly, some agency problems may result in unnecessary inward investments by firms (Hirshleifer, 1993; Holmstrom & Ricart i Costa, 1986). In this situation, presumably in building their short-term reputations, some managers may cultivate information asymmetry and promote enhanced firm investments even when such investments could be wasteful because of lack of growth opportunities. Yet other managers reduce strategic investments in the presence of growth opportunities perhaps to show their concern for further cost savings. However, these reduced investments may enhance immediate cash flows, enabling the managers to fund their pet projects but at a substantial cost to the shareholders (Jensen, 1986; Jensen & Murphy, 1990). We emphasize that outsiders, due to information asymmetry, are not immediately capable of evaluating that such agency driven decisions are poor.

Some researchers (Kelm et al., 1995) have suggested that capital markets positively evaluate corporate capital investment efforts within the parameters of type or stage of investment projects. High-technology firms with high-q are usually in the early stages of their life cycle. Although such firms possess good growth opportunities, they could reduce their capital expenditure temporarily to address other issues associated with enormous growth. Investor response could be more lenient as a stagnant outlook (short-term) may be offset by a positive future prospect. In a similar vein, low-tech/low-q companies in the later stages of their life cycle may be willing to diversify. A less severe market response to increase in capital investment by such firms could be based on the expectation of creating future growth opportunities. This is perchance reflected in our results being in the hypothesized direction but not significant. (6)

5. Conclusion and implications

Studies of effects of strategic investments have largely consisted of analyses of their aggregate influence on firms or the impact they may have on enterprises, contingent on industry characteristics, or alternatively in the context of agency conflict. While these studies have significantly increased our understanding of effects of strategic investments on firms, they are limited because they have not theoretically identified what determines the potential benefit of these investments. Thus, we have not been able to predict for which firms further inward investments may be beneficial. A firm’s growth potential is theoretically be an important predictor of outcomes associated with its strategic investment decisions. Even where past capital equipment was largely identical, significant differences in firms’ subsequent productivity/output can be observed within industries, based on growth prospects of firms investing further in capital upgrades. Thus, it is likely that past studies of capital expenditure announcements have underestimated the value of growth opportunities in both high-tech and low-tech industries

In our study, we used several contemporary theories to argue that a firm's growth opportunity provide us with further insights on whether increases or decreases in strategic investments may contribute to shareholder returns. We find several interesting results pertaining to the impact of potential investment decision. We have demonstrated that the relationship of investment decisions and the wealth effects of related announcements is moderated by the firms' growth opportunities. Our approach supplements traditional analysis by enabling more meaningful interpretations of evaluation of capital investment i.e. integrated within the overall strategic opportunity rather than in isolation.

While we have found consistent empirical support for "good" managerial investment decisions, our second main finding is that the results are not consonantally significant regarding "bad" investment decisions. If bad decisions are reflective of agency problems (Holmstrom & Ricart i Costa, 1986; Jensen, 1986; Jensen & Murphy, 1990), however, they may not always be immediately evident. That is, to the extent that abusive agents are able to cultivate information asymmetry in the shorter term (Hirshleifer, 1993), bad decisions may not immediately be subject to accurate evaluation in financial markets. Consequently, the existence of this possibility may explain the lack of consistently significant results regarding bad managerial decisions. Nevertheless, we believe our theoretical discussion and empirical findings suggest that a firm's growth opportunity is a valuable forecaster of the potential beneficial impact of its investment decisions.

6. Suggestions for Future Research

Several questions are raised by the current study. Does the stock market evaluate investment decision announcements in isolation, or does the past investment pattern of the firm affect its reaction? Would the stock market differentiate between diverse long-term investment? The current research focuses on capital expenditure decision that may be more applied. Other long-term investments such as R&D expenditures may be more speculative and invoke a different pattern of response. We have not distinguished between these two types of expenditure. Also, we did not address the issue of a potentially varied response from different institutional investors(7). Future research might address some of these limitations. Future studies could differentiate between two types of expenditure announcements: (1) research and development expenditures and (2) large capital expenditure announcements. Further research could examine the extent to which past success effects evaluation of current capital investment decisions.

Endnotes

1 Scholes-Williams estimates of market model parameters are calculated using the formulae:

$$\hat{\alpha}_i = \frac{1}{120} \sum_{t=-150}^{-31} \left(R_{it} - \hat{\beta}_i R_{mt}\right); \hat{\beta}_i = \frac{\beta_i^- + \beta_i^0 + \beta_i^+}{1 + 2\rho_m}$$

.

Here, β^-_i, β^0_i, and β^+_i are, respectively, the values of $cov(R_{it}, R_{mt-1})/\sigma(R_{mt})\sigma(R_{mt-1})$, $cov(R_{it}, R_{mt})/\sigma(R_{mt})\sigma(R_{mt})$, and $cov(R_{it}, R_{mt+1})/\sigma(R_{mt})\sigma(R_{mt+1})$ during the estimation period t = -150 to -31. ρ_m is the first-order autocorrelation coefficient of the value-weighted market return during the estimation period (see Scholes & Williams 1977, p. 317).

2 See Warner, Watts, and Wruck (1988) for the description of this methodology.

3 The results are available from the authors upon request.

4 See Lang, Stulz, and Walkling (1989) for this methodology.

5 $CAAR_\tau$ is measured by the intertemporal summation of the average abnormal returns over a given period, i.e., $CAAR_\tau = \Sigma_\tau AAR_t$, where Σ_τ denotes the summation over $t = \upsilon$ through τ, where υ and τ are, respectively, the beginning and ending day of each *CAAR* calculation.

6 We would like to thank our reviewer for pointing this explanation of our results.

7 We would like to thank our reviewer for pointing this limitation of our study.

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Appendix A
Calculation of Tobin's *q*

Tobin's *q* is defined as the ratio of the market value of assets to the replacement cost of assets. We used computational procedures as suggested by Lindenberg and Ross (1981).

Calculation of market value of assets

The market value of a firm's assets is the summation of the market values of common stock, preferred stock, short-term liabilities, and long-term debt.

i. *Market value of common stock*: The market value of common stock is obtained by multiplying the fiscal-year-end closing price (Compustat Data #24) by the number of common shares outstanding (#25).

ii. *Market value of preferred stock*: The market value of preferred stock is obtained by the capitalized value of preferred dividends (#19), where the yield on medium-grade industrial bonds (from Moody's Industrial Manual) is used as the discount rate.

iii. *Market value of short-term liabilities and long-term debt*: We use the book value of current liabilities (#5) as an estimate of their market value. The market value of long-term debt is calculated using the Lindenberg and Ross procedure.

The book value of long term debt (#9) can be decomposed into two components: debt with known maturity and debt with unknown maturity. The known maturity portion consists of bonds maturing in year 2 through year 5 (#91, #92, #93, #94) and bonds issued in the current year (which is assumed to mature in 20 years).

The unknown maturity portion of debt is equal to the difference between the total long term debt and the known maturity debt [i.e., #9 - (#91 + .. + #94 + #111)]. We assume that the unknown maturity debt is distributed evenly over the years for which the maturity information is not available (i.e., year 6 to year 19 relative to the current year). We assume that debt maturing in year t has been issued in year t-20 with a coupon rate equal to the average yield for BAA bonds obtained from Moody's Investors Service.
Then we discount these payments with the bond yield from the current year to obtain the estimate of the market value of debt for that year.

Replacement cost of assets

Assets of a firm can be categorized into four groups: quick assets (i.e., current assets, excluding inventory), inventory, plant and equipment, and investments in unconsolidated subsidiaries, intangibles and other investments. The replacement costs of these assets are calculated using the following procedures.

i. *Quick assets*: The book value of quick assets (#4 - #3) is used as the proxy for their replacement costs.

ii. *Inventory:* If the firm uses the FIFO method of accounting, the replacement cost of inventory (RVINV) equals its book value (#3). If the firm uses LIFO, the following adjustment is made. In the base year, *t*, $RVINV_t$ is set equal to the book value (#3). RVINV in the following year is calculated by adjusting for the inflation and the change in the inventory. For example, $RVINV_{t+1}$ equals $RVINV_t x(1+I_{t+1}) + (\#3_{t+1}-\#3_t)$, where I_{t+1} is the rate of inflation and #3 is the book value of inventory in each year. If the firm uses more than one method of inventory valuation, the book values are combined with the adjusted values using weights derived from the ranking of methods reported in Compustat (#59). The following weights are from McConnell and Servaes (1990):

Reported number of inventory valuation method	Rank of LIFO	LIFO as weight
1	1	1
2	1	2/3
2	2	1/3
3	1	1/2
3	2	1/3
3	3	1/6

iii. *Plant and equipment*: The average age (AA) of plant and equipment is assumed to equal the ratio of accumulated depreciation to depreciation for the year (i.e., AA = (#7-#8)/#14). Then the replacement cost (RVPE) is equal to the net value of plant and equipment multiplied by the current GNP deflator and divided by the GNP deflator AA years ago (i.e., RVPE = #8X(GNP_t/GNP_{t-AA}), where GNP_t is the GNP deflator for fixed nonresidential investment in the current year t).

iv. *Investments in unconsolidated subsidiaries, intangibles and other investments:* The same approach in B.2 for the LIFO inventory is used to estimate the replacement value of investments in unconsolidated subsidiaries, intangibles and other investments (#31, #32, #33). Finally, the replacement cost of assets equals the sum of those values determined in B.1 through B.4.